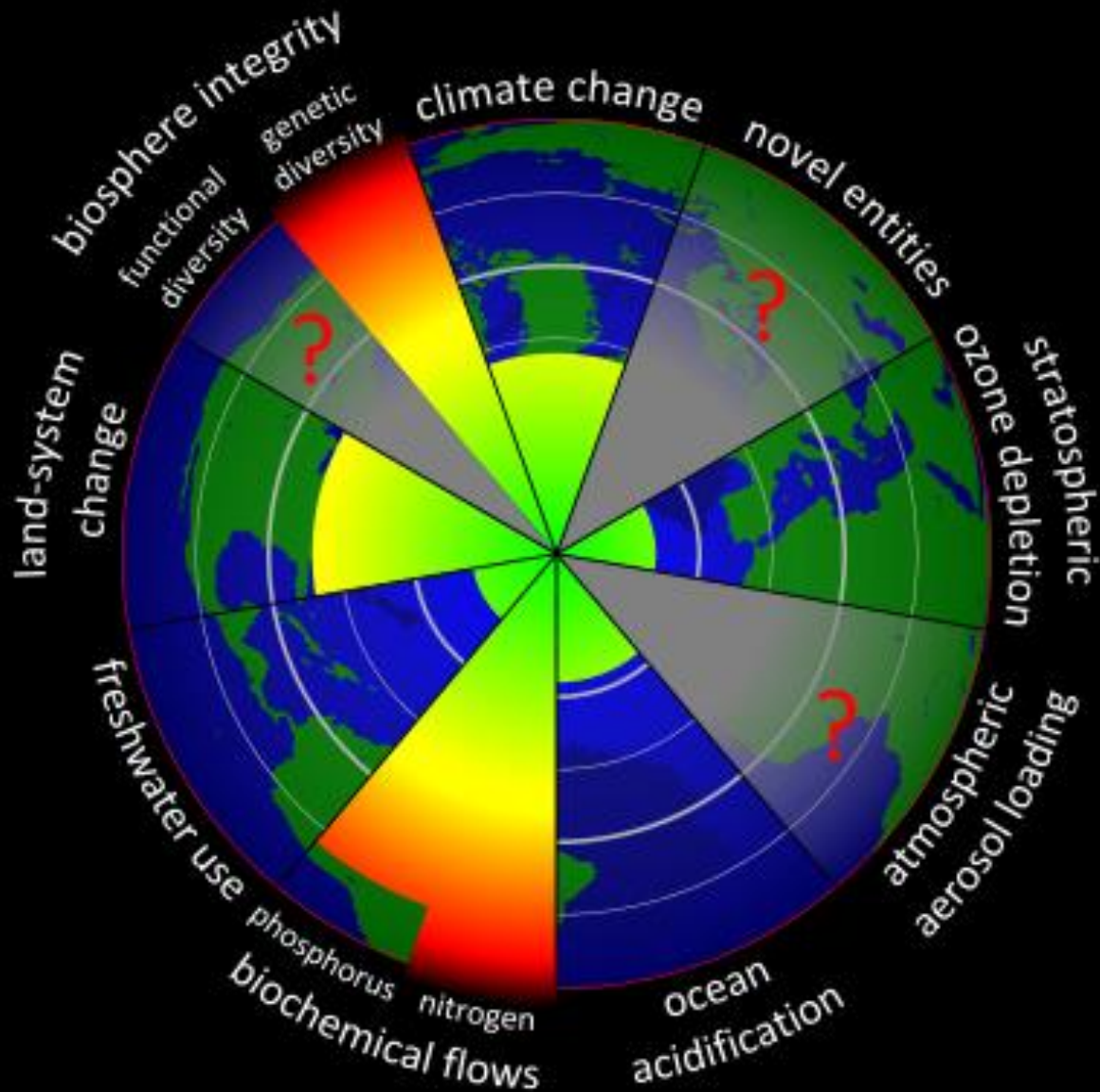


Trender for verdens mangfold



Dag O. Hessen
Inst. Biovitenskap, UiO

Planetens tålegrenser



Inn i Antropocen

- Klodens CO₂-konsentrasjon økte mer enn noensinne i fjor (vi har nå passert 400 ppm, restkapasiteten for utslipp = 500 Gt CO₂)
- Verdens dyrebestander er halvert i løpet av 40 år (og vi er avhengig av intakte økosystemer)
- Verdens folketall kan øke mye mer enn antatt (fra < 10 til > 13 mrd) – økt behov for mat, vann og “grønn” teknologi
- Global footprint: årskapasiteten brukt opp 02.08

Grunn til bekymring?

- **Vi vil gå tom for ressurser:** Malthus 1803, Ehrlic 1968 (*The population bomb*), "Romaklubben" 1972 (*Limits to growth*) og 1991 (*Beyond the limits*)
- **Vi vil drukne i avfall/giftstoffer:** fra Carson 1962 (*Silent spring*) til IPCC
- **Problemer knyttet til habitatødeleggelse og/eller tap av biologisk diversitet:** Norman Myers 1979 (*Sinking Ark*)

Andre trender...

- Habitatødeleggelse og fragmentering
- Lite "villmark" tilbake
- Klimaendringer
- Invaderende arter
- Forurensning
- (Over)høsting
- Forstyrrelser
- **Merk endringstakten: STORE endringer i løpet av 100 år.**

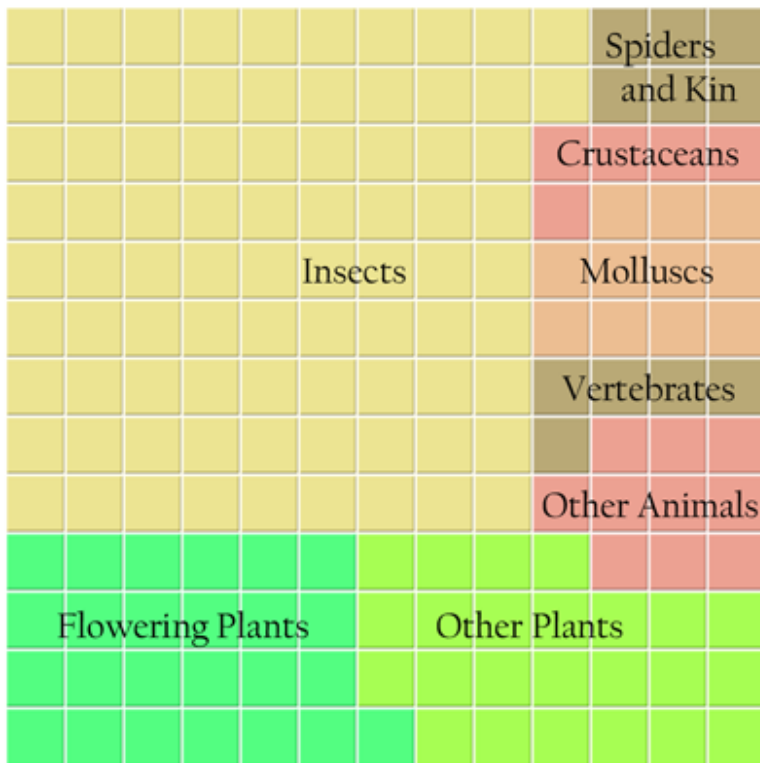


Noe blir bedre....

