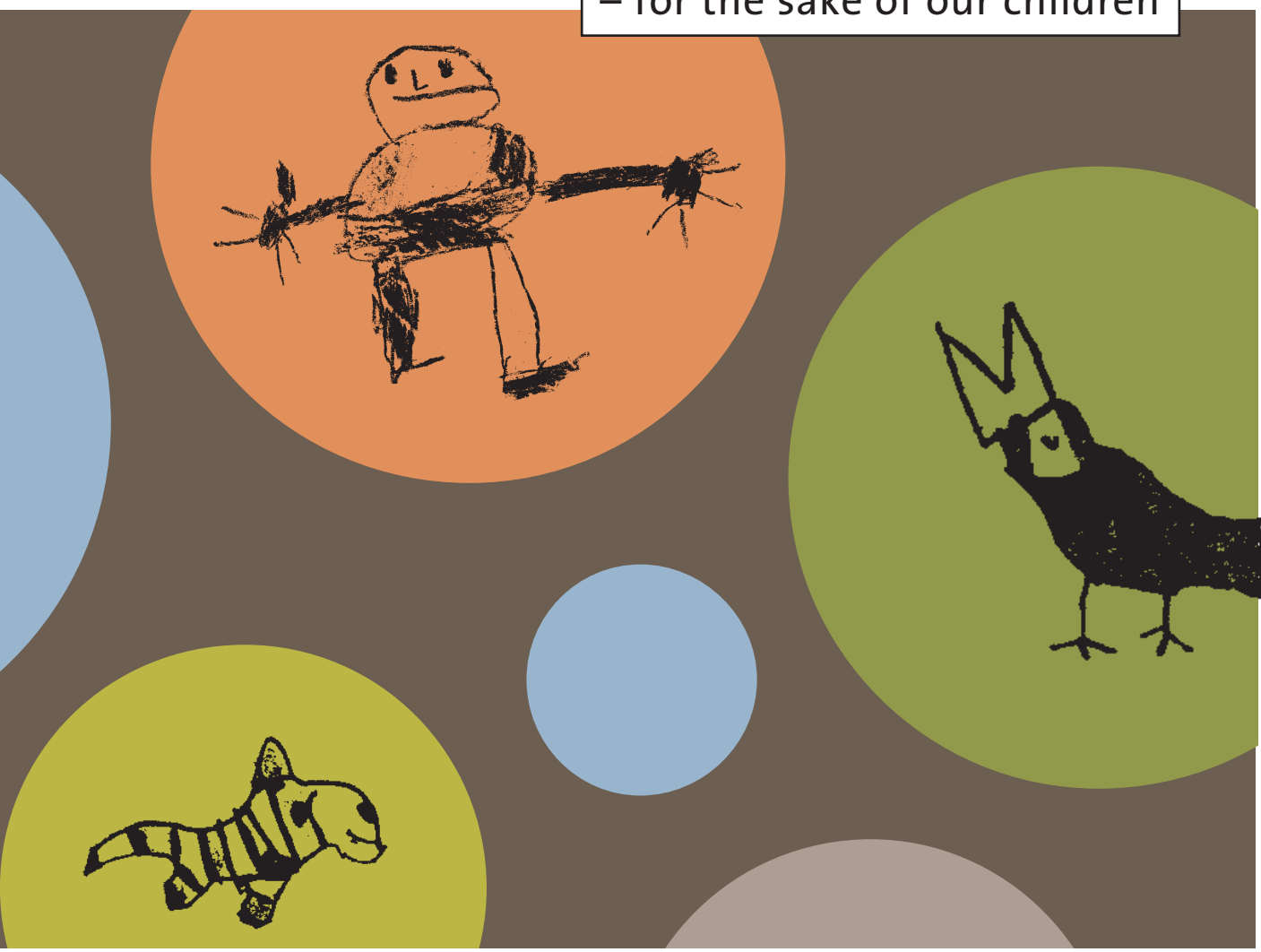
SWEDEN'S ENVIRONMENTAL

objectives

– for the sake of our children



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2005

A PROGRESS REPORT FROM THE SWEDISH ENVIRONMENTAL OBJECTIVES COUNCIL

* target year 2050, as a first step

The environmental objectives – more than the sum of the parts

The environmental quality objectives are more than simply the sum of the interim targets; many other factors and circumstances need to be taken into account to assess progress towards them. The objectives are long-term, whereas – with a few exceptions – the interim targets can be seen as staging posts, to be reached just a year or a few years from now.

The targets do not cover everything required to bring about a satisfactory state of the environment – even more must be done if the environmental quality objectives are to be attained. An objective may therefore prove difficult to achieve, despite favourable assessments on most of the interim targets.

One example of how progress towards an objective depends on so much more than attaining the interim targets is Zero Eutrophication. In this case, two of the targets are expected to be met (indicated by a green smiley). The other three are also within reach, provided that measures beyond those currently foreseen are implemented. And yet there is a considerable risk that the state of the environment which this objective describes will not be attained by 2020. Why? The answer is that much of the nutrient load responsible for eutrophication comes from other countries. In other words, Swedish action alone will not be enough to realize the objective. What is more, the necessary recovery of natural ecosystems will take time.

Will the objectives and targets be achieved?

Assessments have been made of whether the environmental quality objectives will be achieved by 2020 (2050, as a first step, in the case of Reduced Climate Impact) and whether the interim targets will be met within the time-frame set for each of them.

Current conditions, provided that they are maintained and decisions already taken are implemented in all essential respects, are sufficient to achieve the environmental quality objective/interim target within the defined time-frame.

It will be possible to achieve the environmental quality objective/interim target to a sufficient degree/on a sufficient scale within the defined time-frame, but only if additional changes/measures are brought about.

It will be very difficult to achieve the environmental quality objective/interim target to a sufficient degree/on a sufficient scale within the defined time-frame.

Contents

Preface

In April 1999 the Swedish Parliament adopted fifteen national environmental quality objectives, describing what quality and state of the environment and the natural and cultural resources of Sweden are environmentally sustainable in the long term. In a series of decisions from 2001 to 2003, Parliament subsequently adopted a total of seventy-one interim targets, indicating the direction and timescale of the action to be taken to move towards these fifteen objectives.

Ultimately, our efforts to attain the environmental quality objectives are concerned with ensuring that the next generation – our children and grandchildren – and generations to come are able to live their lives in a rich and healthy environment. This, the fourth annual report of the Environmental Objectives Council to the Swedish Government, focuses in particular on the environment of children. It includes a special chapter on this theme, based on data from the 2005 environmental health report of the National Board of Health and Welfare.

The main body of the present report deals with the fifteen environmental quality objectives and the interim targets set for each of them. It also includes brief outlines of the four broader issues that cut across the different objectives: The Natural Environment, The Cultural Environment, Human Health, and Land Use Planning and Wise Management of Land, Water and Buildings.

The diagram on the inside front cover summarizes the Council's assessments of progress towards the objectives and targets, using smiley face symbols. Our assessments answer the questions: Will the environmental quality objectives be achieved by 2020 (or 2050, as a first step, in the case of the climate objective), and will the interim targets be met within the time-frames laid down for each of them?

For further information on Sweden's environmental goals, indicators tracking progress at the national and regional levels, and interesting links to other government agencies and organizations, readers are referred to the Environmental Objectives Portal, www.miljomal.nu.

Lars-Erik Liljelund
Vice-Chairman, Environmental Objectives Council

The environmental objectives – for the sake of our children

A PROGRESS REPORT FROM THE SWEDISH ENVIRONMENTAL OBJECTIVES COUNCIL

'We want to pass on to the next generation a society in which the major environmental problems now facing us have been solved.'

That is the overall environmental goal adopted by the Swedish Parliament. So what does today's environment look like for our youngest citizens, the people who will one day take over the job of shaping our society?

The physical environment in which Swedish children live their lives is good in comparison with most other countries. In general, they enjoy good health, although there are a number of environment-related health risks that need to be addressed.

Damp and mould are a common problem in homes, and one that increases the risk of infant asthma. Children whose parents smoke run a greater risk of developing respiratory conditions and ear infections. In inner city areas, air pollutants in the form of particulates and nitrogen oxides entail an increased risk of impaired lung function in children, with symptoms that can continue into and persist throughout adulthood. Many children are exposed to constant traffic noise, two potential effects of which are sleep deprivation and learning difficulties.

To get to grips with these problems, action needs to be taken at many different levels. We all need to think through what we can do, as parents, property owners or road users. It is also important that local authorities implement the action programmes that have been adopted to meet existing environmental quality standards for air pollutants.

It does children good to be active and spend time in the open air. The Council for Outdoor Recreation has provided funding for projects that encourage children and young people to get out into the countryside. Schools, too, have an important part to play, both in this respect and in creating quieter educational environments.

Will the national goals be achieved?

As in previous years, the Environmental Objectives Council judges the environmental quality objectives Reduced Climate Impact, A Non-Toxic Environment, Zero Eutrophication and Sustainable Forests to be very difficult to attain. The key measures to achieve or move closer to these goals are to be found in the areas of transport, chemicals, forestry and agricultural policy. The upward trend in carbon dioxide emissions from road traffic must be reversed. It is also important to ensure that the EU's new legislation on chemicals (REACH) is rigorous and effective, to gain better control of dangerous substances in new products.

For many of the objectives, trends in the environment are encouraging, but compared with earlier years greater attention needs to be paid to certain issues, including emissions of acidifying substances.

REVISED ASSESSMENTS

Compared with last year, the Council has revised its appraisals of progress towards three of the interim targets. In the case of Clean Air, our assessment for interim target 3 has been changed from a green to a yellow smiley face, since the action taken has not been sufficient to ensure that this target is also met in warm summers, when formation of ground-level ozone peaks.

Interim target 3 under Flourishing Lakes and Streams has also been reassessed from green to yellow. Local authorities' and county administrative boards' efforts to establish water protection areas are progressing, but not sufficiently quickly to meet this target by 2009.

Our appraisal of progress towards interim target 5 under Thriving Wetlands has been revised to a green smiley. More resources have been made available to develop action programmes for threatened species, and it therefore looks as if the target can be met during 2005.

For several of the interim targets, assessments are uncertain. This is the case for target 2 under A Varied Agricultural Landscape, for example: the number of small-scale habitats is constantly changing, but to revise our earlier appraisal in this case, and several others, we would need to have better data.

FURTHER MEASURES NEEDED TO ACHIEVE GOALS

In the in-depth evaluation which it submitted to the Government in February 2004 (abridged English version: *Sweden's environmental objectives – a shared responsibility. An evaluation by the Swedish Environmental Objectives Council*), the Council proposed a range of action which it judged necessary to achieve many of the environmental objectives. At the same time, it pointed out that the most essential thing was that measures already decided on were actually implemented. The Council considered it important, for example, to take greater account of the environmental objectives in the application of the Environmental Code and the Planning and Building Act.

The agencies represented on the Council, which are responsible for the various objectives and broader issues related to them, put forward additional proposals during 2004. Many of these call for measures and policy instruments in the energy and transport sectors, including a green tax shift. Proposals include a vehicle tax differential based on vehicles' carbon dioxide emissions, a distance-based tax on heavy goods vehicles, further funding for research and technological development, and continued support for local climate investment programmes and climate information. Action in these areas is important for several of the objectives, among them Reduced Climate Impact and Clean Air.

Many of the proposals relate to waste management and the drafting of national, EU and international rules on environmentally hazardous and other substances. Such measures are of particular importance for A Non-Toxic Environment and A Good Built Environment. Proposals were also put forward during the year concerning land use planning, valuable cultural environments and improved long-term planning of drinking water supplies.

Regional objectives important for action at a practical level

Regional environmental objectives have now been adopted by all of Sweden's county administrative boards and regional forestry boards. Such goals are intended to give a clearer focus to efforts at the regional level and thus to help achieve the national environmental quality objectives. The basic principle must be that the sum total of these objectives should closely correspond to the national ones. Regional goals have been defined in consultation with local authorities, the business sector and other partners.

Objectives adopted at the regional level should provide a basis, for example, for local environmental goals, land use planning, regional development programmes, local authorities' comprehensive plans, and

regulatory supervision and environmental assessments under the Environmental Code. Environmental objectives still play too limited a role in such contexts. For companies, too, regional goals ought to be more useful than national ones, for example in environmental management systems.

DIFFICULT TO COMPARE NATIONAL AND REGIONAL OBJECTIVES

It is difficult to assess how significant the regional objectives adopted are in achieving the national ones, or what it means when there is a mismatch between the two. Sometimes the regional goals correspond to the national ones, though often they vary in form and in level of ambition. Sometimes different interim targets have been developed, or different measures or target years used. All in all, it is difficult to give an overall picture of how closely the regional goals tally with their national counterparts.

Often objectives have been adjusted to take account of regional differences in natural conditions, settlement structure, principal industries and so on. They may also have been made more relevant to local authorities and businesses, following a dialogue with the parties concerned.

Some county administrative boards have been guided by the instruments and measures they themselves have at their disposal, a consideration which probably explains the unambitious character of several of the regional targets set under A Varied Agricultural Landscape. Here, agricultural policy is a decisive factor, and the boards have little scope to influence the use of different payment and support schemes. Other areas in which they feel they have little power to implement the measures required include A Non-Toxic Environment and A Protective Ozone Layer.

BROADLY SUPPORTED GOALS

In the case of Natural Acidification Only, regional interim targets are usually expressed in the same terms as the national ones and reflect roughly the same level of ambition.

As regards Sustainable Forests, the regional forestry boards have engaged in consultation exercises with, in particular, the private sector, NGOs and other regional authorities. This has resulted in broadly supported goals which often deviate from the national norm, but which, when combined, nevertheless meet the requirements of the national objective. For example, it is widely accepted that the target increase for the quantity of dead wood in forests has been set appreciably higher in the counties of Östergötland and Kalmar (70% and 54%, respectively, compared with the national figure of 40%). The national agency in this area, the National Board of Forestry, has supported these regional discussions by providing basic data and scenarios.

VARYING LEVELS OF AMBITION

For Zero Eutrophication, the level of ambition reflected in regional goals varies. One of the national interim targets is concerned with reducing waterborne emissions of nitrogen. Just over half the regional targets for these emissions are as ambitious as the national one, but so many counties have set a less demanding goal, or none at all, that it is doubtful whether the national target will be met.

As for the corresponding target for ammonia emissions to air, a crucial concern is that the action taken should result in lower emissions in the south of the country. Here, the regional targets call for the same reduction as the national one, although some southern Swedish counties are aiming for larger and some northern counties for smaller reductions. In this case, the differing levels of ambition at least partly reflect where most action needs to be taken.

IMPLEMENTATION IMPORTANT

The most important factors for success in safeguarding the environment are making sure that measures decided on are actually implemented, and maintaining a constructive dialogue that ensures that the need for this is understood and accepted. Most county administrative boards in Sweden have drawn up action

programmes that are linked to their regional environmental objectives. Approaches vary: in some cases these programmes have been formally adopted by the boards, in others they are to be regarded more as internal documents.

One key issue is whether a county administrative board can decide what action is to be taken by other parties, such as local authorities. Several boards have interpreted the position as being that they can only decide on examples of measures, and that it is then up to local authorities and other bodies and organizations themselves to decide what specific action they wish to take.

REGIONAL MONITORING

Regional monitoring of environmental trends against regional goals is an important responsibility of county administrative and regional forestry boards. However, in the case of targets for air quality for example, it is difficult to achieve, as continuous and sufficiently detailed statistics on atmospheric emissions and concentrations are not available at the regional level.

In other areas, too, the range of data collected limits what monitoring is possible. Here the joint system of indicators will be an important tool. Some 70 indicators can now be found on the Environmental Objectives Portal (www.miljomal.nu). Many of these are the same for both national and regional monitoring, but indicators meeting local needs are also being developed.

As part of its efforts to assemble data for the next in-depth evaluation with the help of regional authorities, the Environmental Objectives Council intends to monitor and assess how regional measures are being implemented, how they complement national measures, and what trends can be seen in the state of the environment.

Sweden in Europe and the world

Progress towards Sweden's environmental goals is dependent on success in international efforts to protect the environment, and conversely development in Sweden must be achieved in such a way as to contribute to sustainable development world-wide.

EU cooperation has a particularly important part to play. Indeed, according to *Eurobarometer 62*, published by the European Commission in the autumn of 2004, Swedes in general consider protection of the environment to be one of the primary tasks of the EU.

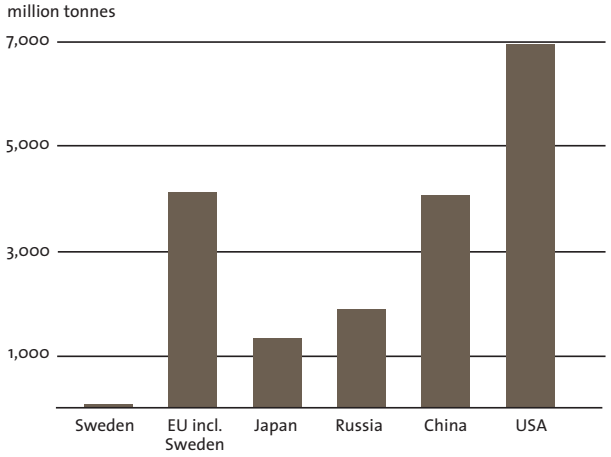
The United Nations Environment Programme, in its *Millennium Ecosystem Assessment*, has warned that human activities are putting so much pressure on natural ecosystems that there is a risk of their not being able to support future generations. Use of food, water, energy and materials is increasing at the cost of the complex systems of plants, animals and biological processes that make the earth habitable. Major problems identified include overfishing, the vulnerability of the two billion people living in dry regions, and the growing threats posed by climate change and nutrient pollution. Among the measures called for are more effective deployment of technology and knowledge, and policy choices in the areas of investment, trade, subsidies, taxation and regulation. This international assessment highlights partly the same environmental problems, trends and courses of action as have been identified in Sweden. Through the Swedish objectives, which are a key tool in national efforts to safeguard the environment, we are also making a clear contribution to addressing these international environmental issues.

GREENHOUSE GASES AND HAZARDOUS PARTICLES

One important step forward is the entry into force of the Kyoto Protocol in February 2005, following its ratification by Russia. The United States, though, is still unwilling to play its part in global cooperation to address climate change. It will soon be necessary, moreover, to involve China, India and other developing countries in this cooperation, to ensure that it has a sufficient impact on global emissions of carbon dioxide.

The extreme weather events – heatwaves, torrential rainfall, storms and extended periods of precipita-

FIG. A.1 Emissions of greenhouse gases



Note: Figures refer to 2002, except for Russia (1999) and China (1994).

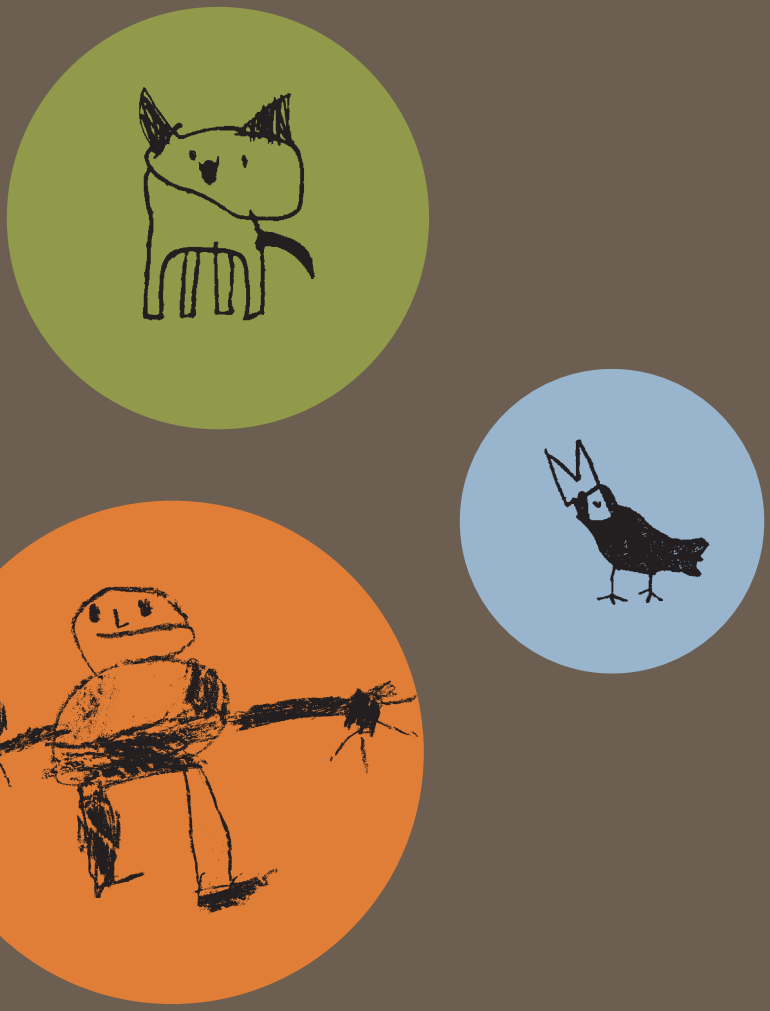
SOURCE: UN FRAMEWORK CONVENTION ON CLIMATE CHANGE

The United States is the largest single emitter of greenhouse gases, while China's emissions are rising rapidly in pace with economic growth. It is important to try to involve both the US and China in cooperation to tackle climate change.

tion – and generally mild winters that have ushered in the 21st century may help to create greater awareness of the importance of a serious commitment to tackling greenhouse gas emissions. The damage to forests and electricity supplies across southern Sweden caused by the severe storm of January 2005 was exacerbated by the fact that the ground in many areas was unfrozen and therefore wet. Mild winters are expected to become more common in the climate of the future.

The European Environment Agency's report *Ten key transport and environment issues for policy-makers* (EEA Report No. 3/2004) points out that carbon dioxide emissions from transport in the EU are increasing and that current policies are insufficient to stop the rise. It notes that manufacturers are having some success in producing increasingly fuel-efficient vehicles, but that the benefits of this are being eaten up by increased travel and a growing preference among new car buyers for larger vehicles that consume more fuel. The report says that emissions of other air pollutants from transport are falling, thanks to improved technology, but that more action needs to be taken, especially regarding nitrogen oxides and particles.

In the context of the Clean Air For Europe (CAFE) programme, undertaken in collaboration with WHO Europe, it has been noted that fine particles (< 2.5 µm) increase mortality, especially from cardiovascular and respiratory disease. Current levels shorten life expectancy to an extent comparable to road accidents. In Sweden, according to new research based on WHO's risk estimates, existing particulate concentrations in air (including the contributions from both long-range transport and local sources) may contribute to a reduction of life expectancy of 9–10 months. These particles come primarily from road transport, mobile machinery and small-scale burning of wood.



children's environment and health

Children's environment and health

As growing individuals, children are often especially susceptible to environmental influences. The National Board of Health and Welfare's environmental health report 2005, on the effects of the environment on children's health in Sweden, shows that the environment-related health of children is generally good, although problems such as asthma, allergies and noise disturbance are on the increase.

In several cases, progress towards the environmental objectives has a direct bearing on children's health:

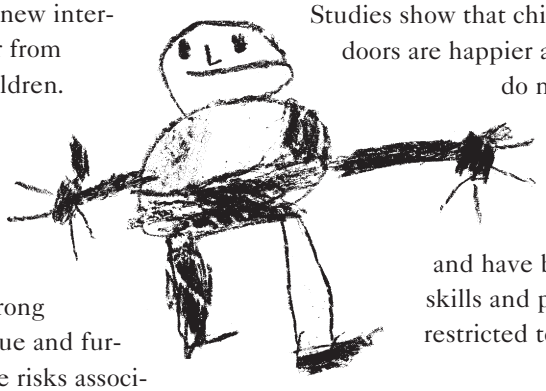
- Clean Air – Children breathe more than adults in relation to their weight and are often more active outdoors. It is important to meet the interim targets for nitrogen dioxide and ground-level ozone, together with a new target for particles. Special attention must also be paid to children with asthma.
- A Non-Toxic Environment – All six interim targets are highly relevant to child health. When assessing risks associated with chemicals, particular account needs to be taken of children.
- Good-Quality Groundwater – A new interim target for the quality of water from private sources could benefit children. More data on contaminants in food and drinking water are also needed.
- A Safe Radiation Environment – Information campaigns on the need to protect children from strong ultraviolet radiation must continue and further studies must be made of the risks associated with electromagnetic fields.
- A Good Built Environment – Noise is a major concern for both children and adults. Existing problems must therefore be tackled and noise taken into account in planning. A new interim target may be necessary to protect children from noise in public places that could damage their hearing. Damp, mould, tobacco smoke and radon in the indoor environment must also receive continued attention.

