The Nature Index as a Tool for Activism

Iulie Aslaksen, Per Arild Garnåsjordet, Jonathan Loh, Kristin Thorsrud Teien

Seminar at BI to celebrate Jørgen Randers 70 years

21 May 2015

It started with the Living Planet Index . . .

PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B

Phil. Trans. R. Soc. B (2005) **360**, 289–295
doi:10.1098/rstb.2004.1584
Published online 28 February 2005

The Living Planet Index: using species population time series to track trends in biodiversity

Jonathan Loh[1,*], Rhys E. Green[2], Taylor Ricketts[3], John Lamoreux[3], Martin Jenkins[4], Valerie Kapos[4] and Jorgen Randers[5]

[1]*WWF International, Avenue du Mont-Blanc CH-1196, Gland, Switzerland*
[2]*RSPB and Conservation Biology Group, Department of Zoology, University of Cambridge, Downing Street, Cambridge CB2 3EJ, UK*
[3]*Conservation Science Program, WWF-US, 1250 Twenty-fourth Street, NW, Washington DC 20037, USA*
[4]*UNEP-WCMC, Huntingdon Road, Cambridge CB3 0DL, UK*
[5]*Norwegian School of Management, Elias Smiths vei 15, Box 580 N-1302, Sandvika, Norway*

The Living Planet Index was developed to measure the changing state of the world's biodiversity over time. It uses time-series data to calculate average rates of change in a large number of populations of terrestrial, freshwater and marine vertebrate species. The dataset contains about 3000 population time series for over 1100 species. Two methods of calculating the index are outlined: the chain method and a method based on linear modelling of log-transformed data. The dataset is analysed to compare the relative representation of biogeographic realms, ecoregional biomes, threat status and taxonomic groups among species contributing to the index.

The Living Planet Index (LPI)

- LPI was started in 1997 by WWF to measure change in the world's biodiversity.
- The first LPI was published in WWF Living Planet Report 1998 and has been updated subsequently.
- LPI measures trends in populations of vertebrate species around the world.
- The principle is species abundance: the more individuals, the better are conditions for biodiversity.