- Miljøbevisstheten er bedret
- Renseteknologien er bedret
- Sterkt reduserte utslipp av en rekke miljøgifter
- Noen store seire: Forsuring, ozon visse miljøgifter
- ... men noe blir verre: klima, mangfold og andre miljøgifter...

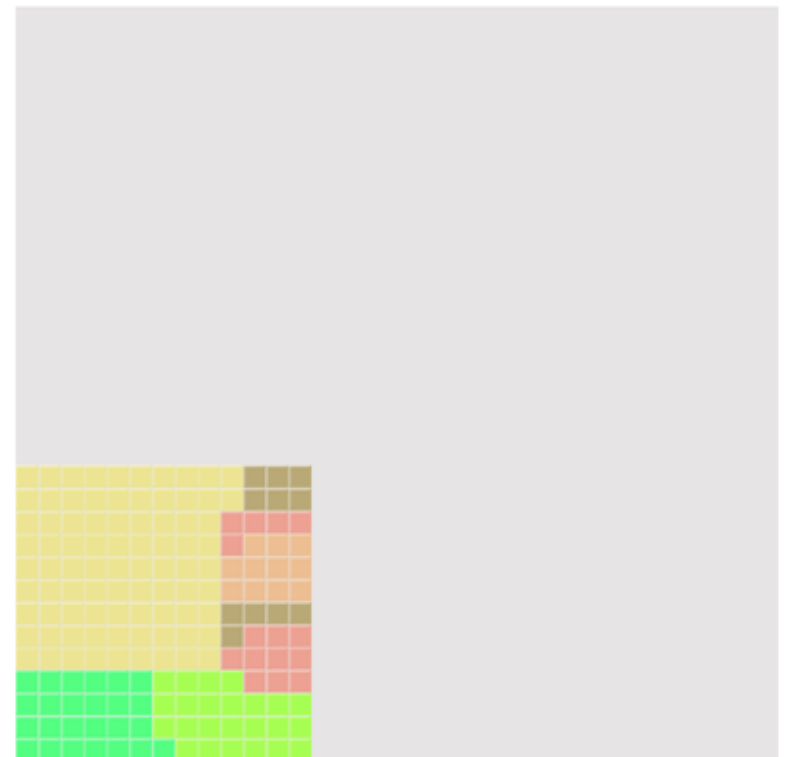
Hvor mange arter?

Known Biodiversity
Approximately 1.7 million named species of plants and animals.



1 square = 10,000 species

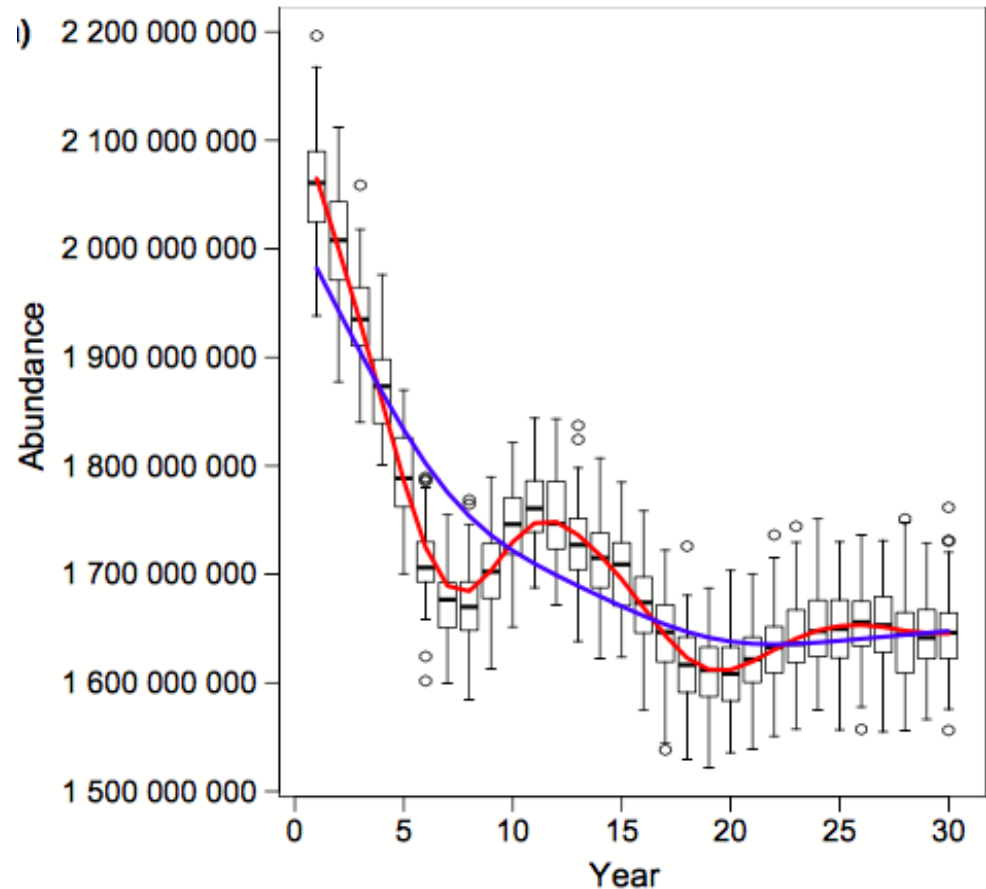
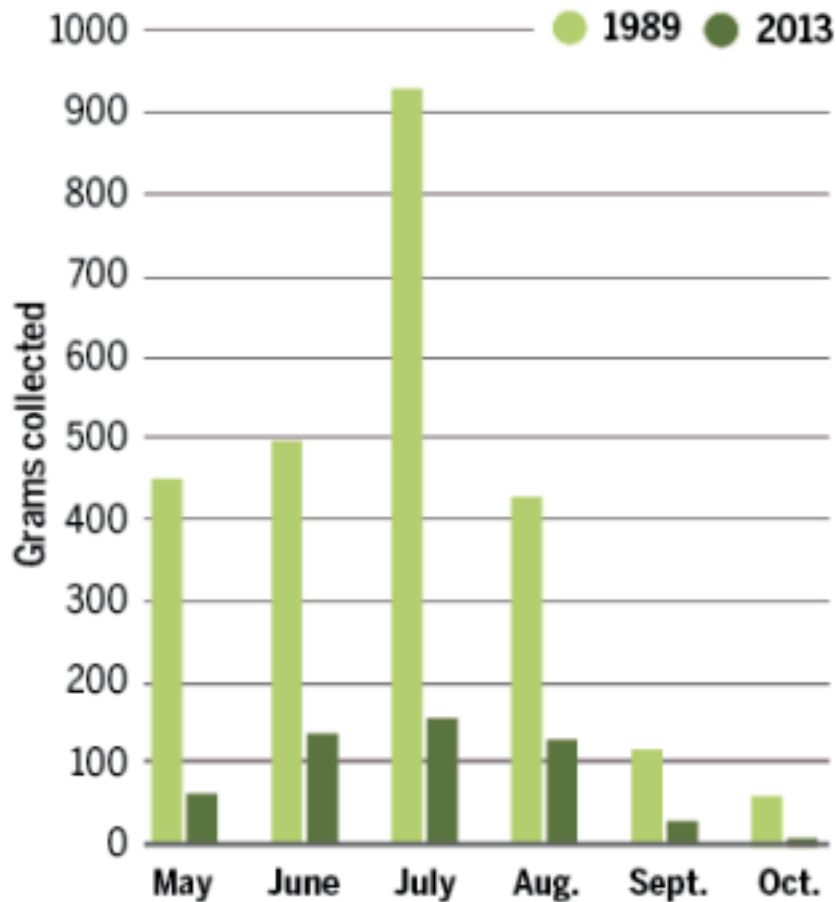
Estimated Biodiversity
10 million species

