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UNESCO Chair on Education in Biosphere Reserves for Sustainable Societies

YNU-EBRoSS

Yokohama National University

Convention on Biological Diversity: Achievements and challenges

Hiroyuki Matsuda 松田裕之

Keywords

- Sustainability.
- Tragedy of the Commons, Economic Discount Rate
- Ecosystem services, Nature's Contributions to People
- Coexistence between people and nature, One Health, Nature positive (co-existence with mutual use)
- 30 by 30, OECM (Other Effective Conservation Measures)
- natural capital to the future
- 5+1 factors that degrade biodiversity
- Nature-based solutions, Eco-DRR (Ecosystem-based disaster risk reduction)
- Common but differentiated responsibilities
- *ABS (Access and Benefit sharing), genetic resources*
- Precautionary principle, adaptive management, regulatory science
- Extinction risk, Red List

Ecosystem Resilience and Maximum Sustainable Yield (MSY)

But ecosystems are uncertain, non-equilibrium, complex

- Fisheries resources dynamics N

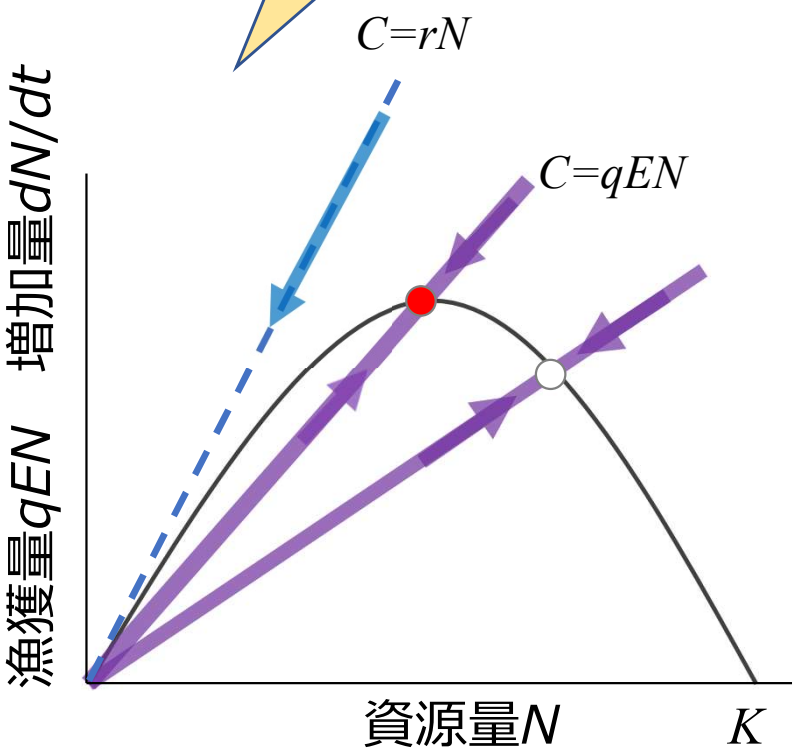
Natural increase　　Harvesting

$$\frac{dN}{dt} = r\left(1 - \frac{N}{K}\right)N - qEN$$

- $C=qEN$ catch amount per time
- E: Fishing effort
- K : Carrying capacity
- C has is an upper limit
- Equilibrium C is maximized

⇔C= $rK/4$ if $E=r/2q$

- If $E > r/q$, $N \downarrow 0$ (overfishing)



Two economic reasons of overfishing (Clark 1974)

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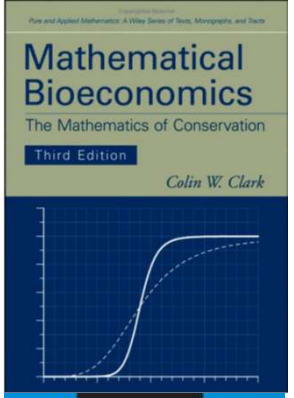
1. Economic discount rate δ

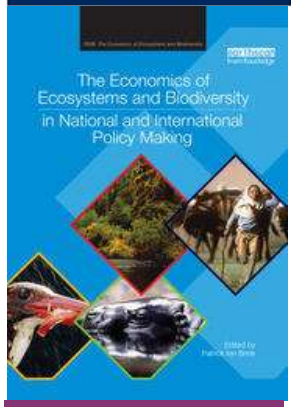
- IWC/SC agreed to catch 2000 minke whales a year
- It is more profitable to catch >40,000 minke whales at once and invest that can make a profit of 5% per year than to catch 2000 whales a year.
- If $r < 4\delta$, overfishing is profitable: forests, whales

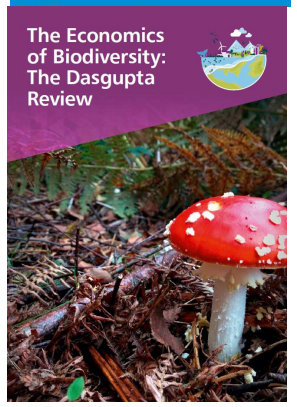
$$C_{total} = C_0 + C_0(1-\delta) + C_0(1-\delta)^2 \ldots = C_0/\delta$$

2. The Tragedy of the Commons

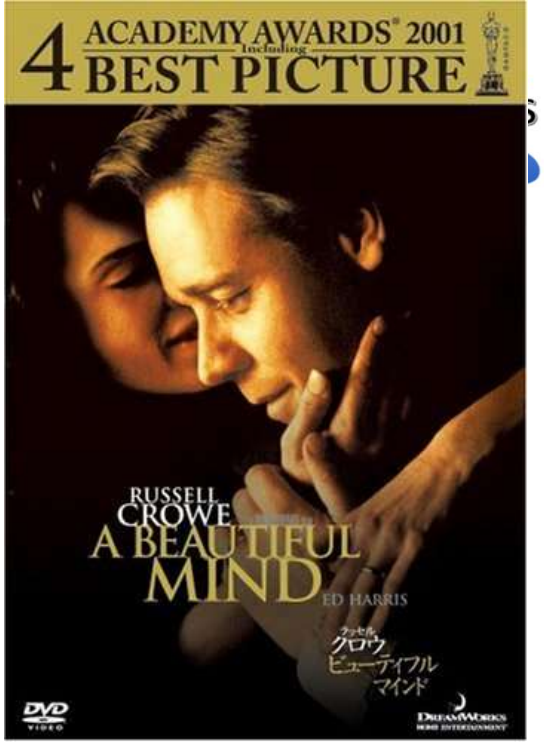
- If you avoid overfishing but someone else who does gains a present benefit and both parties lose a future benefit.
  - $dN/dt = r(1 - N/K)N - qE_1N - qE_2N$
  - Equilibrium: $N^* = K(r - qE_1 - qE_2)/r$
  - Catch of each $C_1 = qE_1N^*$, $C_2 = qE_2N^*$
- Nash solution: $\partial C_1/\partial E_1 = \partial C_2/\partial E_2 = (r - 2qE_i - qE_j)K/r = 0$,
- Therefore $E_1 = E_2 = r/3q$, at which $C_1 + C_2 = 2rK/9 < \text{MSY}$
- If there are n nations, Nash solution is $\Sigma C_i = nrK/(n+1)^2 \downarrow 0$

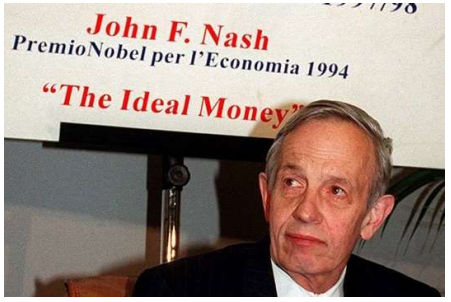






Game for the tragedy of the commons





試してみよう				④両方欲張ると両方損をす		
	N*	500			N*	333
	E	C			E	C
A国	3	1,500.0		A国	4	1,333
B国	3	1,500.0		B国	4	1,333
totac	6	3,000		total	8	2,667
r=	12			K=	1000	

①MSYはほぼほぼにとること

平衡資源量		500
	漁獲努	漁獲量
A国	6	3,000
B国	0	0
合計	6	3,000

②MSYを山分けすると両方得(

平衡資源量		500
	漁獲努	漁獲量
A国	3	1,500
B国	3	1,500
合計	6	3,000

③一方が欲張ると他方が損を

平衡資源量		417
	漁獲努	漁獲量
A国	4	1,667
B国	3	1,250
合計	7	2,917

⑤さらに欲張ると、自分が損を

平衡資源量		250
	漁獲努	漁獲量
A国	5	1,250
B国	4	1,000
合計	9	2,250

https://ecorisk.web.fc2.com/lecture/TragedyOfCommonsGame.xlsx

The Tragedy of the Mitigation Policy in climate change. How to avoid it?

- Mitigation works globally, but adaptation works locally.
  - It is optimal for a nation if it focus on adaptation and the other nations focus on mitigation.

1. Commons should be divided into private property (It is impossible for GHG)
2. Forcing global policy (international legally binding instrument) (Kyoto Protocol 1997/2005)
3. Co-management, Bottom-up approach in global commons*
   1. CBD, and NDC in Paris Agreement in UNFCCC
4. Incentive by Carbon Credit, Cap and Trade, (ITQ)
   - $V_i = B_i - D(\Sigma M_j, A_1) - M_i - A_i + \lambda(\Sigma M_j)\,(M_i - M_i^{cap})$

- NDC = Nationally determined contribution in Paris Agreement
- ITQ = Individual transferrable quota in fisheries

Climate change mitigation and adaptation measures

- Mitigation measures
  - Reducing carbon dioxide emissions (→ climate change) itself
- Adaptation measures
  - Surpassing the negative effects of climate change by other means.
- Mitigation is a matter of climatologists and energy professionals
- Adaptation is a matter of experts and people in all affected sectors (← mainstreaming)

Make no mistake.

Three Dimensions of Sustainable Development

- Sustainable development has been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. (Brundtlant C. 1987)
- For sustainable development to be achieved, it is crucial to harmonize three core elements: **economic** growth, **social** inclusion and **environmental** protection.



https://www.unic.or.jp/files/UN_DPI_SDG_presentation_generic_final_0617.pptx

Millennium Ecosystem Assessment (MA) scheme

National Biodiversity Strategy of Japan

Human Well-being
- Security
- Basic material…
- Health
- Good relationship…
- Freedom of choice..

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Indirect DFs
- Demographic
- Economic
- Sociopolitical
- Cultural & Religious
- Science & Technology

Japan NBSAP*
1. Over-use
2. Under-use
3. Disturbance
- Climate Change

Ecosystem S.
- Biodiversity
- Supporting S.
- Provisioning S.
- Regulating S.
- Cultural S.

Direct DFs
A) Habitat change
B) Climate change
C) Invasive species
D) Over-exploitation
E) Pollution

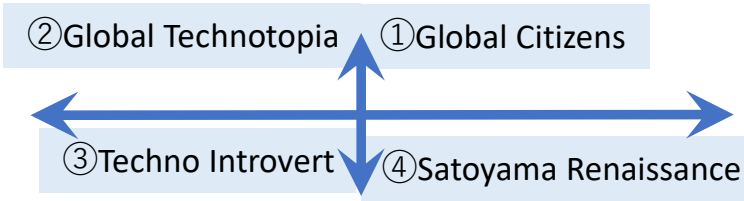
*NBSAP = National Biodiversity Strategy & Action Plan

3 types of ecosystem services

- Consumptive use (will decrease the resource, but ecosystems regenerate)
  - Provisioning services (sustainable use of resources) Resources for food, clothing, shelter, medicine and fuel (← substitutes for fossil and man-made resources)
- Non-consumptive use
  - Regulating services are permanently valued water source forests, windbreaks, mudflats, coral reefs...
  - Cultural services are tourism resources that only have value when used, symbols of festivals... (← Cultural diversity)

Changes in ES under scenarios

(UN Univ. J-SSA Chap.4 2011)



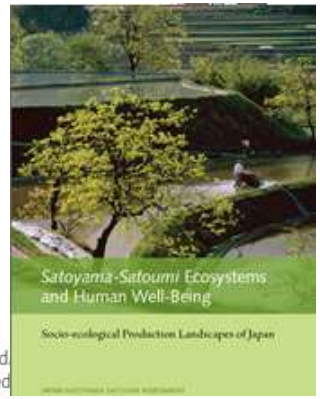
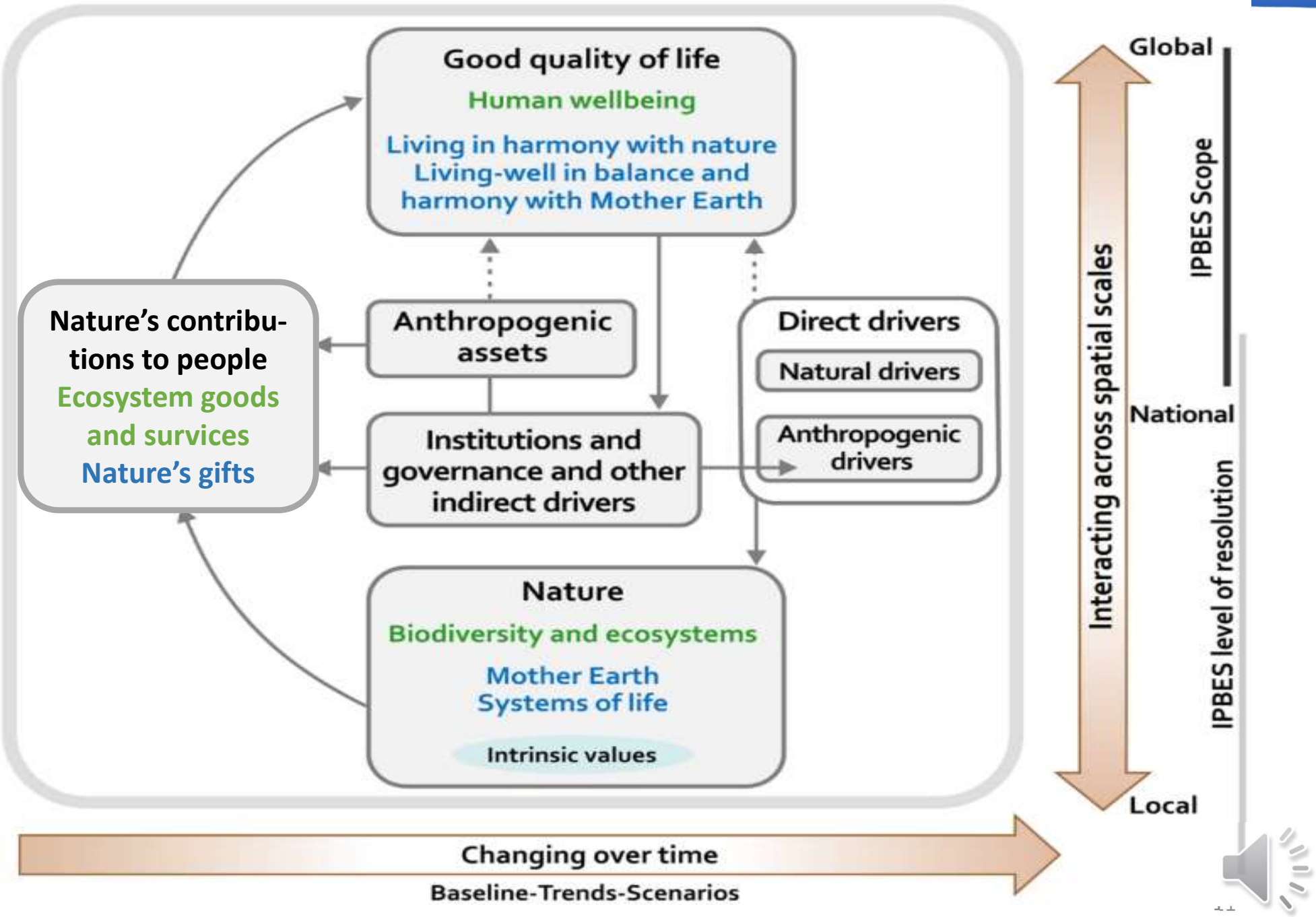


Table 3 Changes in ecosystem services under scenarios

Type and Category of Ecosystem Services			① Global Flow	① Global Stock	② Global Technotopia human use	② Global Technotopia enhanced/ degraded	③ Techno Introvert human use	③ Techno Introvert enhanced/ degraded	④ Satoyama Satoumi Renaissance human use	④ Satoyama Satoumi Renaissance enhanced/ degraded
PROVISION-ING	energy	fuel (biomass, charcoal)	▲	—	▼	▲	▼	▲	▲	—
		electricity (wind, hydro)	▲	▼	▼	—	▼	—	▲	▼
	food	fishery product	▲	▲	▼	▲	—	▼	▲	▲
		rice	—	—	—	—	▼	▼	—	▼
		vegetable	▲	▲	—	▲	—	▲	—	▲
	fiber	material	▲	—	▼	▲	▼	▲	▲	—
REGULATING	atmospheric (climate regulation, air purification, etc)		—	—	▼	—	▼	—	▼	—
	water (flood regulation, water storage, etc)		—	▼	▼	▼	▼	▼	▼	▼
	soil (landslide, soil erosion prevention)		—	▲	▼	▼	▼	▼	▼	▲
CULTURAL	shrines & temples, traditional knowledge		▼	▼	▼	▼	▼	▼	—	▲
	sceneries		▲	—	▼	▼	▼	▼	—	▲
	recreation (festivals, eco-tourism, farming experience)		▲	—	▼	▼	▼	▼	—	—
	art (traditional art, etc.)		▼	▼	▼	▼	▼	▼	—	▲

Why do we conserve nature?



Dis-service or 'negative ecosystem service', which has been discussed in Japan

- Some negative impacts (dis-services) resulting from ecosystems, such as damage to agriculture, forestry and fisheries caused by wild birds and beasts, have become apparent [based on insufficient information], and health risks caused by animals and plants, such as zoonotic diseases, are increasing [insufficient information] (Japan Biodiverstiy Outlook 2,2021)
- A prominent example of the impact of the loss of 'regulating services' is cedar and cypress pollinosis as a result of afforestation programme.

※花粉症＝hay fever

Un-sustainable development

Dasgupta (2021概要版)

- Figure above: In 1950, World population was around 2.5 billion and global output of final goods and services (i.e. global GDP) at 2011 prices was around 9 trillion international dollars (i.e. dollars at purchasing price parity, PPP). The average person's annual income was around 3,300 dollars PPP.
- Figure middle: Global wealth per capita of the three classes of capital goods over the period 1992 to 2014. It shows that the value of produced capital per capita doubled and human capital per capita increased by around 13%, but the value of the stock of natural capital per capita declined by nearly 40%.
- Figure below: Global GDP is the product of human population size and global GDP per capita. Three factors to consider: population size; per capita GDP, and the efficiency with which we convert the biosphere's goods and services into GDP. This is the three-way breakdown of our ecological footprint: doubling the global population needs to be matched by halving global GDP per capita if humanity's ecological footprint is to remain unchanged.

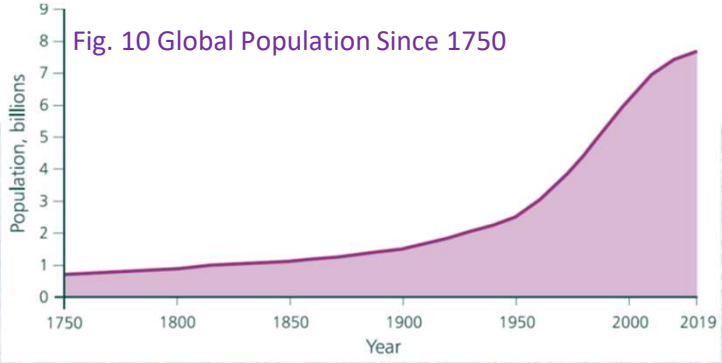


Fig. 10 Global Population Since 1750

Source: Maddison (2010). UNPD (2019) and review calculations

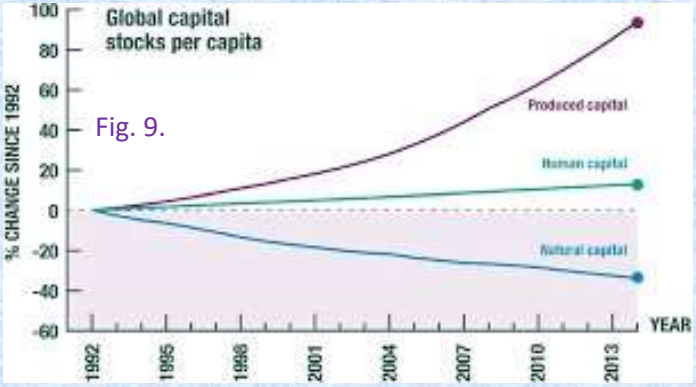


Fig. 9.

Source: Managi and Kumar (2018)

Fig. 11 Global Real GDP Per Capita Since 1750

Source: Our World in Data based on World Bank (2020a), Maddison (2018), Bolt et al. (2018)

（和訳WWFJapan）

Do mitigation measures and nature conservation pay?

- The costs of mitigation measures are high right now. The effects of mitigation will not be significant for more than half a century (← taking into account the economic discount rate...). .