WHO IS RESPONSIBLE?

The authorities given a supervisory role under the Environmental Code – local authorities' environment committees – have an important part to play in improving the environment of children. Many of them undertake supervisory activities with a specific focus on children, such as projects to improve school and pre-school environments. Noise and allergy issues have received particular emphasis in recent years.

SOCIAL SIGNIFICANCE OF NATURAL ENVIRONMENT

It is important when planning communities to bear in mind the child's need to play and move about. Studies show that children who spend time outdoors are happier and healthier than those who do not. For example, children who play in environments of a natural character are healthier, more able to concentrate and have better developed motor skills and patterns of play than children restricted to artificial play areas.



CHILDREN ARE NOT 'SMALL ADULTS'

There are important biological differences between children and adults. Children have a higher metabolic rate and thus require more energy, relatively speaking, than adults, which means they have a higher intake of food and drink per kilogram of body weight. They also have a higher respiratory rate and breathe in more air in relation to their weight than adults. Children are thus more exposed to pollutants, and may in addition be especially vulnerable since they are still growing and developing.

Generally, children are not able to choose the environments in which they spend their time, and are dependent on adults to protect them. Air pollutants, environmental tobacco smoke, allergens, mould, dust, poor ventilation, noise and radiation are some of the factors children may be exposed to at home, at day nursery or school, and outdoors.

Studies have also found a link between children's activity levels and access to green space and nearby play areas. Green space should therefore be available in the immediate vicinity of the home, i.e. within five minutes' walk (for children and the elderly, a radius of about 200 m).

Significance of environmental factors for ill health in children

Environment-related health effects that have received particular attention include effects on the fetus and on the nervous and endocrine (hormone) systems, allergies and, to some extent, cancer.

NERVOUS SYSTEM

The developing nervous system is particularly sensitive. The commonest conditions linked to disturbed development of this system are motor problems, mental retardation, learning difficulties and hyperactivity. The causes are often unclear – both heredity and environment are probably involved. The risk of children in Sweden suffering serious harm of this kind as a result of environmental pollution is judged to be small, however.

ENDOCRINE-DISRUPTING PROPERTIES

Over the past decade, the endocrine-disrupting properties of certain chemicals have been discussed. Experiments on animals show that several pollutants can interact with the endocrine system and affect early development. However, virtually no studies have been made of humans, and it is therefore impossible to assess the health risks to children.

CANCER

Cancer is uncommon under the age of 15, with around 270 new cases among Swedish children each year. Nevertheless, it is one of the most frequent causes of death in children, and to a large extent its causes are not fully understood. The commonest childhood cancers are leukaemia and brain tumours.

ALLERGY

In recent decades the number of allergic children in Sweden and the rest of Europe has more than doubled. Today, more than one child in four has a symptomatic allergic condition. How much of the increased prevalence is due to environmental factors is difficult to say, but maternal smoking during pregnancy, early cessation of breastfeeding, and damp housing have been shown to increase the risk of asthma.

Children's exposure to environmental factors

CLEAN AIR

Children breathe more than adults in relation to their weight and are often more active outdoors. According to the Children's Environmental Health Survey carried out in Sweden in 2003 (BMHE 03), almost 40% of children travel more than 5 km a day to and from pre-school/school and other activities. This may expose them to traffic environments with high air pollutant levels.

Air pollutants affect children's respiratory organs. They slow lung development, and a child growing up in a polluted area runs a greater risk of suffering impaired lung function as an adult. Judging from studies in other countries, children in inner city areas of Sweden could run twice the normal risk of reduced lung function. Pollutants can also trigger a range of respiratory symptoms in children, probably partly in combination with infections. On the basis of existing data, however, it is not possible to gauge the scale of the problem in Swedish children.

Children with asthma are particularly sensitive to respiratory effects. It is unclear, though, whether air pollutants have any role in the development of asthma in previously healthy children.

HOW CAN PROGRESS TOWARDS THE OBJECTIVE IMPROVE CHILDREN'S HEALTH?

- Achieving the existing interim targets for nitrogen dioxide and ground-level ozone will be a step in the right direction, but will not fully protect all children from the effects of air pollutants.
- Growing attention is being paid to the respiratory effects of particles, especially in areas with heavy traffic. To stress the importance of the issue, an interim target for particles is needed.
- Children with asthma are a susceptible group that must be taken into account when targets under Clean Air are adopted or revised.

A NON-TOXIC ENVIRONMENT AND GOOD-QUALITY GROUNDWATER

Toxic pollutants in the form of metals and persistent organic compounds accumulate in the natural environment. Humans are primarily exposed to such substances in food and drinking water.

METALS

In the environment, inorganic mercury is converted into the methyl form. The highest concentrations are found in freshwater and predatory marine fish, and the National Food Administration has issued dietary advice regarding these species. Exposure levels among pregnant women in Sweden are usually below those with effects on children, but the margins are narrow.

Arsenic occurs naturally in bedrock, from which it can enter groundwater. Most drinking water sources in Sweden are below the limit value, but it is important to keep the intake of arsenic as low as possible, particularly in the case of children.

Emissions of lead have been successfully reduced, resulting in a sharp fall in concentrations in air, food and blood over the last 20 years. However, the margin between the blood lead levels found in pregnant women and pre-school children, and those at which central nervous system effects begin to appear, is still relatively narrow (a factor of 2–5).

ORGANIC POLLUTANTS

Several organic pollutants are regarded as actual or potential risks to children's health. Dioxins and PCBs occur in our diet, chiefly in oily fish, but also in dairy produce and meat. Their effects, primarily observed

in animal experiments, include disturbed development of the sexual organs, behavioural effects, immune suppression and cancer. Infants are exposed to relatively large amounts of these substances in breast milk, though levels have fallen sharply since the early 1970s.

In the case of polybrominated diphenyl ethers (PBDEs), which are used as flame retardants, concentrations in breast milk rose very significantly in the 1990s. They have levelled off in recent years, and now appear to be falling somewhat in Sweden. Given all its advantages for the infant, however, there is agreement within both the EU and the WHO that breastfeeding should be encouraged.

Scientific data on brominated flame retardants, phthalates and alkyl phenols are incomplete, but enough is known to justify precautions. The EU has banned some PBDEs and is proposing a ban on certain phthalates in toys and other products for children.

HOW CAN PROGRESS TOWARDS THE OBJECTIVES IMPROVE CHILDREN'S HEALTH?

All six interim targets under A Non-Toxic Environment are highly relevant to children's health.

- In risk assessment and management of chemicals, account must be taken of the possibility of children being particularly at risk. In international cooperation in this area, Sweden can contribute by continuing to stress the special needs of children.
- One interim target under Good-Quality Groundwater concerns drinking water quality, but it only applies to major sources. What do we know about exposure levels for the hundreds of thousands of children who drink water from private wells? Better data are needed to avoid risks to their health.
- A new target focusing on private groundwater sources has previously been proposed by the Geological Survey of Sweden. Such a target could be of value in ensuring that children drinking water from private wells, too, can enjoy water of good quality.
- There are many contaminants in food and drinking water that have been inadequately studied, especially with regard to children's exposure to them. Available data need to be improved, e.g. through health-related environmental monitoring.

A SAFE RADIATION ENVIRONMENT

IONIZING RADIATION

High doses of ionizing radiation are the only proven risk factor for childhood cancer, apart from certain rare hereditary factors. At the radiation levels to which children in Sweden are exposed, however, the increased risk is judged to be low.

ELECTRIC AND MAGNETIC FIELDS

Electric and magnetic fields arise wherever there is an electric current. Epidemiological data suggest that exposure to power-frequency magnetic fields could increase the risk of cancer, and especially of leukaemia in children. Estimates suggest that a very small fraction (< 0.5%) of childhood leukaemia cases in Sweden can be attributed to this factor.

RADIO-FREQUENCY ELECTROMAGNETIC FIELDS

Radio-frequency electromagnetic fields are used to transmit information by radio, television, mobile telephony etc. Mobile phones give rise to exposure during use, especially close to the aerial. The fields arising from base stations have also been discussed as a potential health risk. However, exposure to those fields is at least 1,000 times lower than the levels associated with the phones themselves.

At present there is very limited support for the hypothesis that exposure to radio-frequency fields up to current guide values could entail risks to health. While there is little cause to suspect harmful effects, simple precautions can be taken to reduce exposure, such as choosing a handset with a low SAR, using a hands-free kit and avoiding long calls.

ULTRAVIOLET RADIATION

According to estimates, 80–90% of all skin cancer is caused by ultraviolet radiation from the sun. The incidence of malignant melanoma, a serious form of the disease, has risen by 2% a year over a period of 20 years.

Skin cancer is attributed to strong UV radiation in childhood and later life. Certain constitutional factors, such as fair skin, red or blond hair and blue/green/grey eyes, are associated with a higher risk of developing malignant melanoma. Young children are particularly sensitive to UV radiation, since they are not as well protected by pigment as adults.

HOW CAN PROGRESS TOWARDS THE OBJECTIVE IMPROVE CHILDREN'S HEALTH?

- According to interim target 2 under A Safe Radiation Environment, the annual incidence of skin cancer caused by the sun should not be greater in 2020 than it was in 2000. Information about the need to protect children from strong UV radiation is now being disseminated in a wide range of contexts. This target is expected to be achieved.
- Interim target 3 calls for the risks associated with electromagnetic fields to be studied on an ongoing basis. The susceptibility of children was one of the issues considered in the 2004 annual report of the Swedish Radiation Protection Authority's Scientific Advisory Board on Electromagnetic Fields.

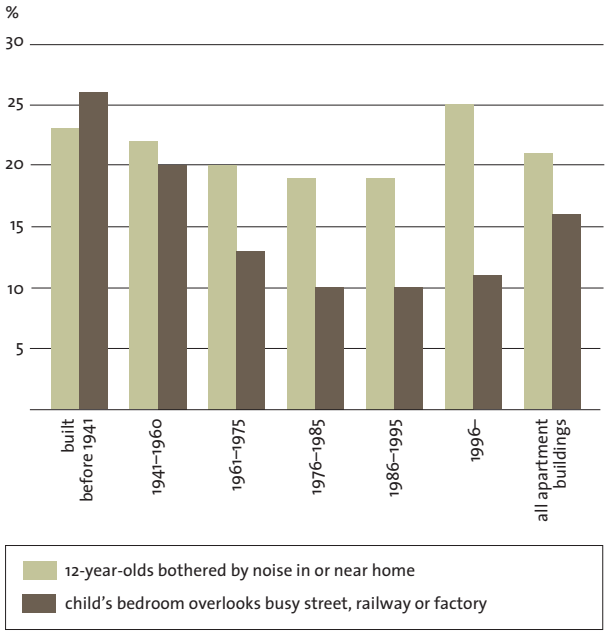
A GOOD BUILT ENVIRONMENT

NOISE AND HIGH SOUND LEVELS

Judging from the results of BMHE 03, some 162,000 Swedish children aged up to 14 have their bedroom window overlooking a street with traffic, a railway or a factory. The noise sources that disturb most 12-year-olds are other children and loud music. One in seven of all 12-year-olds are bothered by noise in or near their home (almost 17,000 children in this age group), while one in four (some 30,000) are disturbed by noise in or near their school/after-school centre.

One of the most serious effects of environmental noise is disrupted sleep. An estimated 19,000 12-year-olds have had difficulty getting to sleep because of

FIG. B.1 Bedrooms exposed to noise, and 12-year-olds' reports of disturbance from noise in or near the home, in apartment buildings built different years



SOURCE: BMHE 03

Many children are disturbed by noise in or near their home. The Children's Environmental Health Survey also showed that a significant number of children in Sweden have their bedroom windows facing busy streets or other noisy environments.

noise, and for over 3,000 of them this has happened several times a week. In the same age group, 7,000 children have sometimes been disturbed by noise to such an extent that they have had difficulty sleeping all night without waking, and just over 2,000 have had this problem several times a week.

A particular cause for concern is that children and young people are now exposed to hearing-impairing noise to a greater extent than they seem to have been before. At the age of 4, some 2,000 children are reported to have impaired hearing, and at the age of 12, around 4,000. It is not known, though, how many of them have had their hearing damaged by high sound levels. At day nurseries and schools, the sound levels recorded have in some cases exceeded the limit above which, under workplace health and safety legislation, hearing protectors must be worn.

Following long-term exposure to aircraft noise near airports, schoolchildren have been found to do less well on tests, e.g. proofreading, jigsaw puzzles and reading comprehension, and to have poorer memory and motivation. The greater and more protracted the exposure is, the more marked the adverse effects appear to be.

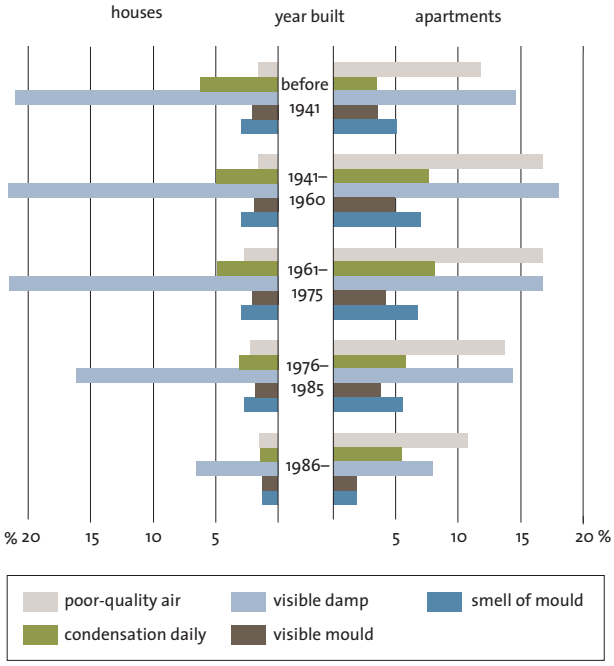
THE INDOOR ENVIRONMENT

There is evidence to suggest that damp and mould in homes can result in the release of harmful substances into indoor air. Living in a house or apartment with problems of damp has been linked to a (1.5–3.5 times) higher incidence of lower respiratory tract symptoms (infant asthma) in children.

In BMHE 03, 19% of parents reported that there was visible damp, visible mould and/or a smell of mould in the home. Exposure to such factors increases the risk of repeated lower respiratory tract symptoms by about 50%, which means that over 1,000 cases a year can be linked to damp in dwellings.

As for the significance of ventilation for children's health, risk assessments are more difficult. Studies in school buildings confirm the importance of compliance with the air-flow standards that apply to such premises.

FIG. B.2 Percentages of houses and apartments in Sweden, built in different periods, reported to have damp, mould, condensation and poor-quality air



SOURCE: BMHE 03

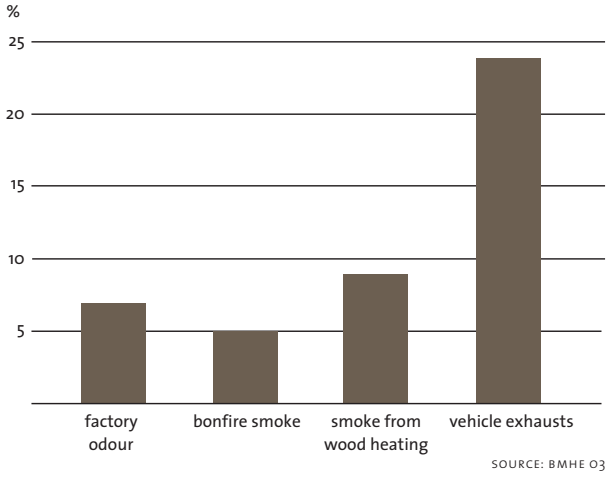
Problems affecting the indoor environment are common, especially damage caused by damp. In general, respondents living in apartments reported more problems than those living in houses.

Children's exposure to tobacco smoke has decreased appreciably in recent years. Fewer parents smoke during pregnancy (<10% according to BMHE 03), but some 5% of children are exposed to tobacco smoke daily in the home. Every year, parental smoking is estimated to cause more than 500 cases of acute lower respiratory tract disease and over 500 of otitis.

RADON

Radon is the biggest single source of ionizing radiation in Sweden. It is well known that it increases the risk of lung cancer. Many children live in homes with radon levels above the Swedish guide value (200 Bq/m^3), but it is unclear how exposure affects the risk of developing lung cancer later in life.

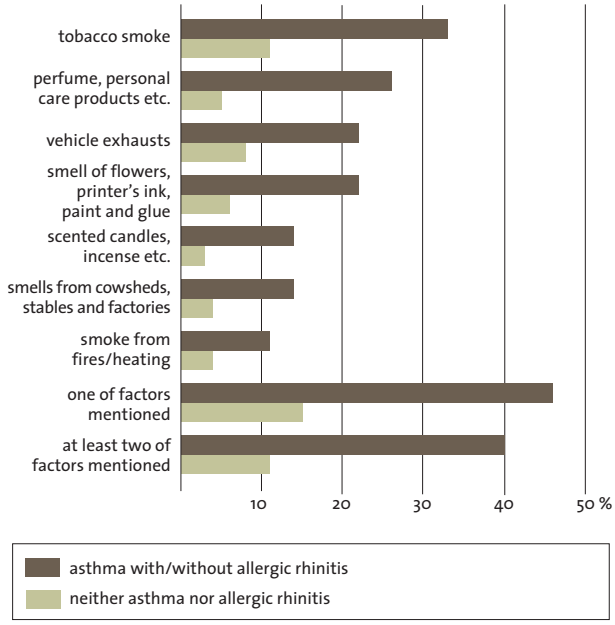
FIG. B.3 Percentages of 12-year-olds in 2003 Children's Environmental Health Survey answering yes to question: 'Have you been bothered by any of these smells in the last month?'



SOURCE: BMHE 03

The diagram shows that the smell of vehicle exhausts is the one children are most often bothered by. They more often find it a problem in large towns than in smaller towns and villages. Many children are also bothered by smoke from wood-fuelled heating.

FIG. B.4 Prevalence of lower respiratory tract symptoms associated with exposure to different environmental factors among children with asthma and allergic rhinitis, compared with children without those conditions



Note: 'Lower respiratory tract symptoms' means cough, wheezing or difficulty breathing.

SOURCE: BMHE 03

The diagram shows that children with asthma/allergic rhinitis are adversely affected by environmental factors to a much greater degree than children not suffering from those conditions. The commonest cause of symptoms is tobacco smoke.

HOW CAN PROGRESS TOWARDS THE OBJECTIVE IMPROVE CHILDREN'S HEALTH?

- It is important when planning communities to bear in mind children's need to play and move about outdoors. BMHE 03 showed that children who spent time in the open air also enjoyed better quality of life.
- Clearly children, like adults, are often disturbed by traffic noise. It is important to tackle this problem in existing built environments and to take noise into account in planning new developments.
- Traffic noise is the only form of noise disturbance covered by an interim target under A Good Built Environment. An additional target regarding high sound levels is called for to protect children from noise in public places that could damage their hearing.
- Damp and mould in homes result in many cases of illness among children each year and are probably also a contributory cause of asthma. A systematic reduction of the proportion of dwellings with such problems is important in improving children's health.
- Effective ventilation is important in achieving good-quality indoor air, especially in premises accommodating large numbers of children.
- Many children in Sweden are exposed to unacceptably high levels of radon. Active efforts to address this problem are urgently required.

the 15 national environmental quality objectives

ENVIRONMENTAL OBJECTIVE ONE

Reduced Climate Impact

The UN Framework Convention on Climate Change provides for the stabilization of concentrations of greenhouse gases in the atmosphere at levels which ensure that human activities do not have a harmful impact on the climate system. This goal must be achieved in such a way and at such a pace that biological diversity is preserved, food production is assured and other goals of sustainable development are not jeopardized. Sweden, together with other countries, must assume responsibility for achieving this global objective.

Globally, the past ten years have been the warmest on average since records began. Between 1860 and 2000, the mean temperature of the earth rose by 0.6 °C. In Europe, the average temperature increased by 0.8 °C over the same period.

GREENHOUSE EFFECT

We know that emissions of greenhouse gases affect climate. The rise in temperature since the 1950s can only be explained by increasing emissions of such gases, chiefly carbon dioxide from the use of fossil fuels. Anthropogenic enhancement of the greenhouse effect can be expected to persist throughout the 21st century. Global climate scenarios from the Intergovernmental Panel on Climate Change (IPCC) point to a further increase in temperature of 1.4–5.8°C over the period 1990–2100, accompanied by a rise in sea level of 0.09–0.88 m and a range of other effects.

ARCTIC PARTICULARLY HARD HIT

To date, the Arctic has experienced a rise in annual mean temperature that is twice the global increase. This region is extremely sensitive to changes in climate, and over the next hundred years it is anticipated that precipitation there will increase, winters become shorter, storms become more frequent, and snow and ice cover be reduced. Many of these changes can already be observed, and they could have major ecological, social and economic implications. The polar ice cap, for example, has already shrunk considerably since the middle of the last century. If it continues to contract, conditions will deteriorate dramatically for animals such as polar bears, seals and seabirds that are dependent on the ice. Some species could become completely extinct. Such a trend would also alter the very basis for the way of life of the Inuit.

Will the objective be achieved?

☹ The environmental quality objective Reduced Climate Impact requires atmospheric concentrations of the six greenhouse gases (as defined in the Kyoto Protocol and by the IPCC, and calculated as carbon dioxide equivalents) to be stabilized below 550 ppm. Sweden must seek to ensure that global efforts contribute to achieving this objective. International cooperation and commitment on the part of all countries are crucial to it being attained.

The long-term climate goal means that Swedish emissions need to be reduced to no more than 4.5 tonnes of carbon dioxide equivalents per capita per year by 2050, with further reductions to follow. Here, too, international collaboration and efforts by all countries are necessary if the goal is to be achieved.

KYOTO PROTOCOL

It is very difficult to assess the prospects of securing global agreements to reduce emissions, but the entry into force of the Kyoto Protocol gives cause for somewhat greater optimism. The road to new agreements, though, is a long and arduous one, and so far the initial discussions have not been very encouraging.

Under the Kyoto Protocol, negotiations on commitments beyond 2012 are to begin in 2005. It is important to find ways of persuading more countries to participate in this process, while still ensuring that it results in pledges to achieve further emission cuts. Future agreements need to provide incentives to reduce emissions, through both technological development and economic instruments.

Will the interim target be achieved?

GREENHOUSE GAS EMISSIONS

INTERIM TARGET, 2008–2012

😐 *As an average for the period 2008–12, Swedish emissions of greenhouse gases will be at least 4% lower than in 1990. Emissions are to be calculated as carbon dioxide equivalents and are to include the six greenhouse gases listed in the Kyoto Protocol and defined by the IPCC. In assessing progress towards the target, no allowance is to be made for uptake by carbon sinks or for flexible mechanisms.*

Emissions in 1990 totalled 72.2 million tonnes of carbon dioxide equivalents, to be compared, for example, with the estimated figure of 70.6 million tonnes for 2003. Several proposals were put forward in 2004 which, if implemented, will enable this interim target to be met.