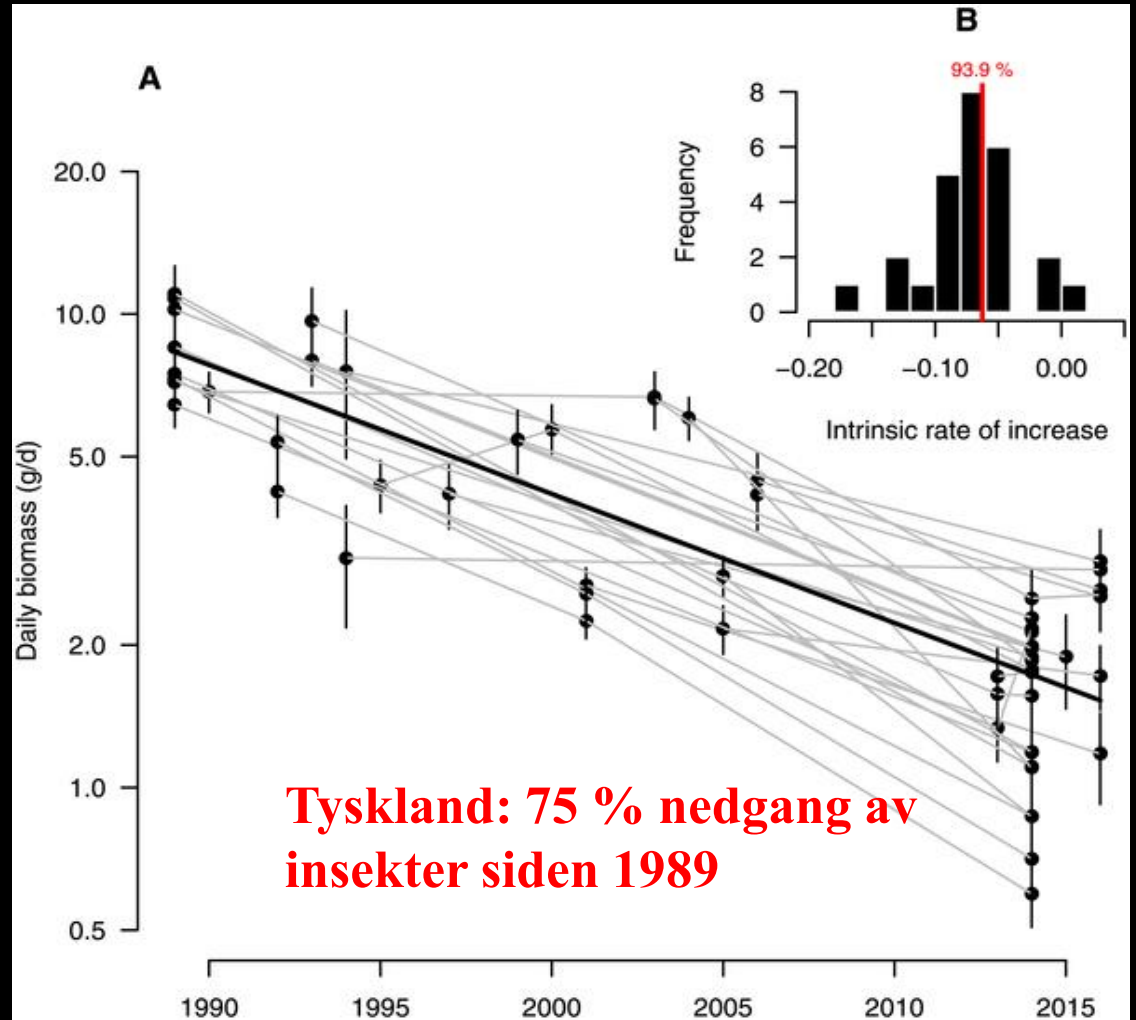
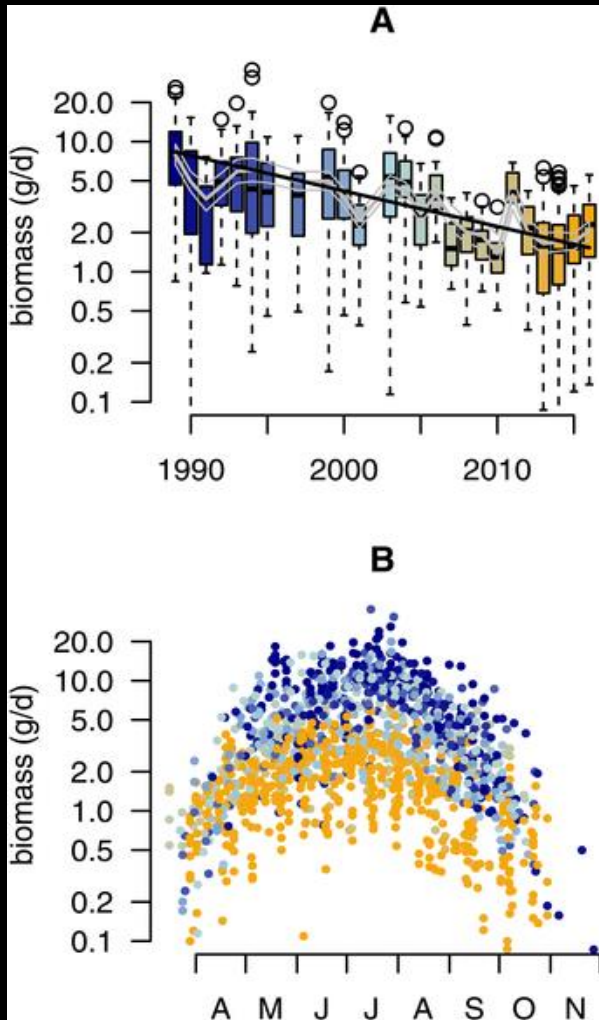


Nedgang i de vingede skarer..