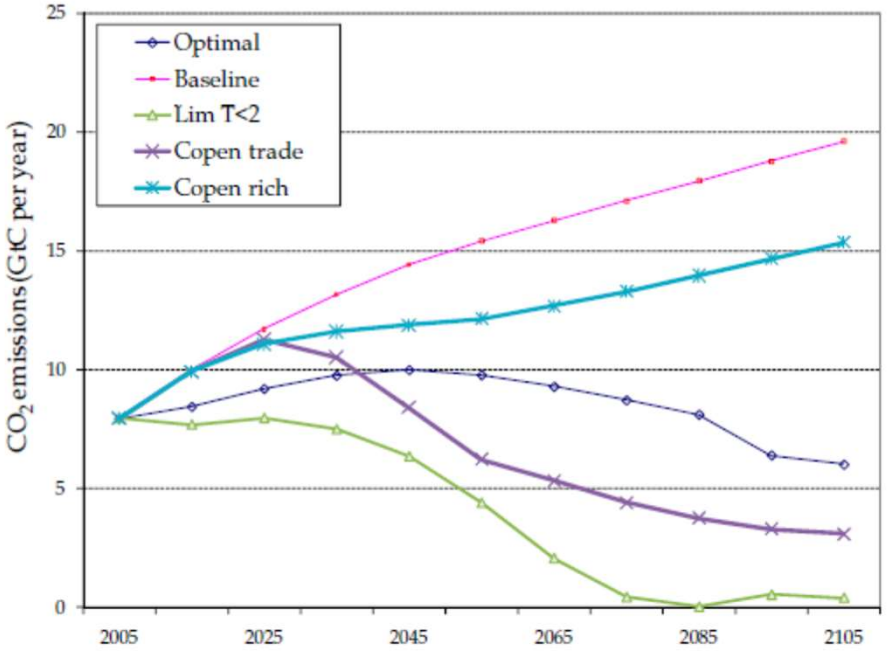


Fig. 1. Projected emissions of CO_2 under alternative policies. Copen, Copenhagen.

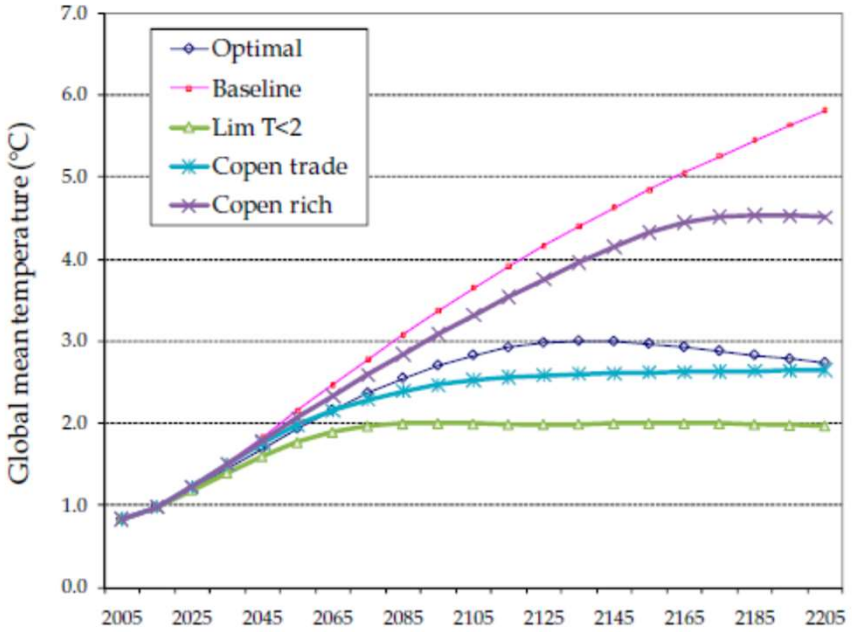
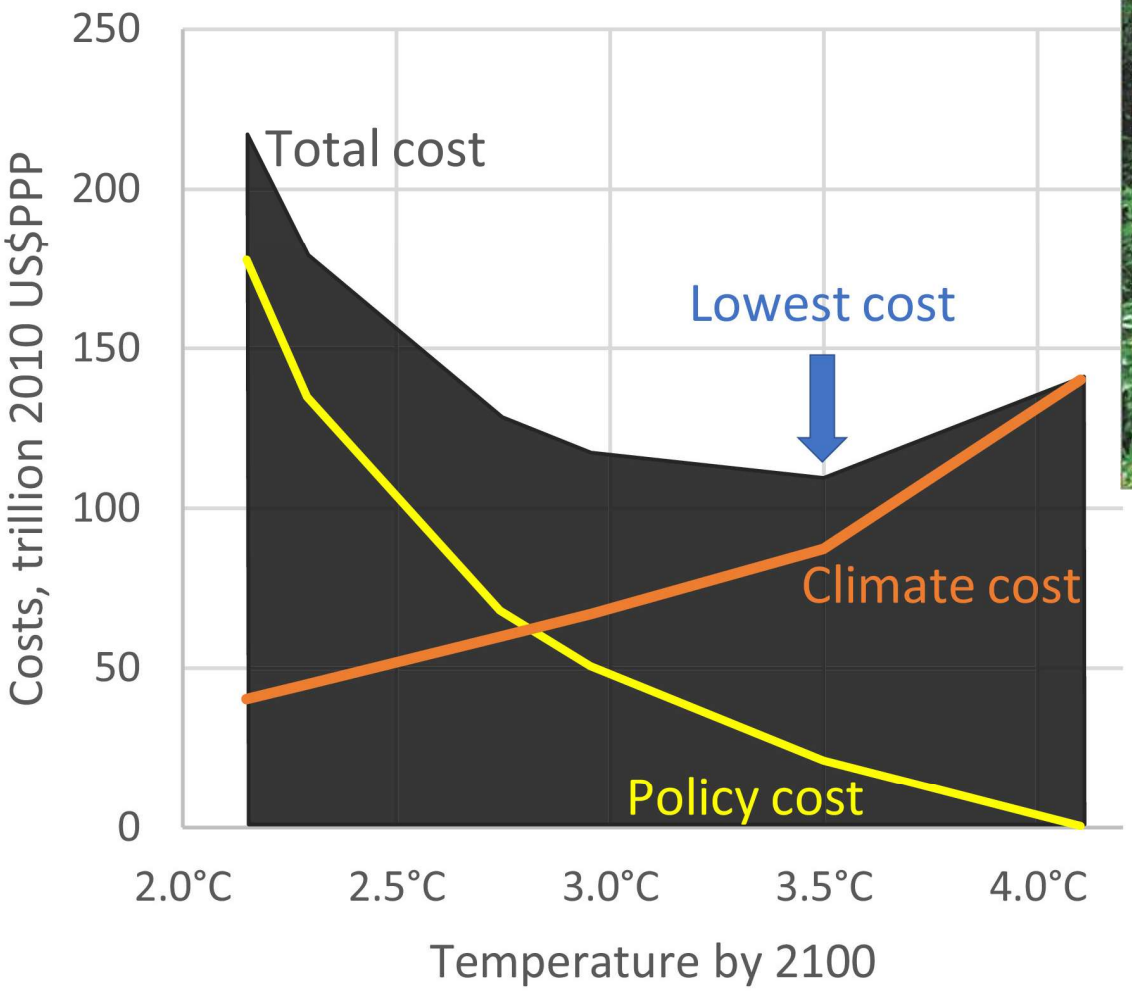


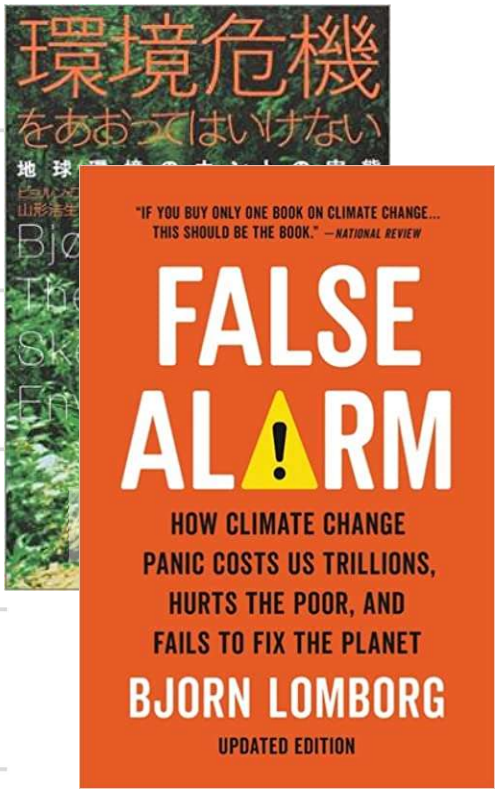
Fig. 3. Global temperature increase (°C from 1900) under alternative policies. Copen, Copenhagen.

Nordhaus (2010: PNAS 107:11721-)

Do the cost of mitigation measures outweigh benefits?

(Bjørn Lomberg 2020 Technol. Forecast. Soc. Change.)

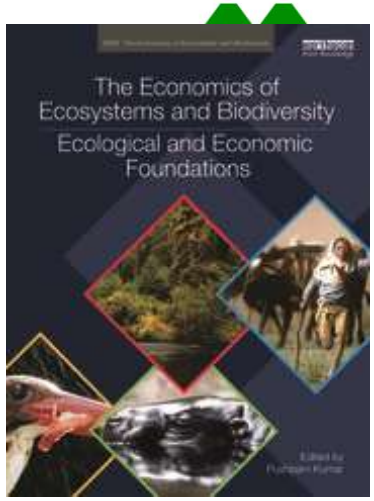




PPP = Purchasing Price Parity

- Fig. 24. Tot e outcomes by 2100, along with the total cost (the sum of climate and policy cost). All use base (4.1° C) discount rates for comparability. DICE-2016R2 from 2017 (Nordhaus 2018a) run on GAMS,. The results for 4.1° C, 3.5° C and 2.3° C are near-identical to the runs in (Nordhaus 2018b).

Discounting, ethics, and options for maintaining biodiversity and ecosystem integrity



- There are no purely *economic* guidelines for choosing a discount rate. Responsibility to future generations is a matter of ethics…
- A variety of discount rates, including zero and negative rates, should be used, depending on the time period involved, the degree of uncertainty, and the scope of project or policy being evaluated.
- …A 5% discount rate implies that biodiversity loss 50 years from now will be valued at only 1/7 of the same amount of biodiversity loss today.
- The rich and poor differ greatly in their direct dependence on biodiversity and ecosystem services and bear different responsibilities for their protection.

Gowdy et al. (2012) https://doi.org/10.4324/9781849775489

ESG and Principles for responsible investment

- ESG scores are calculated by third-party evaluation agencies based on their assessment of the ESG initiatives of all companies.
  Information on ESG initiatives of target companies is collected and organised through company disclosures and company questionnaires, and finally evaluated according to a scoring model developed independently by each ESG evaluation organisation.
  ESG information differs from financial information in that it is often atypical information that cannot be expressed numerically, and from the company's perspective, the medium for disclosure is also inconsistent.

https://www.sbbit.jp/article/cont1/83293

une Chair

Fossil fuel divestment

www.theguardian.com/ 24 Nov. 2015

Allianz to cut investments in companies using coal in favour of renewable energy

Divestment based on climate and business reasons, says German financial giant as decision is likely to affect €4bn worth of investments

Steam and exhaust gases emitted from a coal-based power station Lippendorf, south of Leipzig, eastern Germany. Photograph: Eckehard Schulz/AP

- Germany's Allianz SE, one of the world's largest financial asset managers, said it would decrease investments in companies using coal and boost funding in those focused on wind power over the next six months.
- Chief executive Oliver Baete said Allianz will no longer invest in companies if more than 30% percent of sales come from coal mining or if coal generates more than 30% percent of electricity.
- He said Allianz decided ahead of next week's United Nations climate change conference in France with "an eye on the 2°C goal of the Paris climate negotiations as well as the economic risks involved."

"Fossil fuel divestment" rather than environmental impact assessment stopped plans of coal-fired power stations in Tokyo Bay.

Factors for ESG assessment

- Corporate governance (G) assessment factors: board independence, effectiveness of executive remuneration. Japan has a low G rating.
- Social (S) factors: employment and industrial relations, human rights risks such as Supply Chain, consumer issues such as product responsibility, community relations, fair business practices and compliance.
- Environmental (E) assessment factors: natural environment and global warming, waste management, environmental market opportunities, etc. + air and water pollution, use of resources such as raw materials and energy, biodiversity, etc.
- Checking and sharing the status of environmental and social issues not only with the company but also with partner companies and suppliers, and taking care of the entire supply chain with regard to the way in which they are used.
- There is a limit to what a single company can do to improve its E- and S-ratings, and in the future it will be necessary to take a view of the industry as a whole and the supply chain as a whole.

福本 勲（東芝） https://www.sbbit.jp/article/cont1/83293

The dynamism of ESG investment

- ESG initiatives are influencing corporate value at a time when:
  - Having a business that produces a lot of greenhouse gases is not valued by the market
  - ESG responses are a management issue for company managers
  - Raising ESG scores is a means, not an end
- It is important for companies to first understand their competitive environment - ESG initiatives are becoming more important not only for the global environment, but also for their business, and they must be aware that they should aim for ESG management for the future of their company. Investors are now selecting their investments based on ESG initiatives. Top management needs to operate their businesses with the perspective that one of the ways to achieve it is to improve ESG scores.

福本 勲 https://www.sbbit.jp/article/cont1/83293

Mizuho Financial Group, Inc. (MHFG) “Strengthening Sustainability Action” 2022/5/17

1. Cross-sectoral prohibitions on investments and loans

Liverpool, Dresden erased from World Heritage List

- MHFG does not make investments or loans to projects that fall into the following categories, as they involve significant risks or negative impacts on the environment and society.
- Projects that have a negative impact on Ramsar Convention-designated wetlands.
- Projects that have a negative impact on UNESCO World Heritage sites (unless prior consent has been obtained from the government of the country concerned and UNESCO).
- Projects that violate the CITES (with due regard to the reservations of the countries concerned).
- Projects causing forced labour, child labour or human trafficking

No ivory trade, no bear extermination, no venison use will no longer be possible?

2. Targets requiring attention for cross-sectoral investment and financing, etc.

- When considering investments and loans, etc., Mizuho will check the status of the counterparty's measures to reduce or avoid risks, and will make careful decisions on transactions.
- Projects with negative impacts on indigenous communities
- Projects involving land expropriation leading to involuntary resettlement
- Projects that cause or encourage human rights violations in conflict areas or are directly linked to human rights violations

https://www.mizuho-fg.co.jp/release/pdf/20220517release_jp.pdf

話題を変えて、絶滅危惧種
Changing the subject to endangered species

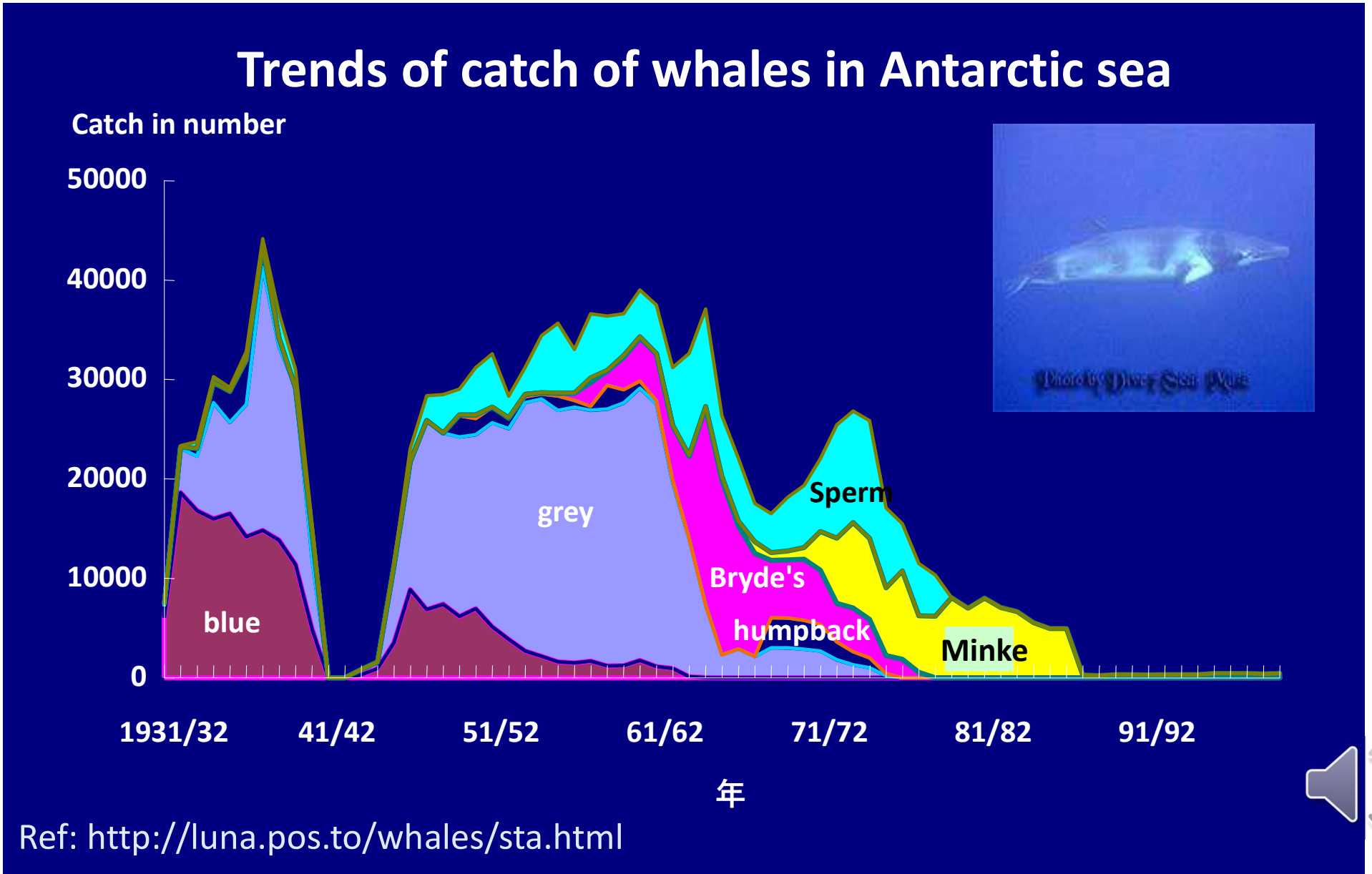
IUCN Redlist Criteria (2001)

Criterion	CR	EN	VU
A: Population decline rate is	>80%/10yrs or 3 generations	>50%/10yrs or 3 generations	>30%/10yrs or 3 generations
A1 (under managed)	>90%/10yrs or 3 gen.	>70%/10yrs or 3 gen.	>50%/10yrs or 3 gen.
B1: Area of occupied	<10km^2	<500km^2	<2000km^2
B2: Extent of occurrence is	<100km^2	<5000km^2	<20000km^2
C1: Population is declining and is	<250 (25%/ 3yrs or 1 gen.)	<2500 (20%/ 5yrs or 2 gen.)	<10000 (10%/ 10yrs or 3 gen.)
D1: Population size is	<50	<250	<1000
D2: AOO is	--	--	<10% of related sp.
E: Extinction risk is	>50% in 10yrs or 3 gen.(cap 100yrs)	>20% in 20yrs or 5 gen. (cap 100 yrs)	>10% in 100 yrs

[1] http://iucn.org/themes/ssc/siteindx.htm

Any one of these should be fulfilled (state the criteria that are met).