Living Planet Index 2014

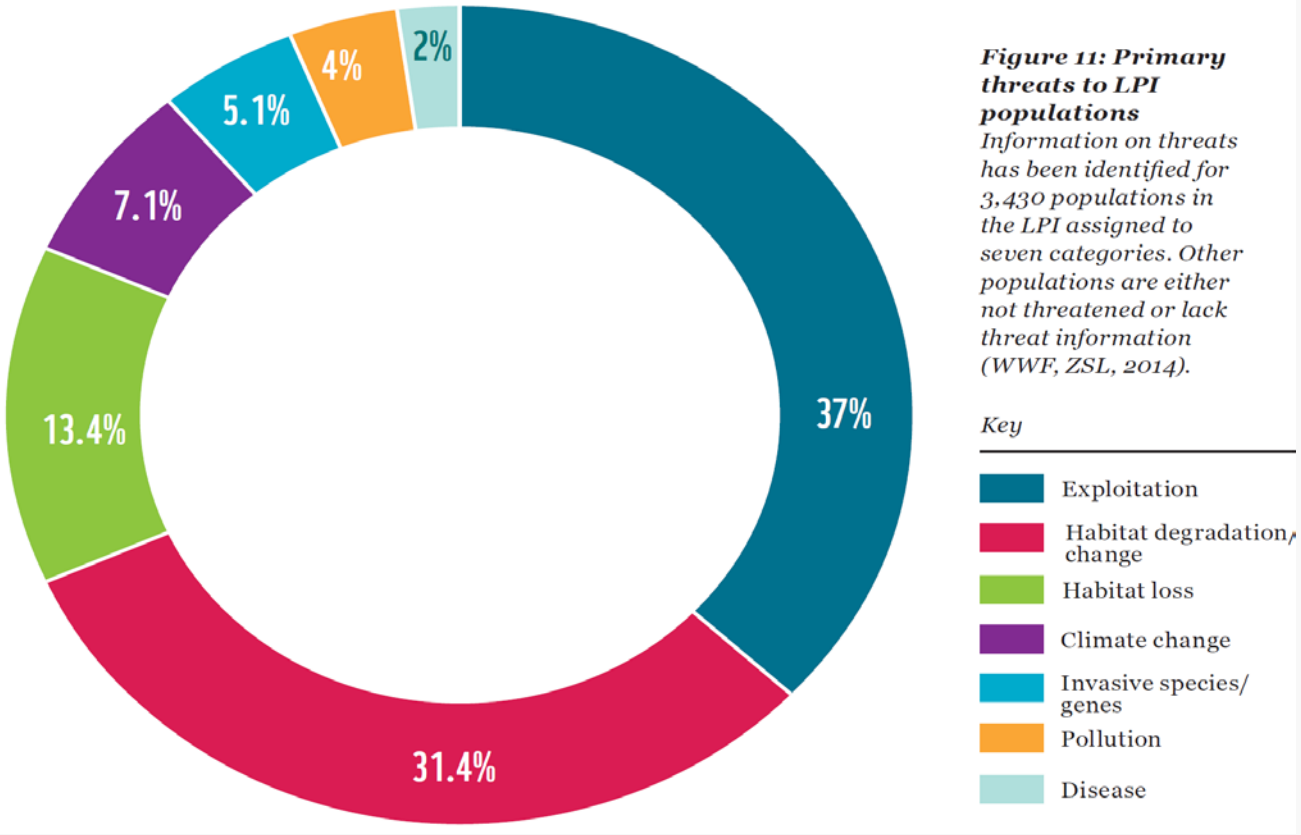


Figure 11: Primary threats to LPI populations
Information on threats has been identified for 3,430 populations in the LPI assigned to seven categories. Other populations are either not threatened or lack threat information (WWF, ZSL, 2014).

«Big five»: Land use change (habitat degradation/change and loss), exploitation (overharvesting), climate change, invasive species, pollution.

A Living Planet Index for Norway

A Living Planet Index for Norway

- In 2005, WWF in Norway made a pioneering contribution to develop a biodiversity index for Norway, based on LPI.
- The LPI data for Norway included vertebrates and large crustaceans, with 568 long time series for species in sea, land and freshwater.
- The Living Planet Index for Norway showed that nature was going downhill: The included species had on average a reduction in abundance of 35 per cent in less than 30 years.

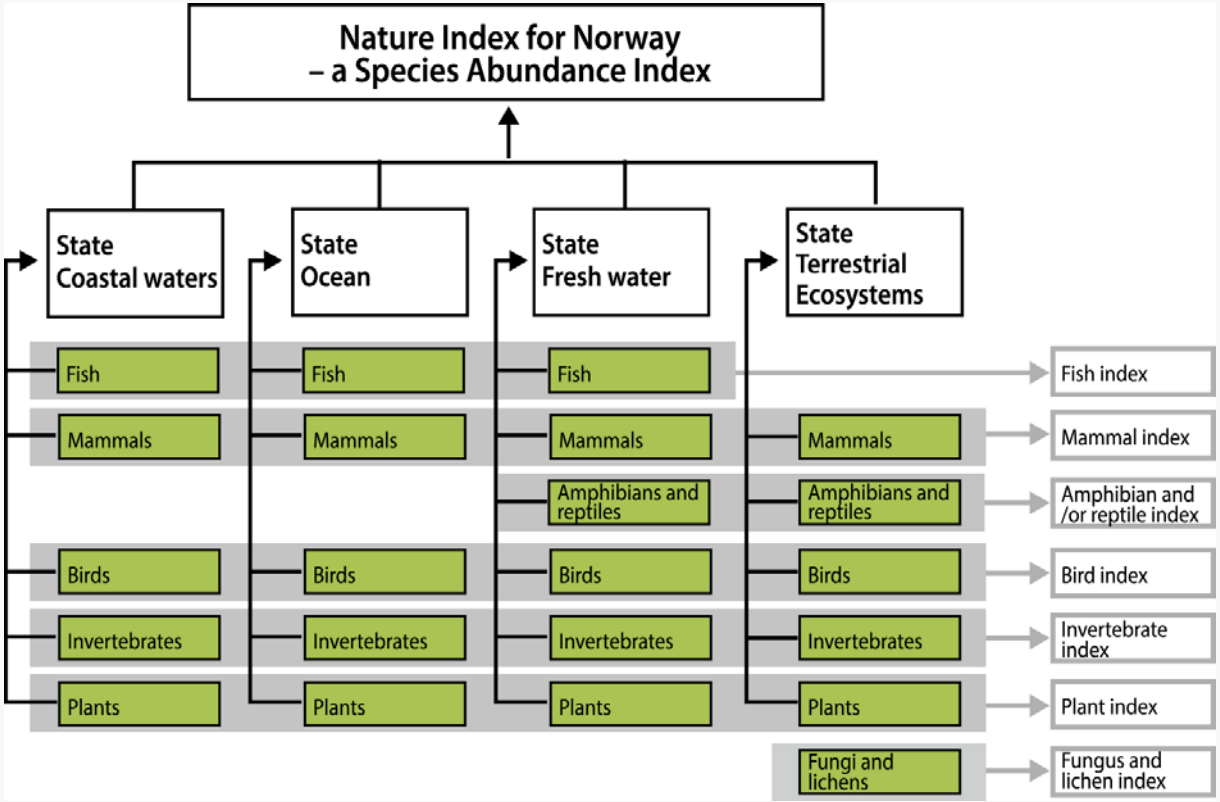
- Source:
- Popular report: WWF by Kristin T. Teien (2005): *Utfor bakke med norsk natur.*
- Complete report: WWF by Kristin T. Teien (2005): *Naturindeks for Norge – langsiktige trender i norsk natur.* http://awsassets.wwf.no/downloads/wwfrapport_naturindeks2005_27aug2005.pdf