Insekter UK

Fugler, Europa 1980-2009





Hallmann CA, Sorg M, Jongejans E, Siepel H, Hofland N, et al. (2017) More than 75 percent decline over 27 years in total flying insect biomass in protected areas. PLOS ONE 12(10): e0185809. <https://doi.org/10.1371/journal.pone.0185809>
<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0185809>



REPORT

INT

2016

THIS REPORT HAS BEEN PRODUCED IN COLLABORATION WITH:

ZSL
LET'S WORK FOR WILDLIFE



Living Planet Report 2016

Risk and resilience in a new era

BBC

News Sport Weather Capital Future Shop

NEWS SCIENCE & ENVIRONMENT

Home UK Africa Asia Europe Latin America Mid-East US & Canada Business Health Sci/Enviro

30 September 2014 Last updated at 08:20 GMT



World wildlife populations halved in 40 years - report

COMMENTS (657)

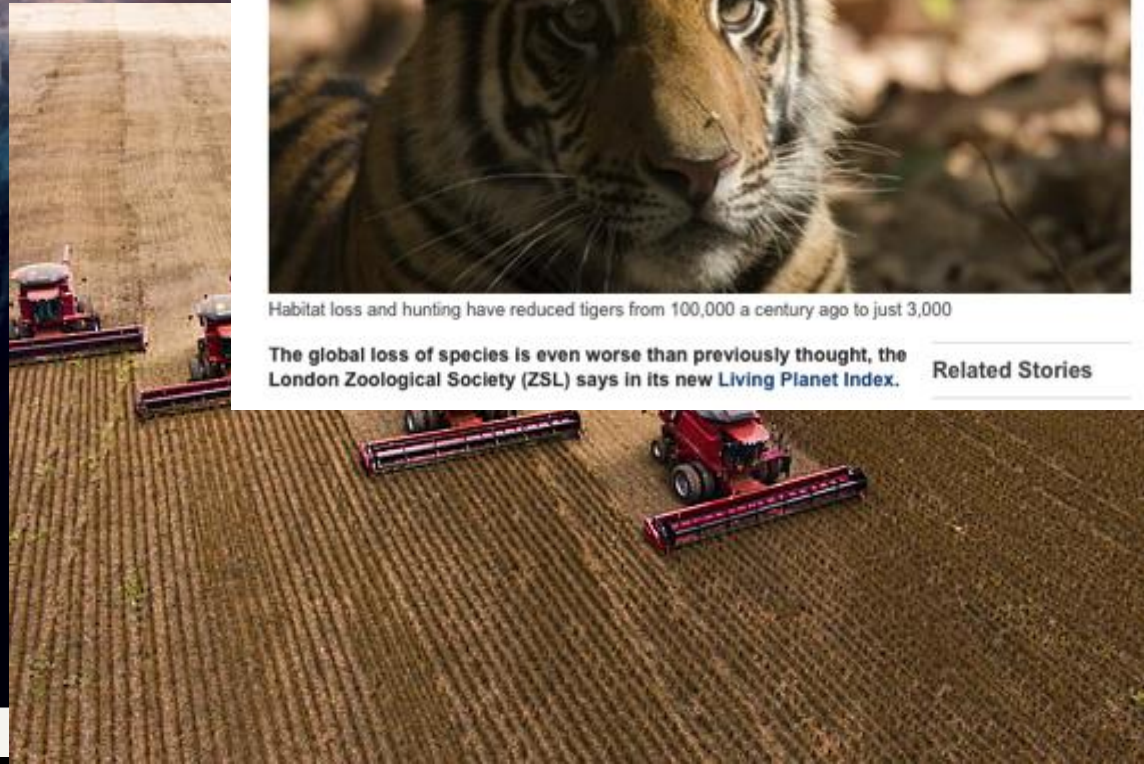
By Roger Harrabin
BBC environment analyst