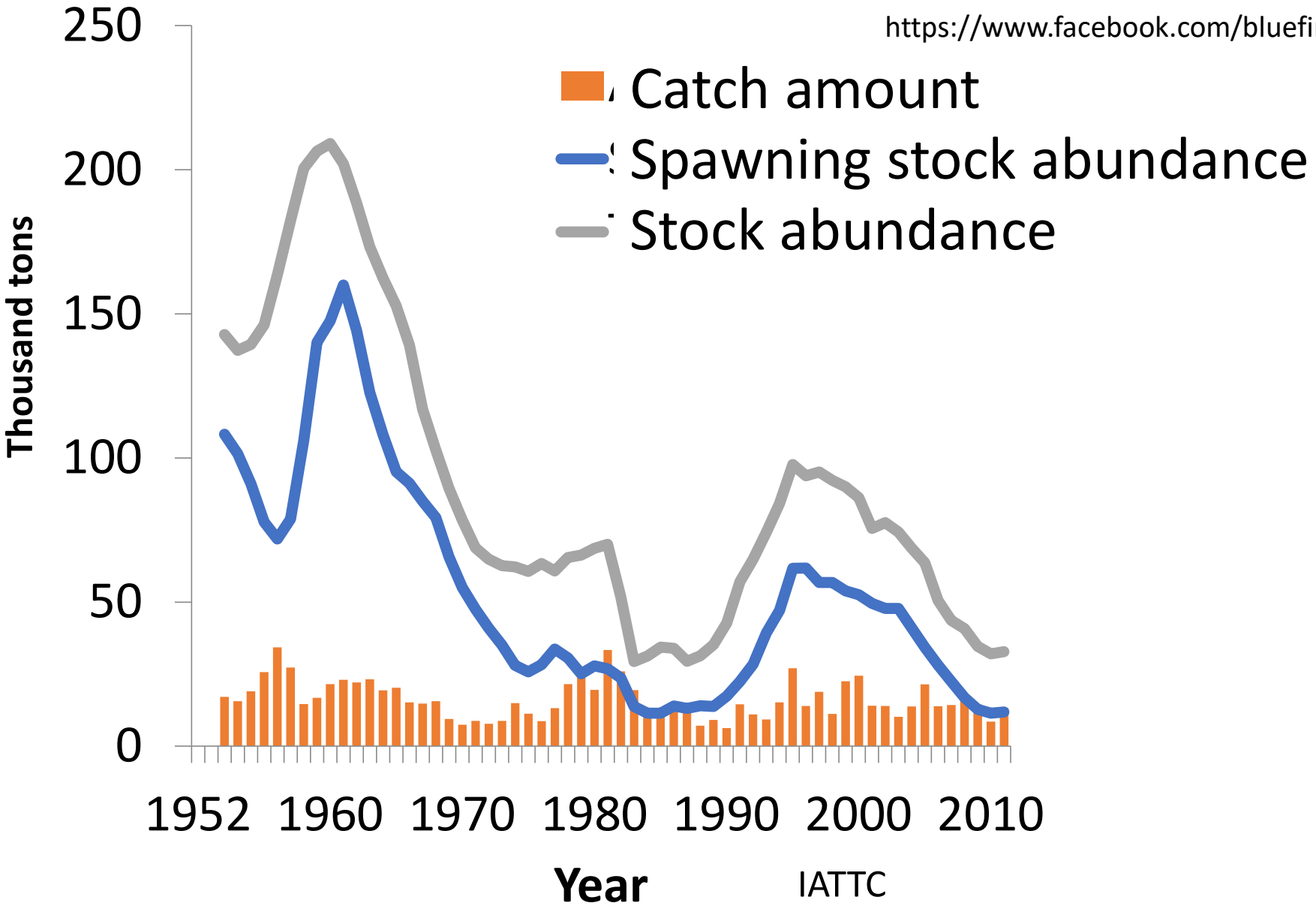
History of overharvesting whales



Ref: http://luna.pos.to/whales/sta.html

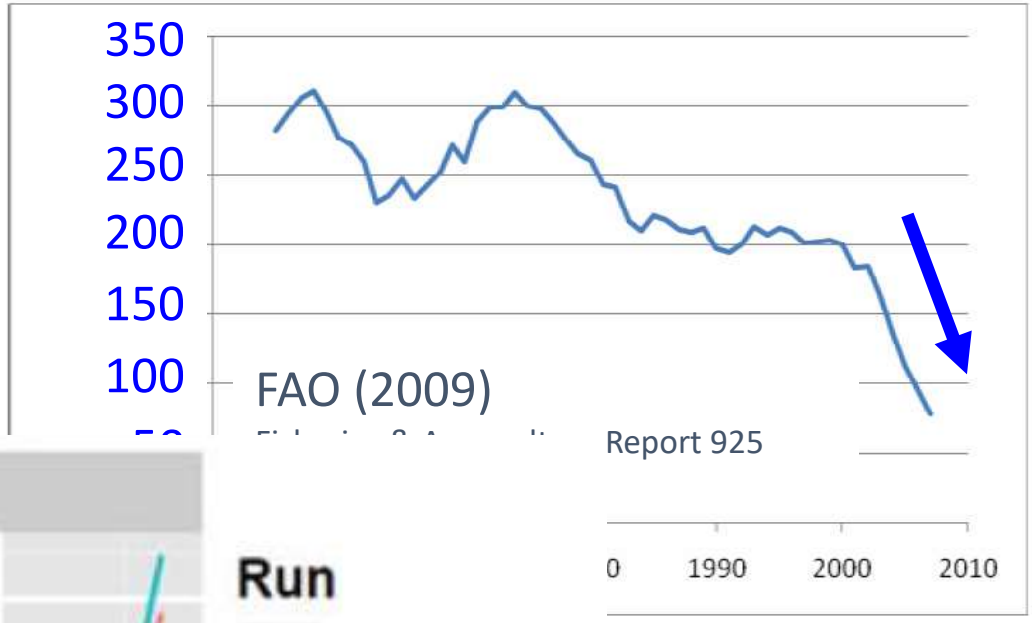
Rapid decline in Pacific bluefin tuna

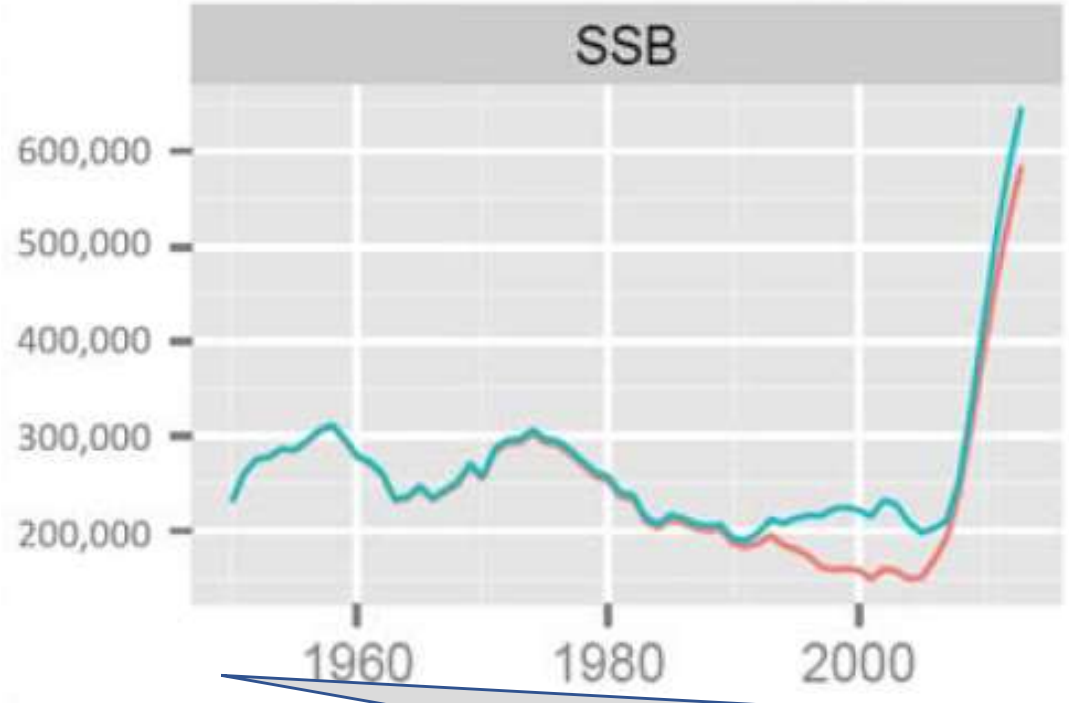
https://www.facebook.com/bluefintunajapan/



Atlantic bluefin tuna, depleted in five years, from 2009 to highest in 2014.

- CITES COP15 2010



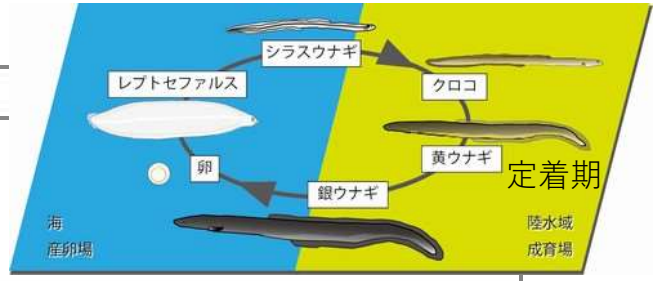


stock (results from run 14; SCRS 2008).

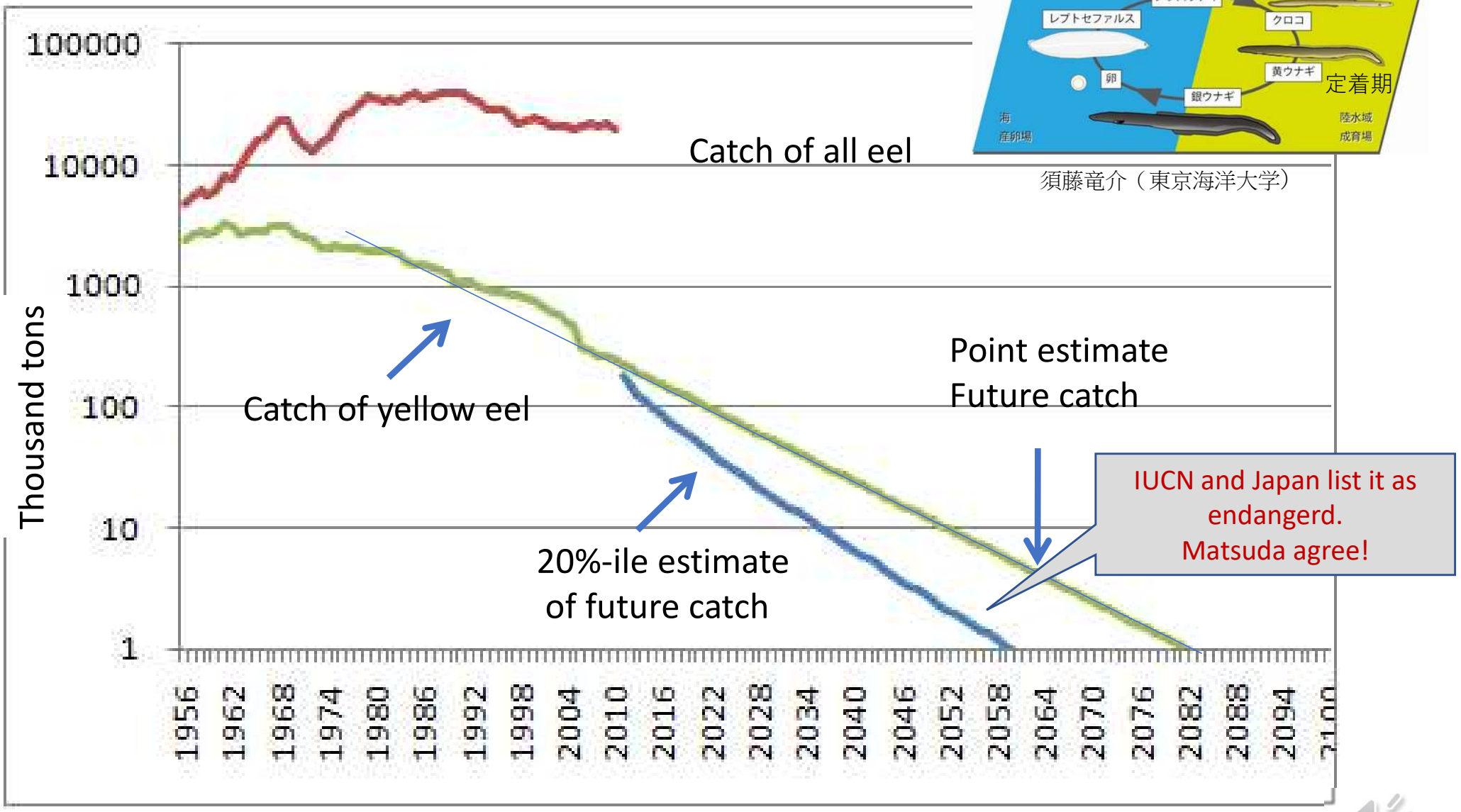
ICCAT 2014

Matsuda 2016: I never believe neither. These are not science.

Japanese eel (ranked as Endangered)



須藤竜介（東京海洋大学）



漁業・養殖業生産統計年報　http://www.e-stat.go.jp/SG1/estat/List.do?lid=000001087405
内水面漁業・養殖業魚種別生産量累年統計 内水面漁業・養殖業魚種別生産量累年統計

http://www.jfa.maff.go.jp/j/press/saibai/120629.html

Fisheries Agency Emergency measures for eel 29 June 2012.

The Fisheries Agency has decided to implement emergency measures, focusing on support for eel farmers and the management and protection of eel stocks, to ensure a stable supply of eels in the future.

1. management measures for eel farmers

(1) Financial measures

(2) Measures for compound feed

2. discharge and improvement of river habitat

(1) On releasing fish into rivers

(2) Promotion of multi-nature river creation

(3) On habitat improvement by fishermen

3. domestic stock management measures

(1) Management of parent eels

(2) Management of glass eel

(4) International stock management measures

5. reinforcement of research and surveys

(1) Establishment of technology for mass production of glass eel

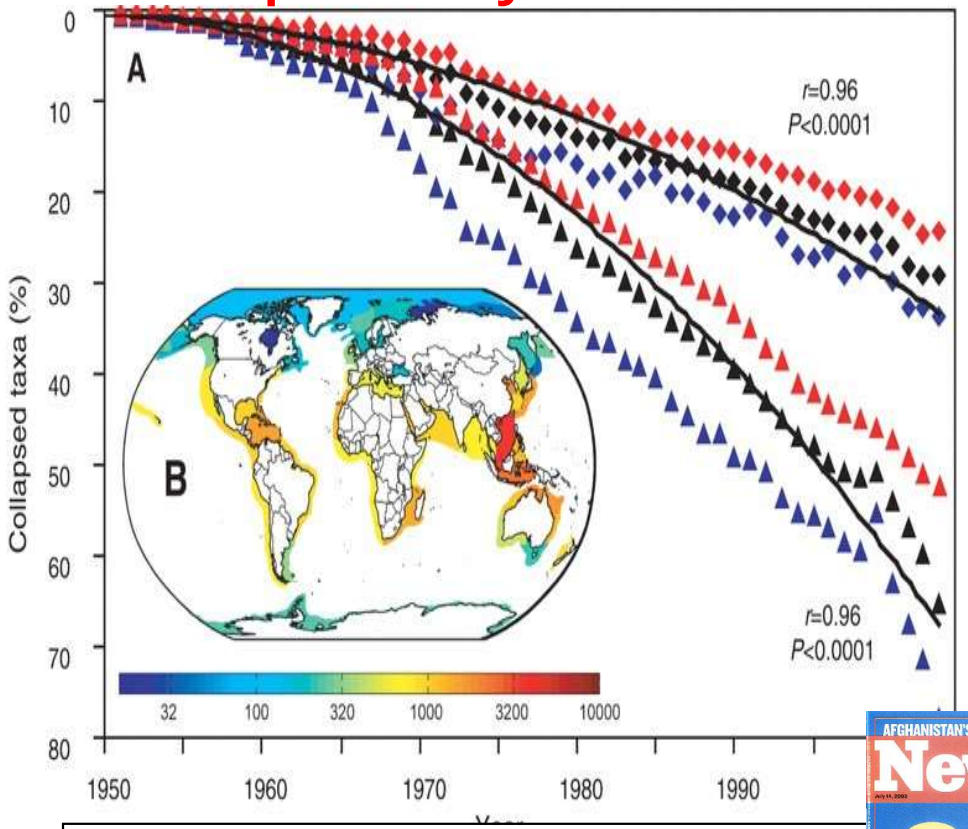
(2) Research on eel ecology and resources

Aichi Biodiversity Targets

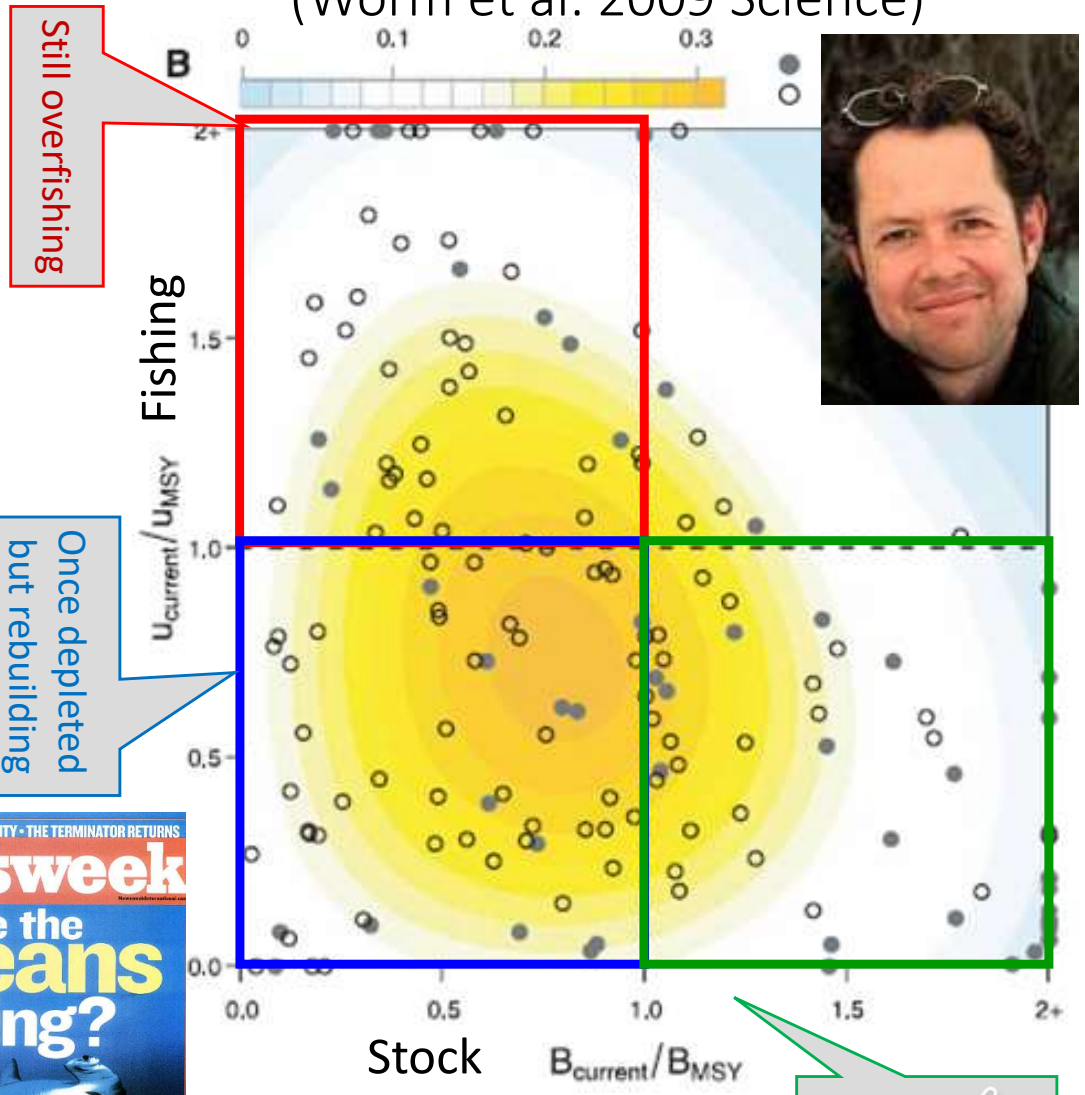
- **3.** By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions
- **6.** By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits

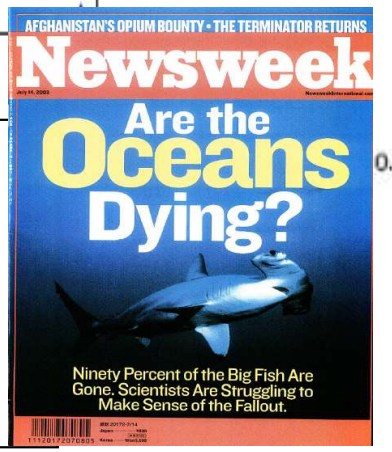
Change the premise and anything is possible? The same author changes the premise and writes a paper that is the exact opposite of...

Global fisheries stocks depleted by 2048.



Rebuilding Global Fisheries (Worm et al. 2009 Science)





Impacts of Biodiversity Loss on Ocean Ecosystem Services

Boris Worm,[1]* Edward B. Barbier,[2] Nicola Beaumont,[3] J. Emmett Duffy,[4] Carl Folke,[5,6] Benjamin S. Halpern,[7] Jeremy B. C. Jackson,[8,9] Heike K. Lotze,[1] Fiorenza Micheli,[10] Stephen R. Palumbi,[10] Enric Sala,[8] Kimberley A. Selkoe,[7] John J. Stachowicz,[11] Reg Watson[12]

Kobe plot

予防原則　precautionary principle

- 環境に対して深刻あるいは不可逆的な打撃を与えるとき，科学的証拠が不十分であるからという理由で環境悪化を防ぐ費用効果的な措置を先延ばしにしてはいけない
- In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

1992年リオ宣言第15原則 Rio Declaration Principle 15　http://www.unep.org/

http://www.biodiv.org/convention/articles.asp?lg=0

生物多様性条約 (1992/1993)
Convention for Biological Diversity

- *"Noting also* that where there is a threat of significant reduction or loss of biological diversity, **lack of full scientific certainty should not be used as a reason for postponing measures** to avoid or minimize such a threat,

国連気候変動枠組み条約
UNFCCC 1992/1994

"Where there are threats of serious or ir-reversible damage, **lack of full scientific certainty should not be used as a reason for postponing such measures,** taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost.

When adopted in 1992, climate change was not confirmed.
2007 AR4 wrote that global warming is definitely occurring
In 2021 AR6 wrote that the main cause was anthropogenic impact

http://unfccc.int/

予防原則と統計学
Precautionary Principle (PP) and statistics

- 第1種の誤り：無用の対策を採る
  Type I error: Doing unnecessary actions
- 第2種の誤り：採るべき対策を怠る
  Type II error: Not doing necessary actions
- 科学は第1種の誤りを避ける（有意差5%）
  Science usually avoids type I errors (5% rule).
- 予防原則は第2種の誤りを避ける（定量的・定性的評価基準がない）
  PP avoids type II errors (no quantitative nor qualitative rule).

It is statistically unnatural that nothing regulated by the precautionary principle is reviewed after the fact.