EMISSION TRENDS

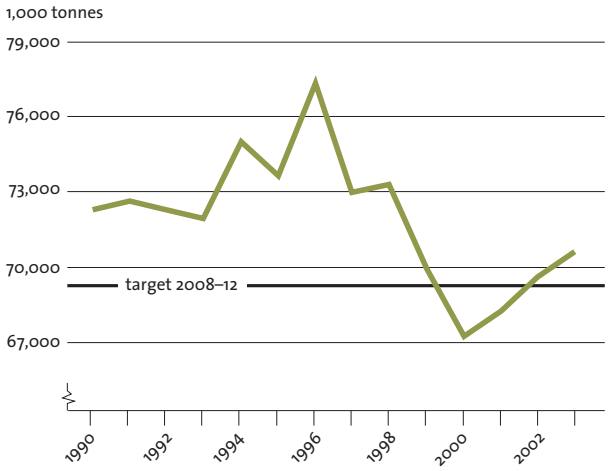
Emissions of greenhouse gases in the residential and services sector have gradually fallen since 1990, thanks to a shift from oil-fired boilers to district heating, heat pumps and biofuels. Emissions from agriculture and landfill sites are also declining. In agriculture, the decrease is chiefly attributable to reduced numbers of livestock; in the waste sector, to recovery of landfill gas and restrictions and a tax on landfill, which have reduced the quantities of waste disposed of in this way.

These decreases, however, have been offset by higher emissions from road transport, in particular from heavy goods vehicles. Cars have on average become somewhat more fuel-efficient over the period, and in recent years ethanol–petrol blends have also assumed significance. According to preliminary figures, the proportion of ethanol in petrol in 2004 was 3.5%. At the present rate of increase, the maximum permitted level of 5% will be reached as early as next year.

EMISSION PROJECTIONS

As part of a report prepared as a basis for the 2004 evaluation of Swedish climate policy (Checkpoint 2004), the Swedish Environmental Protection Agency and the Swedish Energy Agency produced a new projection of greenhouse gas emissions, covering all sectors. It suggests that, in 2010, emissions will be just over 1% below their 1990 level, but that they will subsequently increase up to 2020. The rise will

FIG. 1.1a Total greenhouse gas emissions in Sweden

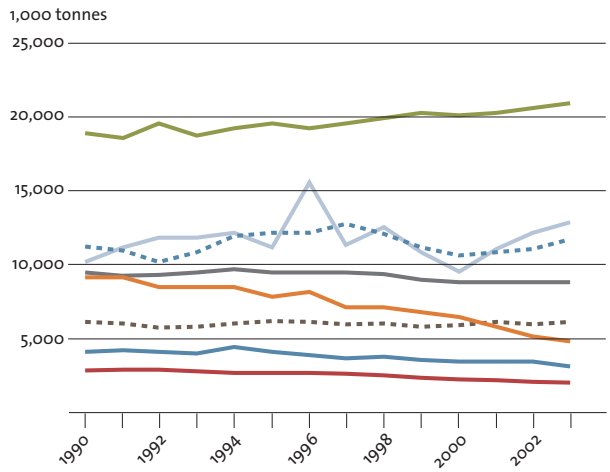


Note: Figures are not climate corrected.

SOURCE: SWEDISH EPA

Over the period 1990–2003, Swedish emissions of greenhouse gases have varied between 67.5 (2000) and 77.2 million tonnes (1996). Differences between years are due largely to variations in temperature and precipitation. Every year since 1999, however, emissions have been somewhat below their 1990 level. In 2003 they increased by around 1.1 million tonnes over the previous year, chiefly because in 2003 hydroelectric power was in short supply, electricity prices were high and it was somewhat colder than in 2002. All these factors combined resulted in greater use of fossil fuels for power production and heating. Emissions from certain industries, mainly pulp and steel, also rose.

FIG. 1.1b Greenhouse gas emissions in Sweden, by sector



Note: Figures are not climate corrected.

SOURCE: SWEDISH EPA

In 2002, some 79% of Sweden's greenhouse gas emissions were due to combustion of fossil fuels in the transport sector, in industry and in electricity and heat production. Other sectors accounted for the remaining 21%.

be a result of higher emissions from the transport sector (chiefly road freight), electricity and heat production, and certain sectors of industry.

According to a survey by the European Environment Agency (EEA) in 2004, only Sweden and the UK are expected to meet their share of the EU's joint commitment on greenhouse gas emissions. Under the EU's burden-sharing agreement, Swedish emissions are permitted to increase by up to 4% from their 1990 level.

NEW POLICY INSTRUMENTS PROPOSED

Economic instruments, such as energy and carbon dioxide taxes and renewables certificates, are seen as the principal means of curbing emissions. Policy instruments relating to waste (chiefly bans on landfill disposal of combustible and organic waste), and agricultural policy, will also bring about reductions.

The projection takes account of the effects of the EU's emissions trading scheme. Assessments of national emissions are based on prices for emission allowances ending up at a relatively low level. The

PROPOSALS AND STRATEGIES PUT FORWARD IN 2004 BY ENVIRONMENTAL OBJECTIVES COUNCIL AGENCIES

Checkpoint 2004 report

- vehicle tax differential based on carbon dioxide emissions
- distance-based taxes on heavy goods vehicles
- stricter tax rules on vehicles provided by employers
- continued and expanded climate investment programme
- continued climate information campaign
- continued effort to utilize potential of Directive on the energy performance of buildings
- continued and increased support for climate projects in other countries (Joint Implementation and Clean Development Mechanism).

Tax shift report

The Environmental Protection Agency proposes that further tax shifts should primarily be introduced in areas where the goals set are most difficult to achieve. The long-term climate objective is one such area. The Agency highlights the need for a further shift in the tax base in the transport sector, towards higher taxes on fuels, differentiated sales and vehicle taxes, and distance-based taxes.

Renewables certificates

In an evaluation of the system of tradeable renewable energy certificates, the Energy Agency proposes that the system should become a permanent feature of Swedish policy in this area. It also proposes that quota levels should be set far enough ahead to ensure reasonable investment conditions for the parties involved.

Wind energy

In 2004 the Energy Agency presented a report on sites that could be suitable for designation as areas of national interest on account of their potential for electricity generation from wind energy.

Climate strategy of National Road Administration

This strategy comprises three fields of action: improvements in energy efficiency in the short and long term, a long-term commitment to renewable fuels, and measures to shape transport demand and modal breakdown.

scheme, which will initially cover carbon dioxide emissions from energy-intensive industries and heat and power plants, is crucial to the EU meeting its joint commitment under the Kyoto Protocol.

The Checkpoint 2004 report proposes additional measures, chiefly in the transport sector (see box). It also suggests that the effects of Swedish participation in the EU trading scheme should in future be taken into account in assessing progress towards the target. If the proposals in the report are implemented, the interim target will probably be met with some room to spare.

STRATEGY FOR TRANSPORT SECTOR

In 2004, at the Government's request, the National Road Administration developed a climate strategy for the road transport sector. Briefly, it has as its cornerstones a clear, long-term climate and transport policy and vigorous international cooperation. The strategy includes measures which, in the long term (by 2050), could reduce carbon dioxide emissions by a total of 20 million tonnes. To achieve that reduction, radical changes will be required in both transport systems and society at large.

ENVIRONMENTAL OBJECTIVE TWO

Clean Air

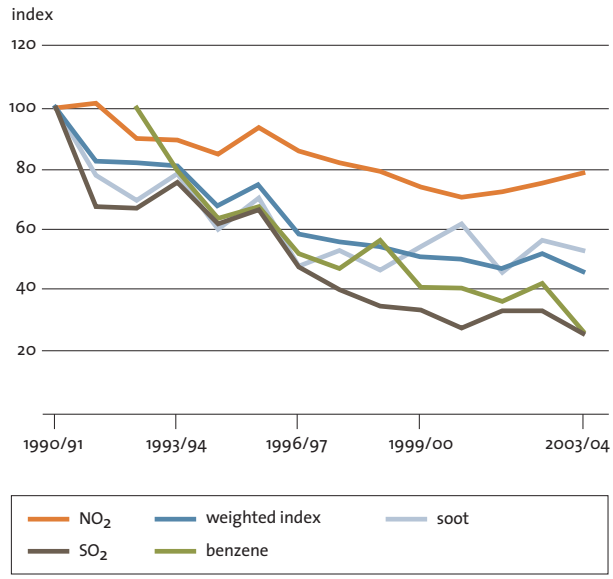
The air must be clean enough not to represent a risk to human health or to animals, plants or cultural assets

Will the objective be achieved?

Air pollutants cause damage to health, natural ecosystems, materials and cultural artefacts. New research shows that inhalable particles are a contributory factor behind over 5,000 deaths a year in Sweden. In the in-depth evaluation of the environmental objectives, therefore, an interim target for particulates was proposed.

Emissions of several major air pollutants continue to fall. In the case of both sulphur and nitrogen oxides, however, projections suggest that the decrease has slowed down. The environmental quality objective will be difficult to attain unless emissions of particles and ozone precursors are reduced, both in Sweden and across Europe. Previously, falling emissions were reflected in lower concentrations in ambient air, primarily of sulphur dioxide and nitrogen dioxide. In recent years, the air quality index has unfortunately shown no appreciable change with regard to soot, nitrogen dioxide or sulphur dioxide. For benzene,on the other hand, a continued improvement has been recorded.

FIG. 2.1 Environmental index for air quality in Swedish towns and cities



Note: The index is based on a weighted average of concentrations in some 30 local authority areas. Figures for base year 1990/91: NO_2 = 21 µg/m³, soot = 10 µg/m³, SO_2 = 5 µg/m³. Concentration of benzene in base year 1992/93 was 6 µg/m³.

SOURCE: IVL

The index shows that, in the last five years, the earlier improvement in air quality has levelled out.

Work on a new European strategy on air pollution has drawn attention to the major costs which the health and environmental effects of air pollutants represent, and to the wide range of measures that need to be implemented.

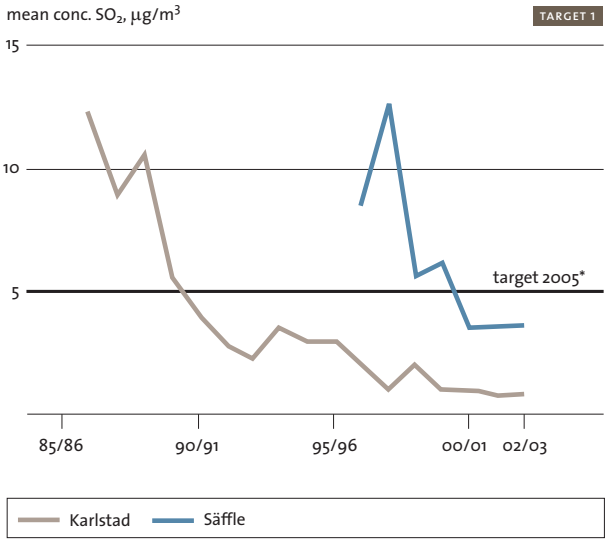
Will the interim targets be achieved?

SULPHUR DIOXIDE

INTERIM TARGET 1, 2005

A level of sulphur dioxide of 5 µg/m³ as an annual mean will have been achieved in all municipalities by 2005.

FIG. 2.2 Mean concentrations of sulphur dioxide in winter months (October–March) in two towns in Värmland



* Interim target refers to annual mean concentration.

SOURCE: DRAFT REGIONAL ENVIRONMENTAL OBJECTIVES FOR VÄRMLAND, 2004

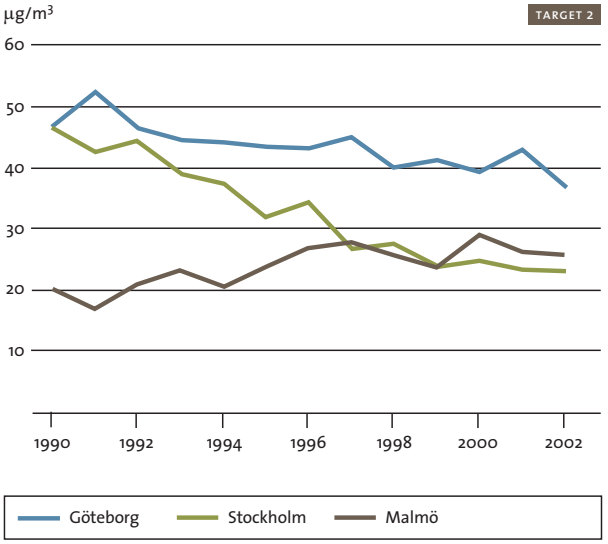
An example of regional monitoring of progress towards an interim target. Following the introduction of district heating (Karlstad) and improvements in industry (Säffle), the target for sulphur dioxide in air has been met in the county of Värmland.

NITROGEN DIOXIDE

INTERIM TARGET 2, 2010

Levels of nitrogen dioxide of 20 µg/m³ as an annual mean and 100 µg/m³ as an hourly mean will have been achieved in most places by 2010.

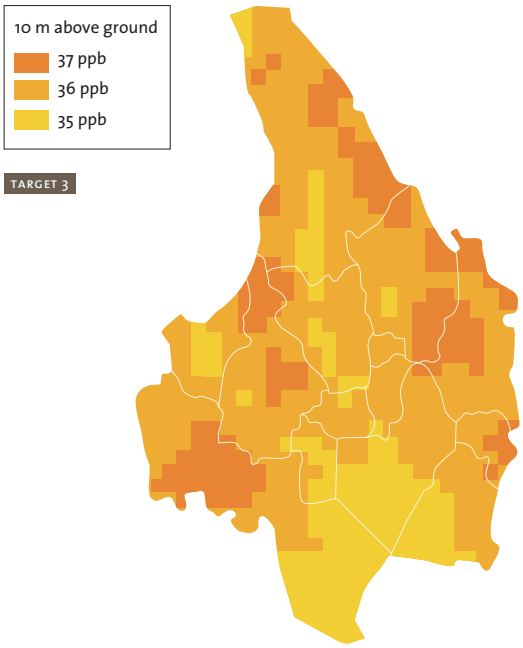
FIG. 2.3 Trends in annual mean concentrations of NO_x (nitrogen oxides) in Göteborg, Malmö and Stockholm, 1990–2002



SOURCE: NATIONAL ROAD ADMINISTRATION

Nitrogen oxide concentrations differ between Sweden's major cities. The differences may be due to long-range transport of air pollutants into southern Sweden and differences in measures introduced at the local level.

FIG. 2.4 Ground-level ozone in Värmland, mean for April–September 2002



SOURCE: VÄRMLAND COUNTY ADMINISTRATIVE BOARD

Another example of regional monitoring of an interim target, with the concentration of ozone expressed in ppb (parts per billion). Regional modelling of ground-level ozone provides a basis for assessing environmental impacts and any local measures required.

GROUND-LEVEL OZONE

INTERIM TARGET 3, 2010

By 2010 concentrations of ground-level ozone will not exceed 120 µg/m³ as an 8-hour mean.

VOLATILE ORGANIC COMPOUNDS

INTERIM TARGET 4, 2010

By 2010 emissions in Sweden of volatile organic compounds (VOCs), excluding methane, will have been reduced to 241,000 tonnes.

ENVIRONMENTAL OBJECTIVE THREE

Natural Acidification Only

The acidifying effects of deposition and land use must not exceed the limits that can be tolerated by soil and water. In addition, deposition of acidifying substances must not increase the rate of corrosion of technical materials or cultural artefacts and buildings.

Will the objective be achieved?

There is much to suggest that this environmental quality objective will not be achieved by 2020, but at present the data available are insufficiently well developed to justify a revision of our assessment. In 2002 critical loads of acid deposition were exceeded for 17% of Sweden's lakes, which was as high a figure as in 1997. A calculation of exceedances for forest land has not been possible, owing to changes in both the methods and the basic data used.

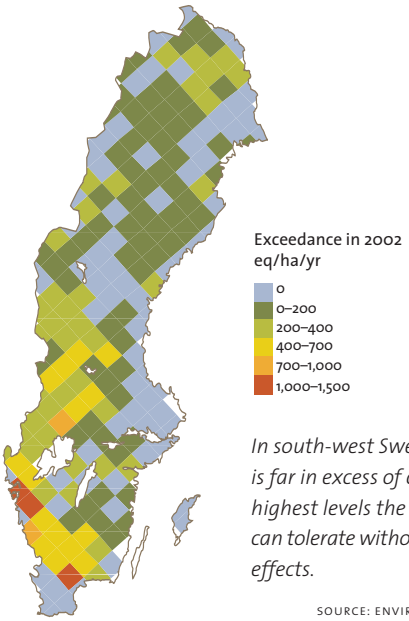
Between 1990 and 2002 sulphur deposition fell by around 60% in southern and central Sweden and by about 55% in the north. No clear trends can be seen for deposition of nitrogen.

MORE ACTION REQUIRED

To attain this objective, a wide range of additional measures need to be introduced in Europe, going beyond the Gothenburg Protocol and the EC's National Emission Ceilings and Large Combustion Plants Directives. Priority areas are energy production, road transport, shipping and agriculture. Climate policy is an important driving force in reducing acidifying as well as greenhouse gas emissions.

At the national level too, further action should be taken, chiefly to cut emissions of nitrogen oxides and to mitigate the acidifying effects of forestry.

FIG. 3.1 Exceedance of critical loads of acid deposition to Swedish lakes in 2002



In south-west Sweden, acid deposition is far in excess of critical loads, i.e. the highest levels the natural environment can tolerate without significant harmful effects.

SOURCE: ENVIRONMENTAL DATA CENTRE, SLU

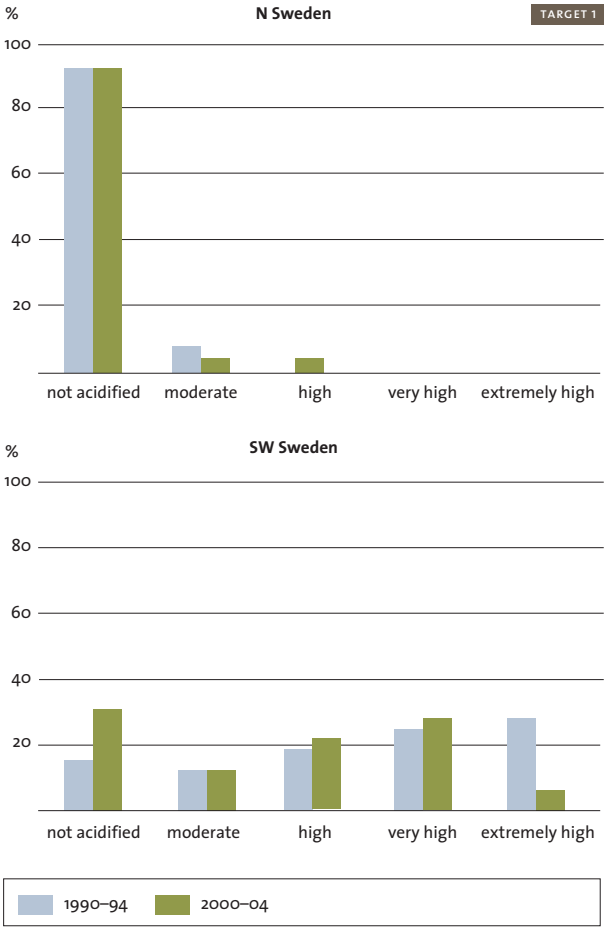
Will the interim targets be achieved?

ACIDIFICATION OF LAKES AND STREAMS

INTERIM TARGET 1, 2010

By 2010 not more than 5% of all lakes and 15% of the total length of running waters in the country will be affected by anthropogenic acidification.

FIG. 3.2 Percentages of lakes in north and south-west Sweden affected by different degrees of acidification during two periods



Note: Sample of 58 lakes is not representative of all lakes in Sweden, but reflects those more susceptible to acidification.

SOURCE: DEPT. OF ENVIRONMENTAL ASSESSMENT, SLU

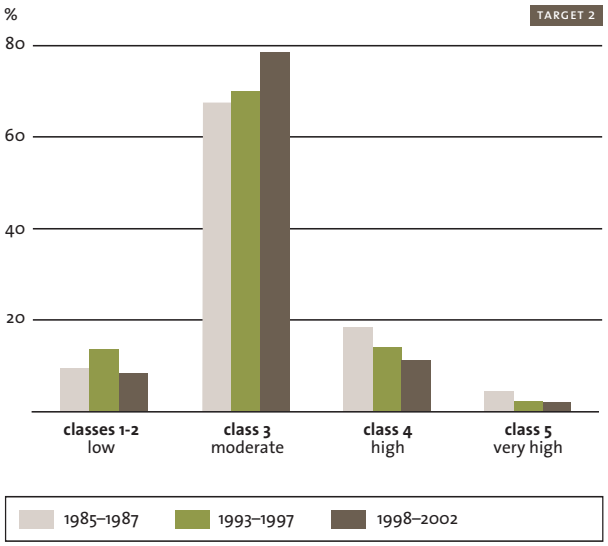
Lakes are recovering more rapidly from acidification in the more seriously affected areas of southern Sweden.

ACIDIFICATION OF FOREST SOILS

INTERIM TARGET 2, BEFORE 2010

By 2010 the trend towards increased acidification of forest soils will have been reversed in areas that have been acidified by human activities, and a recovery will be under way.

FIG. 3.3 Breakdown of forest land in Sweden by soil acidity class during three periods



SOURCE: DEPT. OF FOREST SOILS, SLU

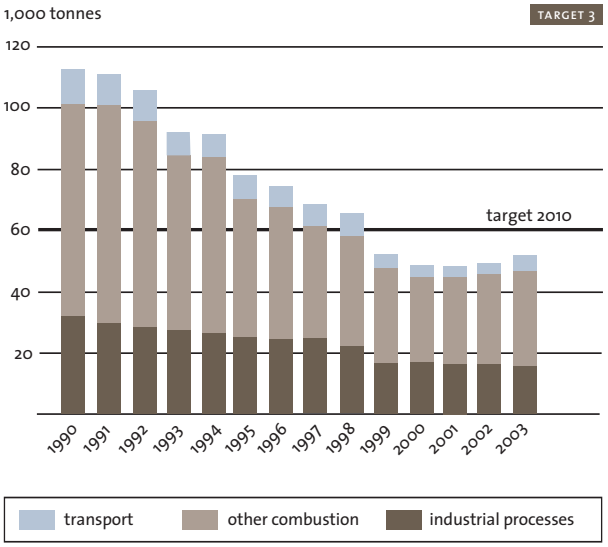
The clearest signs of recovery can currently be observed in the most acidic soils.

SULPHUR DIOXIDE EMISSIONS

INTERIM TARGET 3, 2010

By 2010 emissions of sulphur dioxide to air in Sweden will have been reduced to 60,000 tonnes.

FIG. 3.4 Swedish emissions of sulphur dioxide to air, 1990–2003 (excluding international bunker fuel emissions)



SOURCE: SWEDISH EPA, SWEDISH REPORTING UNDER CLIMATE CONVENTION

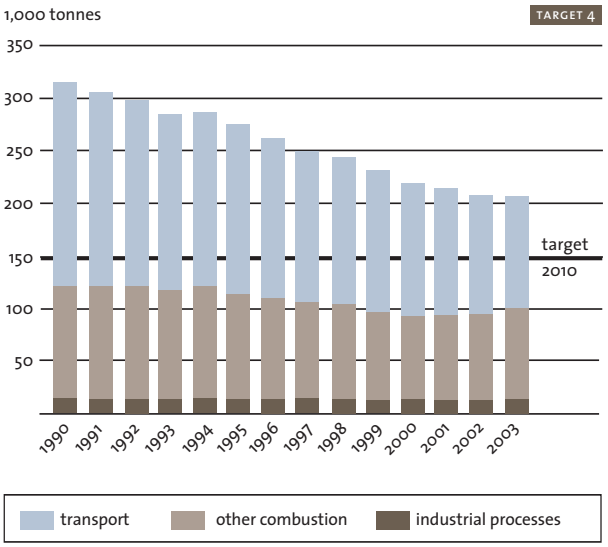
The interim target for sulphur dioxide emissions has already been met. The increase in 2003 was probably due to a shortage of hydroelectric power and a somewhat colder winter, resulting in increased use of fossil fuels.

NITROGEN OXIDE EMISSIONS

INTERIM TARGET 4, 2010

By 2010 emissions of nitrogen oxides to air in Sweden will have been reduced to 148,000 tonnes.

FIG. 3.5 Swedish emissions of nitrogen oxides to air, 1990–2003 (excluding international bunker fuel emissions)



SOURCE: SWEDISH EPA, SWEDISH REPORTING UNDER CLIMATE CONVENTION

Provided that additional action is taken, the target for nitrogen oxide emissions to air should be met. One source of uncertainty, however, is trends in road transport, particularly transport of goods.