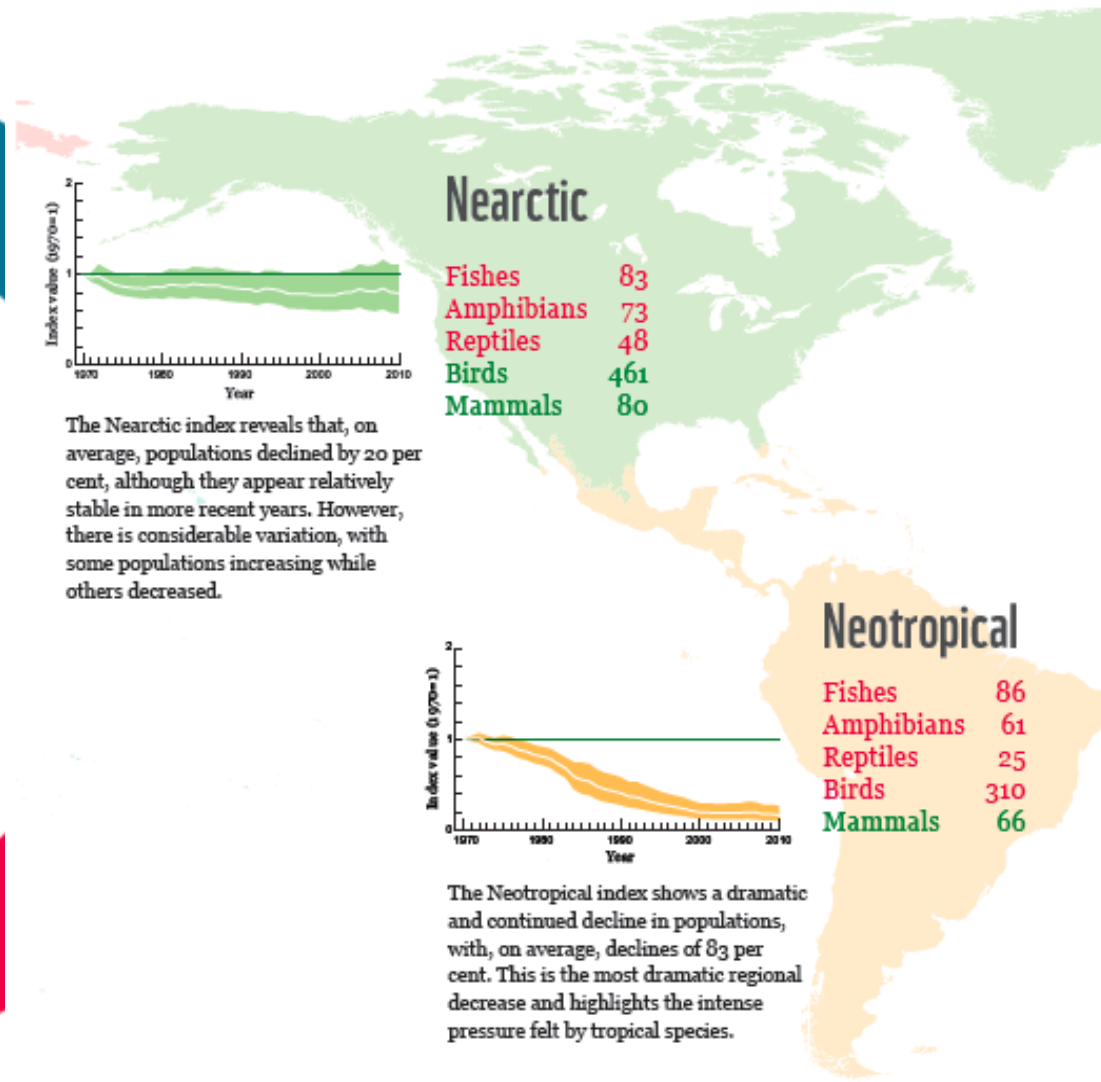
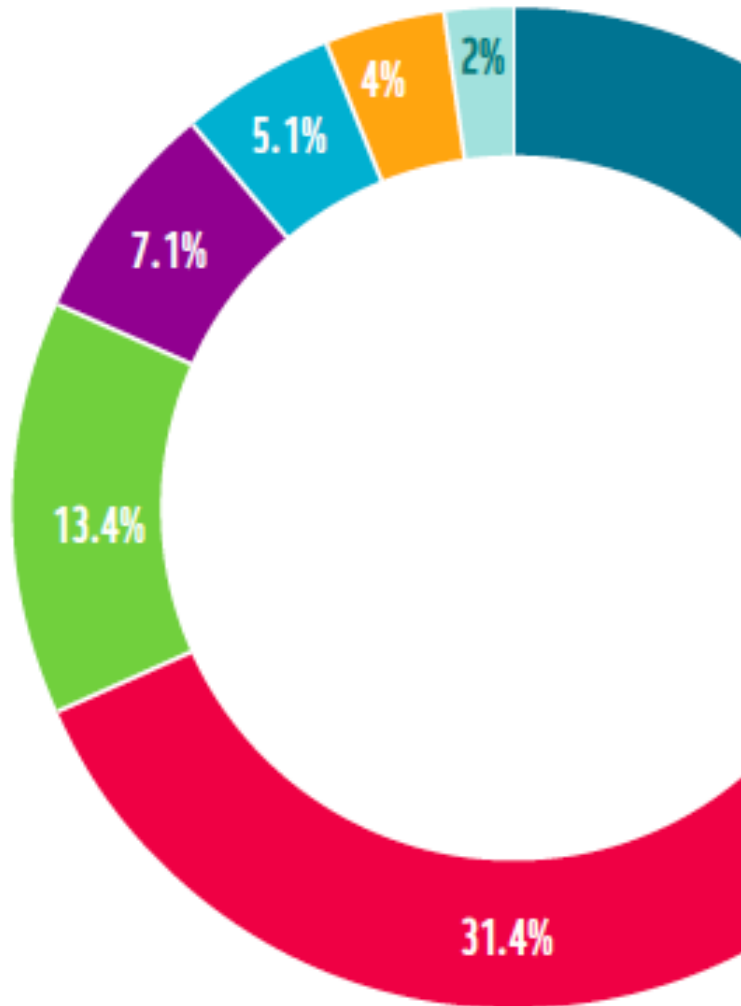
Habitat loss and hunting have reduced tigers from 100,000 a century ago to just 3,000

The global loss of species is even worse than previously thought, the London Zoological Society (ZSL) says in its new Living Planet Index.

Related Stories



“Halvering av verdens dyrebestander” – bestandsutvikling, ikke bare artstap



Klima og den 6. masseutryddelsen?

- ”15 – 37 % av landlevende arter er direkte utrydningstruet innen 2050” (Thomas et al. 2004).
- Klimaeffekter forsterkes av ødelagte leveområder.
- Polare og alpine arter i faresonen, men det totale mangfold vil øke ... inkludert parasitter, ”pest” organismer, zoonoser...



Og hvor mange kan dø ut?

OPINION

Are We in the Midst Of a Sixth Mass Extinction?