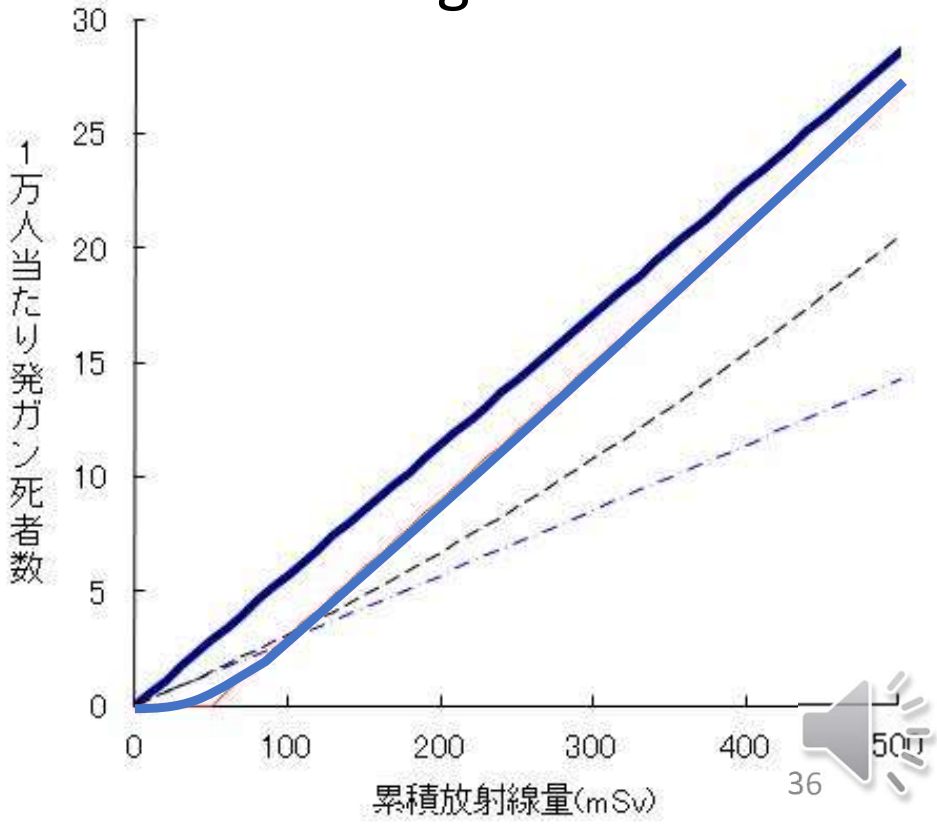
Environmental issues ≠ empirical science.

- risk assessment is based on unverified assumptions.
- Waiting for verification is late (precautionary principle)
- Conclusion depends on adopted assumptions!
- Regulatory science = science that determines the promises of society
- Scientists should be Narrative?
  ◎ Speak in terms that non-experts can understand
  × Agitate uncertain extreme opinion
- Inconvenient truths on both sides
- Doubt your own decisions
- Political 'justice' is not always scientifically valid

Relationship between cumulative radiation exposure and cancer risk.

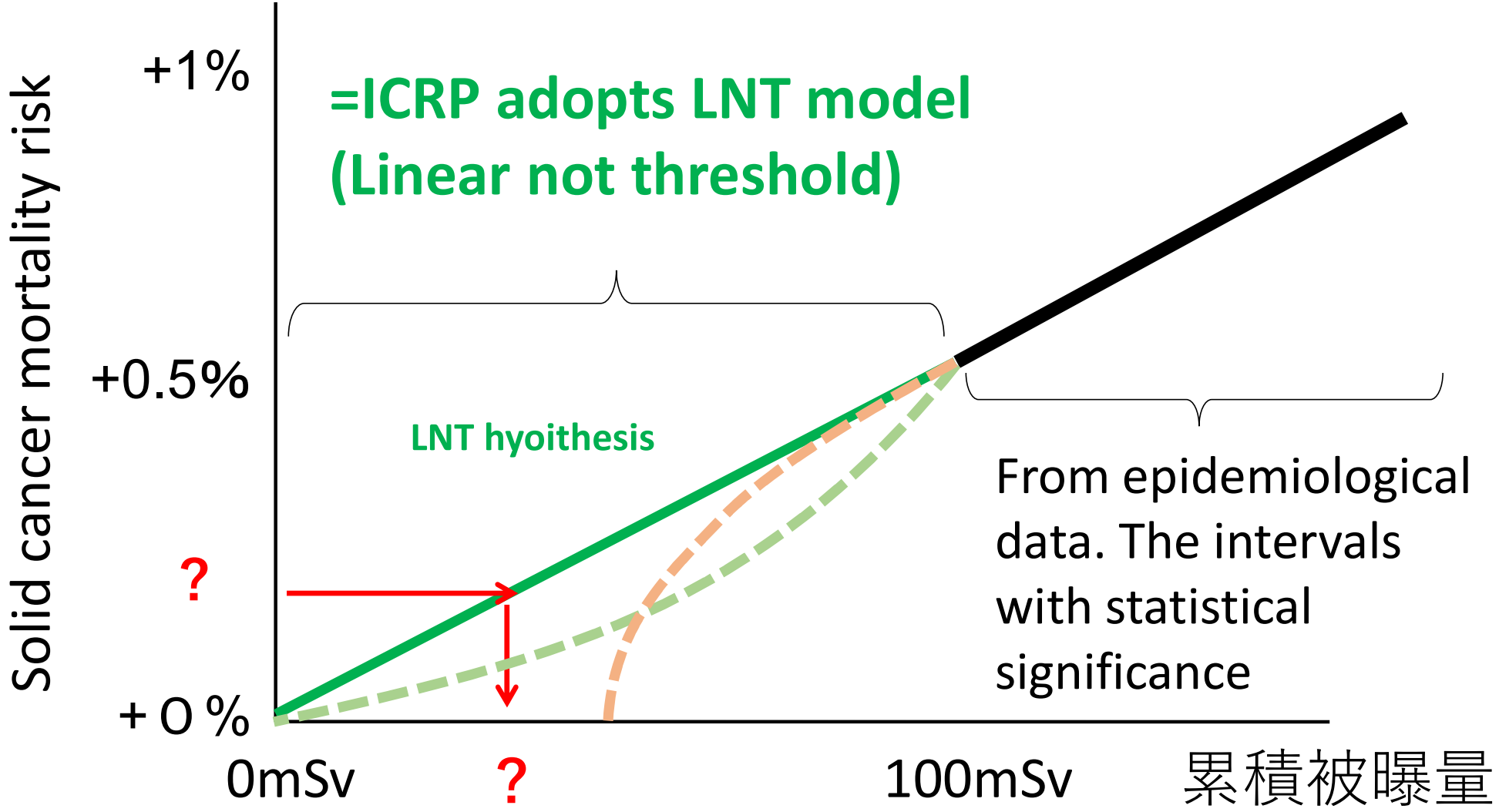
- Organisms have immune function and the risk of low dose exposure should be a low curve
- But we don't know the magnitude of nonlinearity
- Assume a linear model
- This is usually an overestimation
- = precautionary principle

1mSv makes 0.000057 case
ICRP warns: Do not use to estimate the number of low-dose radiation exposure fatalities in large numbers.



岸本充生氏より改定

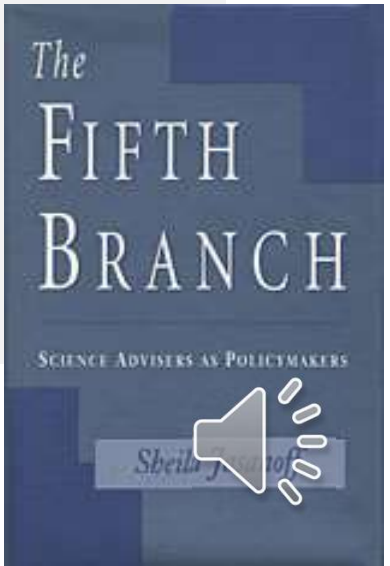
LNT model obtained by Reguratory Science



The 'unacceptable level of risk' needs to be defined separately from the empirical science.

What is Regulatory Science?

- Mitsuru Uchiyama (1987) proposed 'regulatory science' as 'the science of optimising scientific and technological development for the purpose of human health'.
- Sheila Jasanoff (1990: The Fifth Branch) analysed the concept of regulatory science and the 'boundary' drawing activities of scientific advisory committees in order to meet legally defined standards.



We need experts who can act as coordinators for stakeholders

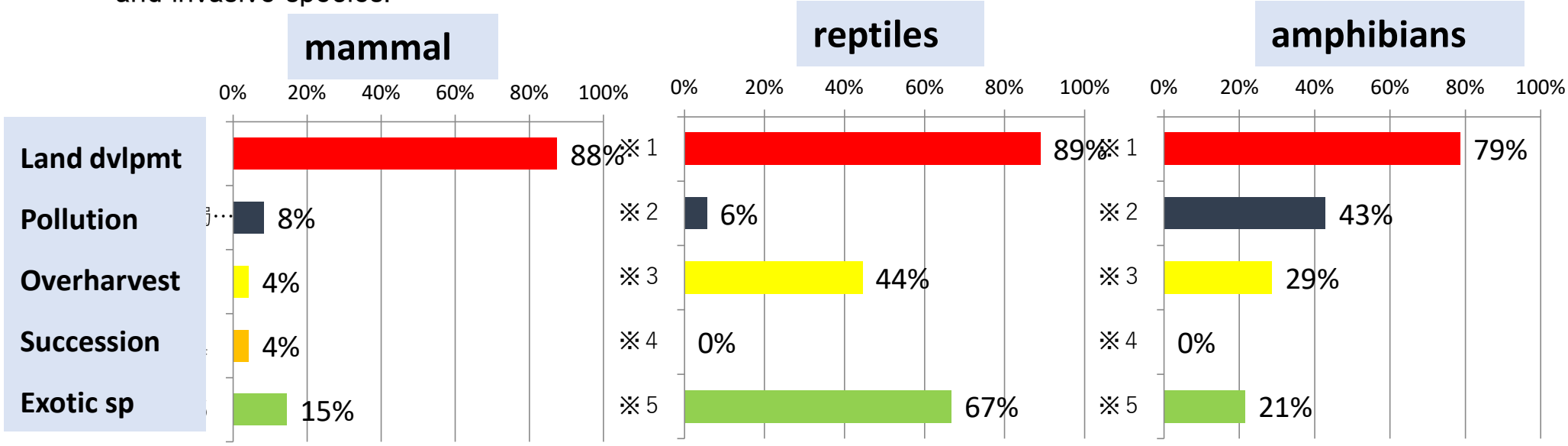
5 + 1 anthropogenic factors to degrade biodiversity.

- Land use change = tropical forest loss, Aral Sea
- Invasive alien species = Lake Biwa
- Overharvesting = whales, eels, bluefin tuna
- Pollution = TBT, active nitrogen
- Climate change = changes in geographical distribution

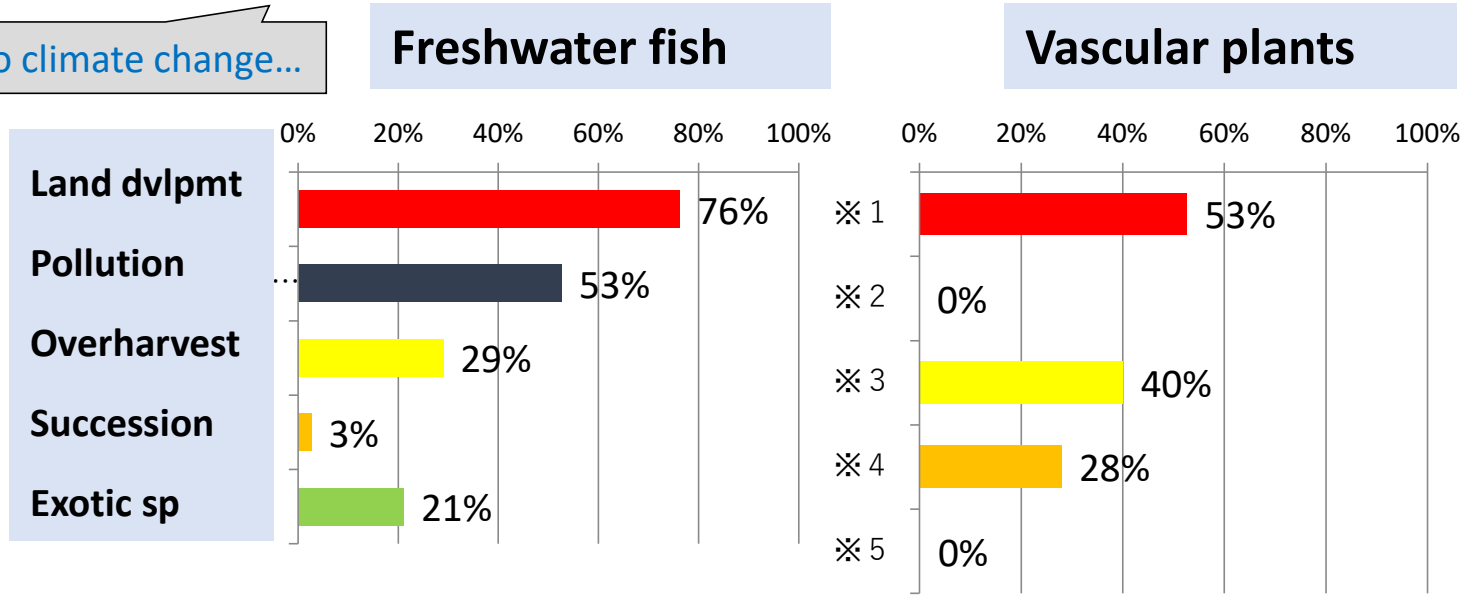
- Under use =natural succession

Factors of decreasing populations

Factors contributing to the decline of species listed in the RDB were categorized into the following major groups: development, water pollution (including pesticides), collection and trapping, natural succession, and invasive species.



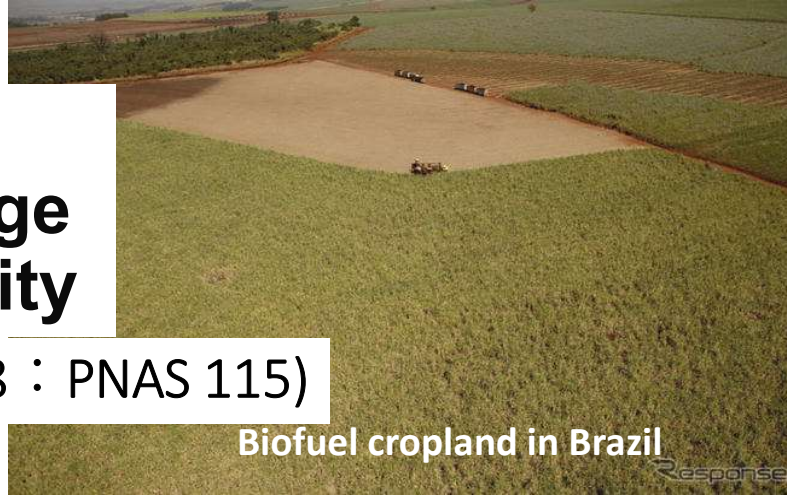
No climate change…



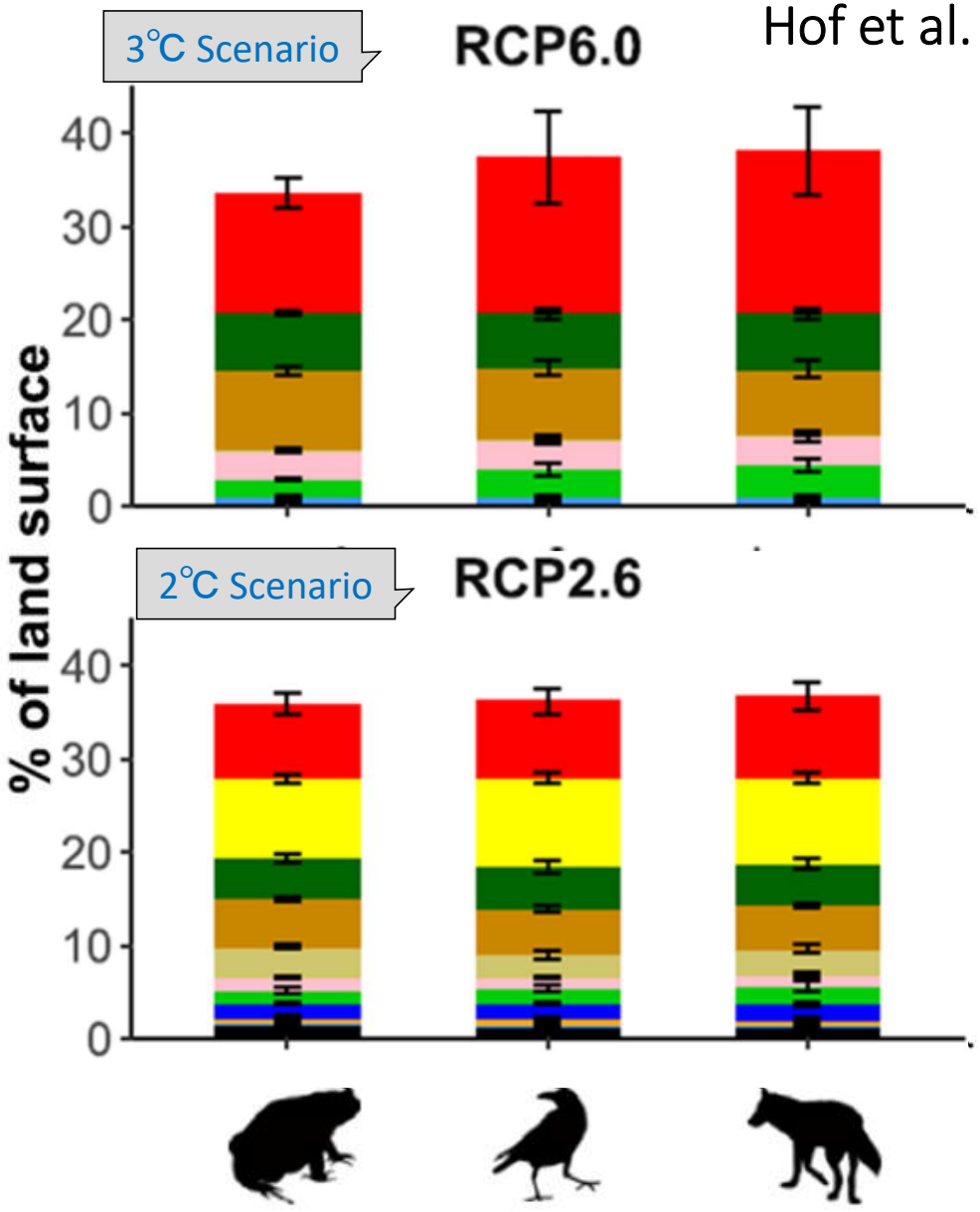
出典：環境省，改訂・日本の絶滅のおそれのある野生生物
哺乳類（2002）、爬虫類（2000）、両生類（2000）、汽水・淡水魚類（2002）、植物（維管束植物）（2000）

注：本資料は、議論のたたき台とするため、現時点の作業結果をもとに内容や表現の妥当性にこだわらず作成したもので、今後の検討により大幅な変更がありうる。

Bioenergy cropland expansion may offset positive effects of climate change mitigation for global vertebrate diversity



Hof et al. (2018：PNAS 115)



Biofuel farmland has a significant negative impact on biodiversity.

BC, Biefuel cropland
CC, Climate Change
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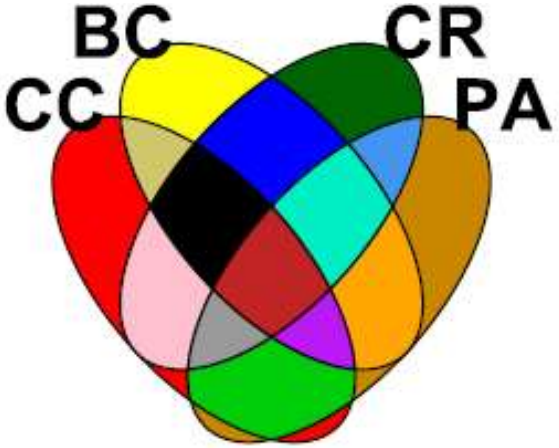
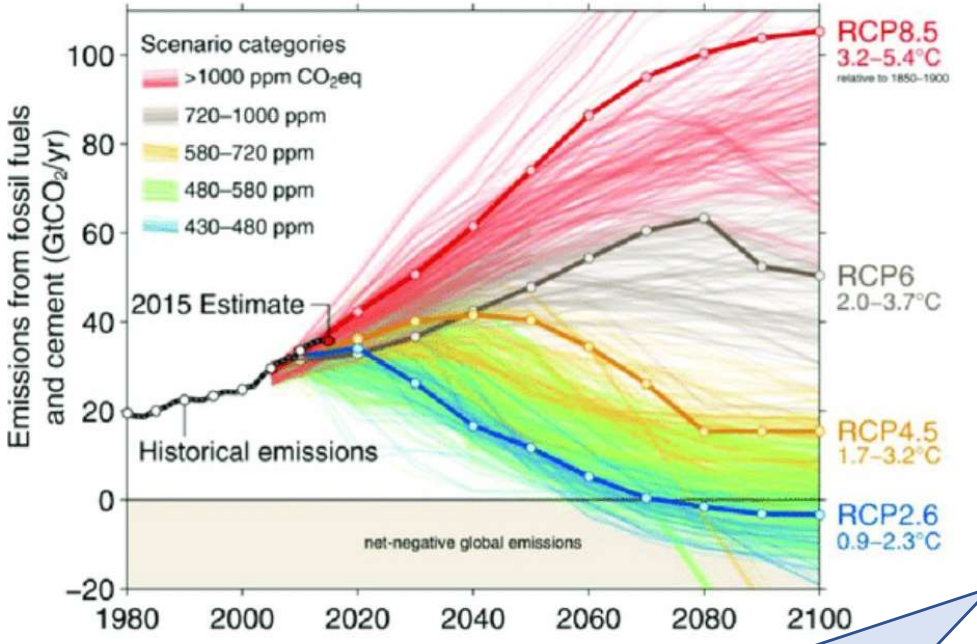


RCP Representative Concentration Pathway

- possible range of radiative forcing values in the year 2100 (2.6, 4.5, 6, and 8.5 W/m^2,

In the climate change scenario, land-use change is taken into account along with temperature increase and precipitation change.

