



# Assessing the condition of biodiversity in Norway using the Nature Index

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# The Nature Index

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- ▶ Commissioned by the Norwegian government in 2005
- ▶ Framework for condensed reporting of the state of nature
- ▶ Methodology based on the Natural Capital Index (ten Brink & Tekelenburg 2002) and Biological Intactness Index (Scholes & Biggs 2005), but further developed
- ▶ Launched in 2010
- ▶ Published in 2010-2012  
(Nybø S. 2010, Certain G. et al. 2011, Skarpaas O. et al. 2012)
- ▶ Update in 2015
- ▶ Aggregated measure of biodiversity, reflecting the state of terrestrial and marine ecosystems.
- ▶ Ecological equivalent to a stock market index

# Where is information on biodiversity located?



In the **brain of experts**  
and in their **computer**



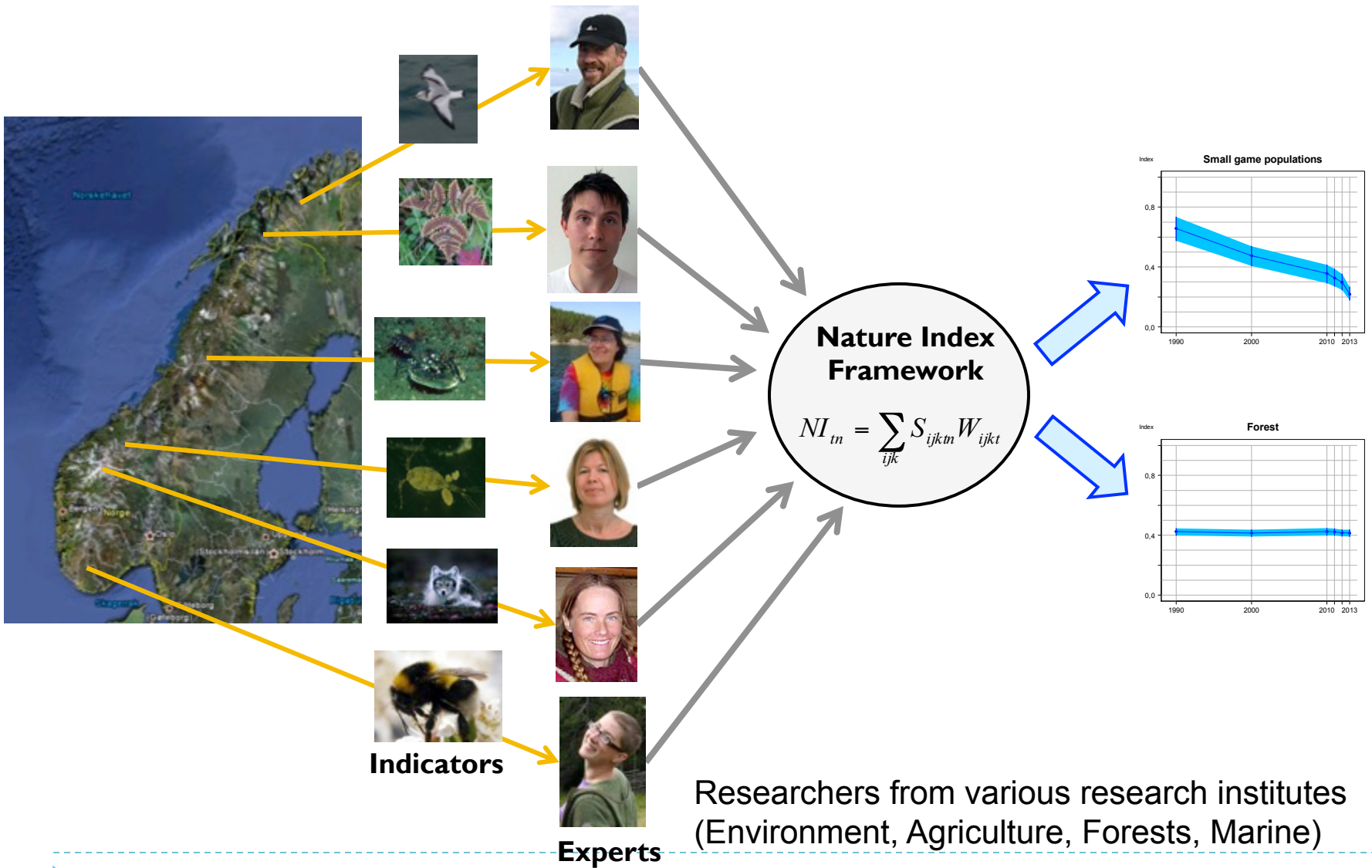
Through diverse  
**reports**  
**publications**  
**medias...**

How is it communicated to society ?

The **integrated picture** might be hard to get...