A Living Planet Index for Norway: Scientific activism

- The Living Planet Index for Norway brought attention to lack of data from surveying and monitoring.
- WWF's aim: LPI for Norway as basis for «policy rule» for decision makers, to follow up nature, in the same way as for interest rates, exchange rates, or petroleum fund.
- The Living Planet Index for Norway was a remarkable example of scientific activism:
- The index became a wake-up call for society.
- The trends reported became a considerable cause for concern for environmental management and spurred the decision to develop an official Nature Index for Norway, mandated by the Government in 2005.

The Nature Index for Norway

- Measure state and trends of biodiversity indicators
- Common conceptual framework: monitoring data, expert evaluations, and model data
- Assessment of uncertainty
- Suggest research needs
- Aim: easily communicated and broadly accepted in science and society


Nature Index for Norway
– a Species Abundance Index
State
Coastal waters
State
Ocean
State
Fresh water
State
Terrestrial
Ecosystems
Fish
Mammals
Birds
Invertebrates
Plants
Fish
Mammals
Birds
Invertebrates
Plants
Fish
Mammals
Amphibians and reptiles
Birds
Invertebrates
Plants
Mammals
Amphibians and reptiles
Birds
Invertebrates
Plants
Fungi and lichens
Fish index
Mammal index
Amphibian and /or reptile index
Bird index
Invertebrate index
Plant index
Fungus and lichen index

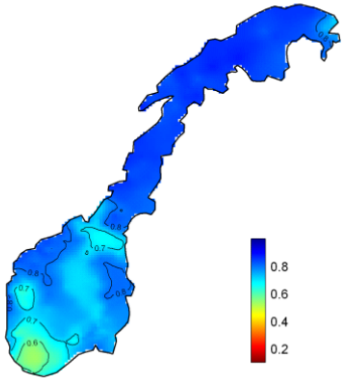
The Nature Index for Norway

- The Nature Index for 2010: the state of biodiversity was highest relative to the reference states in mountains, ocean, coast, and freshwater, intermediate for mires and wetlands, while open lowlands and forests had the lowest values.
- Precautionary approach is needed: Supplement the Nature Index with early warnings of biodiversity loss.