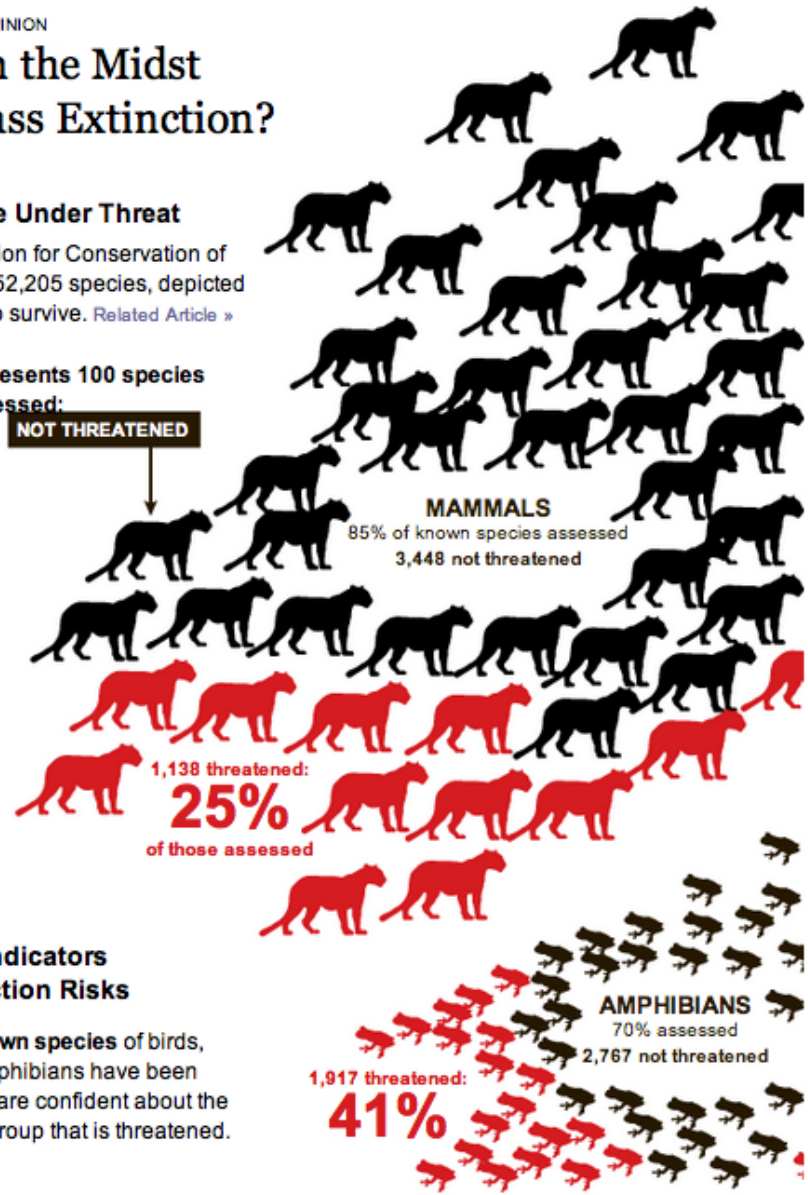
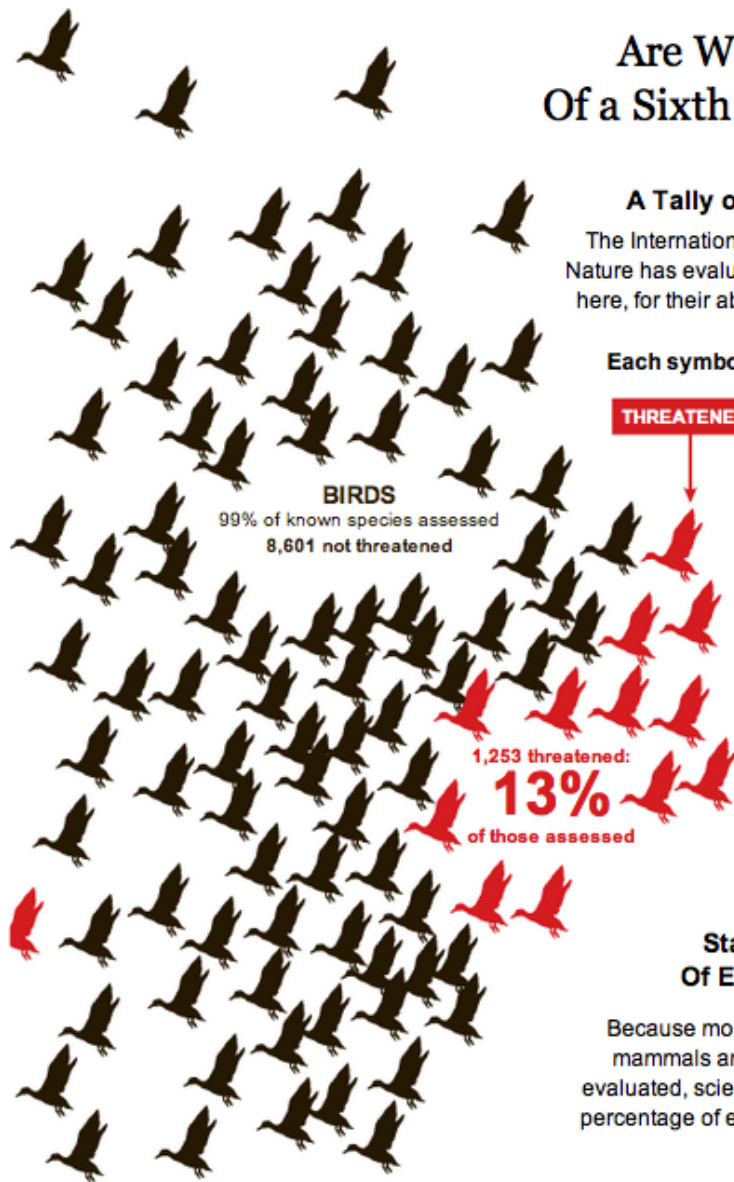
A Tally of Life Under Threat

The International Union for Conservation of Nature has evaluated 52,205 species, depicted here, for their ability to survive. [Related Article »](#)

Each symbol represents 100 species assessed:

THREATENED

NOT THREATENED



Stark Indicators Of Extinction Risks

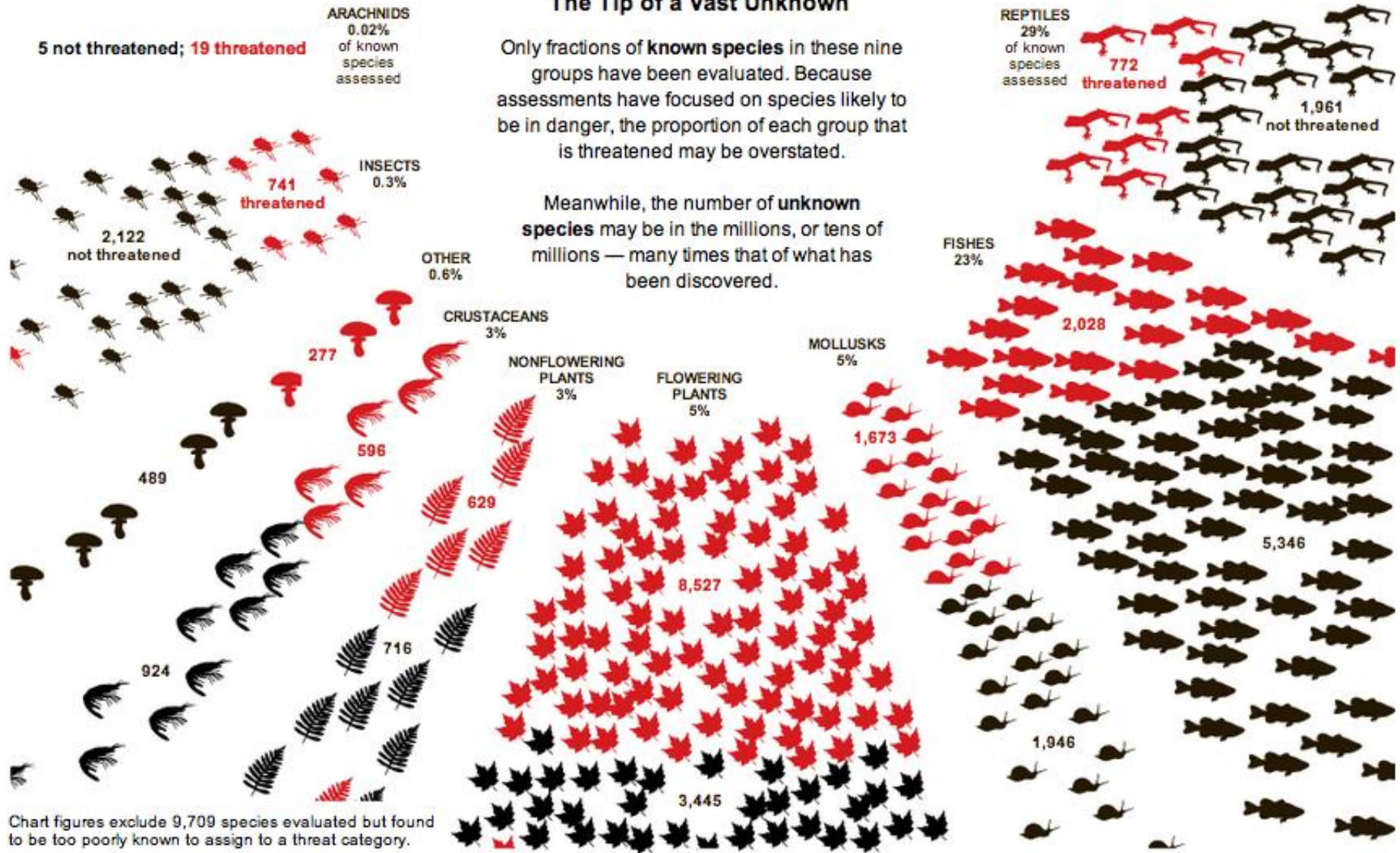
Because most **known species** of birds, mammals and amphibians have been evaluated, scientists are confident about the percentage of each group that is threatened.