# Information flow - nature index framework

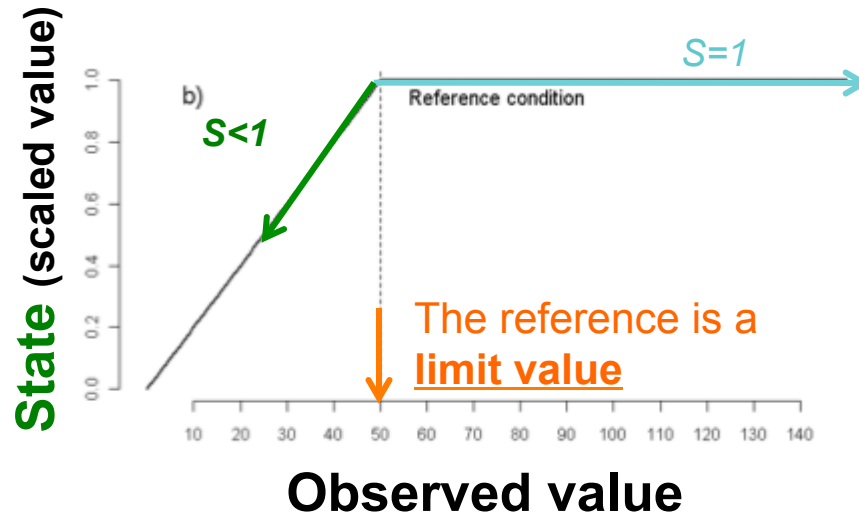


# States are calculated by scaling indicators by their reference value:

Facilitates the use of data from various conceptual models for scaling to different scales, state composite indices for systems with the combined human composite index.

“Intact” semi-natural systems under influence of traditional, agricultural practices

All **States** are dimensionless numbers, expressed on a **0-1** scale

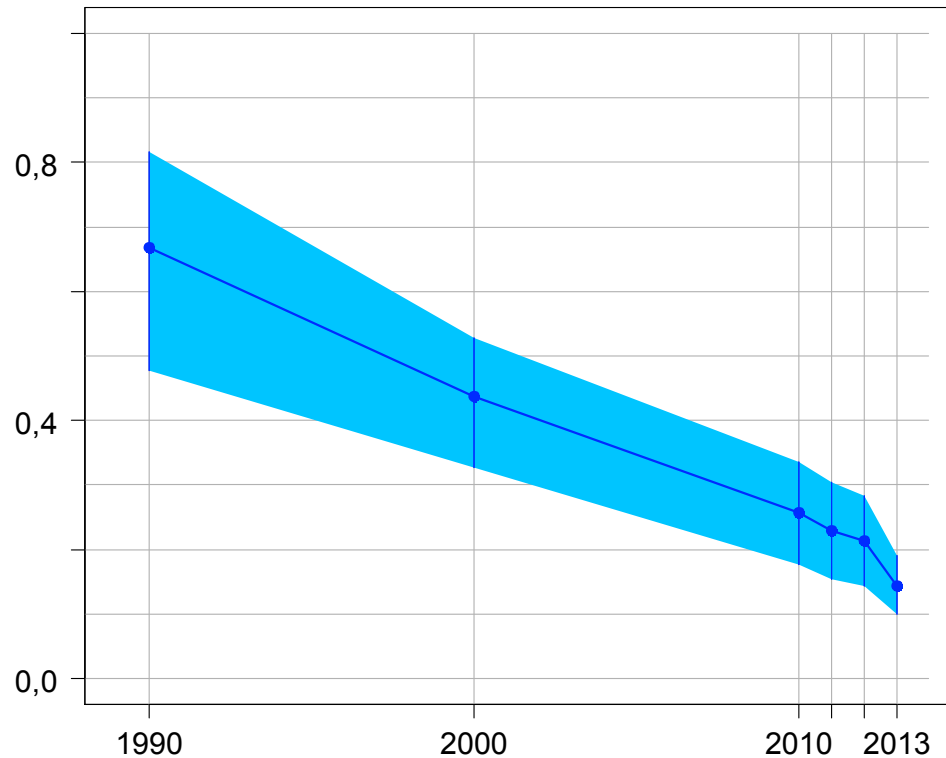


# A scaled indicator



Index

## Willow Ptarmigan




# The mathematical structure of the Nature Index: a **weighted average**...

4 axes:

*i* - indicators,  
*j* - major habitats  
*k* - spatial units  
*t* - time

$$NI_{tj} = \sum_{ik} S_{ijkt} W_{ijkt}$$

States Weights



The average may in principle be made across any combination of these 4 axes.