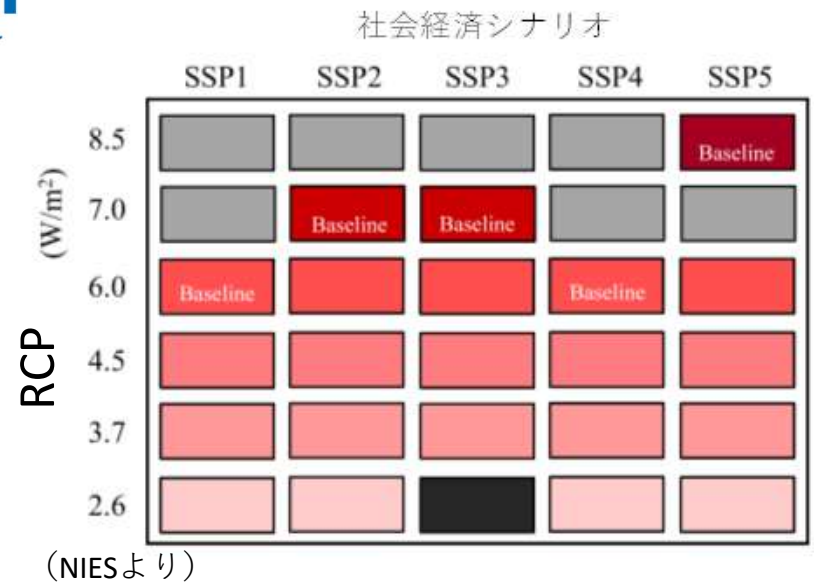
It WAS “business as usual”



(since before the Industrial Revolution)

Fuss et al. 2014 https://www.nature.com/articles/nclimate2392

Shared Socioeconomic Pathways (SSPs)



（NIESより）

Scenarios of projected socioeconomic global changes up to 2100. They are used to derive GHG emissions scenarios with different climate policies（SRES, 2000）.

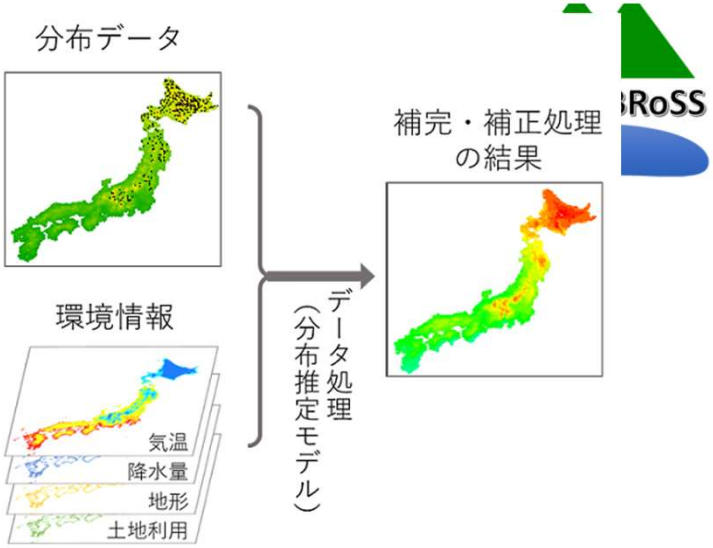
- SSP1: low challenges for mitigation (resource efficiency) and adaptation (rapid development)
- SSP3: high challenges for mitigation (regionalized energy / land policies) and adaptation (slow development)
- SP4: low challenges for mitigation (global high tech economy), high for adapt. (regional low tech economies)
- SSP5: high challenges for mitigation (resource / fossil fuel intensive) and low for adapt. (rapid development)

https://unfccc.int/sites/default/files/part1_iiasa_rogelj_ssp_poster.pdf

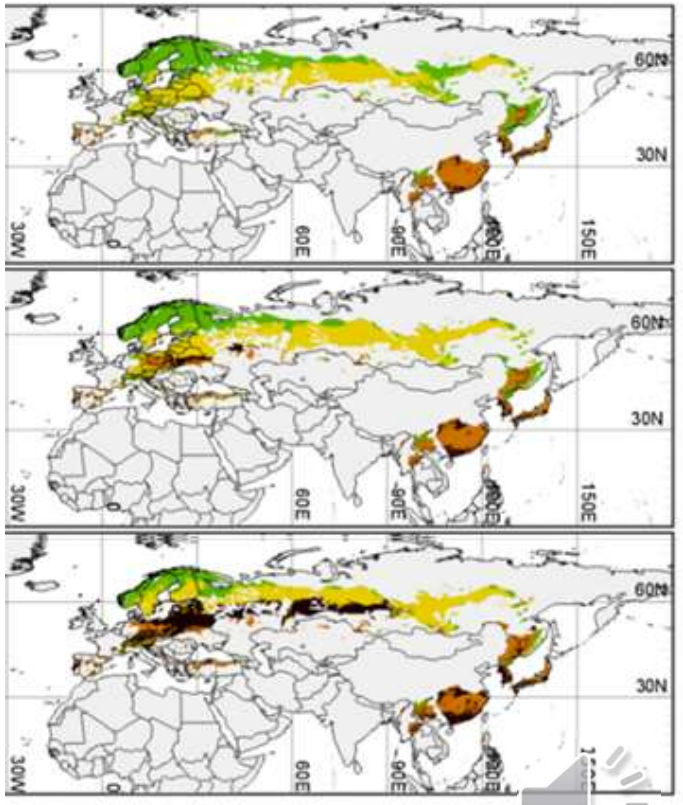
SDM Species distribution model

- Using Environmental information (temperature t, precipitation p, topography h, land use u) and
- Spatial distribution of actual organisms, we obtain
- Species distribution = f(t,p,h,u,...) Statistical model.
- Using this model and
- future t',p',u' at each grid sets for climate change scenarios, we project the future species distribution
- → distribution f(t',p',h,u',...) with the above function
- Climate change and land use change are considered among the main drivers of biodiversity loss

- Overharvesting, invasive species, pollution and natural sucessions are not taken into account.
- Only an extrapolation of unverified model applied to the future
- Better than extrapolation of historical decline rates in Red list…



国立環境研より
https://www.nies.go.jp/whatsnew/20200110/20200110.html

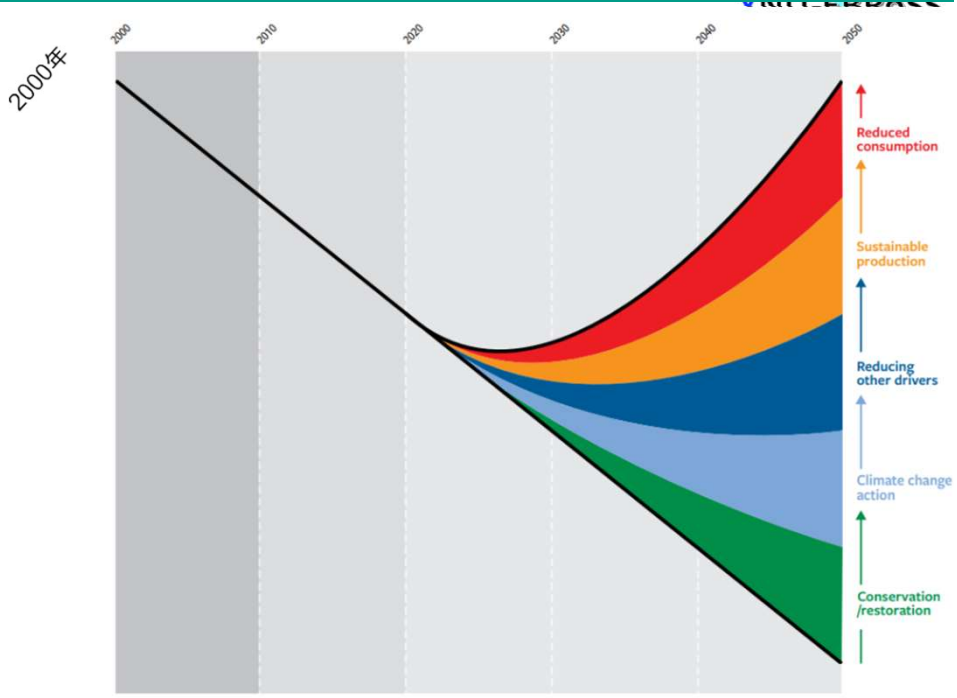


森林総研より
https://www.ffpri.affrc.go.jp/pubs/seikasenshu/2018/documents/p14-15.pdf

Global Biodiversity Outlook (GBO5)

生物多様性の損失を低減し回復させるための行動

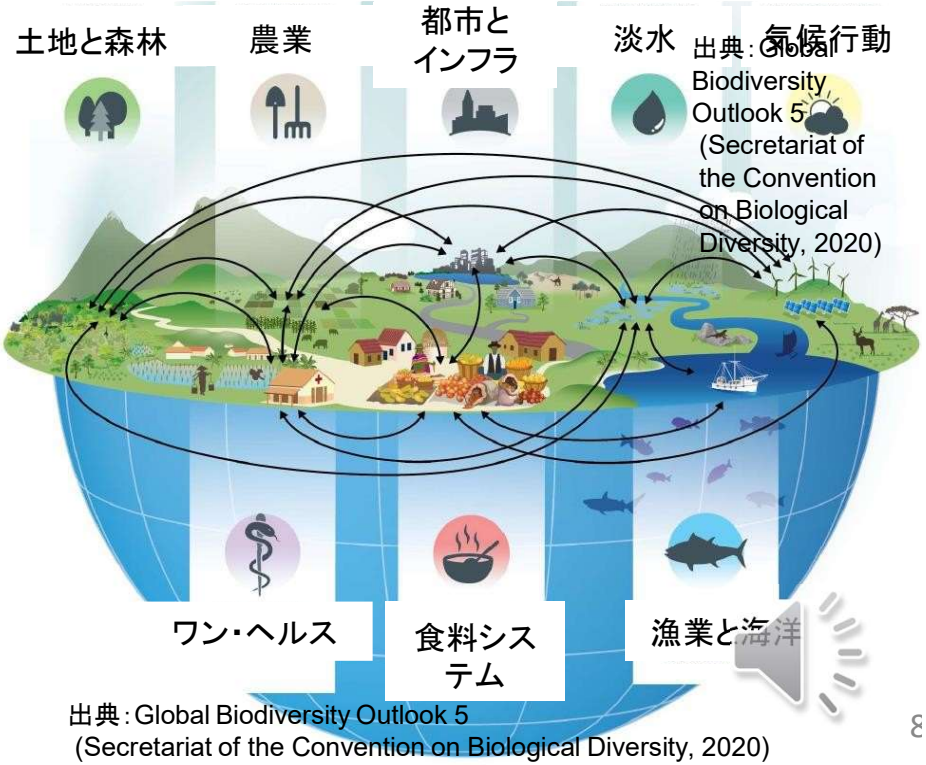
- 「今まで通り（business as usual）」からの脱却、社会変革（transformative change）が必要。
- 個別ではなく連携した対応が必要。
- これにより、生物多様性の低下を止め、増加に転じさせることで、2030年以後に生物多様性のネット・ゲインを実現する可能性を指摘。



出典：Global Biodiversity Outlook 5 (Secretariat of the Convention on Biological Diversity, 2020)

2050年ビジョン達成に向けて移行（transition）が必要な8分野

(i) Land and forests - conservation and restoration of ecosystems.
(ii) Sustainable freshwater ... Improvement of water quality, control of invasive species, ensuring continuity.
(iii) Sustainable fisheries and oceans: protection and restoration of marine and coastal ecosystems, fisheries restoration, aquaculture management
(iv) Sustainable agriculture: Redesign of agricultural systems, including agroecology, and increased productivity with minimal negative impact on biodiversity.
(v) Sustainable food systems: plant-based diets with reduced meat and fish consumption, significant reduction of waste.
(vi) Cities and infrastructure: development of 'green infrastructure', reduction of the environmental footprint of cities and infrastructure.



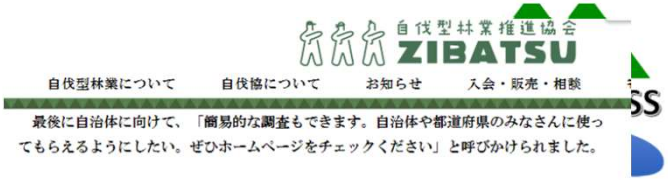
出典：Global Biodiversity Outlook 5 (Secretariat of the Convention on Biological Diversity, 2020)

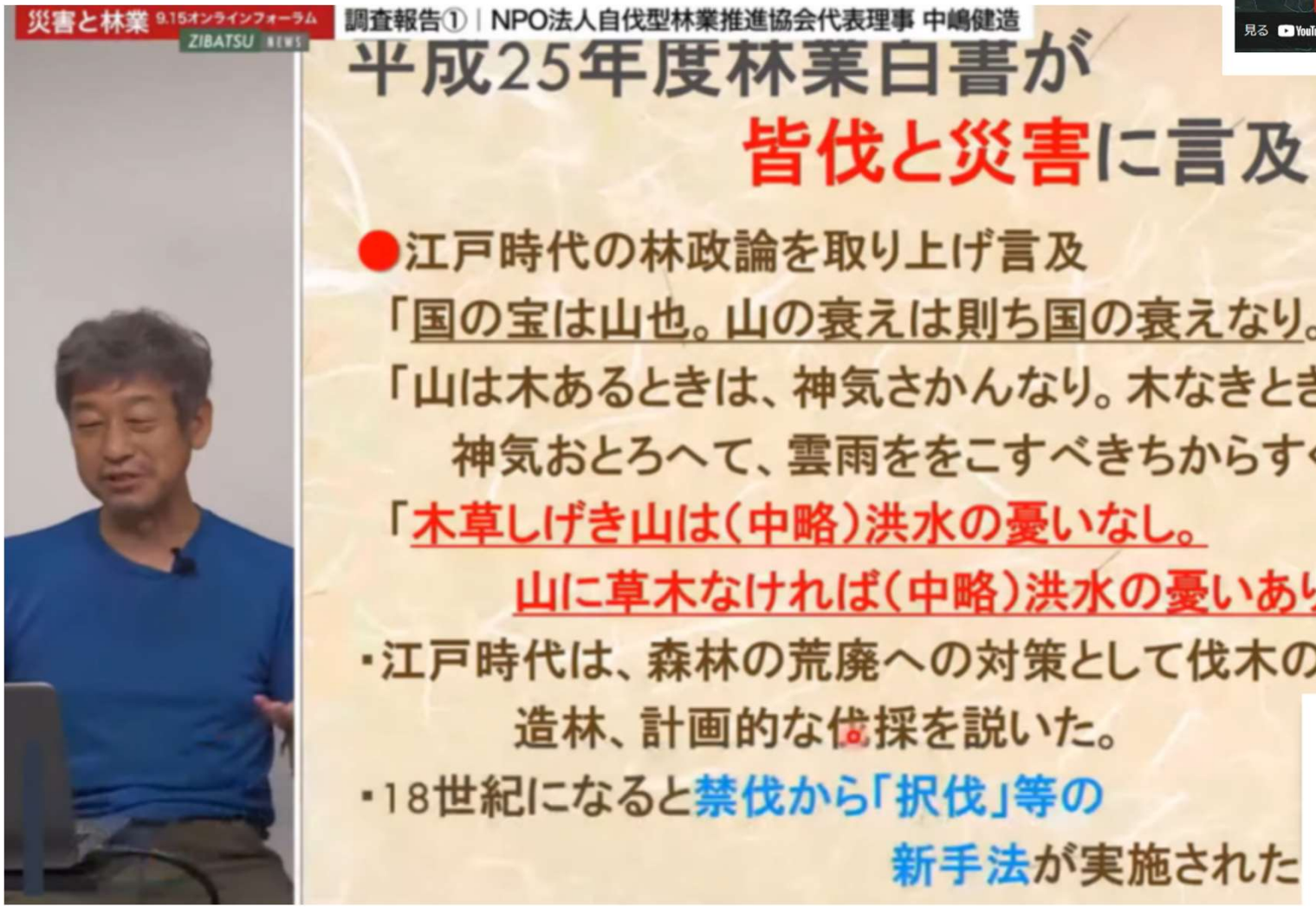
Key points of the next draft National Biodiversity Strategy.

- Strategies to protect and utilise natural capital, the foundation of global sustainability and human security. Emphasises an integrated response to the 'two crises' of biodiversity loss and the climate crisis, and a fundamental transformation of society in light of the crisis of the new coronavirus pandemic, with the aim of creating a society in harmony with nature. Five 5basic strategies have been set to realise Nature Positive 2030.
- Ensure healthy ecosystems, maintain and restore ecosystem benefits and expand socio-economic activities to protect and utilise natural capital through actions including the achievement of the 30 by 30 target.
- State and action targets are set for each basic strategy. By linking measures to action targets, the entire strategy is organised in a unified manner, from individual initiatives to targets and visions for 2030 and even 2050.

https://www.env.go.jp/council/content/12nature03/000063326.pdf

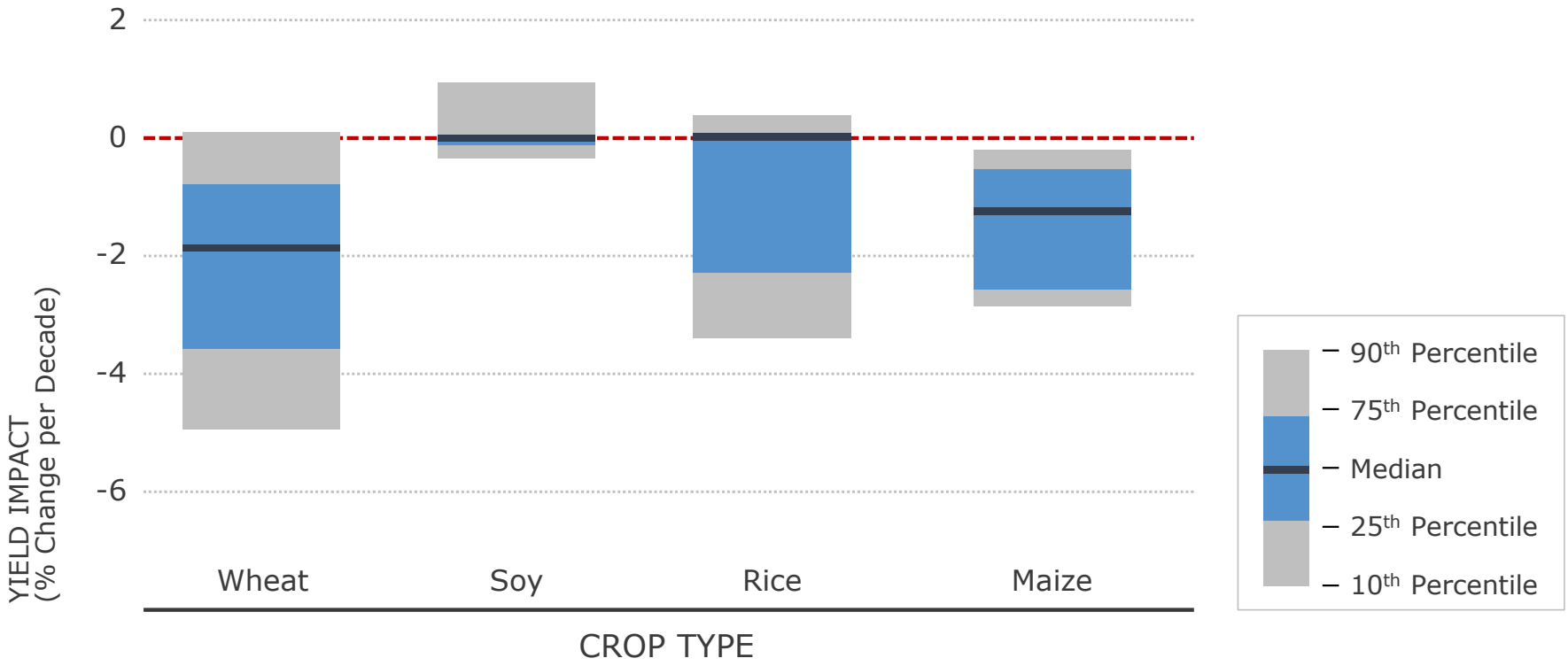
Is proper forestry effective in disaster management?