ENVIRONMENTAL OBJECTIVE FOUR

A Non-Toxic Environment

The environment must be free from man-made or extracted compounds and metals that represent a threat to human health or biological diversity.

Will the objective be achieved?

☹ This objective will be difficult to attain, particularly with regard to persistent substances already present in products, buildings and the environment. With additional action at the national and international levels, though, it should be possible, within the time-frame envisaged, to reduce the quantities of new hazardous substances entering the environment.

NEW EUROPEAN LEGISLATION

The outcome of the negotiations on new EU-wide legislation on chemicals (REACH) will significantly affect the prospects of achieving the objective. The health and environmental benefits of REACH are expected to far outweigh the costs involved. The European Commission estimates that the system will cost European industry getting on for €5 billion in the first eleven years. At the same time, a Nordic Council study suggests that €7–27 billion could be saved in the EU member states up to 2028. The idea is that, with the REACH system, it will be possible to avoid mistakes of the kind that occurred with the use of PCBs.

Will the interim targets be achieved?

DATA ON HEALTH AND ENVIRONMENTAL PROPERTIES OF CHEMICAL SUBSTANCES

INTERIM TARGET 1, BEFORE 2010/2020

☹ *By 2010 data will be available on the properties of all deliberately manufactured or extracted chemical substances handled on the market. For substances handled in larger volumes and for other substances which, for example after initial general tests, are assessed as being particularly dangerous, information on their properties will be available earlier than 2010. The same information requirements will apply to both new and existing substances. In addition, by 2020 data will as far as possible be available on the properties of all unintentionally produced and extracted chemical substances.*

The REACH system will result in a significantly improved understanding of the properties of chemical substances. The proposed test requirements for substances manufactured and imported in smaller volumes are still far from adequate, however, and the timetable for their introduction is so protracted that this target cannot be met on schedule.

ENVIRONMENTAL AND HEALTH INFORMATION ON PRODUCTS

INTERIM TARGET 2, 2010

By 2010 finished products will carry health and environmental information on any dangerous substances they contain.

PHASE-OUT OF SUBSTANCES OF VERY HIGH CONCERN

INTERIM TARGET 3, 2003/2005/2007/2010/2015

Newly manufactured finished products will as far as possible be free from:

- *carcinogenic, mutagenic and reprotoxic substances, by 2007, if the products are intended to be used in such a way that they will enter natural cycles;*
- *new organic substances that are persistent and bioaccumulating, as soon as possible, but no later than 2005;*
- *other organic substances that are very persistent and very bioaccumulative, by 2010;*
- *other organic substances that are persistent and bioaccumulative, by 2015;*
- *mercury by 2003, and cadmium and lead by 2010.*

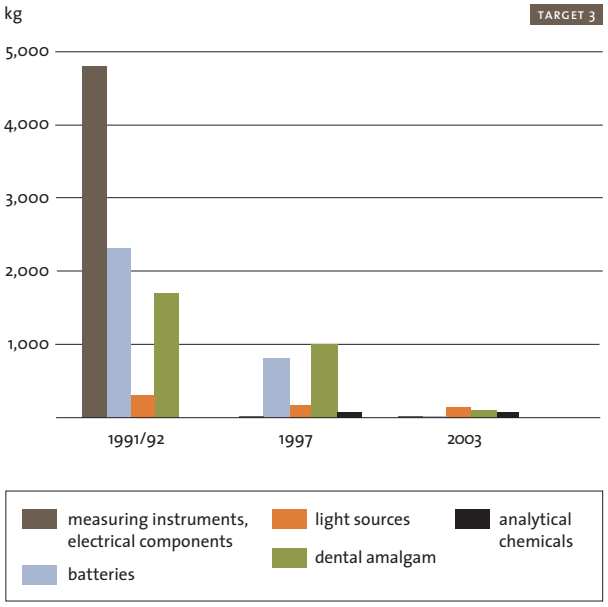
Nor will these substances be used in production processes unless the company can prove that human health and the environment will not be harmed.

Already available finished products containing substances with the properties listed above, or mercury, cadmium or lead, will be handled in such a way that the substances in question are not released to the environment.

This interim target applies to substances that are man-made or extracted from the natural environment. It also applies to substances giving rise to substances with the above properties, including those formed unintentionally.

The system of authorization proposed within REACH for substances of very high concern will probably provide a good basis for progress towards this target. The system is expected to have a preventive effect. However, wide-ranging exemptions from the authorization requirement, and the lack of a clear timetable, could unfortunately make it difficult to achieve the interim target. The target dates for the phase-out of dangerous substances in newly manufactured finished products will be difficult to meet.

FIG. 4.1 Quantities of mercury entering into circulation in Swedish society in chemical and other products



SOURCE: NATIONAL CHEMICALS INSPECTORATE

Volumes of the chemical and other products representing the largest sources of mercury in Sweden have fallen sharply since the early 1990s. The proposed general ban on mercury would further reduce the amount of new mercury entering into circulation in products from some 340 kg/yr (2003) to around 190 kg/yr, with dental amalgam accounting for the biggest decrease.

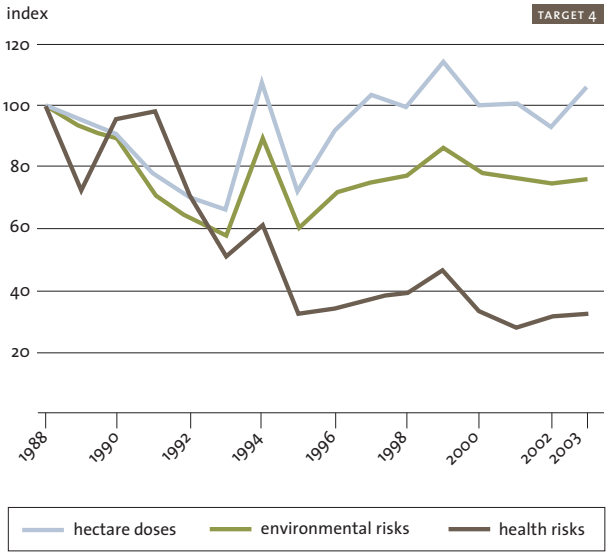
CONTINUOUS REDUCTION OF HEALTH AND ENVIRONMENTAL RISKS OF CHEMICALS

INTERIM TARGET 4, 2010

Health and environmental risks associated with the manufacture and use of chemical substances will be reduced continuously up to 2010, as measured by indicators and ratios to be established by the competent authorities. Over the same period, the occurrence and use of chemical substances which impede recycling of materials will decrease.

This target applies to substances not covered by interim target 3.

FIG. 4.2 Risk indicators for plant protection products used in Swedish agriculture and horticulture, 1988–2003



Note: Risk indicators compared with total number of hectare doses. Index for 1988 = 100.

SOURCE: NATIONAL CHEMICALS INSPECTORATE

The national risk indicators for plant protection products are intended to reflect longer-term trends in the health and environmental risks associated with such products. Over the last 15 years, the potential risks have been reduced – despite an increase in the intensity of use, expressed as the number of hectare doses.

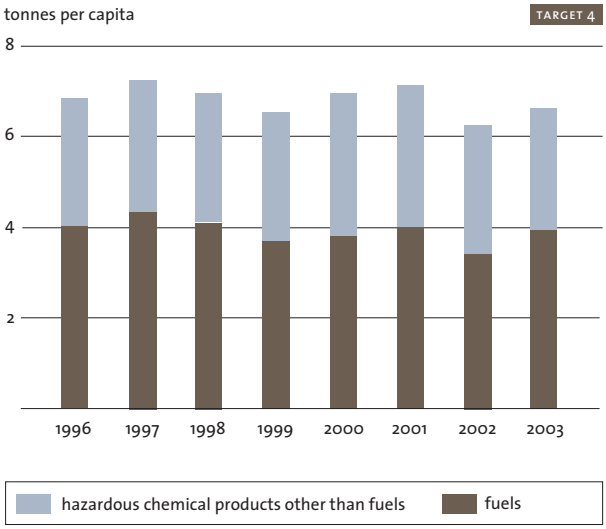
The lower level of risk can be attributed to several factors, including targeted information and advice, successful regulation of certain problem products, and the development of safer products. Improved formulations have for example reduced exposure levels for individuals using the products, and a higher proportion of doses are now applied directly to seeds. The latter has the advantage of greatly diminishing the risk of pesticides ending up in the wrong place.

GUIDELINE VALUES FOR ENVIRONMENTAL QUALITY

INTERIM TARGET 5, 2010

By 2010 guideline values will be established by the competent authorities for at least 100 selected chemical substances not covered by interim target 3. These values will indicate the maximum concentrations to be permitted in the environment or to which humans may be exposed. The aim is that the guideline values will in the long term be adopted as environmental quality standards.

FIG. 4.3 Turnover of chemical products hazardous to health in Sweden, per capita per year, 1996–2003



SOURCE: NATIONAL CHEMICALS INSPECTORATE

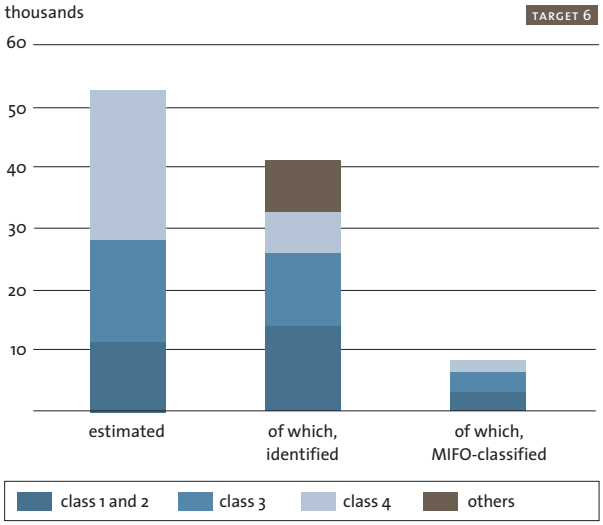
The annual per capita turnover of chemical products representing a risk to health in Sweden has shown little change in recent years. How products affect human health depends on what they contain and how they are handled. Separate figures are shown for fuels, which make up a large share of the total. For comparison, Statistics Sweden estimates the total annual direct material input between 1987 and 1998 at 24–27 tonnes per capita.

REMEDIATION OF CONTAMINATED SITES

INTERIM TARGET 6, 2005

By 2005 contaminated sites will have been identified and remediation will have begun at a minimum of 100 of the sites given highest priority with regard to the risks to human health and the environment. In addition, remediation will have been completed at a minimum of 50 of the sites at which such work has begun.

FIG. 4.4 Contaminated sites in Sweden in 2004, by risk category



SOURCE: SWEDISH EPA

The number of contaminated sites in Sweden that have been identified has risen by 10%, to over 40,000. The number of sites in the two highest risk classes (1 and 2) remains at the same level as in 2003, implying that we have a good picture of which sites need to be studied more closely and possibly remediated.

Risk classification using the MIFO method provides a good basis for determining priority sites for investigation and remediation. Over 40% of sites in the highest risk category have now been classified according to this method.

ENVIRONMENTAL OBJECTIVE FIVE

A Protective Ozone Layer

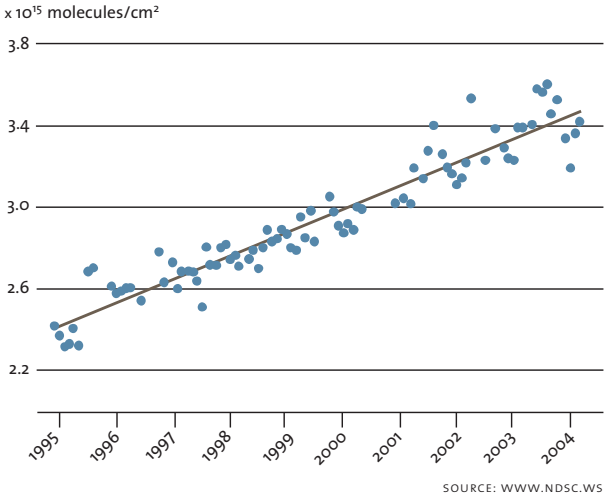
The ozone layer must be replenished so as to provide long-term protection against harmful UV radiation.

Will the objective be achieved?

😐 Adverse pressures on the ozone layer are continuing to abate, thanks to action taken in Sweden and other countries. Since the Montreal Protocol was signed in 1987, global emissions of ozone-depleting substances have fallen by over 70%. Despite the progress made, it is unclear when this environmental quality objective will be achieved. Measurements made at Harestua in Norway show that levels of HCFCs (hydrochlorofluorocarbons) in the stratosphere are still rising, whereas those of CFCs (chlorofluorocarbons) have probably peaked.

Long-term measurements of the thickness of the ozone layer above Norrköping show no definite signs of a recovery, but the downward trend does seem to have been halted. In the autumn of 2004 a very thin ozone layer was observed above Scandinavia and other regions, with values close to 200 DU. This is part of the annual cycle of ozone, low values being the natural state of affairs at high latitudes in autumn. Values as low as this, though, are not observed every year.

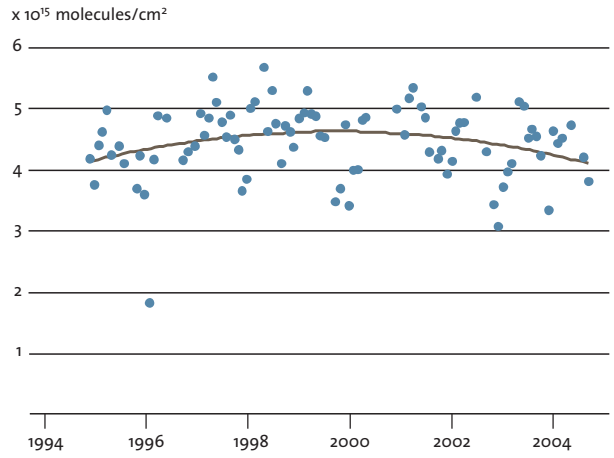
FIG. 5.1 Monthly mean levels of HCFC-22 (a hydrochlorofluorocarbon) recorded at the Harestua Solar Observatory



SOURCE: WWW.NDSC.WS

HCFC-22, a 'soft CFC', is now the refrigerant most widely used in fridges and freezers around the world, and its use continues to increase. In Sweden, HCFCs are permitted in existing refrigeration equipment, but may not be used for recharging or in new installations. The small-scale variation seen in the diagram is due to the effects of atmospheric dynamics.

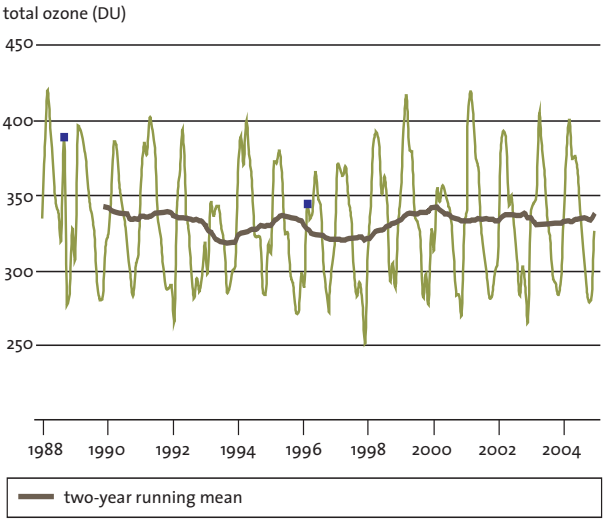
FIG. 5.2 Monthly mean levels of HCl (hydrogen chloride) in the stratosphere, recorded at the Harestua Solar Observatory



SOURCE: WWW.NDSC.WS

Levels of halogens, which originate from emissions of CFCs (chlorofluorocarbons), peaked some time in the late 1990s. Use of CFCs has decreased by more than 90%. HCl is an important reservoir molecule for chlorine deriving from CFC emissions.

FIG. 5.3 Ozone levels above Norrköping, 1988–2004



SOURCE: SWEDISH ENVIRONMENTAL MONITORING PROGRAMME

Measurements of the thickness of the ozone layer above Norrköping, south-west of Stockholm, have yet to reveal a clear recovery trend.

EXEMPTIONS AND NEW CHEMICALS

The Montreal Protocol has so far been a success, resulting in major reductions in emissions of ozone depleters. However, there are several causes for concern at present, including requests for significant exemptions from the rules on methyl bromide and on other applications. Under the protocol, methyl bromide is to be phased out altogether by 2005.

Another problem is that new ozone-depleting chemicals continue to appear on the market. The EU has drawn the Ozone Secretariat's attention to eight potential new substances, but it takes several years for notified substances to be regulated under the Montreal Protocol.

Will the interim target be achieved?

EMISSIONS OF OZONE-DEPLETING SUBSTANCES

INTERIM TARGET, 2010

By 2010 the great majority of emissions of ozone-depleting substances will have ceased.

ENVIRONMENTAL OBJECTIVE SIX

A Safe Radiation Environment

Human health and biological diversity must be protected against the harmful effects of radiation in the external environment.

Will the objective be achieved?

😐 Conditions for achieving this objective exist, but untiring efforts will be needed to ensure success. We need a better overall picture of the radiation environment in society, and of how people and the environment are affected by different sources of radiation.

A system to manage non-nuclear radioactive waste needs to be introduced, and emergency preparedness for radiological and nuclear events must continue to be developed.

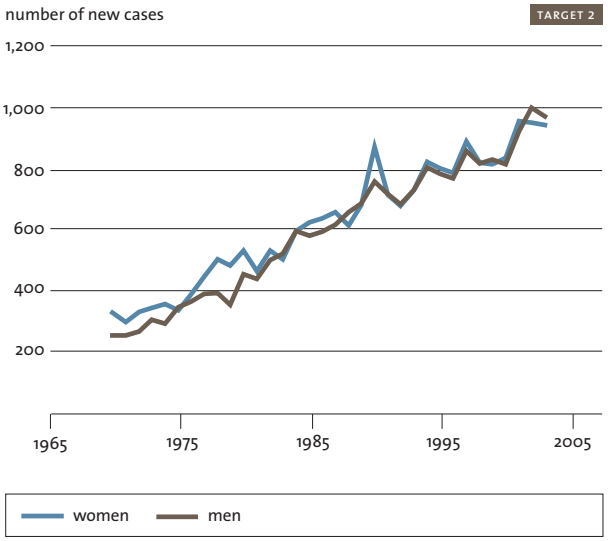
Will the interim targets be achieved?

RADIOACTIVE SUBSTANCES

INTERIM TARGET 1, 2010

😐 *By 2010 environmental concentrations of radioactive substances emitted from all human activities will be so low as not to represent a threat to human health or biological diversity. The additional individual dose to members of the public will be lower than 0.01 mSv per person per year from each individual operation.*

FIG. 6.1 Number of new cases of malignant melanoma in Sweden, 1970–2003



SOURCE: CENTRE FOR EPIDEMIOLOGY, NATIONAL BOARD OF HEALTH AND WELFARE

The incidence of skin cancer continues to rise. Our assessment is that it is still possible, but will be difficult, to achieve interim target 2. One problem is that changing attitudes to sunburn and outdoor behaviour patterns takes time, and that such changes are difficult to monitor on a regular basis. Another is that it will take decades for any effects of behavioural changes to show up in the cancer statistics.

Campaigns aimed at children and young people are expected to have the greatest long-term impact. Priority target groups in 2004–5 are pre-school and school teachers and child health professionals.

SKIN CANCER

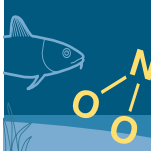
INTERIM TARGET 2, 2020

By 2020 the annual incidence of skin cancer caused by the sun will not be greater than it was in 2000.

ELECTROMAGNETIC FIELDS

INTERIM TARGET 3

Risks associated with electromagnetic fields will be studied on an ongoing basis and necessary action will be taken as any such risks are identified.



ENVIRONMENTAL OBJECTIVE SEVEN

Zero Eutrophication

Nutrient levels in soil and water must not be such that they adversely affect human health, the conditions for biological diversity or the possibility of varied use of land and water.

Will the objective be achieved?

Emissions to both air and water continue to decline, but the effects of eutrophication in the environment are not abating. Priority must be given to further measures to reduce emissions, and action must be taken where it will have the greatest impact. At present, a considerable discrepancy exists in many cases between measures proposed and those actually decided on, and several measures decided on have yet to be implemented. If action is delayed too long, both the interim targets and the environmental quality objective could prove difficult to attain.

REGIONAL ACTION

Almost all of Sweden's county administrative boards have proposed measures linked to regional goals in this area, but only one in three have taken decisions to implement them. The most carefully elaborated action strategies have been adopted in predominantly agricultural counties, where the need for action is greatest.

The quality of the measures concerned, and their status as measures, is debatable, however. Some measures have the character of targets, which could result in uncertainty as to how the real interim targets are to be implemented. Others require policy instruments which are not primarily within the competence of county administrative boards. In general, the link between measures and policy instruments is relatively weak. Furthermore, views of the status of goal documents vary: some counties see them as the principal documents guiding their activities, others simply as one of many sources of support for decision making.

Will the interim targets be achieved?

PROGRAMMES OF MEASURES TO ACHIEVE GOOD ECOLOGICAL STATUS

INTERIM TARGET 1, 2009

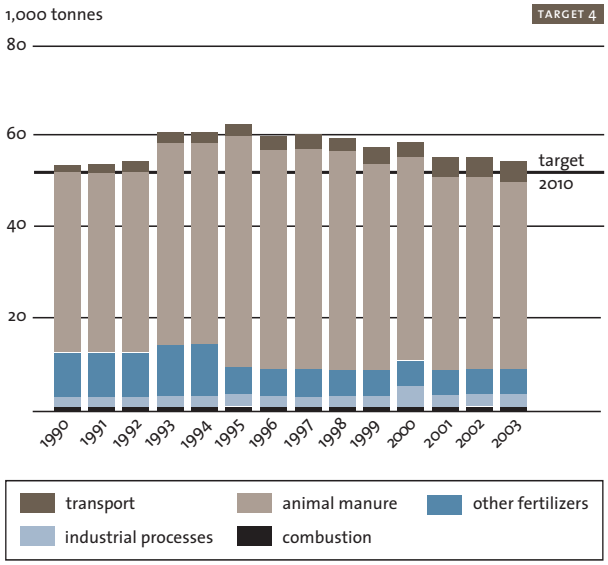
By 2009 programmes of measures as provided for in the EC Water Framework Directive will be established, specifying how good ecological status is to be achieved in lakes and streams and in coastal waters.

PHOSPHORUS EMISSIONS

INTERIM TARGET 2, 2010

By 2010 Swedish waterborne anthropogenic emissions of phosphorus compounds into lakes, streams and coastal waters will have decreased continuously from 1995 levels.

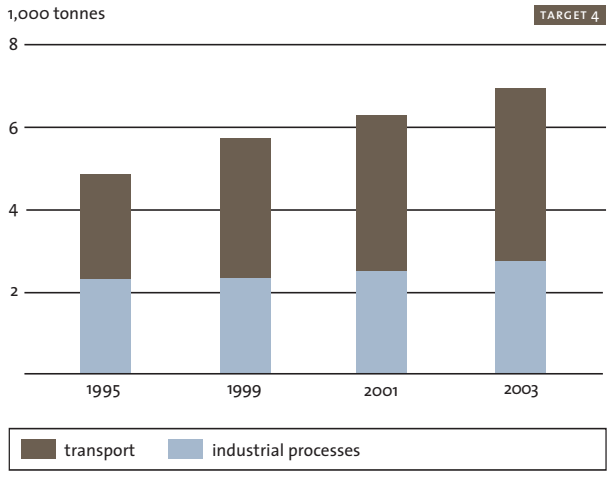
FIG. 7.1 Swedish emissions of ammonia, 1990–2003



SOURCE: SWEDISH EPA

Ammonia emissions have fallen by about 13% since 1995. The prospects of achieving the interim target by 2010 appear to be good.

FIG. 7.2 Emissions of ammonia from industrial processes and transport, 1995–2003



SOURCE: SWEDISH EPA

Emissions of ammonia from transport and industry increased by some 10% between 2001 and 2003, and by 30% between 1995 and 2003. However, these sources account for only about 10% of total emissions of this pollutant in Sweden.