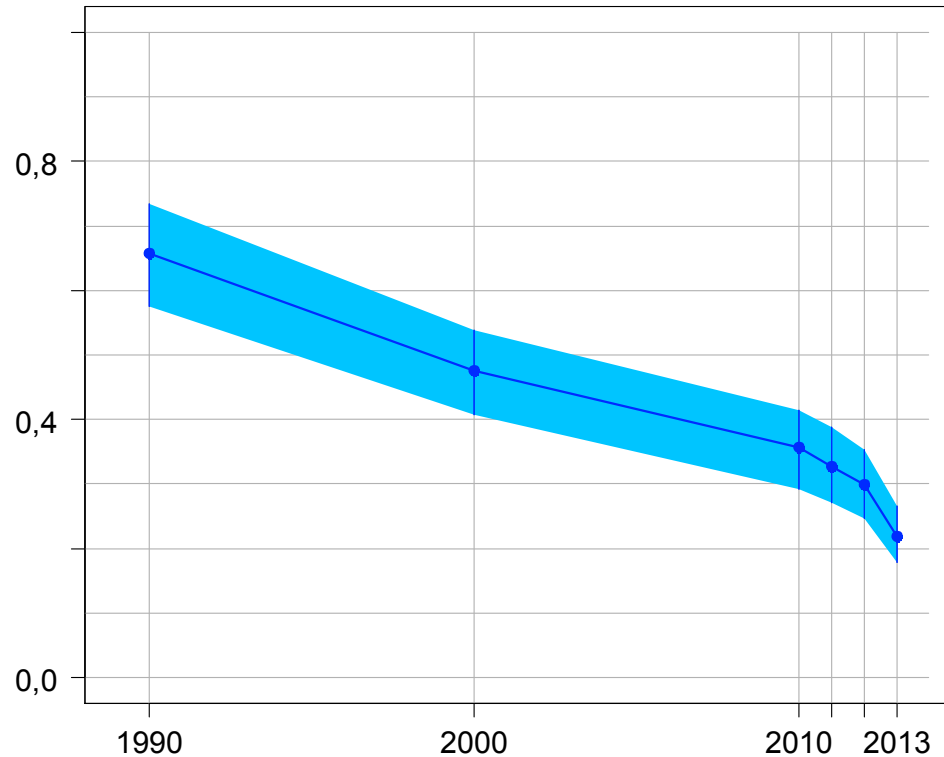
# Ecosystem service capacity

## A composite index over 4 indicators



Index

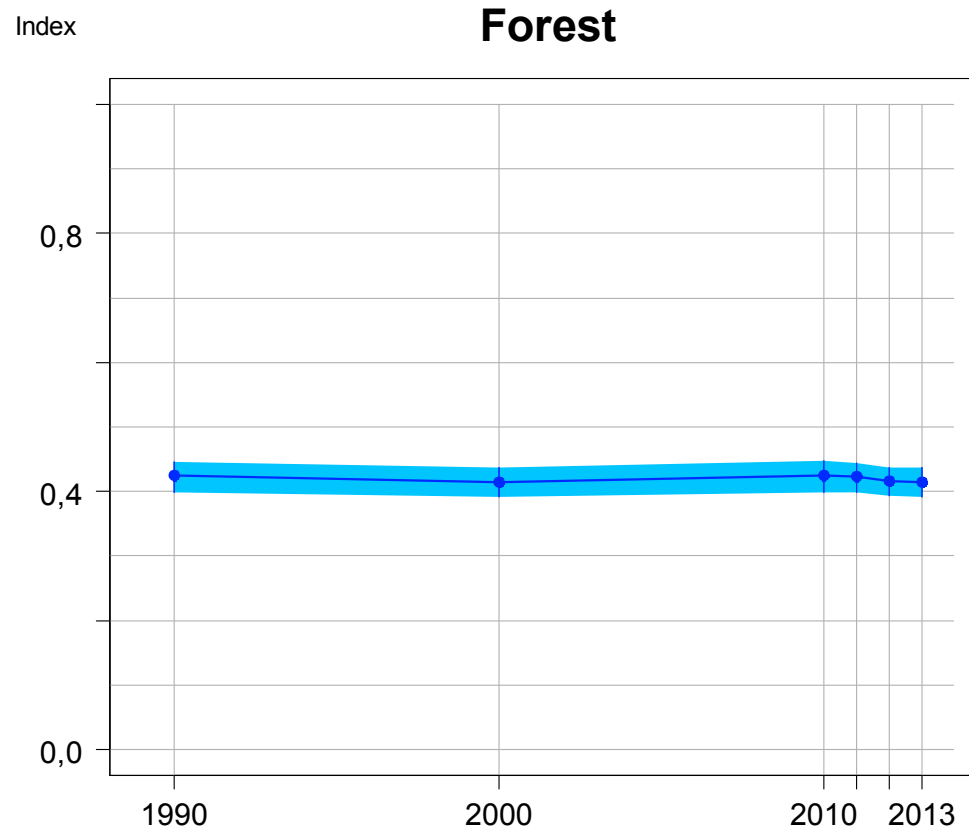
### Small game populations



Photos: © John Atle Kålås, © Jan Ove Gjershaug

# A major habitat

## A composite index over 86 indicators



# The expert panel is the core of the Nature Index

Implementation of the nature index required the participation of the "Ecological Research Network" in Norway, i.e. scientists involved in all fields of biomonitoring and ecological research". They:

