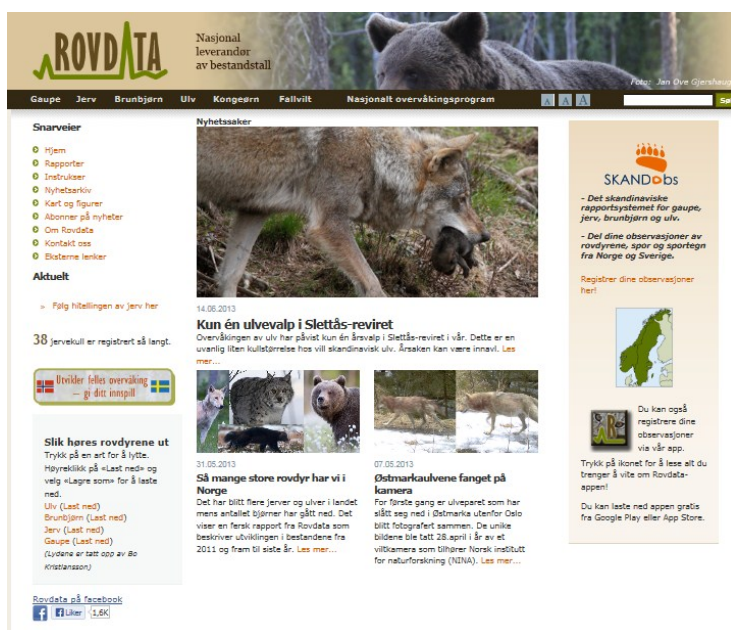


## BIODIVERSITY MONITORING AND INDICATORS AT NINA

**Environmental Monitoring** is not research per se, but an important method for generating data for both research and management. Monitoring data are used within all the other research areas within the department. NINA runs several large-scale national monitoring programs focusing on seabirds (approx. 20 species), large ungulates (moose, red deer and wild reindeer), large predators (ROVDATA -brown bear, wolf, lynx, wolverine and golden eagle; [www.rovdata.no](http://www.rovdata.no)), arctic foxes, willow ptarmigan, mountain birch forests (TOV- Terrestrial Monitoring Programme; which includes epiphytes, vegetation, passerines, willow ptarmigan, raptors, and small mammals), monitoring effects on vegetation from human traffic on Svalbard, monitoring of salmon populations and freshwater biodiversity (ecological status of freshwater), the effect

of climate change on palsa mires, and the concentrations of radiocesium in a number of game and plant species, respectively. These programs have generated long-term (e.g. 20-45 years) data series, which are unique at the national and international level and have provided the basis for extensive scientific publication. In addition to providing baselines for evaluating environmental change, the data are used in a variety of research projects for detailed analysis of responses to climate variation (and change), and human impact (including harvesting and pollution). Furthermore, continuous research efforts are put into improving monitoring design, sampling routines and validation of monitoring parameters.



**Nature Index – indicator development and reporting.** The aim of the Nature Index (NI) of Norway is to provide an overview of the state of biodiversity within and across major ecosystems. The Nature Index (NI) is a general, integrated framework developed to synthesize and communicate the current knowledge of the state and development of biodiversity including reporting obligations. It is designed to make the most of

[www.nina.no](http://www.nina.no)

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the available knowledge in the ecological research community, including expert judgment. The Nature Index of Norway was launched in 2010 for marine ecosystems, freshwater and terrestrial ecosystems. Thematic indices based on a subset of indicators reflect the status of selected species. Currently the Nature Index has been adopted as a sustainable indicator of Norway.

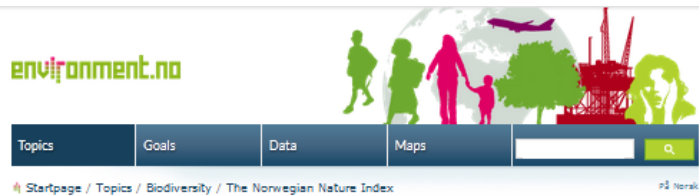
The index is composed of a series of indicators, each representing individual species or diversity measures. The indicators (mainly species) are standardized and scaled in relation to a reference state, and combined for ecosystems or geographical regions, to give a number between one (reference state) and zero (degraded biodiversity). The authors present the basic concepts and definitions of the NI, the associated quantitative expressions, and the practical implementation of data collection and integration of expert judgment and data on biodiversity in Norway. The NI can be implemented in data-rich and data-poor areas, it contains information on both the state of biodiversity and the state of knowledge, and it can be aggregated or disaggregated to address specific management themes, which gives the framework the potential to become an efficient management tool. In a short time a flexible database system will have completed implementation. This database system can easily be transferred to other countries or ecosystems. The database system itself will be freely available, but there is a need for knowledge transfer from NINA to other institutions on optimal use of the database, and on adjustments to tailor the system to local requirements. Indicators and maps are automatically generated from the database and presented on the internet. The internet interface is under programming. In Norway, NINA are in charge of developing, implementing and running the database system, including integrating monitoring data from several research institutions in areas such as marine, agricultural, freshwater and forests, as well as Statistics Norway. NINA also leads the other scientific elements of the programme.

The Norwegian Environment Agency has developed a web-page describing the index : <http://www.environment.no/Topics/Biological-diversity/The-Norwegian-Nature-Index/>

A presentation in slide format with some more technical detail can be found here: [http://www.miljodirektoratet.no/Global/dokumenter/tema/arter\\_og\\_naturtyper/natureindex-ninapresentatiton.pdf](http://www.miljodirektoratet.no/Global/dokumenter/tema/arter_og_naturtyper/natureindex-ninapresentatiton.pdf)

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## The Norwegian Nature Index

The Norwegian Nature Index gives an overview of the state of biodiversity in Norway's major ecosystems. This is good for the open sea, coastal waters, fresh water and mountains, poorer for mires and wetlands, and poorest in open lowland landscapes and forests.

Content	
1. State	<a href="#">Best results for aquatic and mountain ecosystems</a>
2. Pressure	<a href="#">Pressures include physical disturbances, pollution and climate change</a>
3. Response	<a href="#">The Nature Index provides an overview of ecosystems</a>



### Facts about the Nature Index

- The Nature Index measures the state and trends for biodiversity in Norway using more than 200 indicators.
- Indicators are chosen from a variety of species groups for each ecosystem, and measure deviation from a reference state, which is intended to represent ecological sustainability.
- All indicators and the overall Nature Index have values between 1 (for the reference state) and 0 (very poor state).
- The first edition of the Nature Index was published in 2010, and values were calculated for 1990 and 2000 as well as 2010.