NITROGEN EMISSIONS

INTERIM TARGET 3, 2010

By 2010 Swedish waterborne anthropogenic emissions of nitrogen into sea areas south of the Åland Sea will have been reduced by at least 30% compared with 1995 levels.

AMMONIA EMISSIONS

INTERIM TARGET 4, 2010

By 2010 emissions of ammonia in Sweden will have been reduced by at least 15% compared with 1995 levels, to 51,700 tonnes.

NITROGEN OXIDE EMISSIONS

INTERIM TARGET 5, 2010

By 2010 emissions of nitrogen oxides to air in Sweden will have been reduced to 148,000 tonnes.

ENVIRONMENTAL OBJECTIVE EIGHT

Flourishing Lakes and Streams

Lakes and watercourses must be ecologically sustainable and their variety of habitats must be preserved. Natural productive capacity, biological diversity, cultural heritage assets and the ecological and water-conserving function of the landscape must be preserved, at the same time as recreational assets are safeguarded.

Will the objective be achieved?

😐 Although expressions of intent regarding protection and restoration give cause for optimism, only when action programmes have been drawn up will it be possible to assess the prospects of achieving this environmental quality objective.

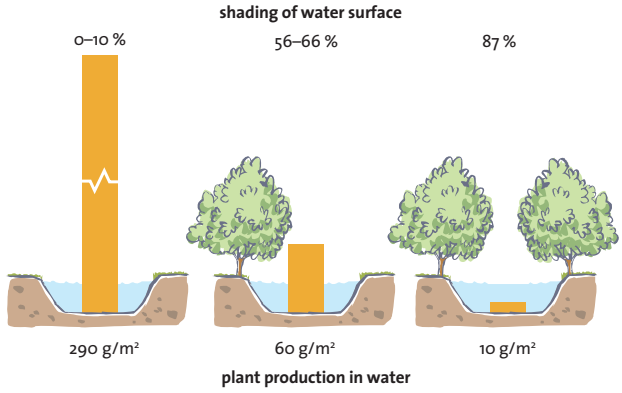
REGIONAL ACTION

If the objective is to be attained, regional work on water supply plans and the adoption by local authorities of protection areas for water sources must be stepped up. Measures also need to be implemented to comply with the Water Framework Directive.

MANY STAKEHOLDERS HAVE PART TO PLAY

Lakes and streams represent a resource for a wide range of sectors and individuals. Success in achieving the environmental quality objective is also dependent on farmers and forest owners managing their holdings in ways that preserve features of nature conservation and cultural heritage interest; on the value of shores and banks for biodiversity and outdoor recreation being maintained; and on hydroelectric companies

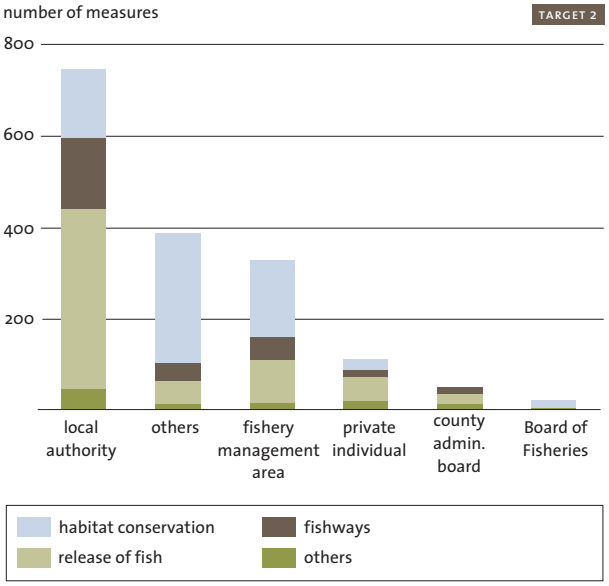
FIG. 8.1 Plant production in running waters with varying degrees of shading



SOURCE: BOOKLET 'ENVIRONMENTALLY SENSITIVE DITCH CLEARANCE'

Trees and bushes on stream and river banks provide shelter and habitat for a wide variety of species. The shade which they offer also benefits aquatic fauna and helps to prevent the water becoming choked with plant growth. Retention of a strip of trees reduces the need for weed cutting, and is an important example of a practice in farming and forestry that can help to maintain the nature conservation value of aquatic environments. The Swedish Board of Agriculture, the Swedish Environmental Protection Agency and the Federation of Swedish Farmers have jointly published a booklet on conservation aspects of ditch clearance.

FIG. 8.2 Number of restoration measures funded by Board of Fisheries fishery conservation grants 1997–2003, by implementing organization



SOURCE: NATIONAL BOARD OF FISHERIES

The commonest habitat conservation measures include improvement of spawning and nursery areas for fish, removal of barriers to migration, and restoration of stream channels modified for log driving. Releases of fish and crayfish are also common. The scale of interventions varies, habitat conservation projects often requiring far more resources than releases of species.

paying due regard to the remaining natural features of the rivers on which they operate.

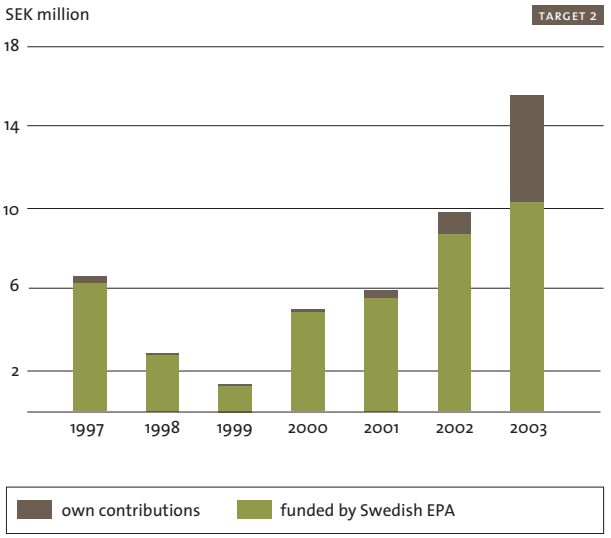
Will the interim targets be achieved?

PROTECTION OF NATURAL AND CULTURAL ENVIRONMENTS

INTERIM TARGET 1, 2005/2010

😐 *By 2005 the competent authorities will have identified and drawn up action programmes for natural and cultural environments, in or in the vicinity of lakes or streams, that are of particularly high conservation value and require long-term protection. By 2010 long-term protection will be provided for at least half of these environments.*

FIG. 8.3 Spending on biological restoration of limed waters



Note: Brown portions of bars show implementing organizations' own contributions (which may derive from fishery conservation grants); the remainder (green) is funding from the Swedish EPA.

SOURCES: SWEDISH EPA AND NATIONAL BOARD OF FISHERIES

As part of the liming programme, physical rehabilitation measures are also being undertaken, to ensure the return of the original species and thus restore lakes and streams in biological terms. State funding for biological restoration projects has increased, a trend that has been reinforced by an accompanying rise in the contributions made by the organizations implementing the projects.

RESTORATION OF RIVERS AND STREAMS

INTERIM TARGET 2, 2005/2010

😐 *By 2005 the competent authorities will have identified and drawn up action programmes for the restoration of Swedish rivers and streams of high conservation value or with the potential to acquire high conservation value following remediation. By 2010 at least 25% of valuable and potentially valuable rivers and streams will have been restored.*

WATER PROTECTION AREAS

INTERIM TARGET 3, 2009

😐 *By 2009 water supply plans, including water protection areas and protection regulations, will have been adopted for all public and large private surface water sources. Large*

surface water sources are defined as surface waters used for the abstraction of water and serving more than 50 persons or providing more than 10 m³ a day as an average.

RELEASES OF ANIMALS AND PLANTS

INTERIM TARGET 4, 2005

By 2005 releases of aquatic animals and plants will be undertaken in ways which do not adversely affect biological diversity.

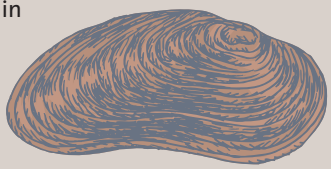
ACTION PROGRAMMES FOR THREATENED SPECIES

INTERIM TARGET 5, 2005

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

FRESHWATER PEARL MUSSEL

A revised action programme to conserve the freshwater pearl mussel (*Margaritifera margaritifera*) was adopted in 2004. Conservation of waters hosting this species is a key element in achieving the environmental quality objective. Many of the rivers and streams of high conservation value which are to be restored and given long-term protection support populations of freshwater pearl mussels. The action programme will also help to implement the conservation measures for the species required under the Habitats Directive.



TECKNING EFTER FOTO AV HÅKAN HOLMBERG

PROGRAMME OF MEASURES TO ACHIEVE GOOD SURFACE WATER STATUS

INTERIM TARGET 6, 2009

By 2009 a programme of measures as provided for in the EC Water Framework Directive will be established, specifying how good surface water status is to be achieved.

FIG. 8.4 Water districts established in Sweden under Water Framework Directive

TARGET 6

Note: The districts are named after the sea areas associated with them.

SOURCE: SWEDISH EPA

In April 2004, as part of the process of implementing the EC Water Framework Directive, five water districts were established in Sweden. One county administrative board in each district has been designated as water authority and is responsible for managing the quality of the aquatic environment in the district. The five water authorities created are the county administrative boards of Norrbotten, Västernorrland, Västmanland, Kalmar and Västra Götaland.

ENVIRONMENTAL OBJECTIVE NINE

Good-Quality Groundwater

Groundwater must provide a safe and sustainable supply of drinking water and contribute to viable habitats for flora and fauna in lakes and watercourses.

Will the objective be achieved?

This objective is expected to be largely attained within one generation, provided that additional action is taken. However, groundwaters affected by agriculture, contaminated sites and acidification will probably remain affected after 2020.

CONSERVE GROUNDWATERS

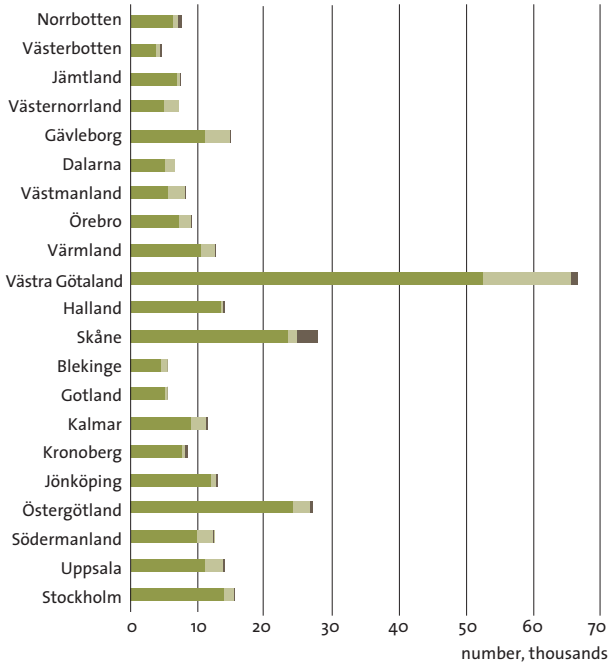
During the year, problems of naturally high levels of arsenic and uranium in groundwaters abstracted for public supply were highlighted. Some naturally occurring substances limit the extent to which groundwater can be used as drinking water. There is consequently a need to conserve bodies of groundwater, even if they are not currently used to supply water. This is particularly true in view of the relatively limited state of knowledge concerning both contaminants and naturally occurring harmful substances in Swedish groundwaters.

PRIVATE WATER SUPPLIES

Some 1.2 million people in Sweden, including around 300,000 children, live in households that obtain their water from private wells. Problems of water quality are common, and it is often difficult to bring the water up to an acceptable and even standard by means of treatment. In 2003 the National Board of Health and Welfare published guidelines on private water supplies (SOSFS 2003:17), which include several guide values designed to protect children. In the in-depth evaluation of the environmental objectives carried out in 2004, the Geological Survey of Sweden (SGU) proposed a new interim target relating to private supplies of water. Several counties have highlighted this issue in various ways, for example by adopting regional targets.

During the year, in collaboration with professional organizations, SGU developed a training package and a list of requirements for certification of water well drillers. By the end of the year, ten well drillers had been certified by a certification company.

FIG. 9.1 Number of children (up to 18) in households with a private well, by county. Estimated numbers exposed to fluoride and nitrate concentrations above guide values for drinking water for young children are shown



SOURCES: NATIONAL ENVIRONMENTAL HEALTH SURVEY 1999 AND SGU

Both naturally occurring substances and pollutants can make drinking water unsuitable for young children. In the case of households with a well of their own, the guide value for fluoride is estimated to be exceeded for 15% of young children and the guide value for nitrate for 2% of them. High concentrations of fluoride occur naturally in water from many wells drilled in bedrock, while high nitrate levels, mainly in water from excavated wells, are usually due to leaching from farmland. For several substances that may be harmful to children, e.g. arsenic, there are insufficient data to estimate the number of children affected.

Will the interim targets be achieved?

PROTECTION OF WATER-BEARING GEOLOGICAL FORMATIONS

INTERIM TARGET 1, 2010

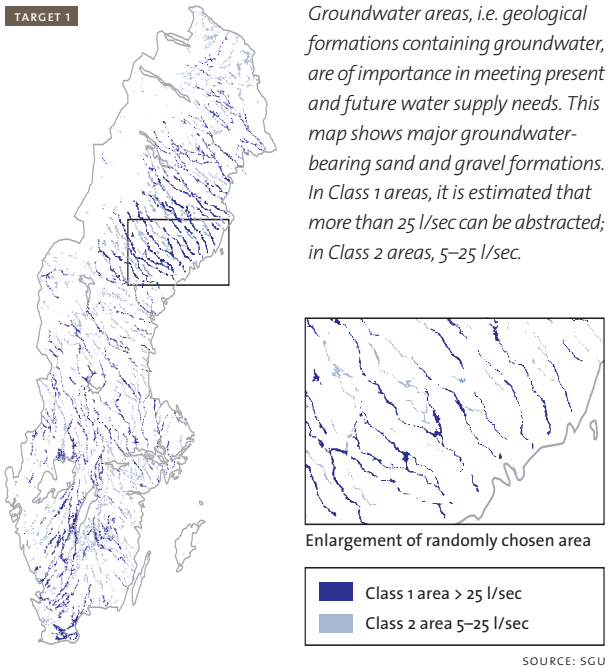
By 2010 long-term protection from development activities that restrict water use will be provided for water-bearing geological formations of importance in meeting present and future water supply needs.

GROUNDWATER LEVELS

INTERIM TARGET 2, 2010

By 2010 the use of land and water will not cause changes in groundwater levels that adversely affect the water supply, soil stability, or the animal and plant life of adjoining ecosystems.

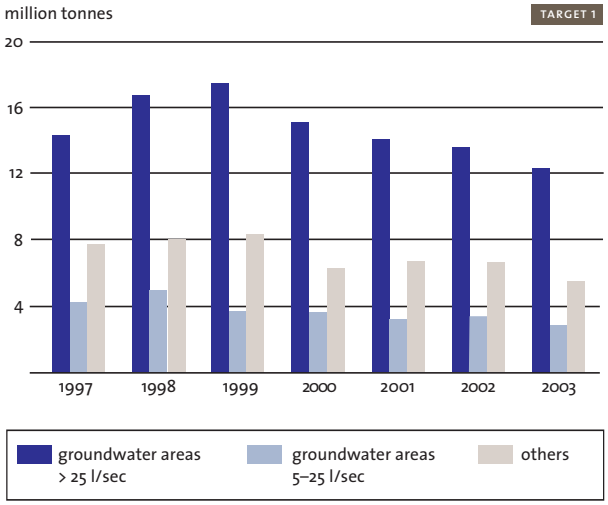
FIG. 9.2a Groundwater areas with significant abstraction potential



Groundwater areas, i.e. geological formations containing groundwater, are of importance in meeting present and future water supply needs. This map shows major groundwater-bearing sand and gravel formations. In Class 1 areas, it is estimated that more than 25 l/sec can be abstracted; in Class 2 areas, 5–25 l/sec.

SOURCE: SGU

FIG. 9.2b Quantities of natural gravel supplied from pits in groundwater areas judged to have significant potential for abstraction of groundwater



SOURCE: SGU

The largest quantities of natural gravel are still extracted in groundwater areas with the greatest potential as sources of groundwater.

GOOD-QUALITY DRINKING WATER

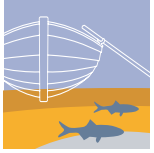
INTERIM TARGET 3, 2010

By 2010 all bodies of water used for the abstraction of water intended for human consumption, and providing more than 10 m^3 a day as an average or serving more than 50 persons, will meet the Swedish standards for good-quality drinking water with respect to anthropogenic pollution.

PROGRAMMES OF MEASURES TO ACHIEVE GOOD GROUNDWATER STATUS

INTERIM TARGET 4, 2009

By 2009 programmes of measures as provided for in the EC Water Framework Directive will be established, specifying how good groundwater status is to be achieved.



ENVIRONMENTAL OBJECTIVE TEN

A Balanced Marine Environment, Flourishing Coastal Areas and Archipelagos

The North Sea and the Baltic Sea must have a sustainable productive capacity, and biological diversity must be preserved. Coasts and archipelagos must be characterized by a high degree of biological diversity and a wealth of recreational, natural and cultural assets. Industry, recreation and other utilization of the seas, coasts and archipelagos must be compatible with the promotion of sustainable development. Particularly valuable areas must be protected against encroachment and other disturbance.

Will the objective be achieved?

😐 To achieve this environmental quality objective within the intended time-frame, additional action needs to be taken.

Progress is being made in the designation of marine nature reserves, with a view to enhancing protection of the marine environment. In addition, many coastal and archipelago areas are now safeguarded through Natura 2000, the EU network of protected areas.

In 2004 the International Maritime Organization decided in principle to class the Baltic as a Particularly Sensitive Sea Area, which will improve maritime safety in the area.

In a new report entitled 'Fish, fishing and the environment', the National Board of Fisheries has given an account of its efforts to implement the environmental quality objectives over the period 2001–4.

FURTHER CONSERVATION MEASURES REQUIRED

Several commercially exploited fish species are now in serious difficulty. A fishing fleet that is too large and efficient is exploiting a finite resource, and bycatches continue to be a problem. To attain this environmental objective, both international cooperation and further measures at the national level are called for.

Will the interim targets be achieved?

MARINE ENVIRONMENTS OF HIGH CONSERVATION VALUE

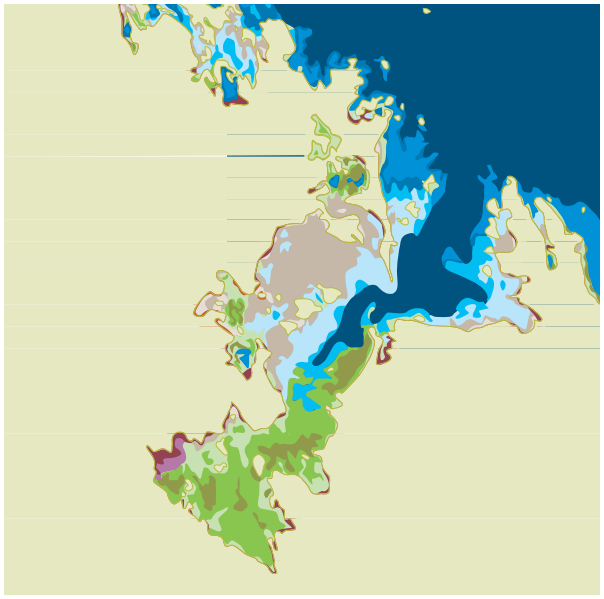
INTERIM TARGET 1, 2005/2010

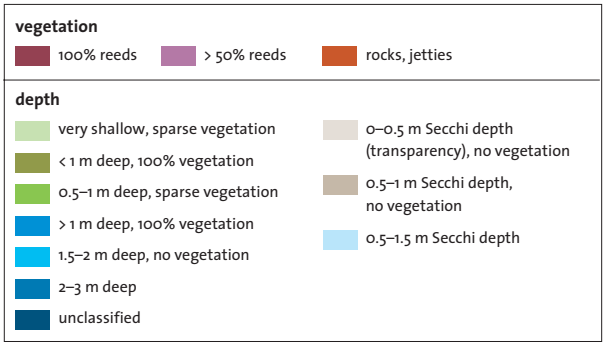
😐 *By 2010 long-term protection will be provided for at least 50% of marine environments of high conservation value and at least 70% of coastal and archipelago areas with significant*

natural and cultural assets. By 2005 another five marine areas will be protected as reserves, and the competent authorities will have decided which other areas in the marine environment are in need of long-term protection.

FIG. 10.1 Estimated vegetation cover of shallow coastal inlets

TARGET 1





SOURCE: NATIONAL BOARD OF FISHERIES

In a joint project with Metria Miljöanalys, the National Board of Fisheries and the Swedish EPA, the Swedish National Space Board is assessing Baltic coastal habitats of value for recruitment of fish. The diagram shows an example, from Kallrigafjärden (Bothnian Sea), of a classification of depth and vegetation based on satellite imagery.

CULTURAL HERITAGE AND AGRICULTURAL LANDSCAPES OF COASTS AND ARCHIPELAGOS

INTERIM TARGET 2, 2005

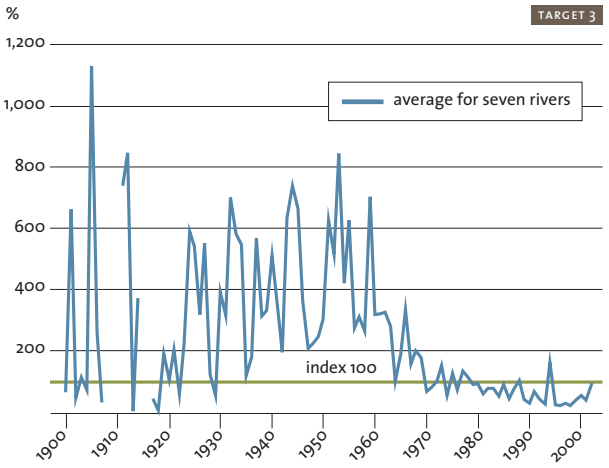
By 2005 a strategy will have been adopted for the preservation and use of the cultural heritage and agricultural landscapes of coastal and archipelagos areas.

THREATENED SPECIES

INTERIM TARGET 3, 2005

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

FIG. 10.2 Recruitment of eels to Sweden in the 20th century



SOURCE: NATIONAL BOARD OF FISHERIES

Upstream migration of elvers (young eels) in seven Swedish rivers during the 20th century. The diagram shows a comparison with the average for 1971–80, which is assigned an index of 100 (green line).

In 1953, one of the peak years, recruitment was eight times as high as during the base period, whereas in the last ten years, on average, only half as many elvers have ascended these rivers as in the 1970s. The eel is included on the new Swedish Red List of threatened marine species.

BYCATCHES

INTERIM TARGET 4, 2010

By 2010 total annual bycatches of marine mammals will not exceed 1% of each population. Bycatches of sea birds and undesired fish species will have been reduced to levels that have no adverse effect on the populations concerned.

CATCHES – RECRUITMENT

INTERIM TARGET 5, 2008

By 2008 catches of fish, including bycatches of juveniles, will not exceed recruitment, enabling fish stocks to survive and, where necessary, recover.

NOISE AND OTHER DISTURBANCE

INTERIM TARGET 6, 2010

By 2010 noise and other disturbance from boat traffic will be negligible in particularly sensitive and designated archipelago and coastal areas.

DISCHARGES OF OIL AND CHEMICALS

INTERIM TARGET 7, 2010

By 2010 discharges of oil and chemicals from ships will be minimized and reduced to a negligible level by stricter legislation and increased monitoring.