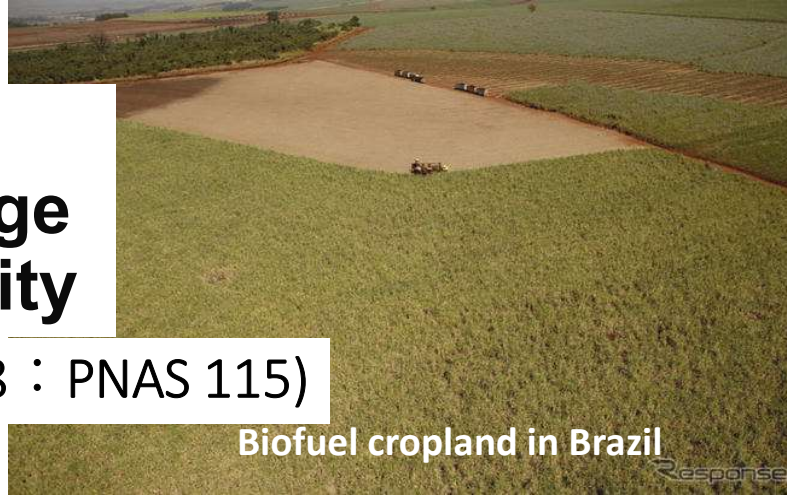
自伐型林業協議会https://zibatsu.jp/info/news/210915_forumreport

Projection of crop yield without adaptation 適応策（含品種改良）なしでの作物収量の予測

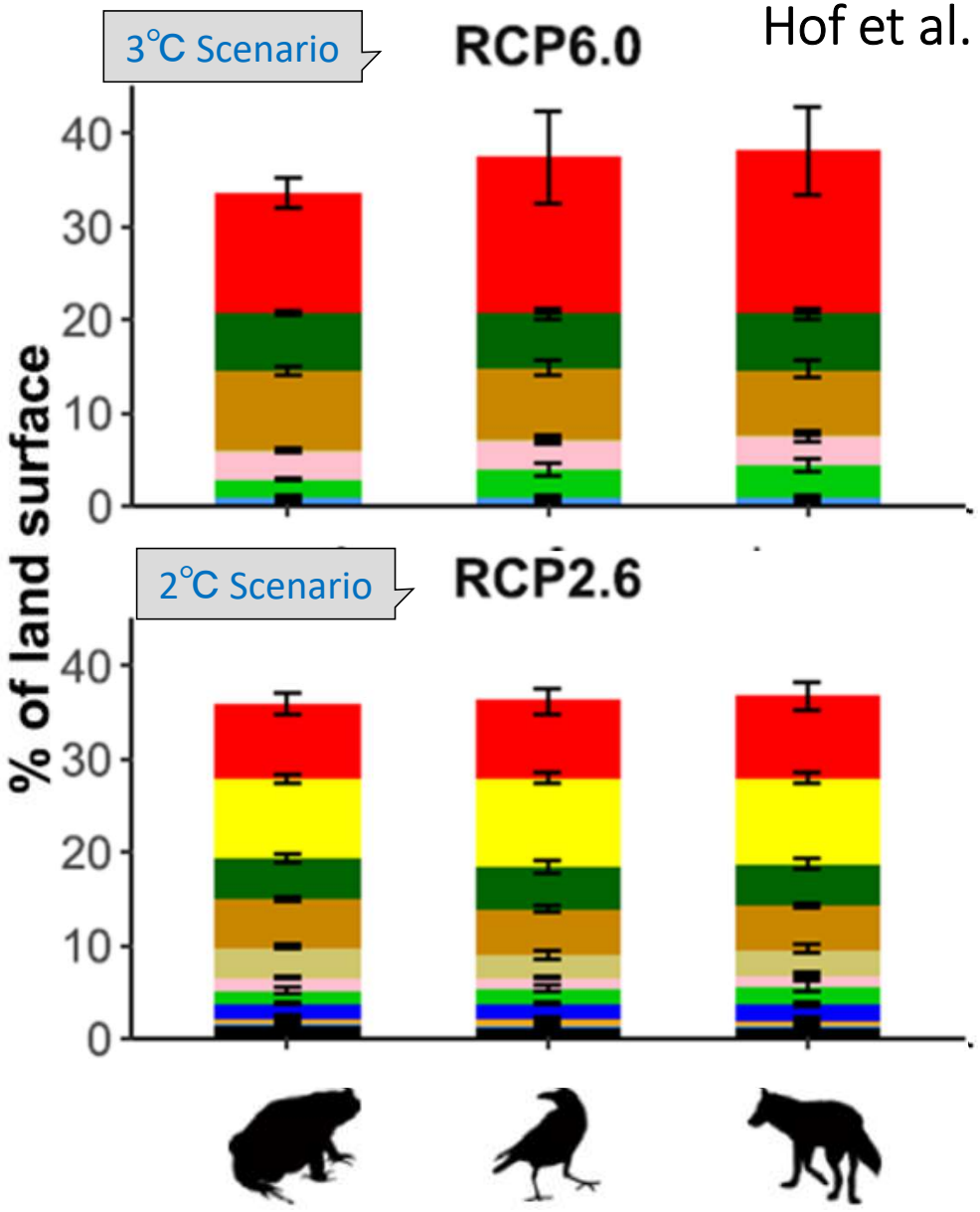


- **For the major crops (wheat, rice, and maize) in tropical and temperate regions, climate change without adaptation is projected tonegatively impact production for local temperature increases of 2˚C or more above late-20th-century levels, although individual locations may benefit (medium confidence)**

Bioenergy cropland expansion may offset positive effects of climate change mitigation for global vertebrate diversity



Hof et al. (2018：PNAS 115)



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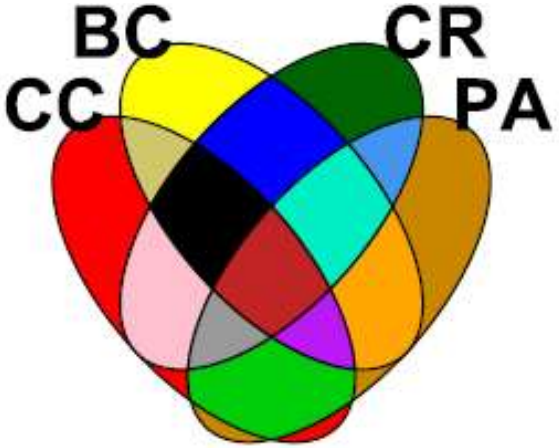
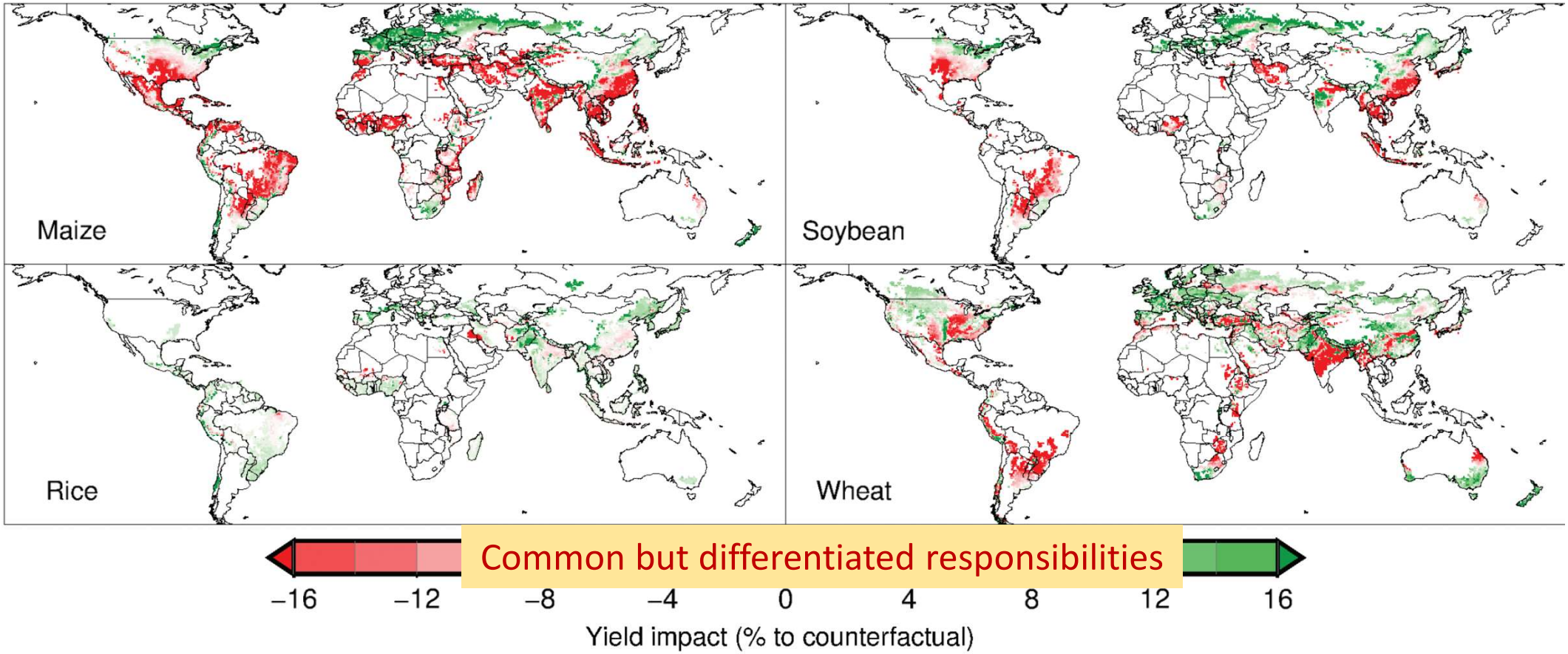


Regions in high latitude may increase crop yields



Estimated impacts of climate change on average yields for 1981–2010. Positive values indicate that climate change has increased the yields, and negative values indicate that climate change has decreased the yields relative to what would have occurred without climate change. The estimated yield impacts with and without CO_2 fertilization are evenly mixed to account for the uncertainty of CO_2 fertilization. The statistical significance of the yield impacts is shown in Iizumi et al. International Journal of Climatology, https://doi.org/10.1002/joc.5818.

Progress in revising Japan's National Biodiversity Strategy.

生物の多様性の保全及び持続可能な利用を目的とする国家的戦略若しくは計画を作成する”（生物多様性条約第６条）

条約締結を受けて

速やかに策定

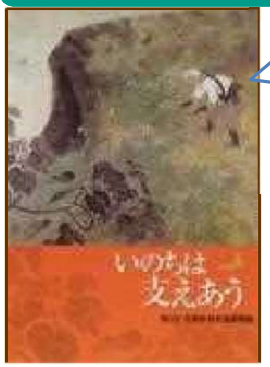
1995年：生物多様性国家戦略 ①

2002年：新生物多様性国家戦略 ②

３つの危機（※）を提示
自然共生社会の打ち出し

（※）３つの危機
1．開発など人間活動による危機
2．自然に対する働きかけの縮小による危機
3．人間により持ち込まれたものによる危機

2007年：第三次生物多様性国家戦略 ③



３つの危機に加え、地球温暖化による危機の追加

2010年：生物多様性国家戦略2010 ④

生物多様性基本法に基づく法定計画

2012年：生物多様性国家戦略2012-2020 ⑤

2010年　愛知目標
(戦略計画2011-2020)

愛知目標を踏まえた国別目標の設定
東日本大震災の経験

ポスト2020生物多様性枠組を踏まえ策定予定

2022年度（予定）：次期生物多様性国家戦略⑥

2022年12月（予定）
ポスト2020生物多様性枠組

Aichi Biodiversity Targets 2010-2020

- Target 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

- 目標11：2020年までに、少なくとも陸域及び内陸水域の17%、また沿岸域及び海域の10%、特に、生物多様性と生態系サービスに特別に重要な地域が、効果的、衡平に管理され、かつ生態学的に代表的な良く連結された保護地域システムやその他の効果的な地域をベースとする手段を通じて保全され、また、より広域の陸上景観や海洋景観に統合される。

https://www.biodic.go.jp/biodiversity/about/aichi_targets/index_03.html

Overview of the “Dashboard” for the Aichi Targets (GBO4 2015)

Elements of the targets

認識

主流化

負の奨励措置

生産消費

生息地

海資源

農林水産業

Not evaluated

汚染

外来種

Not evaluated

気候変動

Elements of the targets

保護区

絶滅

作物の遺伝子

Not evaluated

水

復元

遺伝資源

戦略改訂

先住民

知識共有

資金

科学的な評価

地球規模生物多様性概況第５版（GBO5）①

- Final assessment of the Strategic Plan for Biodiversity 2011-2020 and Aichi Targets by the Secretariat of the Convention on Biological Diversity.
- The report was compiled by the Secretariat of the Convention on Biological Diversity as the final assessment of the Strategic Plan for Biodiversity 2011-2020 and the Aichi Targets (published 15 September 2020), based on the 'national reports' of each Party, IPBES assessments and other data.
- While considerable progress has been made on most of the Aichi Targets, none of the 20 individual targets have been fully achieved.
- Achieving the 2050 Vision "Coexistence with Nature" requires a departure from 'business as usual' and social change.

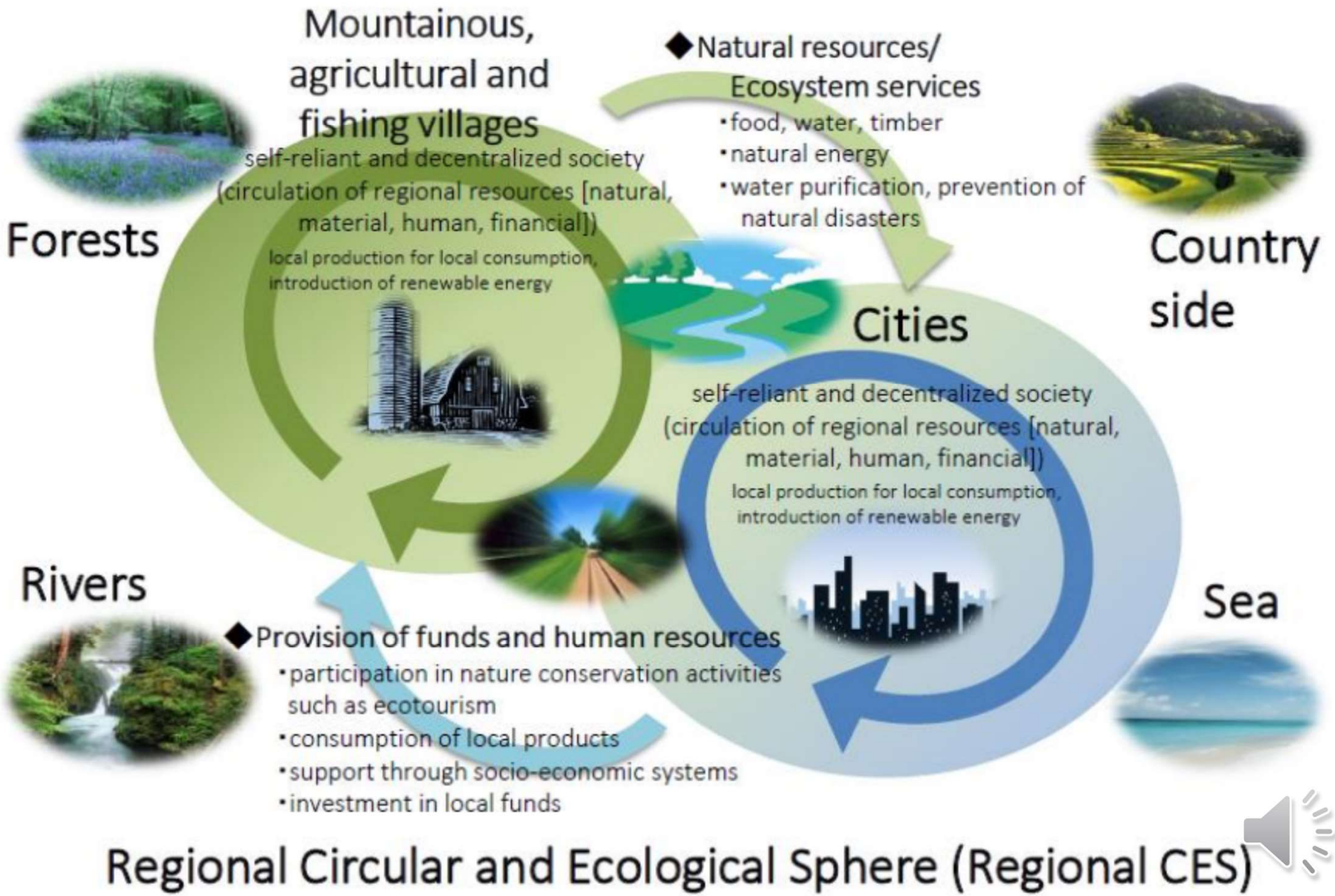
Assessment of Aichi Targets

Examining the 60 specific elements of the Aichi Biodiversity Targets, seven have been achieved and 38 show progress. Thirteen elements show no progress or indicate a move away from the target, and for two elements the level of progress is unknown. The table on the following pages provides an overview of the progress made towards each of the 20 Aichi Biodiversity Targets.

愛知目標と達成状況：部分的に達成した目標：6（黄色囲み）、未達成の目標：14（赤囲み）

https://www.mofa.go.jp/files/000452660.pdf

Basic Environment Policy Plan (2018, Japan)



Regional Circular and Ecological Sphere (Regional CES)

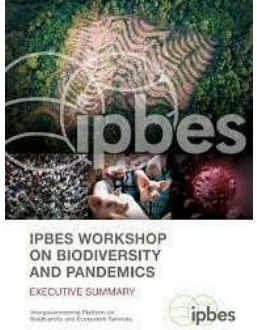
IPBES Workshop on Biodiversity and Pandemics Report

Summary of Executive summary

This report has not been endorsed by the IPBES General Assembly.

- Pandemics emerge from the microbial diversity found in nature
- Human ecological disruption and unsustainable consumption drive pandemic risk
- Reducing anthropogenic global environmental change may reduce pandemic risk
- Land-use change, agricultural expansion and urbanization cause more than 30% of emerging disease events
- The trade and consumption of wildlife is a globally important risk for future pandemics
- Current pandemic preparedness strategies aim to control diseases *after* they emerge. These strategies often rely on, and can affect, biodiversity
- Escape from the Pandemic Era requires policy options that foster transformative change towards preventing pandemics

https://ipbes.net/sites/default/files/2020-12/IPBES%20Workshop%20on%20Biodiversity%20and%20Pandemics%20Report_0.pdf



IPBES Workshop on Biodiversity and Pandemics Report

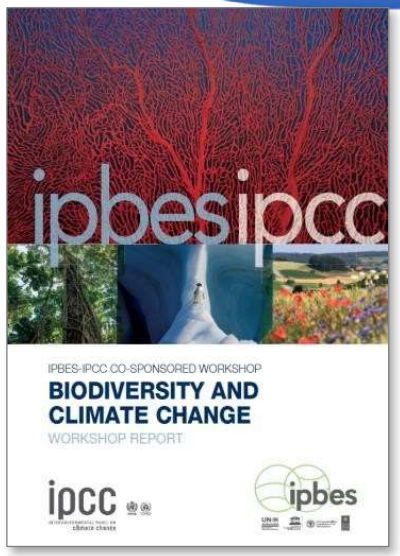
Conclusion

- This report is published at a critical juncture in the course of the COVID-19 pandemic, at which its long-term societal and economic impacts are being recognized. People in all sectors of society are beginning to look for solutions that move beyond business-as-usual. To do this will require transformative change, using the evidence from science to re-assess the relationship between people and nature, and to reduce global environmental changes that are caused by unsustainable consumption, and which drive biodiversity loss, climate change and pandemic emergence. The policy options laid out in this report represent such a change. They lay out a movement towards preventing pandemics that is transformative: our current approach is to try to detect new diseases early, contain them, and then develop vaccines and therapeutics to control them. Clearly, in the face of COVID-19, with more than one million human deaths, and huge economic impacts, this reactive approach is inadequate.

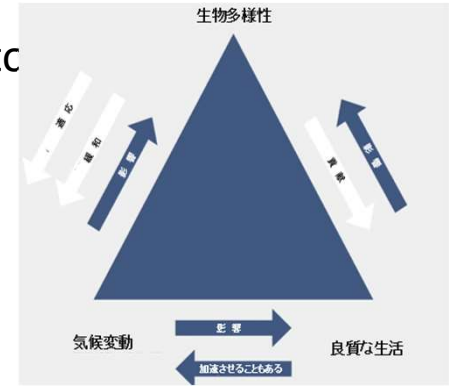
- This report embraces the need for transformative change and uses scientific evidence to identify policy options to prevent pandemics. Many of these may seem costly, difficult to execute, and their impact uncertain. However, economic analysis suggests their costs will be trivial in comparison to the trillions of dollars of impact due to COVID-19, let alone the rising tide of future diseases. The scientific evidence reviewed here, and the societal and economic impacts of COVID-19 provide a powerful incentive to adopt these policy options and create the transformative change needed to prevent future pandemics. This will provide benefits to health, biodiversity conservation, our economies, and sustainable development. Above all, it will provide a vision of our future in which we have escaped the current ‘Pandemic Era’.