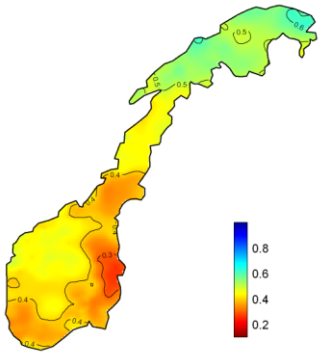
Foto: Egil Michaelsen

Terrestrial ecosystems

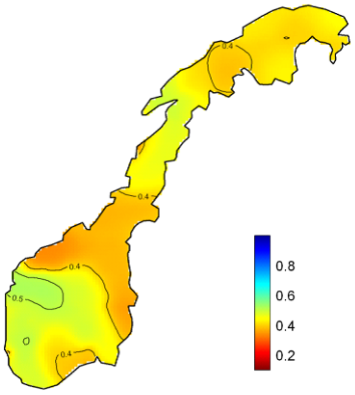
Freshwater



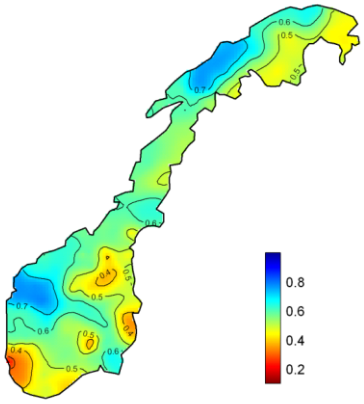
Open lowland



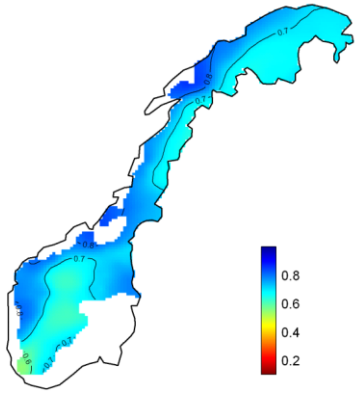
Forest



Marsh



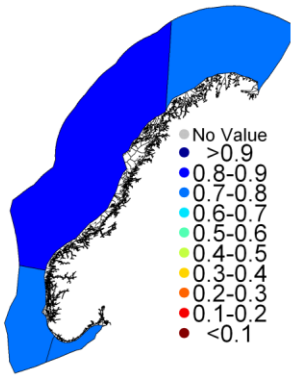
Mountains

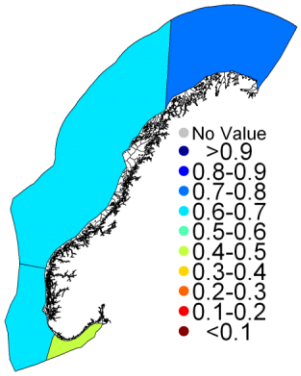


Marine ecosystems 2010

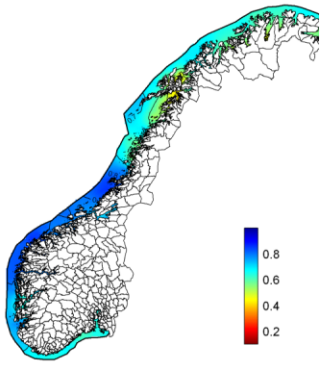
DIREKTORATET FOR NATURFORVALTNING

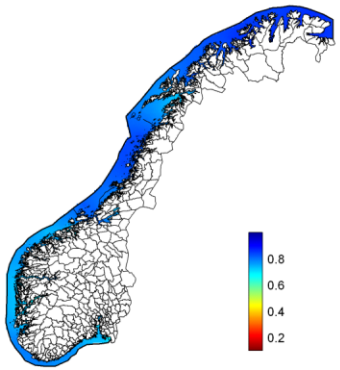
Sea bottom and pelagic





Coastal waters bottom and pelagic





The Nature Index for Norway and LPI

- The difference between the Nature Index and the Living Planet Index reflects different methods:
  - The LPI for Norway only reported trends, whereas the Nature Index reports current state relative to a reference state, expressed by the best available knowledge of an intact ecosystem.
  - Different sets of species in the two indices.

Science-policy as basis for activism

- The dramatic threats to biodiversity are not reflected in the (mainstream) economic discourse.
- “Economists and policymakers speak the same language”, Ben ten Brink (2006).
- Biodiversity as the basis for life-supporting ecosystems - an ethical imperative to give high priority to protection of biodiversity.
- Biodiversity loss requires a context of “post-normal science” : Scientists take into account the intertwined relationships between facts and values, the possibility of catastrophic decision-stakes, the legitimate plurality of conflicting interests and ethical complexities, beyond what is usual in normal scientific practice (Funtowicz and Ravetz 1990).

Biodiversity indices can be applied in ecosystem accounting, to express policy objectives, and as input in deliberation and communication processes.

UN SEEA Experimental Ecosystem Accounting

- Novel approach to integrate ecological and economic values, based on biodiversity
- Ecosystem capacity: Sustaining future delivery of a “basket” of ecosystem services from an ecosystem at a given spatial level.
- Future trade-offs may require a larger capacity than current ecosystem capital.
- Use and valuation of “baskets” of multiple ecosystem services need to be seen together
- The directly relates impact of human activities through use of ecosystem services and land use change to the potential for future ecosystem services
- System will be tested out in pilot studies. Policy relevance is crucial!
- Ecosystem accounting and biodiversity indices may help us – at least – to open our eyes.


NORGES BANK
200
TO HUNDRE KRONER
NORGES BANK
5101586716
100
HUNDRE KRONER
200
NORGES BANK
5302749554
500
FEM HUNDRE KRONER

Trying to aggregate incommensurable values . . .