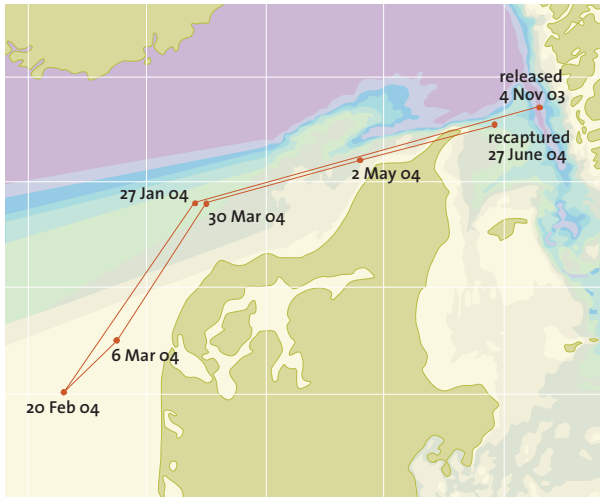
PROGRAMMES OF MEASURES TO ACHIEVE GOOD SURFACE WATER STATUS

INTERIM TARGET 8, 2009

By 2009 programmes of measures as provided for in the EC Water Framework Directive will be established, specifying how good surface water status can be achieved.

FIG. 10.3 Example of a cod migration route

TARGET 5



SOURCE: NATIONAL BOARD OF FISHERIES

Studies of the migratory behaviour of cod using data storage tags indicate that cod tagged in the open Skagerrak originate in the North Sea. Tagging of cod close to the Bohuslän coast, on the other hand, points to sedentary behaviour. An understanding of migration patterns is needed to ensure that, for a given population, catches of fish do not exceed a sustainable level. This diagram shows the migration route of a cod tagged in the eastern Skagerrak in November 2003 and recaptured in roughly the same area in June 2004.

ENVIRONMENTAL OBJECTIVE ELEVEN

Thriving Wetlands

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

Will the objective be achieved?

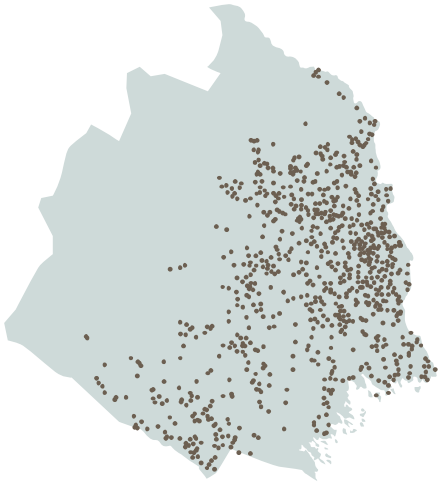
The wetlands inventory of Norrbotten was completed in 2004, with the result that we now have a good picture of the valuable features of wetlands in all the counties of Sweden. The data obtained from the county inventories have been quality-assured by the Environmental Data Centre of the Swedish University of Agricultural Sciences and are now available on the Internet. They provide a good basis for ensuring that greater attention is paid to wetlands, for example in land use planning.

One example of what this can entail in different sectors is the work being done by the National Road Administration to reduce the adverse impacts of roads and traffic by safeguarding amphibian migration routes. Two new wildlife crossings have recently been built at Jernklevevattnet in Bohuslän and Skårby in Stockholm county.

NATIONAL STRATEGY WILL FACILITATE REGIONAL ACTION

The national strategy for wetlands will seek to identify ways of facilitating the work of the relevant sectors at the local and regional levels. Together with the revised Mire Protection Plan, it should enhance the prospects of achieving the environmental quality objective.

FIG. 11.1 Traces of wetland haymaking in Norrbotten county



SOURCE: WETLANDS INVENTORY, NORRBOTTEN COUNTY

In the wetlands inventory of Norrbotten, traces of human activity have been found on more than 800 wetland sites. This map shows traces of haymaking. Many wetlands in the county used to be mown for hay, especially for winter fodder.

Will the interim targets be achieved?

STRATEGY FOR PROTECTION AND MANAGEMENT

INTERIM TARGET 1, 2005

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

MIRE PROTECTION PLAN

INTERIM TARGET 2, 2010

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

FOREST ROADS

INTERIM TARGET 3, 2004

By 2004 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 in other respects.

WETLANDS ON AGRICULTURAL LAND

INTERIM TARGET 4, 2010

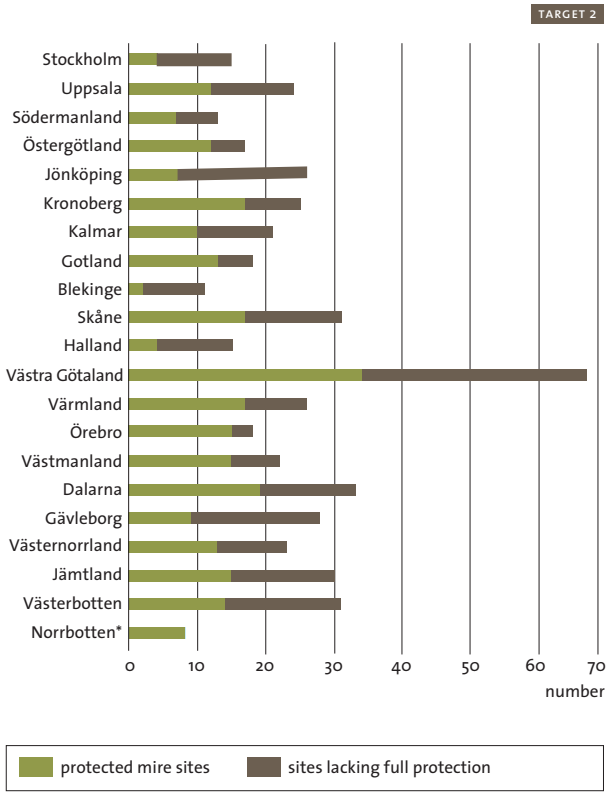
At least 12,000 hectares of wetlands and ponds will be established or restored on agricultural land by 2010.

ACTION PROGRAMMES FOR THREATENED SPECIES

INTERIM TARGET 5, 2005

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

FIG. 11.2 Proportions of Mire Protection Plan sites in each county with long-term protection



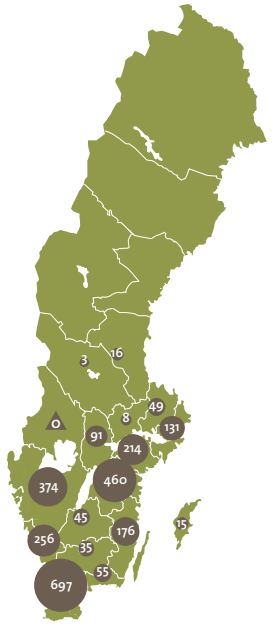
SOURCES: METRIA AND SWEDISH EPA

The number and extent of sites listed in the Mire Protection Plan for Sweden vary from one county to another. This diagram shows how many of these sites had been protected up to May 2003. A site is defined as protected if at least 75% of its area is included in a nature reserve, national park or Natura 2000 site.

** The county of Norrbotten has the largest area of protected mires, with over 400,000 ha divided between eight sites. The Mire Protection Plan is to be extended to include additional sites in Norrbotten, reflecting the improved picture of valuable mire areas in the county provided by the recently completed wetlands inventory.*

FIG. 11.3 Areas of wetlands (ha) established with EU agricultural support (ERDP), 2000–2004, by county

TARGET 4



SOURCE: SWEDISH BOARD OF AGRICULTURE

Support for projects to establish wetlands cannot be applied for in areas covered by Objective 1 of the EU structural funds, i.e. Norrbotten, Västerbotten, Jämtland and Västernorrland counties and parts of the counties of Dalarna, Gävleborg and Värmland. In southern Sweden, such schemes can qualify for project support and/or management payments. In the counties of Jönköping, Kronoberg, Värmland, Dalarna and Gävleborg project support is only granted if the county administrative board judges it to be of particular importance for the environment.

ENVIRONMENTAL OBJECTIVE TWELVE

Sustainable Forests

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.

Will the objective be achieved?

This environmental quality objective will probably not be achieved by 2020, despite the fact that, by and large, it should be possible to meet the interim targets. As far as biological diversity is concerned, this is mainly because of the long timescale of many biological processes in forests. Improvements in biodiversity are unlikely to become apparent until after 2020, even though appreciable progress has been made regarding several of the factors on which it depends.

Air pollution and locally high removals of biomass represent a threat to the long-term productivity of forest land. It is doubtful whether air pollution will be reduced to a sufficient degree by 2020, especially in south-west Sweden. If large amounts of biomass are harvested, compensatory measures are necessary.

Initiatives have been launched to highlight and develop the social values of forests, including urban woodlands. These initiatives may be expected to produce good results.

AFTER THE STORM

In early January 2005 a violent storm swept across southern Sweden, causing the most widespread storm damage to forests ever recorded there. In the space of some 24 hours, a volume of timber corresponding to an entire year's felling was blown down, with spruce forests particularly severely affected.

A detailed picture of the effects has still to emerge. Major efforts are being made to harvest the windthrown trees, which must be done without harming the existing nature conservation and cultural heritage interest of the forests. Following earlier, smaller-scale storms, forest owners have found this a difficult challenge.

The storm will affect operations in the forestry sector over the next few years, and hence the prospects of attaining the environmental goals. Clear-up work is difficult, risky and time-consuming, and several fatalities have already occurred.

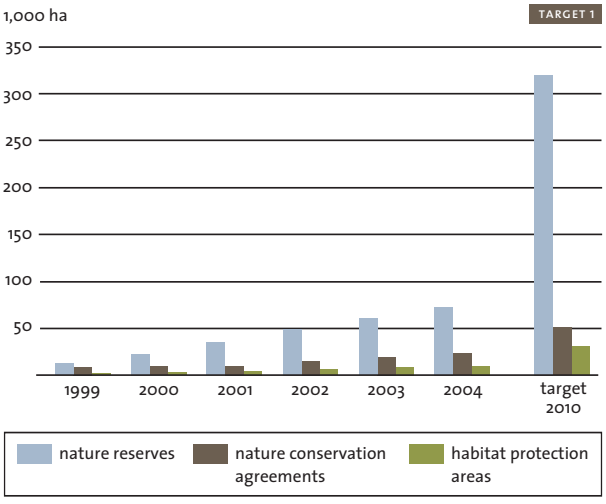
MEASURES TO ACHIEVE OBJECTIVE

The first two of the following measures are planned, while the others have been initiated, but not completed:

- Design a new nature conservation instrument that will enable targeted management measures to be undertaken.
- Develop agreement-based instruments for purposes other than nature conservation.
- Draw up a strategy for formal protection of forests, to ensure effective implementation of interim target 1.

- Introduce sectoral goals, to clarify what the state wishes to achieve regarding forests.
- Develop methods to identify and manage forests with long continuity.
- Increase funding for nature reserves, habitat protection areas and nature conservation agreements.
- Give regional forestry boards greater scope to undertake field visits prior to felling.
- Implement the development phase of the action programme to prevent soil acidification and to promote sustainable forest production throughout the country.
- Avoid damage to ancient monuments and other valuable cultural remains in forests.
- Develop and launch initiatives to highlight the social values of forests.

FIG. 12.1 Areas of forest land designated as nature reserves and habitat protection areas and covered by nature conservation agreements, 1999–2004



Note: The bars to the far right show the target areas to be achieved by 2010.

SOURCES: SWEDISH EPA AND NATIONAL BOARD OF FORESTRY

Progress in establishing long-term protection for new areas of forest needs to be stepped up significantly if interim target 1 is to be met by 2010.

Will the interim targets be achieved?

LONG-TERM PROTECTION OF FOREST LAND

INTERIM TARGET 1, 2010

☹ *A further 900,000 hectares of forest land of high conservation value will be excluded from forest production by the year 2010.*

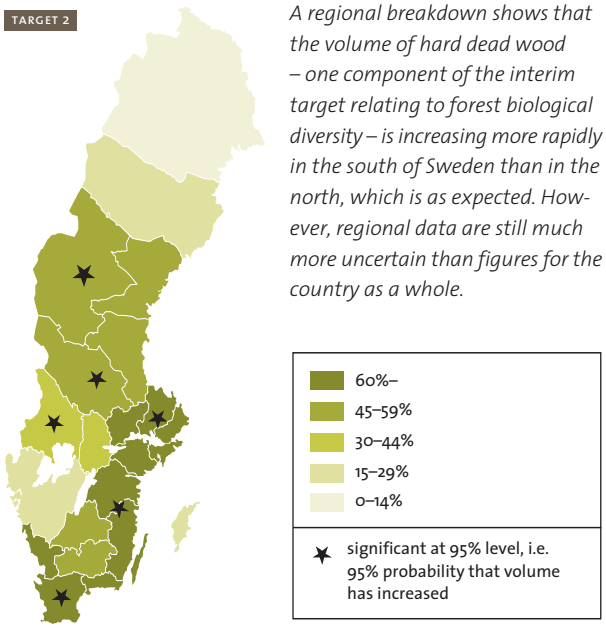
ENHANCED BIOLOGICAL DIVERSITY

INTERIM TARGET 2, 2010

☺ *By 2010 the amount of dead wood, the area of mature forest with a large deciduous element and the area of old forest will be maintained and increased by:*

- *increasing the quantity of hard dead wood by at least 40% throughout the country and considerably more in areas where biological diversity is particularly at risk;*
- *increasing the area of mature forest with a large deciduous element by at least 10%;*

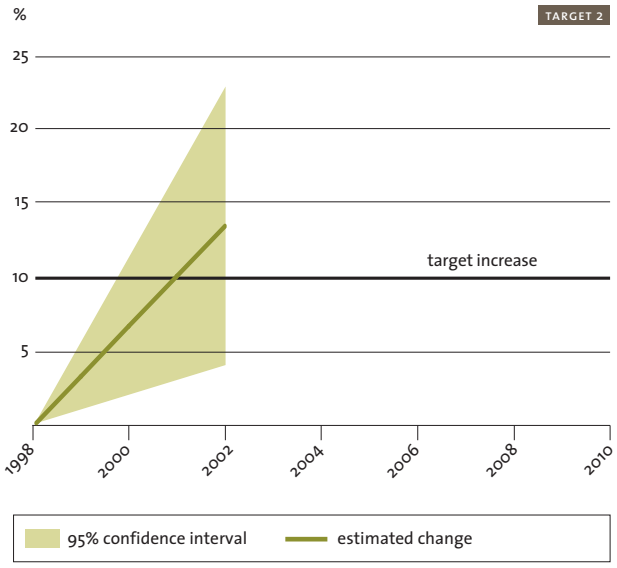
FIG. 12.2 Estimated percentage increase in volume of hard dead wood on productive forest land, 1998–2002



A regional breakdown shows that the volume of hard dead wood – one component of the interim target relating to forest biological diversity – is increasing more rapidly in the south of Sweden than in the north, which is as expected. However, regional data are still much more uncertain than figures for the country as a whole.

SOURCES: NATIONAL FOREST INVENTORY, SLU AND NATIONAL BOARD OF FORESTRY

FIG. 12.3a Change in area of mature forest with a large deciduous element in Sweden as a whole, 1998–2002

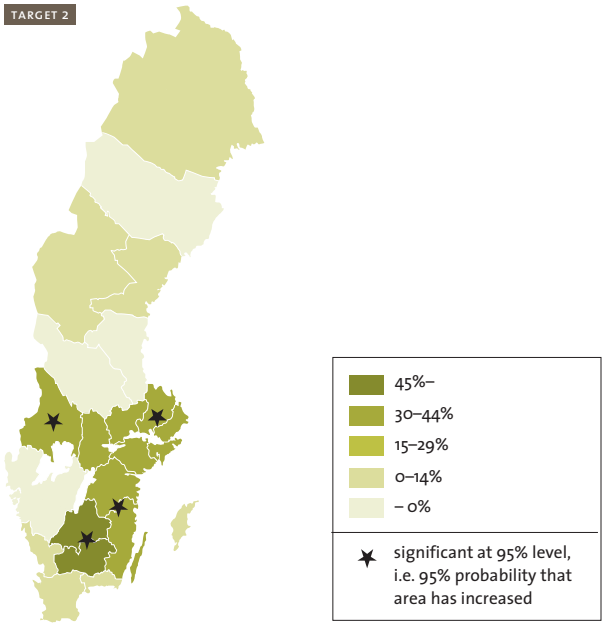


Note: The confidence interval shows the range within which there is a 95% probability of the true change lying.

SOURCES: NATIONAL FOREST INVENTORY, SLU AND NATIONAL BOARD OF FORESTRY

The area of mature forest with a large deciduous element – another parameter included in the interim target for forest biodiversity – is increasing, and according to the estimate made the target increase of at least 10% will be achieved. The estimate is still very uncertain, however.

FIG. 12.3b Estimated percentage change in area of mature forest with a large deciduous element on productive forest land, 1998–2002



SOURCES: NATIONAL FOREST INVENTORY, SLU AND NATIONAL BOARD OF FORESTRY

The regional breakdown is reminiscent of the one for hard dead wood. Considerable uncertainty still attaches to the data for individual regions.

- *increasing the area of old forest by at least 5%;*
- *increasing the area regenerated with deciduous forest.*

PROTECTION OF CULTURAL HERITAGE

INTERIM TARGET 3, 2010

By 2010 forest land will be managed in such a way as to avoid damage to ancient monuments and to ensure that damage to other known valuable cultural remains is negligible.

ACTION PROGRAMMES FOR THREATENED SPECIES

INTERIM TARGET 4, 2005

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

ENVIRONMENTAL OBJECTIVE THIRTEEN

A Varied Agricultural Landscape

The value of the farmed landscape and agricultural land for biological production and food production must be protected, at the same time as biological diversity and cultural heritage assets are preserved and strengthened.

Will the objective be achieved?

The present condition and long-term productivity of arable land are satisfactory. As far as biodiversity and cultural heritage are concerned, good progress has been made towards the objective, but whether this trend will be maintained until 2020 is unclear. An influential factor in this regard is the EU common agricultural policy.

Old farm buildings are of value from both a cultural heritage and an environmental point of view. Today many of them lack suitable uses, increasing the risk of their being inadequately maintained, becoming derelict and being demolished.

ORGANIC PRODUCTION

The Swedish Board of Agriculture has proposed new targets for organic production. According to the proposals, a much larger share of production is to be certified by 2010. Produce may only be sold as organic subject to certification having been obtained.

At present, 17.2% of arable land is covered by the agri-environment scheme for organic production, and just under half this area is certified.

Will the interim targets be achieved?

MEADOW AND PASTURE LAND

INTERIM TARGET 1, 2010

By 2010 all meadow and pasture land will be preserved and managed in such a way as to preserve its value. The area of traditionally managed meadow land will increase by at least 5,000 hectares and the area of managed pasture land of the most endangered types will increase by at least 13,000 hectares by 2010.

SMALL-SCALE HABITATS

INTERIM TARGET 2, 2005

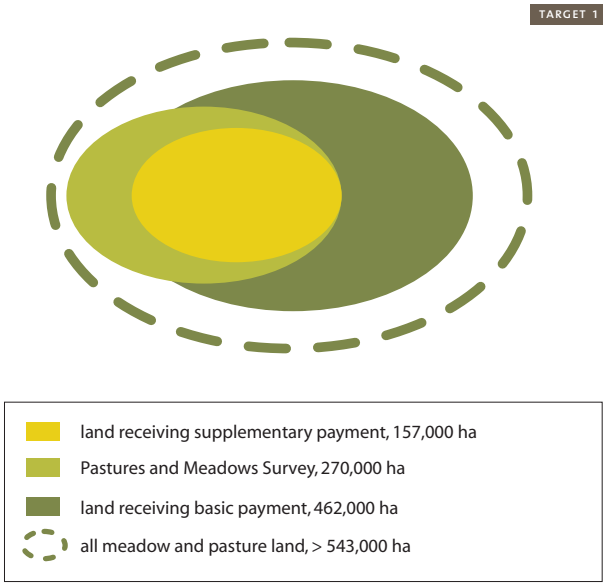
Small-scale habitats on farmland will be preserved to at least the same extent as today throughout the country. By 2005 a strategy will have been adopted to increase the number of such habitats on the agricultural plains of Sweden.

CULTURALLY SIGNIFICANT LANDSCAPE FEATURES

INTERIM TARGET 3, 2010

The number and extent of culturally significant landscape features that are managed will increase by about 70% by 2010.

FIG. 13.1 Meadow and pasture land. Interim target 1 in relation to agri-environment schemes and National Survey of Semi-Natural Pastures and Meadows

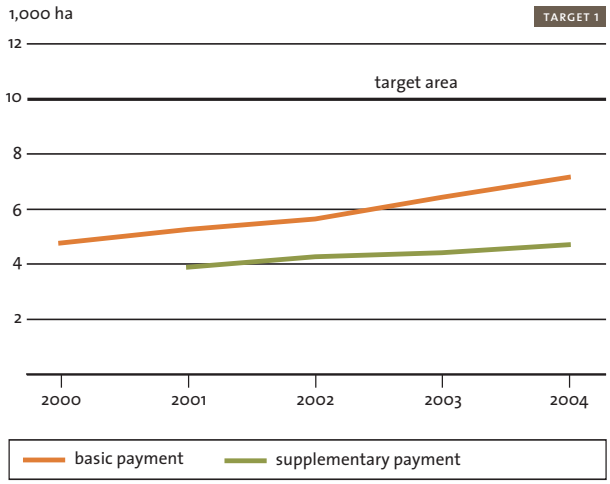


SOURCE: SWEDISH BOARD OF AGRICULTURE

Some 543,000 ha of meadow and pasture land are currently registered, but new areas are still being notified and the total extent of meadows and pastures is not known. The interim target calls for the conservation interest of such land to be preserved, and the management interventions needed to achieve this vary. The agri-environment schemes, which provide for two payment levels (basic and supplementary), lay down management requirements and eligibility criteria. Outside these programmes, the new single farm payment scheme will help to maintain a basic level of management. The National Survey of Semi-Natural Pastures and Meadows has provided an inventory of the most valuable areas. Studies are currently under way to establish why some areas remain outside the agri-environment schemes, and to determine the total area not included. One reason may be that the land in question first needs to be restored.

▶ *If the interim target for culturally significant landscape features is to be met by 2010, the highest take-up of agri-environment payments should occur early on in the life of the scheme. This has been the case as regards linear features, but not to the same extent for point features.*

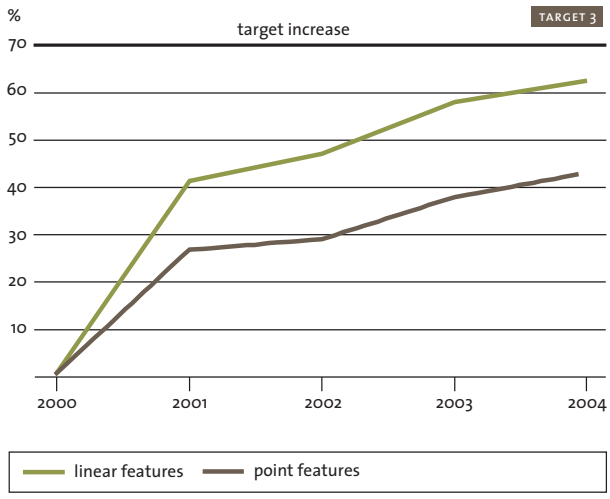
FIG. 13.2 Area of meadow land covered by agri-environment scheme to conserve meadows



SOURCE: SWEDISH BOARD OF AGRICULTURE

The area of meadow land covered by the agri-environment scheme is increasing at a satisfactory pace. However, the area receiving supplementary payments is not growing at a proportionate rate, and there is a risk that the quality envisaged under the interim target will not be achieved.

FIG. 13.3 Percentage change in number or extent of culturally significant landscape features covered by agri-environment scheme



SOURCE: SWEDISH BOARD OF AGRICULTURE

PLANT GENETIC RESOURCES AND INDIGENOUS BREEDS

INTERIM TARGET 4, 2010

By 2010 the national programme for plant genetic resources will be fully developed and there will be sufficient numbers of individuals to ensure the long-term conservation of indigenous breeds of domestic animals in Sweden.

ACTION PROGRAMMES FOR THREATENED SPECIES

INTERIM TARGET 5, 2006

By 2006 action programmes will have been prepared and introduced for threatened species that are in need of targeted measures.

FARM BUILDINGS OF CULTURAL HERITAGE VALUE

INTERIM TARGET 6, 2005

By 2005 a programme will have been prepared for the conservation of farm buildings of cultural heritage value.