Other Threatened Life: The Tip of a Vast Unknown

Only fractions of **known species** in these nine groups have been evaluated. Because assessments have focused on species likely to be in danger, the proportion of each group that is threatened may be overstated.

Meanwhile, the number of **unknown species** may be in the millions, or tens of millions — many times that of what has been discovered.



Already Gone

Species known to be extinct, or extinct in the wild, since 1500:

Mollusks	Birds	Flowering plants	Mammals	Fishes	Insects	Amphibians	Reptiles	Crustaceans	Nonflowering plants	Others	No known arachnid extinctions.
327	136	110	79	68	60	39	22	12	10	2	

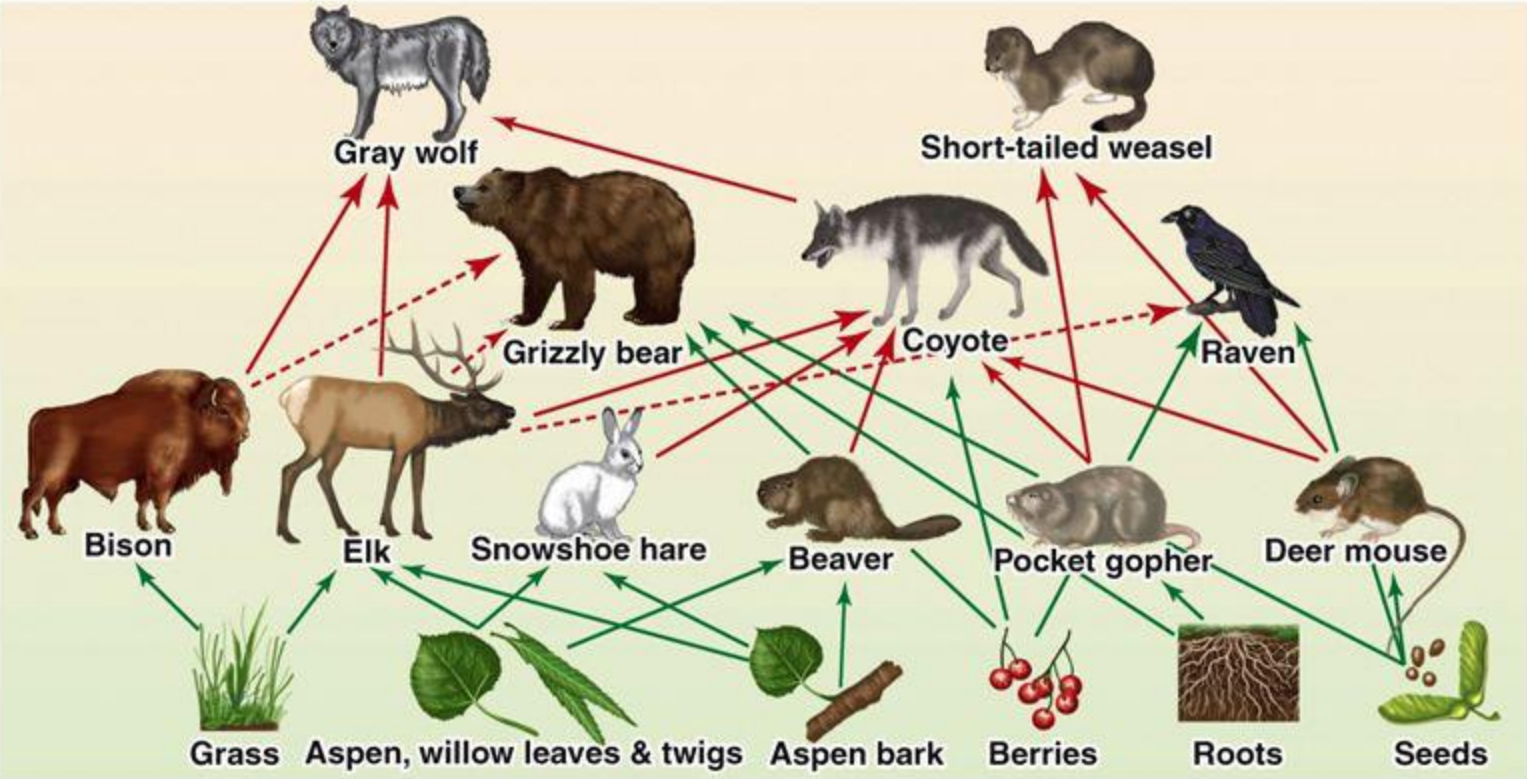
Figure 45.6 A Food Web in the Yellowstone Grasslands