Decided on the Indicator list,

Produced the reference levels associated to all indicators,

Adapted their data to fit the nature index framework,

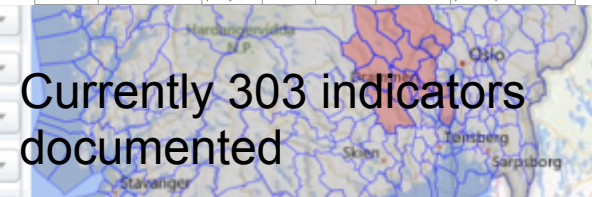
Entered the data into the NI- database,

Currently > 42,000 entries

Vedlegg 2: Indikatorliste

Økosystem	Indikator	Detaljert taxa	Reddisstatus 2006	Skaleringsmodell	Institutt	Kontaktperson
ferskvann	asp	beinfisk	VU	OPT	NINA	Tyggve Hesthagen
ferskvann	aure	beinfisk	LC	OPT	NINA	Tyggve Hesthagen
ferskvann	bygdlandsbleke	beinfisk	CR	OPT	NINA	Tyggve Hesthagen
ferskvann	begrong elver, eutrofierings indeks	alge		MAX	NIVA	Susanne Schneider
ferskvann	begrong elver, forureningsindeks	alge		LOW	NIVA	Susanne Schneider
ferskvann	bunndyr eller forventningsamfunn	insekter		LOW	NIVA/NINA	Zlatko Penin
ferskvann	bunndyr forureningsindeks (Raddam 1)	insekter		LOW	NIVA	Torleif Bakken
ferskvann	bunndyr, ASPT indeks	insekter		LOW	NIVA	Torleif Bakken
ferskvann	dymptankton artsammensetning	krepdyr		OPT	NINA/NIVA	Bjorn Walseng, Anders Hobæk
ferskvann	eddelreps	krepdyr	EN	OPT	NINA	Stein Kar Johnsen
ferskvann	file	beinfisk	NT	OPT	NINA	Tyggve Hesthagen
ferskvann	elvemusling	mollusk	VU	LOW	NINA	Bjorn Middel-Larsen
ferskvann	fiskemåke	fugl	LC	LOW	NINA	Ekspertgruppe, leder Gjershaug
ferskvann	fiskeørn	fugl	NT	LOW	NINA	Ekspertgruppe, leder Gjershaug
ferskvann	gjers	beinfisk	EN	OPT	NINA	Tyggve Hesthagen
ferskvann	fossegrimmose	moser	VU	LOW	VM-NTNU	Kristian Hassel
ferskvann	fosskall	fugl	LC	LOW	NINA	Ekspertgruppe, leder Gjershaug
ferskvann	hornulke	beinfisk	VU	OPT	NINA	Tyggve Hesthagen
ferskvann	horndykker	fugl	EN	LOW	NINA	Ekspertgruppe, leder Gjershaug
ferskvann	horngrimmose	moser	EN	LOW	VM-NTNU	Kristian Hassel
ferskvann	hvitfinaet steinsmett	beinfisk	NT	OPT	NINA	Tyggve Hesthagen
ferskvann	namnbank	beinfisk	CR	OPT	NINA	Tyggve Hesthagen
ferskvann	laks	beinfisk	LOW	LOW	NINA	Peder Fiske
ferskvann	oter ferskvannbestand	pattedyr	VU	OPT	NINA	Joska van Dijk

Ref/År	Gjennomsnitt	N kvartil	Ø kvartil	Datatype
Referansev	6,27	5,35	7,19	Overvåkingsdi
1950	-1	-1	-1	Overvåkingsdi
1990	-1	-1	-1	Overvåkingsdata
2000	-1	-1	-1	Overvåkingsdata
2010	2,19	1,82	2,56	Overvåkingsdata
2011	2,35	1,97	2,73	Overvåkingsdata



Currently 303 indicators documented

Standing dead wood - forest inventory

# Summary

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- ▶ Nature index a framework for communicating experts' knowledge on biodiversity to society.
- ▶ NI presents an **overview** of state and trends of biodiversity based on this knowledge
- ▶ Easy to communicate
- ▶ Uncomplicated and transparent framework
- ▶ Weighted average of scaled indicators
- ▶ Facilitate an intuitive interpretation of results
- ▶ Based on researchers' participation

# Thank you for the attention!



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## References:

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