IPBES-IPCC co-sponsored workshop on biodiversity and climate change （Pörtner, et al. 2021June; not yet endorsed by the IPBES General Assembly)

Chair



- There are complex interactions between climate and biodiversity on the planet, which significantly affect human society. They cannot be separated and controlled separately.
- The biodiversity impacts of human activities and climate change are increasing, impairing nature and nature's bounty. (e.g. depletion of fisheries resources, drought, heat waves, forest fires).
- Climate change impacts and biodiversity loss are a serious threat to modern ecosystems and human societies. (e.g. changes in the distribution of organisms, reduced forest carbon stocks, etc.)
- Some climate change mitigation measures may contribute to or detract from biodiversity.(e.g. mangrove conservation vs. large-scale cultivation of biofuel crops).
- Biodiversity can help people and ecosystems adapt to climate change. Measures to prevent, limit or reverse biodiversity loss contribute to climate change adaptation.(30-50% effective conservation of terrestrial and marine ecosystems)
- Key to effective policy is to treat climate, biodiversity and human society as an integrated system. Integration of biodiversity conservation and climate change action in landscapes, urban and rural areas is effective.
- Affinity between ambitious emission reductions in all sectors and nature-based solutions.
- Transformation of governance in socio-ecological systems is the key to climate and biodiversity resilience.(Resilient future development pathways

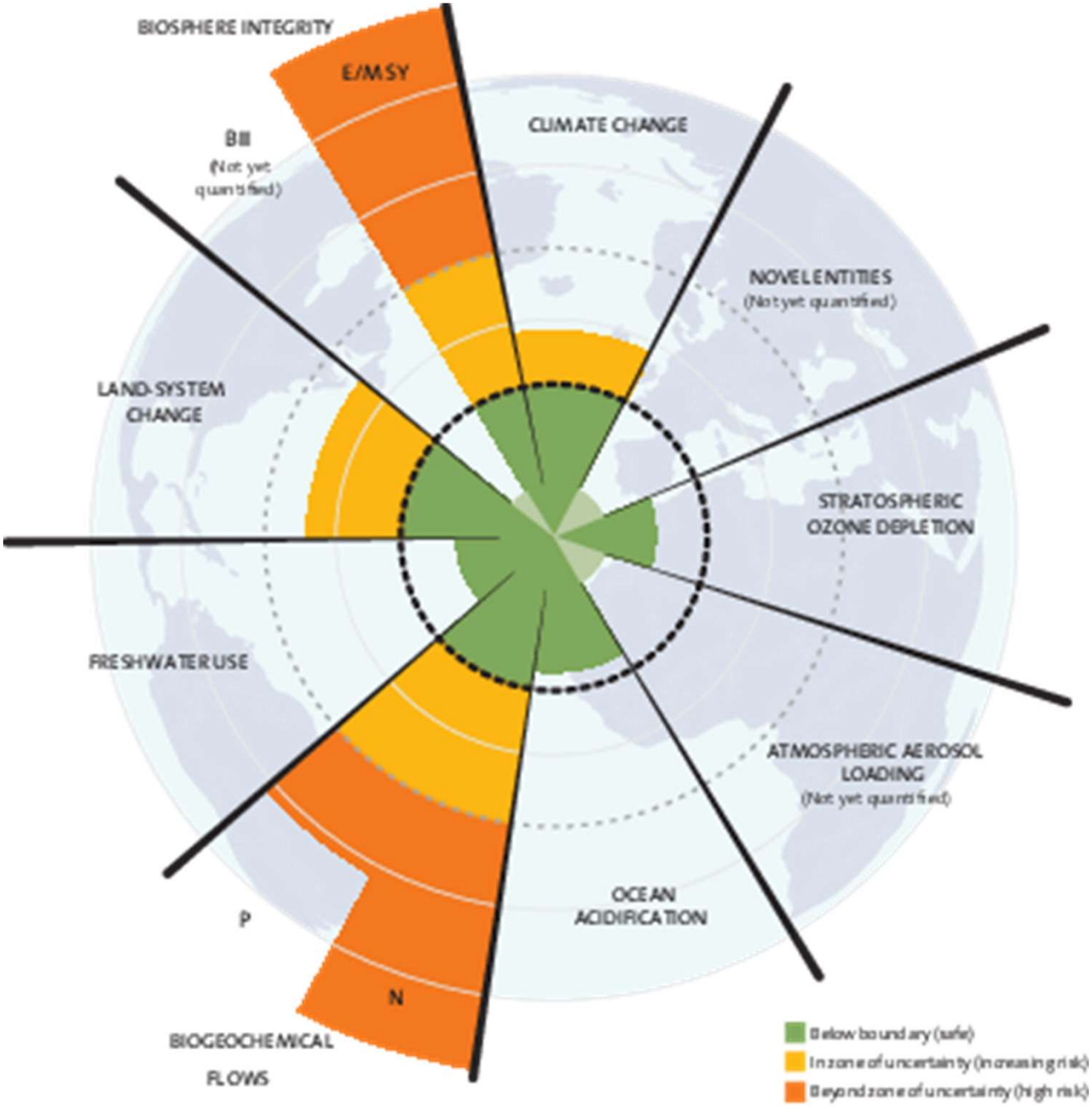


  - Summarized by MOE/IGES, Japan.

https://zenodo.org/record/5101125#.Y6jan[illegible]1D8

https://www.iges.or.jp/jp/pub/ipbes-ipcc-cosponsoredwsreport-jpsummary/jav

Planetary Boundaries ?



2015年コスモス国際賞受賞

(Rockström et al., 2009
Nature 461: 472)

Stockholm center

Kunming-Montreal Global Biodiversity Framework" (GBF), 23 targets for achievement by 2030 (part 1)

1. Loss of high biodiversity important areas are close to zero
2. >30% degraded ecosystems are under effective restoration,
3. >30% of land areas and of sea areas are effectively conserved and managed by protected areas and other effective area-based conservation measures (OECMs)
4. To halt human induced extinction, to maintain the genetic diversity, and to minimize human-wildlife conflict.
5. Ensure that the use, harvesting and trade of wild species is sustainable, safe and legal, preventing overexploitation.
6. To reduce by >50% the impacts of invasive alien species.
7. Halve nutrient run-off into the environment, pesticide risks and reduce plastic pollution
8. Contribute to climate change mitigation and adaptation with nature-based solutions

https://www.cbd.int/article/cop15-cbd-press-release-final-19dec2022

Kunming-Montreal Global Biodiversity Framework" (GBF), 23 targets for achievement by 2030 (part 2)

9. Sustainable management and use of species ensures social and environmental benefits for vulnerable populations
10. Sustainable management of agriculture, aquaculture, fisheries and forestry
11. Maintain the nature's contributions to people, including regulation of air, water, climate, soil, pollination and disease
12. Increase in access and benefits of green and blue spaces
13. Implement measures to promote access to genetic resources and fair and equitable sharing of benefits
14. Integrate biodiversity values into policy, regulation, accounting, development
15. Require companies and financial institutions to assess and gut their risks, dependencies and impacts on biodiversity
16. Halve food waste, reduce over-consumption and enable citizens to make informed and responsible choices

https://www.cbd.int/article/cop15-cbd-press-release-final-19dec2022

Kunming-Montreal Global Biodiversity Framework" (GBF), 23 targets for achievement by 2030 (part 1)

17. Enhance capacities to deal with negative effects of biotechnology
18. Eliminate incentives and subsidies harmful for biodiversity, in a proportionate, just, fair, effective and equitable way
19. Increase financial mobilisation to $200 billion per year and funds for developing countries to $30 billion per year
20. Strengthen scientific research for the conservation and sustainable use of biodiversity
21. Make data, information and knowledge for effective management
22. Equitable participation of indigenous peoples, women and youth in decision-making and respect for their rights
23. Ensure gender equality in the implementation of the framework

https://www.cbd.int/article/cop15-cbd-press-release-final-19dec2022

OEWG4で合意に至ったターゲット（１）都市における親水・緑地空間

unesco

Target 12

Significantly increase the area and quality and connectivity of, access to, and benefits from green and blue spaces in urban and densely populated areas sustainably, by mainstreaming the conservation and sustainable use of biodiversity, and ensure biodiversity-inclusive urban planning, enhancing native biodiversity, ecological connectivity and integrity, and improving human health and well-being and connection to nature and contributing to inclusive and sustainable urbanization and the provision of ecosystem functions and services.

（仮訳）

ターゲット12

生物多様性の保全と持続可能な利用を主流化することにより、都市と人口密集地の緑地・親水空間の面積と質、連結性、アクセス、便益を持続的に大幅に増加させる。そして、在来の生物多様性及び生態系の連結性と完全性を高め、人間の健康と福祉及び自然とのつながりを改善し、包括的で持続可能な都市化及び生態系の機能とサービスの提供に貢献する生物多様性を考慮した都市計画を確保する。

環境省220810https://www.env.go.jp/council/content/12nature03/000063329.pdf

Main results for each of the main issues

- ○ Goal, Target Relationships.
- Climate change (draft target 8)
- Minimising the impact of climate change on biodiversity is supported by many countries (including Japan) support minimising the impact of climate change on biodiversity.
- On the other hand, some countries argued for the contribution to climate change mitigation and adaptation by making use of nature and setting numerical targets for mitigation, but there were opinions that these should not be discussed in the CBD, and a conflict remained.
- No agreement was reached on whether the term "nature-based solutions" should be used in the target, and the issue was left for further discussion. Countries that should introduce the principle of Common but Differentiated Responsibility (CBDR)
- The conflict was between countries (mainly developing countries) and industrialised countries, which argued that the principle of 'common but differentiated responsibilities' should be introduced.

環境省220810https://www.env.go.jp/council/content/12nature03/000063329.pdf

主要論点ごとの主な結果

○ゴール、ターゲット関係

・30by30（ターゲット案３）

✓ 数値（30%）については議論する時間がなく、今後の議論に持ち越し（　）

✓ その他の主な対立ポイント

・陸と海の表現（主に海をoceanとするかseaとするか）について（　）

（日本は愛知目標の表現（terrestrial and inland areas, and of coastal and marine areas）を支持。）

・また、国際目標であるか、あくまで国内で目指す目標であるか（緑）

・保護地域やOECM（保護地域以外で生物多様性の保全に資する地域）における保護の強度等用語の挿入要否（ﾋﾟﾝｸ）

Ensure and enable at least [30 per cent] of [all [---] and of [---]] [globally] [at the national level] especially [key biodiversity areas[, ecologically or biologically significant areas, threatened ecosystems] and other] areas of particular importance for biodiversity [and ecosystem functions and services] are [effectively] conserved through [effectively] [well] managed, ecologically representative, well-connected and equitably governed [systems] [networks] of [highly and fully] protected areas [including a substantial portion that is strictly protected] and other effective area-based conservation measures, [and [indigenous] [traditional] territories] [, where applicable,] [which prohibits environmentally damaging activities] and integrated into the wider land[-]/[scapes] and seascapes [and national and regional ecological networks], [in accordance with national priorities and capabilities,] [including the right to economic development, will not affect the right or ability of all Parties to access financial and other resources required for the effective implementation of the whole Framework,] [while ensuring that [sustainable use] of these areas, if in place, contributes to biodiversity conservation,] [recognizing the contribution of indigenous peoples and local communities to their management] and [respecting] the rights of indigenous peoples and local communities.

環境省220810https://www.env.go.jp/council/content/12nature03/000063329.pdf

30 by 30 の原文（2020年CBD　第1次案）
First Draft of the Post-2020 Global Biodiversity Framework

- The framework has 21 action-oriented targets for urgent action over the decade to 2030…
- この枠組みでは、2030年までの10年間に緊急に取り組むべき21の行動目標を掲げています
- Target 3. Ensure that at least 30 per cent globally of land areas and of sea areas, especially areas of particular importance for biodiversity and its contributions to people, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.　(p.6)
- 目標3.　陸域と海域、特に、生物多様性とその人間への貢献が特別に重要な地域の少なくとも30％が、効果的かつ衡平に管理され、生態学的に代表的でつながりを持つよう工夫された保護地域システムやその他の効果的な地域をベースとする保全手段を通じて保全され、また、より広域の陸上景観や海洋景観に統合される。

www.cbd.int/doc/c/abb5/591f/2e46096d3f0330b08ce87a45/wg2020-03-03-en.pdf

IUCNの保護区カテゴリー（N.Dudley 2008)

	保護区Category of protected areas	主な管理目的Areas managed mainly for
Ia	厳正自然保護区 Strict nature reserve	厳格な保護／主に科学的研究 Strict protection
Ib	原生自然保護区 Wilderness area	厳格な保護／主に原生自然の保護 Strict protection
II	国立公園 National park	主に生態系の保全と保護 Ecosystem conservation and protection
III	天然記念物 Natural monument or feature	主に特定の自然の特徴を保全 Conservation of natural features
IV	生息地/種の管理区域 Habitat / species management area	主に人間の管理介入を通じた保全 Conservation through active management
V	陸上/海洋景観保護区 Protected landscape / seascape	主に陸上・海洋景観の保全及びレクリエーションLandscape / seascape conservation and recreation
VI	持続的資源利用保護区 Protected Area with sustainable use of natural resources	主に資源の持続可能な利用 Sustainable use of natural resources

保護のみ

持続的利用

Dudley 2008の保護区の定義

- “protected area” – An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means – and six categories:
- 「保護区」＝生物多様性、自然および関連する文化資源の保護と維持に特に力を注ぎ、法的またはその他の効果的な手段によって管理される陸地または海洋の地域であり、6つのカテゴリーがある。

https://portals.iucn.org/library/sites/library/files/documents/pag-021.pdf

現在のOECMの定義

"other effective area-based conservation measure" means

- "a geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the *in situ* conservation of biodiversity, with associated ecosystem functions and services and, where applicable, cultural, spiritual, socioeconomic, and other locally relevant values";

- 2018年7月の生物多様性条約の会合（SBSTTA22）でOECMとは「生物多様性、およびこれに関連した生態系の機能とサービス、ならびに適当な場合には文化的、精神的、社会経済的およびその他の地域関連の価値の域内保全に対し、継続的に正の成果をもたらすような方法で運営・管理される、保護地域以外の地理的に画定された地域」と定義された。

保護区の再定義が不明確

CBD/SBSTTA/22/L.2 6 July 2018

https://www.env.go.jp/press/105646.html

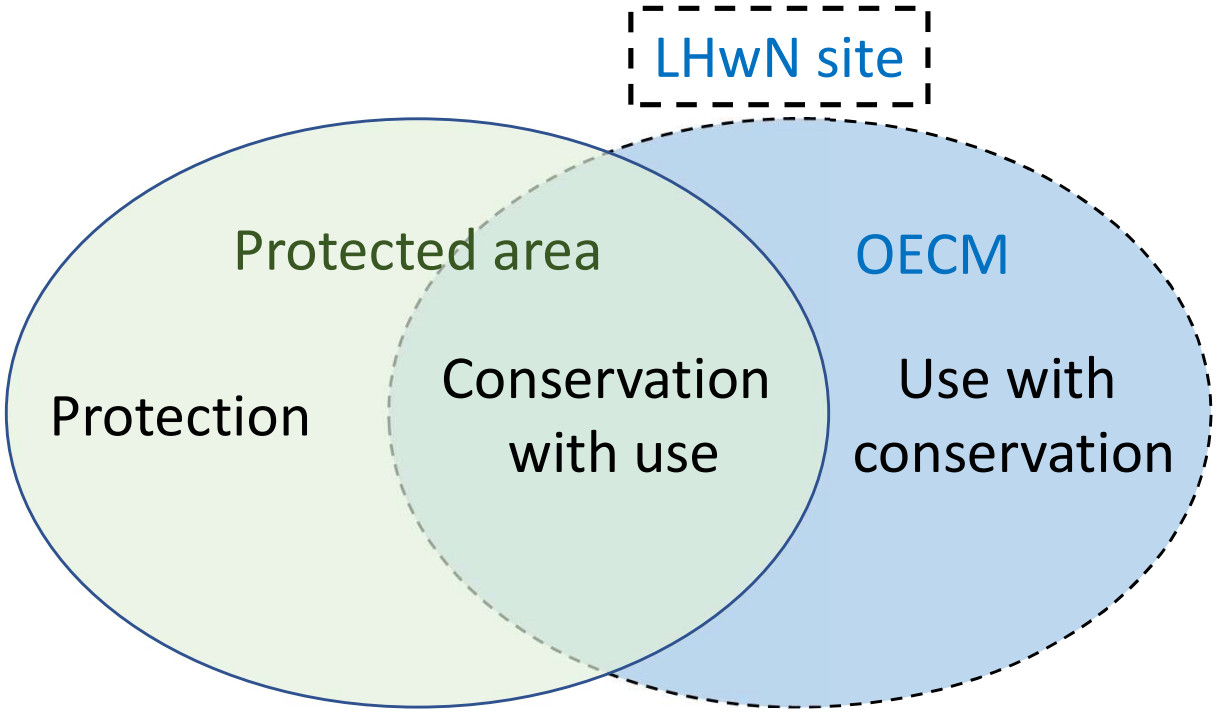
Harry Jonas & Nigel Dudley

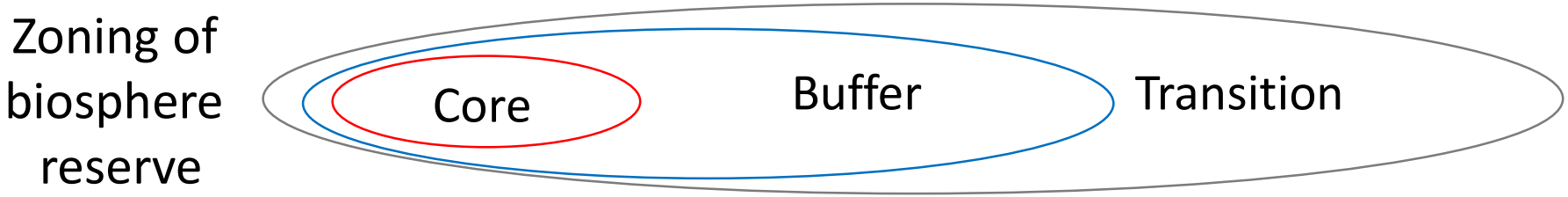
A brief introduction to 'Other Effective Area-based Conservation Measures'

- Specifically, while protected areas should have a primary conservation objective (i.e. aim to promote the *in-situ* conservation of biodiversity), the defining criterion of an OECM is that it should deliver the effective and enduring *in-situ* conservation of biodiversity, regardless of its primary management objectives.
- 具体的には、保護区は生物多様性の保全が第一義的な目的であるべきだが、OECMは第一義の管理目的にかかわらず、効果的かつ持続的な生物多様性の保全を実現することが定義基準である。

Blog on ICCA Consortium site: 25 October 2017

Idea on the relationship between protected area and OECM





3 types of OECMs

1. **Ancillary conservation:** areas delivering *in-situ* conservation as a by-product of management, i.e. where biodiversity conservation is not an objective (e.g. some military training grounds).
2. **Secondary conservation**: active conservation of an area where biodiversity outcomes are a secondary management objective (e.g. some watershed management areas);
3. **Primary conservation**: areas meeting the IUCN definition of a protected area, but where the governance authority does not wish the area to be reported as a protected area. This is likely to be a relatively rare category of OECM, and would be used to avoid unintended consequences, such as in countries where government regulations forbid human occupation in a protected area [religious sanctuary]

https://www.iucn.org/sites/default/files/2022-08/01_iucn_wcpa_technical_note_series_no._1.pdf

Main purpose is (1) biodiversity conservation, (2) other

	想定される地域	目的	生物多様性保全への寄与	管理の内容	想定される主体
①	企業の森、ナショナルトラスト、バードサンクチュアリ、ビオトープ、自然観察の森	生物多様性の保全	場所に応じた生物多様性保全が図られている	自然再生から極力人為を加えない管理まで 様々	民間企業、民間団体、個人、公的機関
②	里地里山 など	農林業の場、生活の場	二次的自然の形成、二次的自然に依存する生物の生息・生育の場	持続可能な資源利用、動的・モザイク的な土地利用	地域コミュニティ、個人
②	森林施業地、水源の森 など	自然資源の商業利用	森林生態系の生物多様性の維持	多様な樹種、複層の構造、生物の生息・生育環境などに配慮した施業	民間企業、個人、公的機関
②	社寺林（鎮守の森）、文化財指定・選定の地域など	信仰及び文化の対象	巨樹巨木の存在、二次的自然に依存する生物の生息・生育の場	長期的な保全	地域コミュニティ、民間団体、個人
②	企業敷地内の緑地、屋敷林、緑道、都市内の緑地 など	生活環境との調和	周辺の生態系との連結性の役割、都市及び都市近郊の生物の生息・生育の場	緑地の保全・造成	民間企業、地域コミュニティ、個人、公的機関
②	都市内の公園、ゴルフ場、スキー場など	レクリエーション	都市及び都市近郊の生物の生息・生育の場、二次的自然に依存する生物の生息・生育の場	生物の生息・生育環境の造成、多様な自然環境の維持	民間企業、公的機関
②	風致保全の樹林 など	風致景観の保全	都市及び都市近郊の生物の生息・生育の場	生物の生息・生育環境の造成	民間企業、民間団体、個人、公的機関

令和３年度第１回「民間取組等と連携した自然環 境保全（OECM）の在り方に関する検討会」資料1
「日本型」 OECMの検討状況料　https://www.env.go.jp/nature/oecm/r3-dai-1-kai-kentokai.html

OECM登録のための自然共生サイト（仮称）の認定

- 国立公園等の既存の保護地域に加えて、**民間等の取組により結果的に生物多様性の保全に貢献している区域**（企業緑地、里地里山、都市緑地）を、**環境省が自然共生サイト（仮称）に認定**する仕組みを構築中。**2023年度より正式に認定を開始。**
- 認定地は、環境省が**OECM（Other Effective area-based COnservatiOn Measures）**として、**国際データベースに登録**することで、COP15で決定予定の**次期世界目標に直接貢献**していることを示すことができる。