Secondary and tertiary consumers

Omnivores

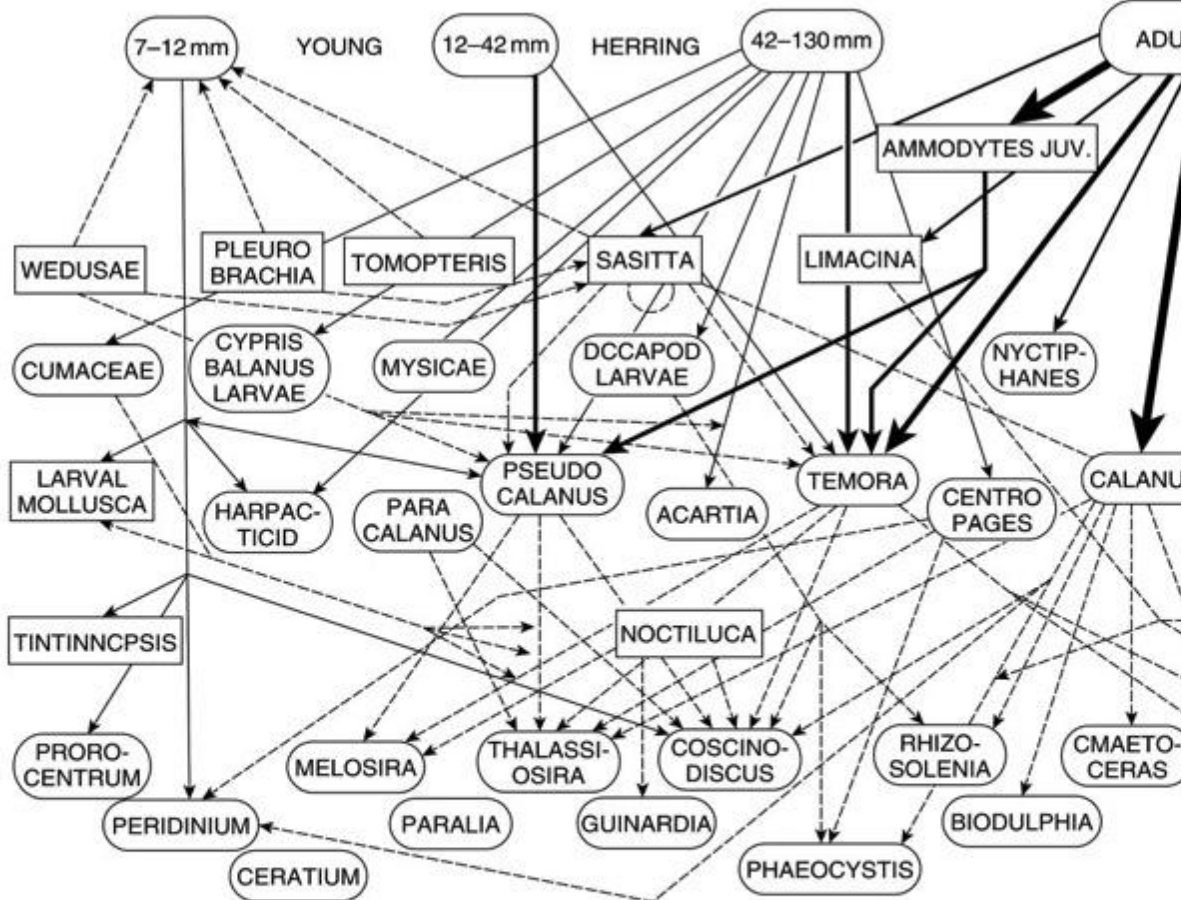
Primary consumers

Primary producers

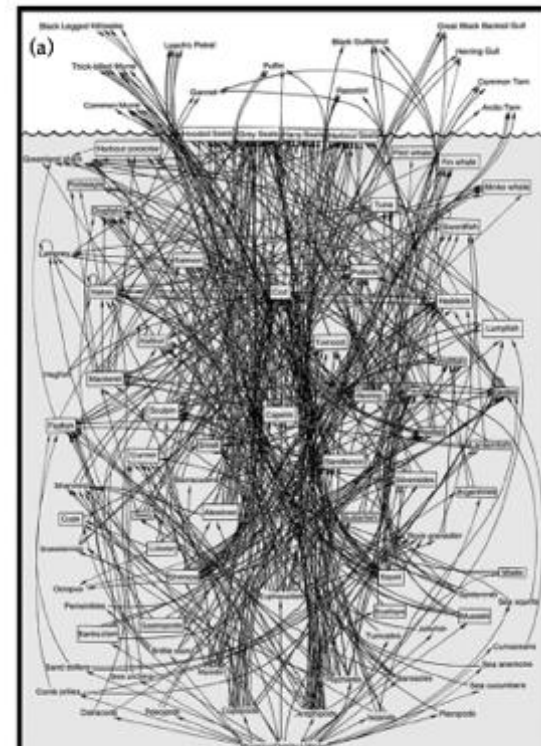


PRINCIPLES OF LIFE, Figure 45.6
© 2012 Sinauer Associates, Inc.

Alt henger sammen...?



Biological Oceanography, Second Edition. Charles B. Miller, Pat
© 2012 John Wiley & Sons, Ltd. Published 2012 by John Wiley



A simplified food web for the Northwest Atlantic

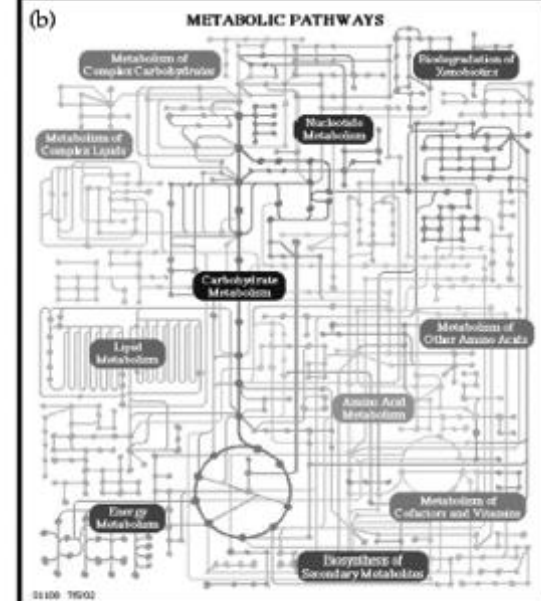
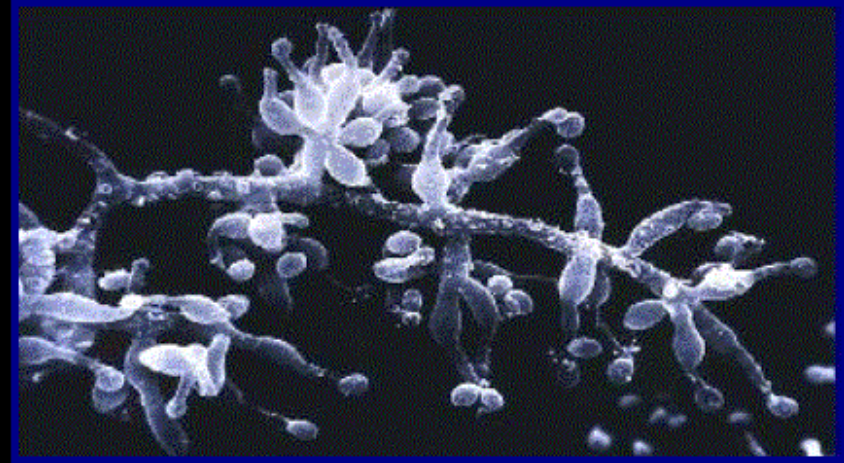


Fig. 9.1 Alister Hardy's (1924) classic pelagic food-web diagram from large phytoplankton to herring. All of these li herring (and trophic levels above those) were also known in 1924. Recent insights introduce much more complexity at th (After Hardy 1924.)

Bier, blomster og økosystemtjenester

- Blomster og bier:
 - \$153 milliarder per år globalt
- *Coffea arabica* (C=0,39)
Uganda \$227.000.000 * 0,39 = \$88.500.000
- *Coffea canephora* (robusta)
Vietnam €450.000.000 * 1 = €450.000.000



Den største økosystemtjenesten