ENVIRONMENTAL OBJECTIVE FOURTEEN

A Magnificent Mountain Landscape

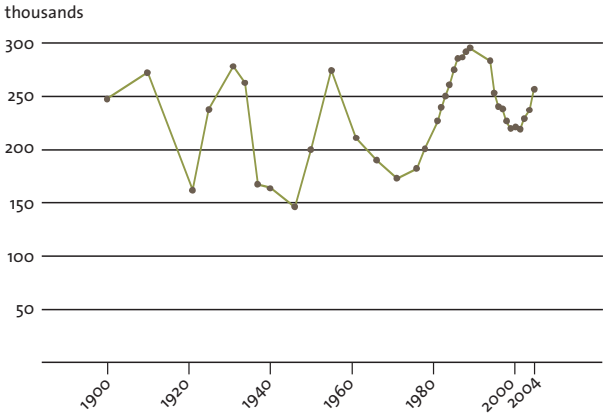
The pristine character of the mountain environment must be largely preserved, in terms of biological diversity, recreational value, and natural and cultural assets. Activities in mountain areas must respect these values and assets, with a view to promoting sustainable development. Particularly valuable areas must be protected from encroachment and other disturbance.

Will the objective be achieved?

A mountain landscape characterized by grazing is dependent on reindeer herding, which needs to be carried out and developed along environmentally sustainable lines.

Pressure to establish new wind energy installations in mountain regions could adversely affect both the natural and cultural assets of such regions and the chances of increasing the area of undisturbed mountain terrain. To avoid this, such projects must be carefully planned. On the other hand, wind power will benefit mountain ecosystems that are dependent on progress towards other environmental quality objectives, such as Flourishing Lakes and Streams.

FIG. 14.1 Reindeer numbers in Sweden, 1900–2004



SOURCE: SWEDISH BOARD OF AGRICULTURE

Reindeer are counted in winter, after the autumn slaughter and before calving. At that time of year, they graze mainly on lichens. Fluctuations in reindeer numbers reflect the varying abundance and accessibility of lichens, chiefly in forest areas outside the mountain region.

KNOWLEDGE AND COORDINATION

Crucial tools in planning land use in mountain areas include the regional environment and sustainable use programme and the environmental plans of reindeer husbandry districts. Existing knowledge concerning vegetation, aquatic organisms, cultural environments etc. needs to be enhanced. In addition, coordination between county administrative boards, the National

Heritage Board and the Swedish Environmental Protection Agency is essential.

This environmental quality objective can be achieved within one generation, provided that the relevant sectors and society as a whole show due consideration for the environment. A wide range of action is in progress, and additional measures are planned, but the pace of implementation needs to be stepped up. The regional goals adopted can help to achieve the national objective.

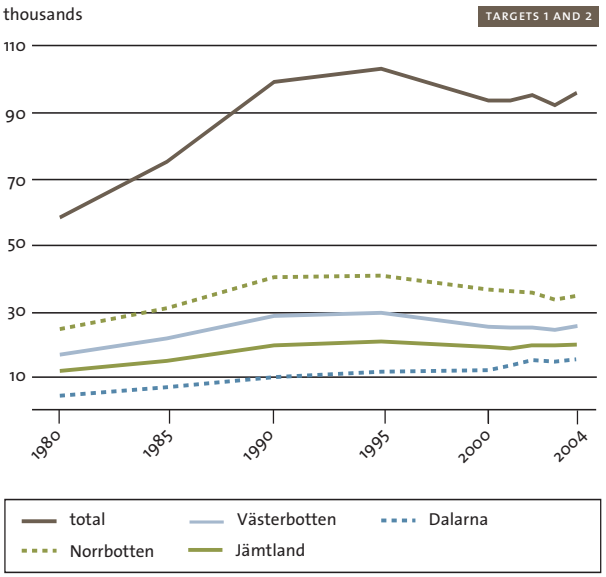
Will the interim targets be achieved?

DAMAGE TO SOIL AND VEGETATION

INTERIM TARGET 1, 2010

😐 *By 2010 damage to soil and vegetation caused by human activities will be negligible.*

FIG. 14.2 Light all-terrain vehicles in use in mountain counties of Sweden, 1980–2004



Note: Light all-terrain vehicle = all-terrain motor vehicle with a maximum ready-for-use weight of 400 kg. In practice, refers to quad bikes, three-wheelers and, above all, snowmobiles.

SOURCE: STATISTICS SWEDEN

NOISE

INTERIM TARGET 2, 2010/2015

☹ *Noise in mountain areas from motor vehicles driven off-road and from aircraft will be reduced to meet the following requirements:*

- *by 2015 at least 60% of light all-terrain vehicles will meet stringent noise standards (below 73 dBA);*
- *by 2010 the noise from aircraft will be negligible both in class A regulated areas under the Off-Road Driving Ordinance (1978:594) and in at least 90% of the national park area.*

NATURAL AND CULTURAL ASSETS

INTERIM TARGET 3, 2010

😐 *By 2010 long-term protection, including where necessary management and restoration measures, will have been provided for the majority of mountain areas with representative and significant natural and cultural assets.*

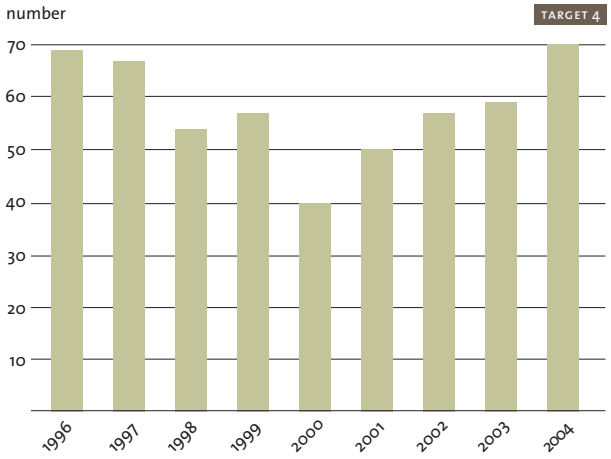
ACTION PROGRAMMES FOR THREATENED SPECIES

INTERIM TARGET 4, 2005

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

◀ *Driving on ground unprotected by snow damages soil and vegetation, and may also harm archaeological remains. Other adverse effects, on snow-covered as well as bare ground, are noise and exhaust emissions, which make the mountain environment less attractive for outdoor recreation. Snowmobiles may, however, be important for certain aspects of tourism. The main legal users of off-road vehicles on snow-free ground in mountain areas are reindeer herders, along with the defence forces and telephone and energy companies.*

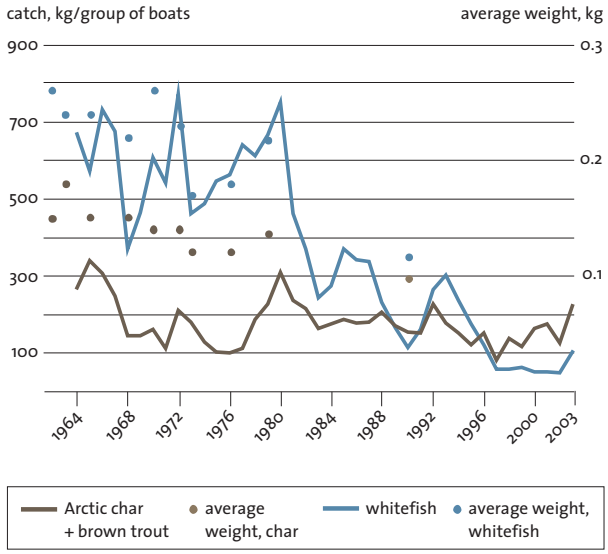
FIG. 14.3 Number of wolverine litters found in reindeer herding region, 1996–2004



SOURCES: NORRBOTTEN, VÄSTERBOTTEN, JÄMTLAND AND DALARNA COUNTY ADMINISTRATIVE BOARDS

The wolverine (Gulo gulo) is one of the threatened species for which action programmes have been drawn up. The Predatory Animals Bill passed by the Swedish Parliament in 2001 set an interim national target for this species of 90 litters per year in the country as a whole. The range and the size of the wolverine population are determined annually by surveys of wild predators conducted by the county administrative boards of mountain counties. The survey results form the basis for the compensation payments for predator populations that are made to reindeer husbandry districts under a new system introduced in 1996. A welcome increase in the number of litters can be noted.

FIG. 14.4 Changes in Sami commercial catches of fish in Suorva Reservoir, 1964–2003



SOURCE: NATIONAL BOARD OF FISHERIES

Fishing in the large Suorva Reservoir on the Övre Luleälven river is a good illustration of the complex effects of river regulation and stocking of non-native fish and food animals. The reservoir has been enlarged on four occasions, most recently in 1966–72 when the water level was allowed to vary by 30 m. Originally only Arctic char and brown trout were present. Whitefish were introduced shortly after the river was first dammed, and burbot not long afterwards. To offset damage to natural food species, the opossum shrimp Mysis relicta was introduced in 1970.

Once the beneficial effects of damming had faded in the course of the 1970s, catches of whitefish fell, probably as a result of fishing and competition for food from Mysis relicta. With less competition from whitefish, catches of Arctic char have been maintained.

Sampling by the National Board of Fisheries shows that, owing to the selective character of fishing with nets, the average weights of both Arctic char and whitefish have decreased. As an effect of Mysis relicta, a smaller form of Arctic char that used to live at greater depth has moved into shallower waters, where it is now being caught.

ENVIRONMENTAL OBJECTIVE FIFTEEN

A Good Built Environment

Cities, towns and other built-up areas must provide a good, healthy living environment and contribute to a good regional and global environment. Natural and cultural assets must be protected and developed. Buildings and amenities must be located and designed in accordance with sound environmental principles and in such a way as to promote sustainable management of land, water and other resources.

Will the objective be achieved?

Local authorities and county administrative boards have an important part to play in achieving this objective and the interim targets associated with it. Of the country's local authorities, 27% have attempted to define what the objective entails in local terms, for example by adopting local environmental goals. The regional goals of county administrative boards often set the bar higher than the national ones, although several of the boards have excluded a number of issues. Many county administrative boards have broadened the objective to include aspects such as human health, access and security.

A lack of resources, especially in smaller municipalities, creates uncertainty as to whether the objective will be attained. Other obstacles are a lack of adequate policy instruments, for example to reduce car use and generation of waste, and to tackle poor indoor environments.

Will the interim targets be achieved?

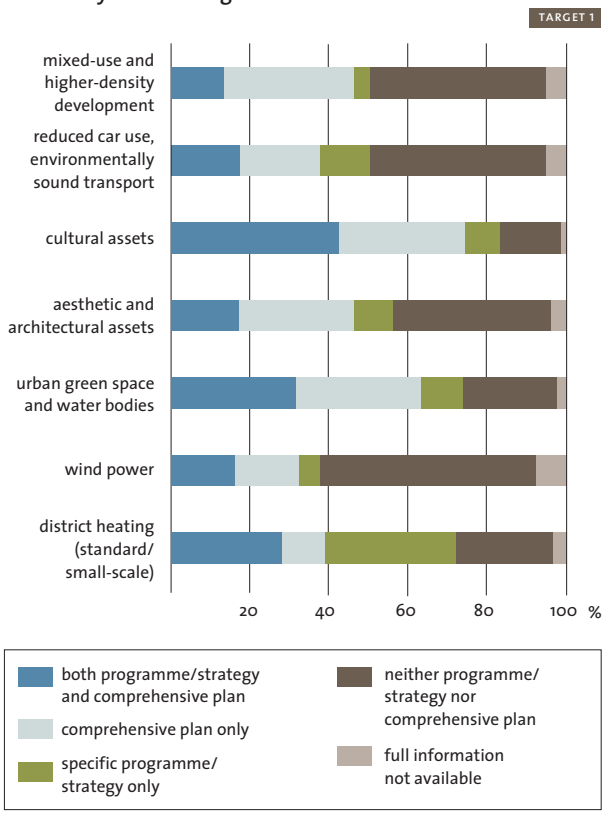
PROGRAMMES AND STRATEGIES FOR PLANNING

INTERIM TARGET 1, 2010

By 2010 land use and community planning will be based on programmes and strategies for:

- *achieving a varied supply of housing, workplaces, services and cultural activities, in order to reduce car use and improve the scope for environmentally sound and resource-efficient transport;*
- *preserving and enhancing cultural and aesthetic assets;*
- *preserving and enhancing green spaces and water bodies in urban and suburban areas and ensuring that the proportion of hard surfaces does not increase;*
- *promoting more efficient energy use, use of renewable energy resources and development of production plants for district heating, solar energy, biofuels and wind power.*

FIG. 15.1 Proportions of local authorities with specific programmes or strategies to address environmental issues covered by interim target 1



SOURCE: NATIONAL BOARD OF HOUSING, BUILDING AND PLANNING, 2004

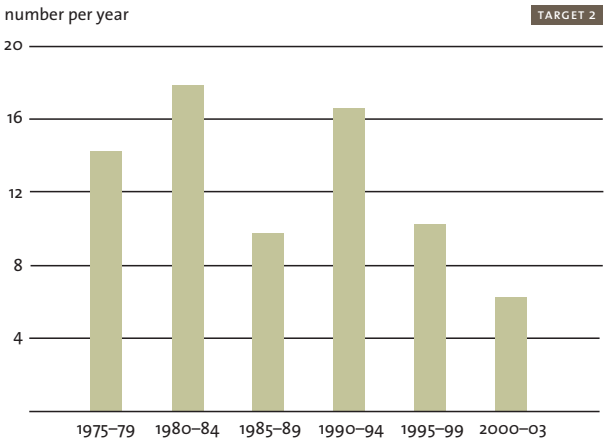
The proportion of local authorities with programmes and strategies addressing issues covered by the interim target increased between 2003 and 2004, particularly with regard to district heating, for which a 22 percentage point rise was seen. The proportion with programmes to reduce car use increased by 10 percentage points. These data need to be supplemented with in-depth studies of how the programmes and strategies are actually used.

BUILT ENVIRONMENTS OF CULTURAL HERITAGE VALUE

INTERIM TARGET 2, 2010

By 2010 built environments of cultural heritage value will be identified and a programme will be in place for the protection of their cultural assets. In addition, long-term protection will be provided for at least 25% of valuable built environments.

FIG. 15.2 Average number of inventories of buildings of cultural heritage value completed per year during periods shown



Note: Diagram is based on data from 15 counties.

SOURCE: NATIONAL BOARD OF HOUSING, BUILDING AND PLANNING

Although there is a considerable need for new and updated information, inventory work seems to have slowed down in recent years and is now taking place on a very limited scale.

NOISE

INTERIM TARGET 3, 2010

By 2010 the number of people who are exposed to traffic noise in excess of the guide values approved by Parliament for noise in dwellings will have been reduced by 5% compared with 1998.

EXTRACTION OF NATURAL GRAVEL

INTERIM TARGET 4, 2010

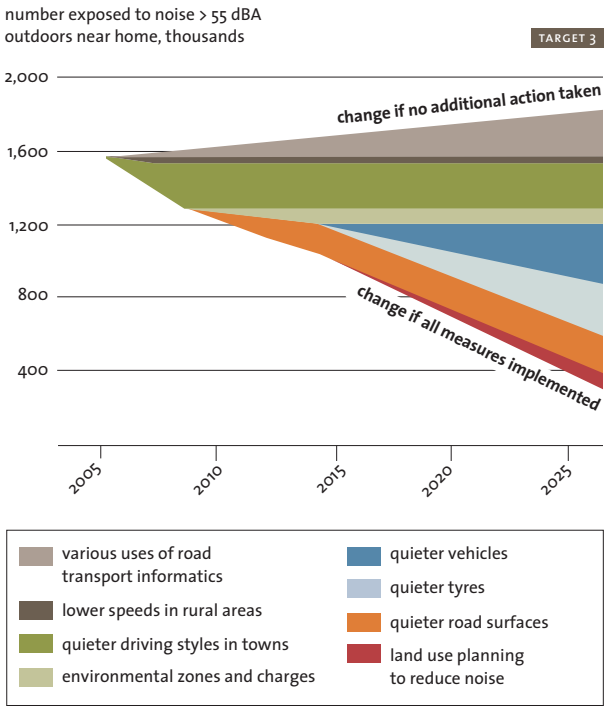
By 2010 extraction of natural gravel in the country will not exceed 12 million tonnes per year and reused materials will represent at least 15% of the aggregates used.

WASTE

INTERIM TARGET 5, 2005

The quantity of waste disposed of to landfill, excluding mining waste, will be reduced by at least 50% by 2005 compared with 1994, at the same time as the total quantity of waste generated does not increase.

FIG. 15.3 Assessment of effects of different measures to reduce number of people disturbed by road traffic noise



SOURCE: NATIONAL ROAD ADMINISTRATION

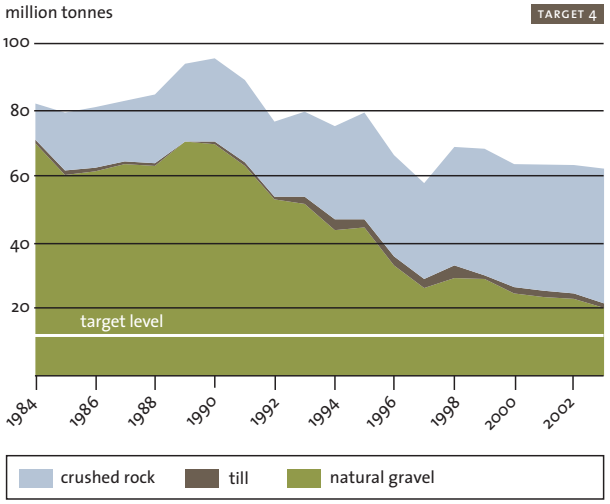
A wide range of measures need to be introduced to reduce the number of people exposed to road traffic noise. Noise screening and soundproofing of buildings are not included in the diagram, since screening is judged to have been implemented where it is economically justifiable, and modifications to buildings do not affect outdoor levels of traffic noise (although they do greatly affect indoor levels). Major improvements could be achieved if quieter vehicles were used and quieter driving styles adopted in urban areas. However, effective instruments to bring about these changes are not available at present.

LANDFILL SITES

INTERIM TARGET 6, 2008

All landfill sites will conform to uniform standards by 2008 and will meet stringent environmental requirements in accordance with Council Directive 1999/31/EC on the landfill of waste.

FIG. 15.4 Quantities of aggregates supplied in Sweden, 1984–2003



SOURCE: SGU

The quantities of natural gravel extracted continue to fall. A doubling of the tax on this resource (from SEK 5 to SEK 10 per tonne) with effect from 1 January 2003 probably contributed to the relatively large decrease of 2.6 million tonnes in 2003. A crucial factor in meeting the interim target for natural gravel is the support and active involvement of all major stakeholders, including county administrative boards, aggregate producers, users and local authorities.

ENERGY USE ETC. IN BUILDINGS

INTERIM TARGET 7, 2010

The environmental impact of energy use in residential and commercial buildings will decrease and will be lower in 2010 than in 1995. This will be achieved, inter alia, by improving energy efficiency and eventually reducing total energy use.

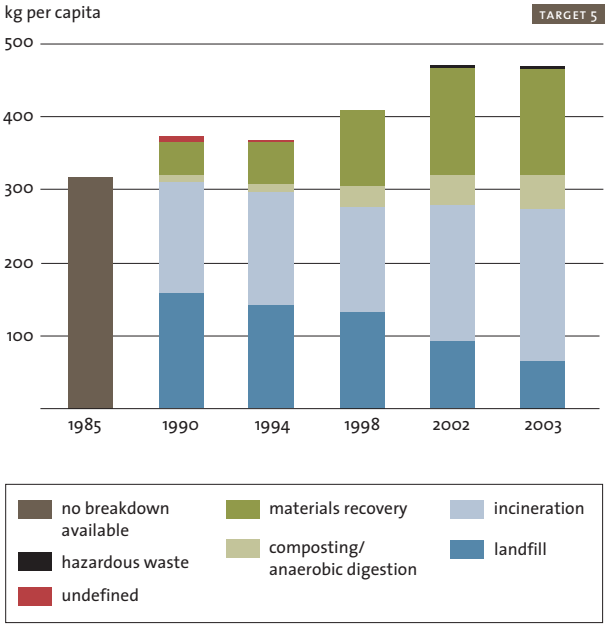
A GOOD INDOOR ENVIRONMENT

INTERIM TARGET 8, 2010/2015/2020

By 2020 buildings and their characteristics will not have adverse impacts on health. It must therefore be ensured that

- *all buildings in which people frequently spend time or spend extended periods of time have ventilation of documented efficiency by 2015,*

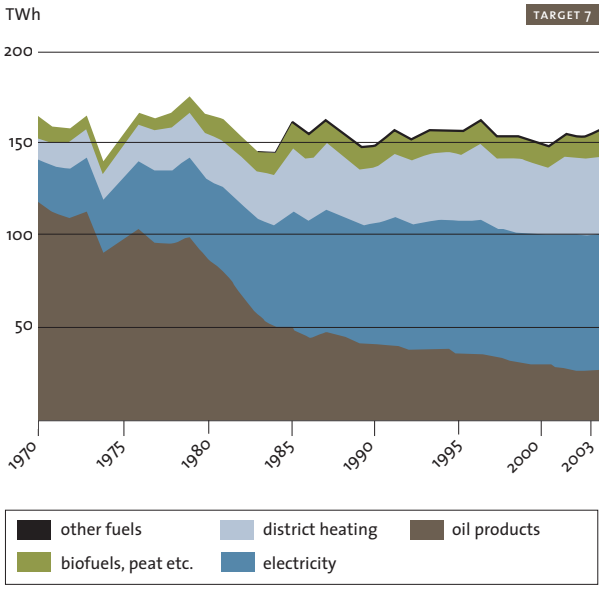
FIG. 15.5 Quantities of household waste 1985–2003, by treatment/disposal route



SOURCE: SWEDISH ASSOCIATION OF WASTE MANAGEMENT

The amount of household waste disposed of to landfill in Sweden decreased by 58% between 1994 and 2003. It should be noted that only household waste is included here, while interim target 5 also covers other types. For other waste categories, e.g. building and demolition wastes, there are still major gaps in the statistics.

FIG. 15.6 Energy consumption in the residential and services sector



SOURCE: SWEDISH ENERGY AGENCY

Total energy consumption in this sector has been more or less constant for a long time. However, the proportion accounted for by fossil fuels has decreased significantly, enhancing the prospects of achieving the interim target for energy use in buildings.

- *radon levels in all schools and pre-schools are below 200 Bq/m³ air by 2010 and that*
- *radon levels in all dwellings are below 200 Bq/m³ air by 2020.*

FOOD WASTE FROM HOUSEHOLDS, RESTAURANTS ETC.

INTERIM TARGET 9, 2010

😐 *By 2010 at least 35% of food waste from households, restaurants, caterers and retail premises will be recovered by means of biological treatment. This target relates to food waste separated at source for both home composting and centralized treatment.*

FOOD WASTE FROM FOOD PROCESSING PLANTS ETC.

INTERIM TARGET 10, 2010

😐 *By 2010 food waste and comparable wastes from food processing plants etc. will be recovered by means of biological treatment. This target relates to waste that is not mixed with other wastes and that is of such a quality as to be suitable, following treatment, for recycling into crop production.*

Underlying the environmental quality objectives are a number of fundamental issues and principles. These broader issues, which cut across the different objectives, are also to be monitored. They relate to the Natural Environment (with the Environmental Protection Agency as the responsible authority), the Cultural Environment (National Heritage Board), Human Health (National Board of Health and Welfare) and Land Use Planning and Wise Management of Land, Water and Buildings (National Board of Housing, Building and Planning).

the 4 broader issues related to the objectives

BROADER ISSUE ONE

The Natural Environment

Efforts to protect the environment should be guided by an integrated, holistic approach – that is the basic idea behind the broader issue of The Natural Environment.

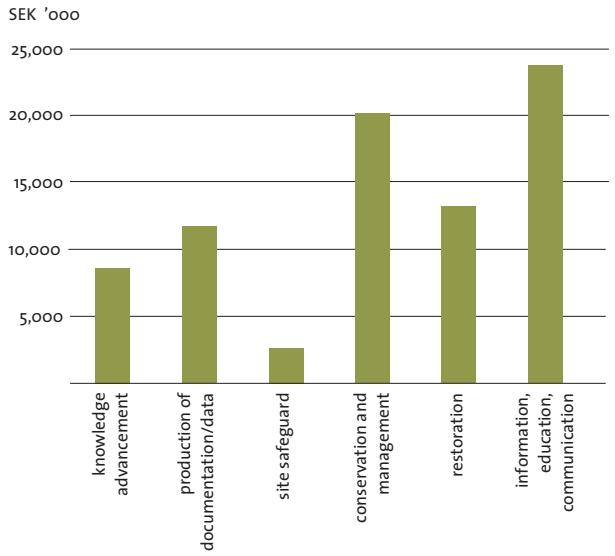
MORE LOCAL INVOLVEMENT

One important concern is to encourage greater local involvement in action to safeguard the environment. Accordingly, the Environmental Protection Agency has in the past year given particular support to local initiatives and discussions. It has, for example, participated in a regional project on local partnerships to manage protected areas in Västerbotten, which has resulted in a guidance document on local management of natural resources. The Agency has also developed the programme *Värna – Vårda – Visa* ('Protect – Preserve – Present'), to promote better and more effective management of protected sites.

INNOVATIVE PROJECTS

The Agency's Council for Outdoor Recreation seeks to ensure that policy on outdoor recreation is put into effect. During the year it distributed state funding of SEK 15 million to different organizations in this field. Priority was given to innovative projects, such as initiatives to encourage children, young people and members of ethnic minorities to visit the countryside, or production of guides to natural areas on the urban fringe.

FIG. I.1 Allocation of state grants for nature conservation projects, by category of project



SOURCE: SWEDISH EPA

A large proportion of state funding to support local authorities' efforts in the area of nature conservation and outdoor recreation has been used for information, education and communication projects, with the aim of reaching members of the public and making natural areas attractive and accessible. Of 418 projects, county administrative boards have judged some 159 to be primarily concerned with outdoor recreation. Large sums have also been invested in conservation and management of natural areas, and in work to achieve the environmental objective A Good Built Environment.

The Council also arranged a 'think tank' meeting at Vålådalen, attended by some 50 representatives of NGOs in the outdoor recreation sector. The suggestions that emerged from it are described in a report entitled 'Implementing an outdoor recreation policy for the 21st century' (available in Swedish at www.naturvardsverket.se).

SUPPORT TO LOCAL AUTHORITIES

2004 was the first year of a three-year programme to support local authorities' efforts in the area of nature conservation and outdoor recreation. The funding is being administered by county administrative boards, which allocated SEK 80.8 million during the year to various local projects.

A CHANGED LANDSCAPE

The severe storm that hit southern and southern central Sweden in January radically changed the landscape. The first concern now is to avoid additional damage in conjunction with harvesting and recovery of the timber. The next step will be a major reafforestation effort, which should be undertaken in such a way – for example in terms of the tree species and regeneration methods used – as to safeguard nature conservation interest and biodiversity.

BROADER ISSUE TWO

The Cultural Environment

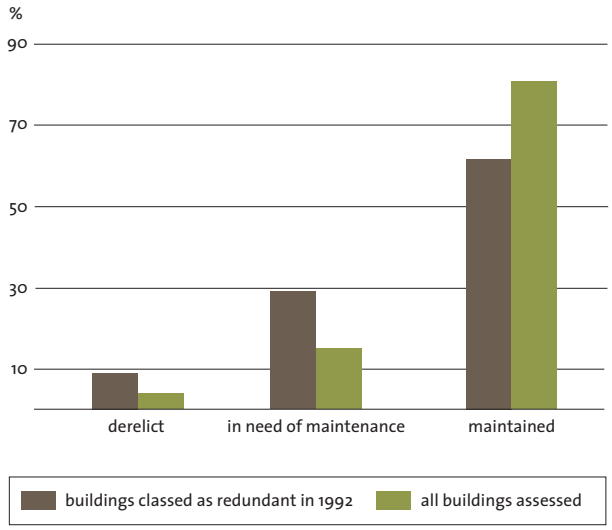
To bring about sustainable development, it is important to safeguard the cultural values of the environment and to view them as resources. The prospects of achieving environmentally sustainable development thus depend largely on the commitment and knowledge of decision makers and the general public at every level – local, regional and national. It can be argued that the process of regionalizing the environmental objectives has given other bodies and groups clearer guidance as to how they can recognize and handle the cultural assets to be found in the environment. This has created better conditions for sustainable development at the regional level.

BUILT ENVIRONMENT IN FOCUS . . .

The National Heritage Board has a particular responsibility for aspects of the environmental objectives relating to the built environment. A number of important measures have been identified in this area:

- In the framework of the strategy for the conservation, development and use of built environments of cultural heritage value (A Good Built Environment), the Board has studied how cultural environment issues are handled in existing plans and programmes – both local government planning documents and local authorities' cultural environment programmes. Only a few of these documents

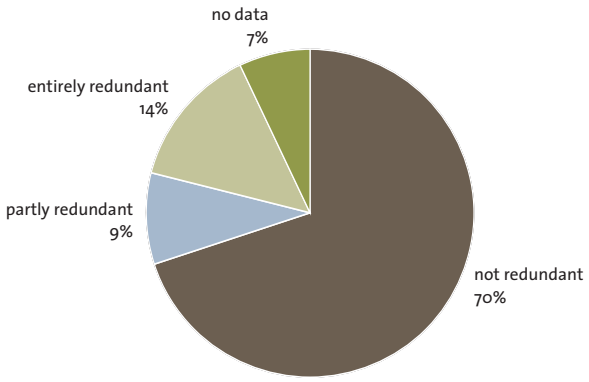
FIG. II.1 Maintenance status of farm buildings in 2003



SOURCE: NATIONAL HERITAGE BOARD

In 2003 the National Heritage Board surveyed over 6,600 farm buildings in ten LiM project reference areas (parishes spread over the entire country). Eight out of ten of the buildings surveyed had been maintained. Just under 20% were derelict or in need of maintenance. In the group of buildings classed in the 1992 survey as wholly or partly redundant (i.e. buildings associated with earlier uses and no longer used), maintenance needs were appreciably greater.

FIG. II.2 Redundancy status of farm buildings in 2003



SOURCE: NATIONAL HERITAGE BOARD

In the National Heritage Board's survey, it was noted whether or not each individual building served a practical function. Of all the buildings covered by the survey, 14% were entirely redundant and 9% partly redundant. However, the proportion of (entirely and partly) redundant buildings varies widely from one region to another, rising to almost 50% in some parishes.

have turned out to be suited to the purpose. There is thus a need for up-to-date and broadly supported local and regional programmes and strategies for planning and building.

- In the context of the programme for the conservation of farm buildings of cultural heritage value (A Varied Agricultural Landscape), a range of measures have been found to be necessary. As a first step, therefore, the National Heritage Board is preparing proposals to include farm buildings in the forthcoming Environmental and Rural Development Programme for 2007–13. These proposals will be supplemented with other measures.

. . . AND A CHANGING LANDSCAPE

The term 'cultural landscape' refers to the whole of the human-influenced landscape, including both agricultural and forest areas and mountain regions. The landscape has always been subject to almost continuous change, but more recently the pace and scale of that change have increased dramatically. Two trends can be seen: invasion of once diversified landscapes by scrub and woodland, and the emergence of highly polarized landscapes, devoted exclusively to either forestry or agriculture. From a cultural heritage point of view, neither trend is sustainable in the long term.

Changes in the landscape and in the cultural values of the environment can also be very sudden. The storm in southern Sweden in January 2005, for example, wrought widespread damage to the forest landscape. In terms of cultural heritage, the main damage was caused to archaeological remains – in several cases graves, where human bones have now been left exposed. In all, 2,400 archaeological sites are estimated to have been adversely affected to varying degrees. As well as restoring such sites, it is important to avoid further damage in conjunction with the harvesting and extraction of windthrown trees.

BROADER ISSUE THREE

Human Health

Environment and health issues have received a good deal of attention internationally in recent years. In 2004, WHO Europe arranged its fourth conference of environment and health ministers as part of the 'Environment and Health for Europe' process, on the theme of 'The future for our children'. Participating countries pledged to draw up national children's environment and health action plans, a task which in Sweden has been entrusted to the National Board of Health and Welfare.

Within the EU, too, environment and health is a priority area. At the WHO conference, the Commission presented its action plan in this field (SCALE).

ARE THINGS MOVING FORWARD?

It is difficult to gain an overall picture of the environmental health situation from existing monitoring systems. New results from Västra Götaland suggest that radon levels in homes are falling, but it is unclear to what extent. However, the findings do indicate that action on radon has had an effect.

In other areas, progress is slow. This is the case as regards noise, for instance, with levels of disturbance from different sources seemingly unabated. Another example is toxic organic pollutants in food, for which the encouraging trends of earlier years have not been maintained. Many of these issues are highly relevant to children.

In addition, a number of new problems emerged in 2004:

- Studies in the United States show that air pollutants affect the development of children's lungs. No Swedish data are available, but children in inner city areas are probably affected.
- In some local authority areas, uranium levels in drinking water have been found to exceed the WHO limit. Further studies and assessments are needed.
- The links between damp buildings and ill health are becoming increasingly clear. In Sweden, an estimated 1,000 cases of infant asthma per year are attributed to damp in buildings.
- Growing attention is being paid to overweight and physical inactivity, particularly among children. How can efforts to implement the environmental objectives help to prevent these problems?

WIDER INVOLVEMENT NEEDED

Environment and health was a theme area in the OECD's environmental performance review of Sweden in 2003–4. Overall, the country received a very favourable rating in this area, but the OECD did recommend that more be done to develop indicators, study social disparities in health, and improve communication of risk.

Many of today's environmental health problems call for involvement on the part of a wide range of groups and bodies, including the construction sector and local authority environment and health committees. One way of achieving this may be to improve monitoring of known risks and dissemination of information about them.

BROADER ISSUE FOUR

Land Use Planning and Wise Management of Land, Water and Buildings

When the environmental quality objectives are regionalized, this broader issue tends to receive little attention. Few tangible strategies have been adopted, even though land use planning and municipal comprehensive plans are mentioned as important means of achieving several of the objectives. One exception is Blekinge, whose county administrative board has drawn up a checklist for the integration of regional environmental goals into planning. The list covers various aspects of the use of land and water, such as how a plan will affect different types of area of high conservation value.

The National Board of Housing, Building and Planning is also working with four local authorities and county administrative boards to develop methods to improve assessments of the resource efficiency of land use plans.

REGIONAL PROGRAMMES

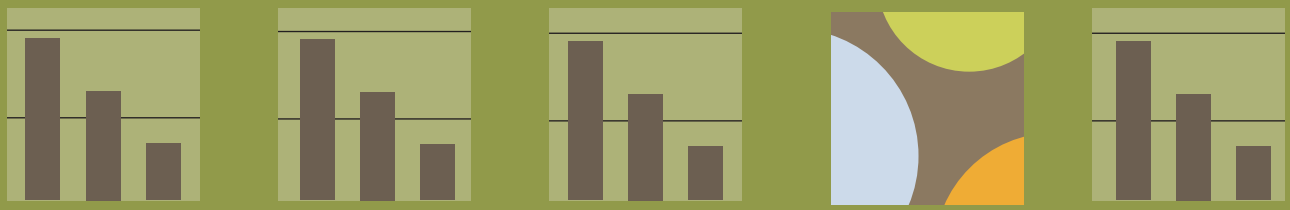
At a regional level, there are other programmes addressing development and resource management issues, e.g. regional development programmes (RDPs). These are intended to meet the region's needs, exploit its potential and foster sustainable growth by coordinating use of resources. The ecological dimension of sustainability is supposed to receive particular emphasis. Unfortunately, links with land use planning in RDPs are rare, despite the fact that underlying geographical factors are basic to many regional issues.

A link between regional development planning, physical planning and the environment is most often found in connection with communications and infrastructure development. Regional environmental goals are occasionally highlighted as important prerequisites for regional development. In Kalmar county, for instance, they form a natural part of the RDP. To ensure attention to environmental aspects from the outset, measures are proposed to improve the integration of such issues into regional growth programmes.

GOVERNMENT GRANTS

Central government can promote more efficient use of resources through the grants it makes, for example to the construction sector. Unfortunately, an evaluation shows that not even support that is conditional on ecological sustainability has resulted in more energy- or resource-efficient buildings. The National Board of Housing, Building and Planning therefore

proposes that grants should have additional conditions attached: the local authority must develop local goals for sustainable construction, and development contracts and site allocation decisions should require developers to state how their projects will help to achieve those goals.



list of figures and glossary

List of figures

Glossary

Area of national interest = area designated as being of national interest under ch. 3 and ch. 4 of the Environmental Code.

Bioaccumulating = of a substance, tending to build up in organisms at higher concentrations than in their environment or food.

Bq = becquerel, unit of activity of a radioactive material. 1 Bq corresponds to one radioactive disintegration per second.

Bunker fuel emissions = emissions from fuel sold to ships and aircraft engaged in international transport.

Carbon dioxide equivalent = quantity of a greenhouse gas expressed as the amount of carbon dioxide that has the same impact on climate: 1 kg of methane corresponds to 21 kg of carbon dioxide, for example.

CFCs = chlorofluorocarbons, used in refrigeration, heating and air-conditioning equipment, chemical products and foamed plastics.

Climate corrected = of greenhouse gas emission figures, corrected to allow for fluctuations in the weather from one year to another.

Comprehensive plan = in Sweden, every local authority is required to have an up-to-date comprehensive plan covering its entire area. This plan should indicate broadly how areas of land and water are intended to be used and how the built environment is to be developed. It is not binding on authorities and individuals, but must be taken into account and serve as a source of guidance when various decisions are taken, as provided in ch. 1, s. 3, of the Planning and Building Act.

County administrative board = authority responsible in Sweden for state administration at the regional level.

Culturally significant landscape features = e.g. stone walls, wooden fences, ditches, solitary trees, avenues, ponds, mid-field pockets of rocky ground, field margins, meadow barns or redundant farm buildings (a full list, with definitions, can be found in Swedish Board of Agriculture Regulation 2001:114).

dBA = unit of sound level. Sound pressure level is usually given in decibels (dB). To approximate to the frequency response of the human ear, a sound pressure meter is equipped with a frequency filter (A filter). The value thus obtained is referred to as the 'sound level', and expressed in dBA.

DU = Dobson unit, a measure of the thickness of the ozone layer. 1 DU = 0.01 mm. The annual mean thickness of the ozone layer above Sweden is normally 350 DU, i.e. about 3.5 mm.

Ecosystem = a dynamic complex of plant, animal and micro-organism communities.

Electromagnetic fields = radio waves, microwaves, visible light, ultraviolet, X-rays and gamma rays are all examples of the same basic physical phenomenon, the electromagnetic wave or field.

Environmental Code = a major codification of environmental law that came into force in Sweden in 1999.

Epidemiological = relating to the distribution of diseases in a population.

ERDP = Sweden's Environmental and Rural Development Programme.

Flexible mechanisms = various mechanisms for trading in greenhouse gas emissions.

Habitat protection area = form of site safeguard (area protection) provided for in the Environmental Code (ch. 7, s. 11), used for relatively small areas of land and water.

Habitats Directive = Council Directive 92/43/EEC, which can be said to be a complement to the Birds Directive, in that it also deals with other groups of species and with different natural habitat types. The term 'natural habitat (type)' is used in a very broad sense in the directive, including everything from geological formations to plant communities.

HCFCs = hydrochlorofluorocarbons, used in refrigeration, heating and air-conditioning equipment, chemical products and foamed plastics.

Ionizing radiation = general term for radiation with the ability to remove electrons from atoms.

IPCC = Intergovernmental Panel on Climate Change.

IVL = Swedish Environmental Research Institute.

Kyoto Protocol = signed in Kyoto, Japan, in 1997 as a first step in establishing quantified commitments to achieve the goals of the Framework Convention on Climate Change (1992).

Limit value = the highest or, in certain cases, the lowest permissible value.

LiM project = Swedish study of the environmental impacts of food policy.

Linear features = e.g. stone walls, wooden fences, ditches or farm tracks.

Malignant melanoma = highly malignant form of skin cancer.

MIFO = Method for Inventories of Contaminated Sites, presented by the Swedish EPA in Report 4918 (in Swedish).

Montreal Protocol = the Montreal Protocol was signed in 1987 and contains binding agreements to reduce the use and production of CFCs (chlorofluorocarbons) and other substances that deplete the ozone layer. It is continuously revised as new substances are identified.

mSv = millisievert, a thousandth of a sievert, a unit used to express the absorbed dose of radiation, taking into account the biological effect of the radiation. Since one sievert is a very large dose, the millisievert is often used.

National Emission Ceilings Directive = EC directive incorporating binding national emission ceilings for sulphur dioxide, nitrogen oxides, ammonia and volatile organic compounds, to be achieved by 2010.

Nature conservation agreement = contract entered into between the state or a local authority and a landowner for the purpose of preserving and developing the natural features of a site.

Persistent = long-lived – a substance that takes a very long time to break down.

Phthalates = plasticizers, used in plastics.

Point features = e.g. mid-field pockets of rocky ground, mounds of boulders cleared from fields, or solitary trees.

ppb = parts per billion.

ppm = parts per million.

REACH = Registration, Evaluation and Authorization of Chemicals – EU proposal for new chemicals legislation.

SAR = Specific Absorption Rate, a measure of the radio-frequency energy absorbed in the head of the user when a mobile phone is transmitting at full power.

SGU = Geological Survey of Sweden

Site safeguard = protection of an area under ch. 7 of the Environmental Code, e.g. through designation as a nature reserve, habitat protection area or national park.

SLU = Swedish University of Agricultural Sciences.

Small-scale habitat = small area of land or water which constitutes or could constitute a habitat for valuable plant and animal species associated with the farmed landscape.

Swedish EPA = Swedish Environmental Protection Agency.

UV = ultraviolet (radiation).

VOCs = volatile organic compounds.

WHO = World Health Organization.

The Environmental Objectives Council

The Environmental Objectives Council was established by the Swedish Government on 1 January 2002 to promote consultation and cooperation in implementing the environmental quality objectives adopted by Parliament. The Council consists of representatives of central government agencies, county administrative boards, local authorities, non-governmental organizations and the business sector.

The principal functions of the Council are:

- to monitor and evaluate progress towards the environmental quality objectives,
- to report to the Government on how efforts to achieve the objectives are advancing and what further action is required,
- to coordinate the information efforts of the agencies responsible for the objectives,
- to ensure overall coordination of the regional application of the objectives, and
- to allocate funding for monitoring of progress towards the objectives, environmental monitoring, and some reporting at the international level.

MEMBERS OF THE COUNCIL

The Government has appointed the following individuals as members of the Environmental Objectives Council for the period 1 January 2005–31 December 2008:

Vacant, *Chairman*

Lars-Erik Liljelund, Director-General, Swedish Environmental Protection Agency, *Vice-Chairman*

Gunnar Ågren, Director-General, National Institute of Public Health

Kjell Asplund, Director-General, National Board of Health and Welfare

Göran Enander, Director-General, National Board of Forestry

Eva Eriksson, County Governor, Värmland County Administrative Board

Ethel Forsberg, Director-General, National Chemicals Inspectorate

Göran Gunnarsson, Lieutenant-General, Swedish Armed Forces

Lars-Erik Holm, Director-General, Swedish Radiation Protection Authority

Thomas Korsfeldt, Director-General, Swedish Energy Agency

Inger Liliequist, Director-General, National Heritage Board

Lars Ljung, Director-General, Geological Survey of Sweden

Mats Persson, Director-General, Swedish Board of Agriculture

Lisa Sennerby-Forsse, Secretary-General, Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas)

Ingemar Skogö, Director-General, National Road Administration

Ines Uusmann, Director-General, National Board of Housing, Building and Planning

The Government has appointed Lars-Erik Liljelund as Vice-Chairman of the Council.

EXPERTS TO THE COUNCIL

The following have been appointed by the Swedish Environmental Protection Agency as experts to the Environmental Objectives Council for the period 1 January 2005–31 December 2008:

Ingela Bendrot, Confederation of Swedish Enterprise

Anna Jonsson, Friends of the Earth Sweden

Mikael Karlsson, Swedish Society for Nature Conservation

Peter Wenster, Swedish Association of Local Authorities and Regions

Sweden's environmental objectives de Facto 2005

– for the sake of our children

This is an abridged English version of the Environmental Objectives Council's annual report to the Swedish Government. The draft texts and data on which it is based have been supplied by the agencies responsible for the environmental quality objectives (see below). The chapter 'Children's environment and health' is based primarily on the environmental health report published in 2005 by the National Board of Health and Welfare.

Comments on the material included have been made by the organizations represented on the Environmental Objectives Council, through its Progress Review Group.

Environmental quality objectives

1. REDUCED CLIMATE IMPACT
   Swedish Environmental Protection Agency
2. CLEAN AIR
   Swedish Environmental Protection Agency
3. NATURAL ACIDIFICATION ONLY
   Swedish Environmental Protection Agency
4. A NON-TOXIC ENVIRONMENT
   National Chemicals Inspectorate
5. A PROTECTIVE OZONE LAYER
   Swedish Environmental Protection Agency
6. A SAFE RADIATION ENVIRONMENT
   Swedish Radiation Protection Authority
7. ZERO EUTROPHICATION
   Swedish Environmental Protection Agency
8. FLOURISHING LAKES AND STREAMS
   Swedish Environmental Protection Agency
9. GOOD-QUALITY GROUNDWATER
   Geological Survey of Sweden
10. A BALANCED MARINE ENVIRONMENT, FLOURISHING COASTAL AREAS AND ARCHIPELAGOS
    Swedish Environmental Protection Agency
11. THRIVING WETLANDS
    Swedish Environmental Protection Agency
12. SUSTAINABLE FORESTS
    National Board of Forestry
13. A VARIED AGRICULTURAL LANDSCAPE
    Swedish Board of Agriculture
14. A MAGNIFICENT MOUNTAIN LANDSCAPE
    Swedish Environmental Protection Agency
15. A GOOD BUILT ENVIRONMENT
    National Board of Housing, Building and Planning

Broader issues related to the objectives

I. THE NATURAL ENVIRONMENT
   Swedish Environmental Protection Agency

II. THE CULTURAL ENVIRONMENT
   National Heritage Board

III. HUMAN HEALTH
   National Board of Health and Welfare

IV. LAND USE PLANNING AND WISE MANAGEMENT OF LAND, WATER AND BUILDINGS
   National Board of Housing, Building and Planning

PUBLISHED BY: Swedish Environmental Protection Agency
ADDRESS FOR ORDERS: CM-Gruppen, Box 11093, SE-161 11 Bromma, Sweden
TELEPHONE: +46 8 5059 3340 FAX: +46 8 5059 3399 E-MAIL: natur@cm.se INTERNET: www.naturvardsverket.se/bokhandeln
ISBN: 91-620-1241-X
EDITORS: Text 100 / Ulrika Mann and Catharina Berg
ENGLISH TRANSLATION: Martin Naylor
ILLUSTRATIONS OF ENVIRONMENTAL OBJECTIVES AND BROADER ISSUES: Tobias Flygar
DESIGN: AB Typoform / Marie Peterson
PRINTED BY: Elanders Gummessons, Box 807, SE-521 23 Falköping, June 2005 NUMBER OF COPIES: 2,000
de Facto 2005 is available in PDF format on the Environmental Objectives Portal, www.miljomal.nu.
The full report in Swedish is available as ISBN 91-620-1240-1.

Sweden's environmental objectives – for the sake of our children. de Facto 2005

This year's report of the Swedish Environmental Objectives Council, the fourth, includes a chapter on the environment and health of children.

The Council's assessment is that the objectives Reduced Climate Impact, A Non-Toxic Environment, Zero Eutrophication and Sustainable Forests will be very difficult to achieve. The key measures that need to be implemented are in the areas of energy, transport, chemicals, forestry and agricultural policy.

Regional environmental goals have now been adopted by all of Sweden's county administrative boards and regional forestry boards. They will play a major role in regional and local planning and hence in attaining the national objectives and targets.

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ISBN 91-620-1241-x