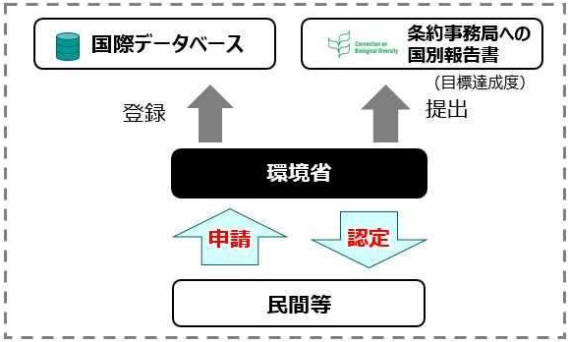
OECMのイメージ

保護地域以外にも、**里地里山、水源の森、都市の自然**など、様々な場所が生物多様性の保全に貢献している

実証事業の実施

- **2022年度**に、アライアンス参加者の協力を得て、**自然共生サイト（仮称）認定の仕組みを試行する実証事業**を実施
- **2023年中**に**少なくとも100地域以上**で認定

認定スキームのイメージ



環境省が自然共生サイト（仮称）に**認定**し、**国際データベースに登録**することで、企業や団体の貢献を明示する

自然共生サイト（仮称）の仕組みの試行について

2022年度

①審査プロセスの試行・検証（前期）の事例として情報提供等ご協力いただくサイト　２３件

サイト名	所在地
史春林業施業地	北海道
北海道製油所	北海道
マテリアルの森 手稲山林	北海道
つくばこどもの森保育園	茨城県
サンデンフォレスト	群馬県
NEC我孫子事業場	千葉県
清水建設「再生の杜」	東京都
三井住友海上駿河台ビル及び駿河台新館	東京都
あさひ・いのちの森	静岡県
富士通沼津工場	静岡県
日本製紙　　鳳凰社有林	山梨県
ソニーグローバルマニュファクチュアリング＆オペレーションズ株式会社 幸田サイト	愛知県

サイト名	所在地
パナソニック エコアイディア工場 びわ湖「共存の森」	滋賀県
三井物産の森/京都 清滝山林	京都府
阪南セブンの海の森	大阪府
サントリー天然水の森　　ひょうご西脇門柳山	兵庫県
御代島	愛媛県
橋本山林（経済性と環境性を高い次元で両立させる自伐林業による多間伐施業の森）	徳島県
王子の森／木屋ヶ内山林	高知県
アサヒの森　　甲野村山	広島県
KMバイオロジクス株式会社菊池研究所	熊本県
Present Tree inくまもと山都	熊本県
九州電力　　水源涵養林用地	大分県

②その他 課題検討の事例として情報提供等ご協力いただくサイト　１０件

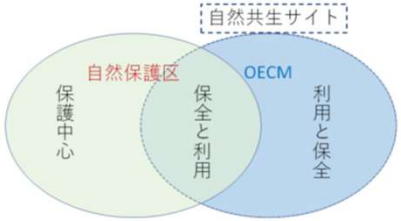
サイト名	所在地
宍塚の里山	茨城県
国分寺崖線	東京都
砺波平野の屋敷林（カイニョ）	富山県
東急リゾートタウン蓼科「もりぐらし」	長野県
知多半島グリーンベルト	愛知県

サイト名	所在地
吉崎海岸	三重県
陽楽の森	奈良県
球磨川流域の迫	熊本県
久米島のサンゴ礁（儀間川河口、字鳥島・島尻湾海域）	沖縄県
「5本の樹」計画プロジェクト	-

神奈川県内がない…

Ministry of the Environment's "Site for LHwN" certification project

- Areas where biodiversity is being conserved through private sector efforts, etc. (to be certified by the Ministry of the Environment starting in FY2023)
- Protected area or OECM
- Requires consent from the landowner.
- 30by30 Alliance for Biodiversity" (free of charge, individual participation is possible)
- Sites to which we ask you to provide information and other cooperation as examples of the previous year's trial and verification of the assessment process (forestry operation sites, oil refineries, nursery forests, factories, buildings, company-owned forests, natural water forests, forests with multiple thinning by self-forestation, Satoyama, cliff lines, residential forests, resort towns, coasts, coral reefs).



https://www.env.go.jp/press/111067.htmlより

Building as a candidate of the "Certified Demonstration Project for the “LHwN” sites (tentative name)

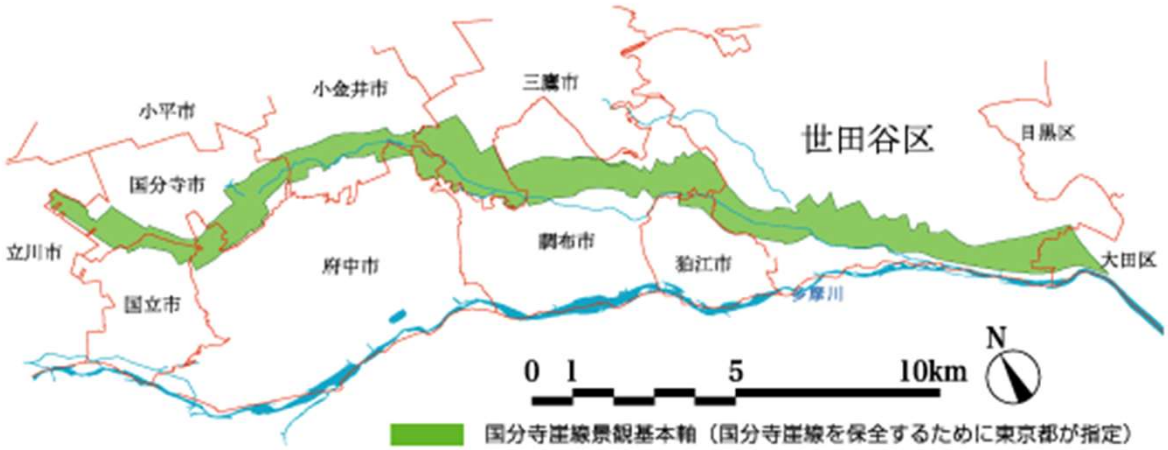
Surugadai Building" with a greening rate of over 40%.

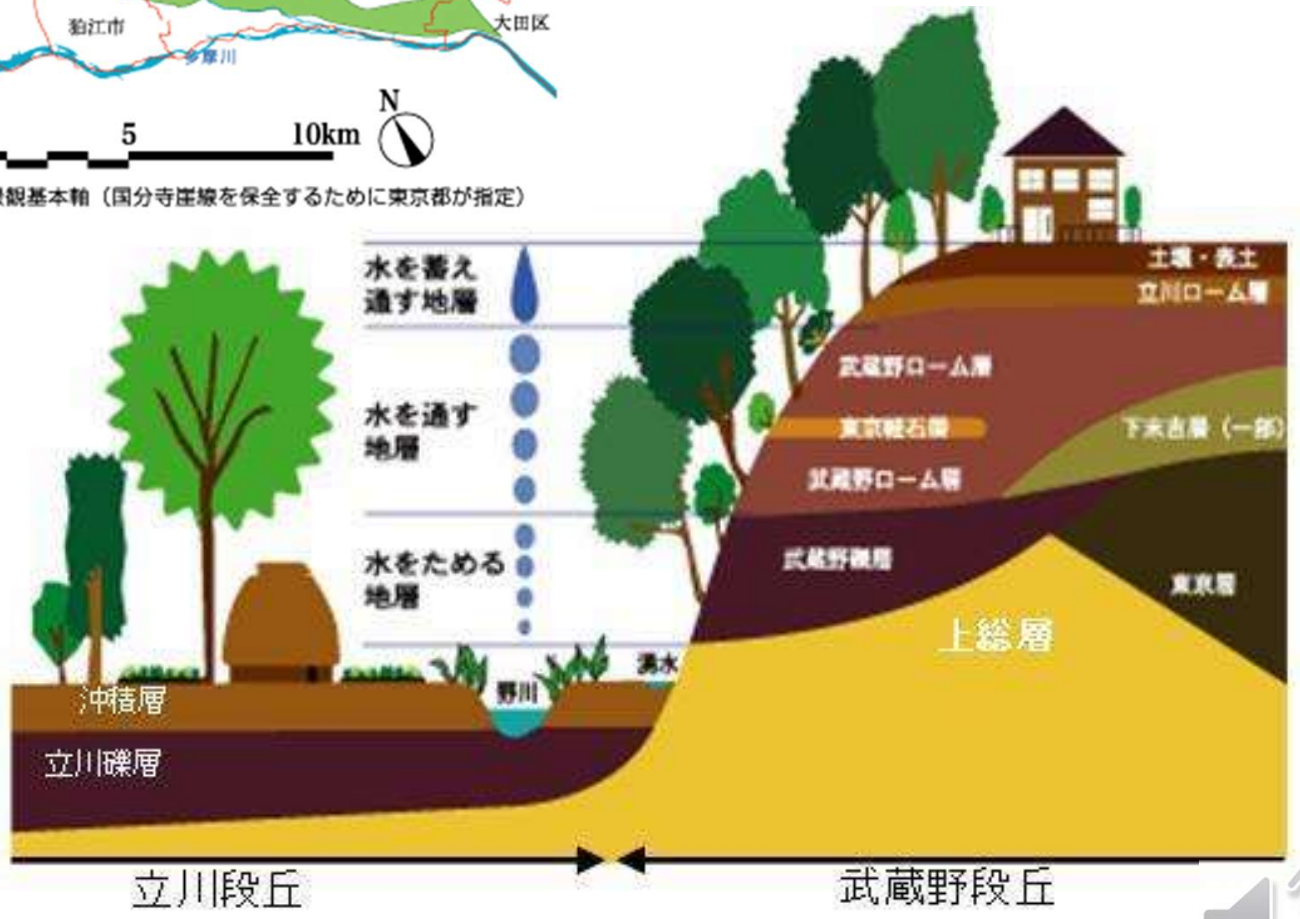
The Surugadai Building was completed in 1984 as the headquarters of the former Taisho Kaijo. In response to local residents' requests for more greenery in the city, we utilized existing trees and constructed a rooftop garden, resulting in a building with a greenery ratio of over 40%, which was groundbreaking at the time. Upon the completion of the new Surugadai Building in 2012, we continued the philosophy and history of the Surugadai Building, and furthermore, in order to proactively address the issue of urban biodiversity, we adopted the concept of "green space where living things and the city can coexist" and incorporated native species, trees that bear fruit and trees that produce nectar. In order to further address the issue of biodiversity in the city, we have added new green areas that incorporate native species and trees that bear fruit and produce nectar, etc. In addition, an elevator directly to the rooftop garden of the Surugadai Building and "ECOM Surugadai," a space for environmental communication with the local community, have been newly created to make the green space more open to the local community.

◆Completion：1984 ◆Laying area：17,387㎡ ◆Green area：7,090㎡

https://www.ms-ins.com/special/sustainability/greenland.html

「認定実証事業」参画地　国分寺崖線





- 特定非営利活動法人 Green Connection TOKYO
- 世田谷区国分寺崖線保全整備条例

https://www.city.setagaya.lg.jp/mokuji/sumai/010/003/001/d00004905.html

松田の整理

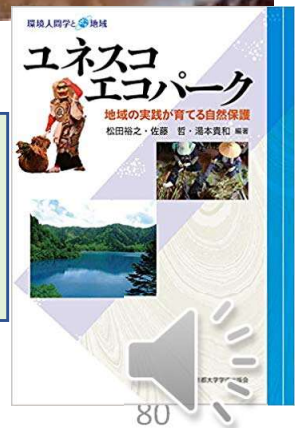
OECM encourages mainstreaming of biodiversity

- Biodiversity could be a matter of all stakeholders who are not primarily concerned with nature conservation but “care for biodiversity” by addressing the OECMs in addition to protected areas.
- Climate change has become a matter of concern for a very large number of stakeholders affected by climate change by addressing adaptation measures in addition to mitigation measures.

Dasgupta Report (Summary)

"Correct economic reasoning is entangled with our values. Biodiversity does not only have instrumental value, it also has intrinsic worth – perhaps even moral worth. Each of these senses is enriched when we recognise that we are embedded in Nature. To detach Nature from economic reasoning is to imply that we consider ourselves to be external to Nature. The fault is not in economics; it lies in the way we have chosen to practise it." (P. Dasgupta, 2021)

「自然共生」そのもの
MAB「人間と生物圏」計画



和訳　https://www.wwf.or.jp/activities/data/20210630biodiversity01.pdf　P75

www.unenvironment.org

A new deal for Nature (21 May 2019)

In 2020, world leaders will meet in China to agree on a new set of commitments to conserve nature. They will also review progress towards targets set in 2010; but the news is not all good. Only a quarter of land on Earth is substantively free of the impacts of human activities. This is projected to decline to just one-tenth by 2050.The implications of such drastic changes in nature for human health, well-being, security and economic development are staggering.

Because our current pathway is unsustainable,

humans and nature alike need a new deal - a new way to <u>coexist and thrive.</u>

Transformed political approaches, bold visions and effective leadership are essential to address our complex

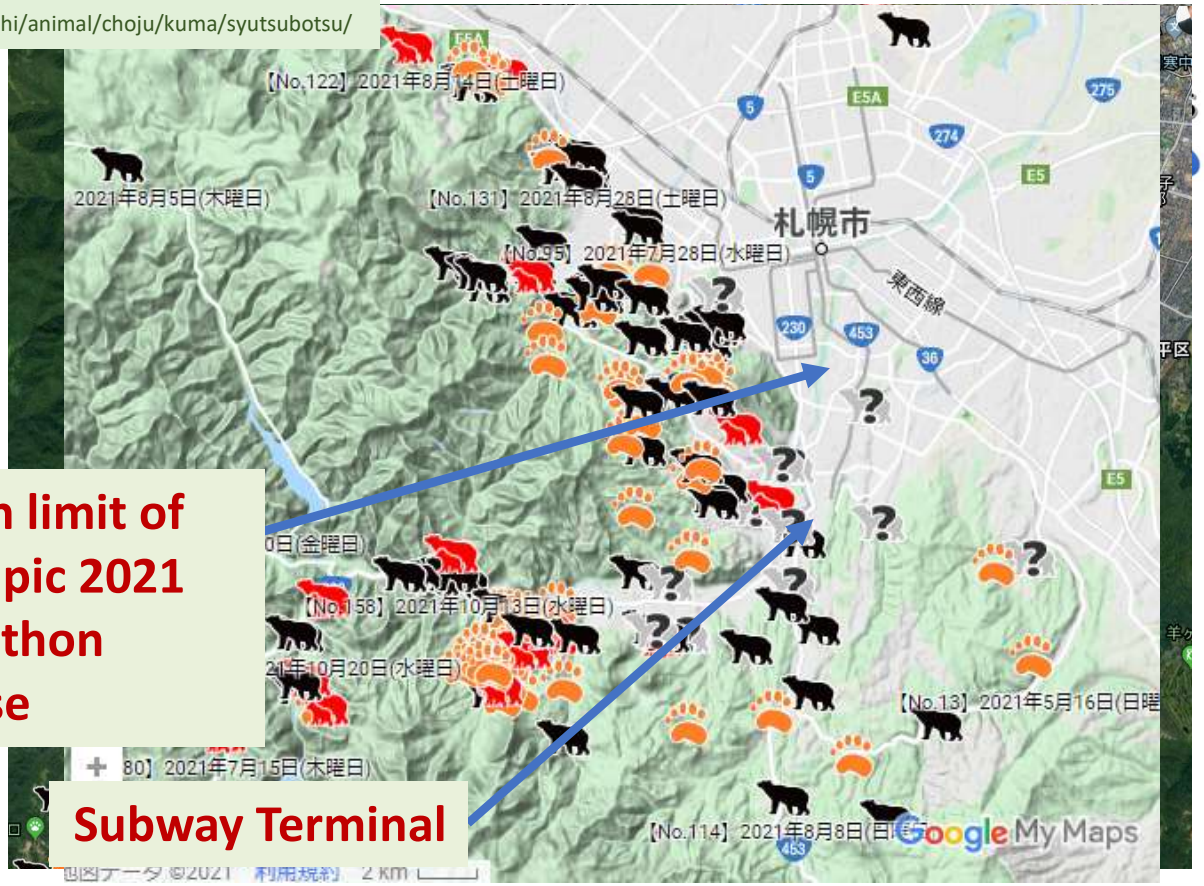
Five transformations.

1. Account for the True Value of Nature
2. Change the Way We Produce and Consume Food
3. Conserve Wildlife and Wild Spaces
   - Enhanced investment in robust biodiversity-based economies that increase benefit flows to the people living with and bearing the costs of wildlife.
4. Restore the Degraded Planet
5. Promote a Better Built Environment

Ideas of people who do not live with wildlife.

https://www.city.sapporo.jp/kurashi/animal/choju/kuma/syutsubotsu/

Map of brown bear appearance in Sapporo residential areas. Killing nuisance bears is strongly protested by citizens outside Hokkaido.



- Unlike deer, bear may kill people, and appearance of bears in the city area limits children going to school and stopping marathon events. Sapporo City wrote, "Before gathering information on brown bear from the websites and stay away from their home range to avoid encountering brown bears", even where in residential urban areas.

NY State kills deer

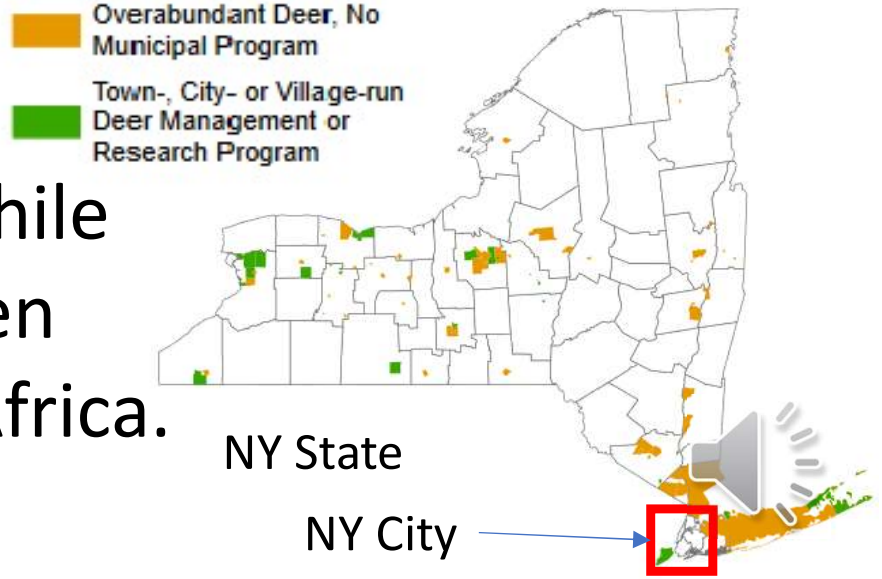
- Culling–In many urban and suburban situations, hunting may not be able to lower deer populations enough to bring impacts down to a sustainable level (Williams et al., 2013). In these cases, the best option may be culling, which is the term for killing deer outside of a hunting framework. In New York, a DEC-issued DDP is necessary for a culling program to occur, and such permits typically allow the use of methods that are not available to hunters, which is why culling is usually more effective for rapid population reduction than hunting.

NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

DEER MANAGEMENT IN URBAN AND SUBURBAN NEW YORK

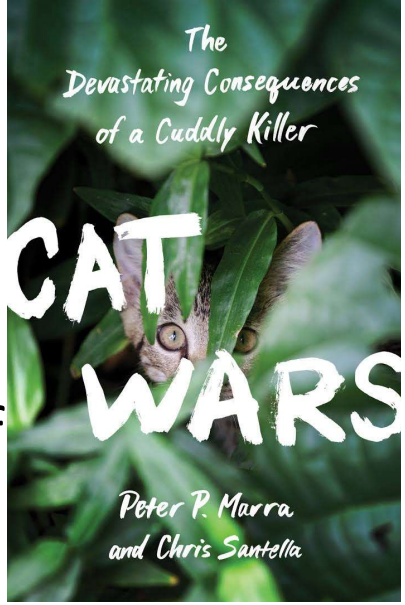
A Report to the New York State Senate and Assembly

December 31, 2018



They kill deer and eat deer meat while NY mayor says not to use ivory taken from elephants that kill people in Africa.

猫戦争Cat wars



- The domestic cat is an alien predator in the “World's 100 Worst Invasive Alien Species”. Predation of cats has become a major cause or cause of the extinction of 33 of the 238 extinct reptiles, birds and mammals in the world. *Toxoplasma*, a zoonotic disease transmitted by cats, poses a significant risk to the fetus if a woman is first infected during pregnancy. Prevalence of women of childbearing age = 63% in Germany and 4% in South Korea.
- [Europe and USA] There is a serious conflict between a bird watchers and cat lovers because wild cats prey on wild birds. Nature protection differs from animal welfare. The lack of agreement on how to treat free-ranging cats is a big problem. [Natural Conservation Thought is still developing. [Our slogan is “Coexistence with environmental risks” instead of “antivirus war”]

https://hymatsuda.hatenablog.com/entry/2019/05/29/211742

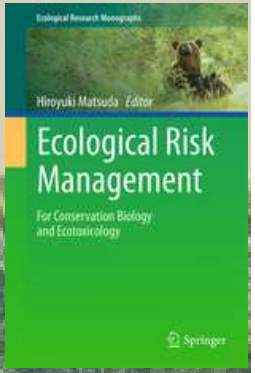
Le programme MAB
Vivre dans la biosphère

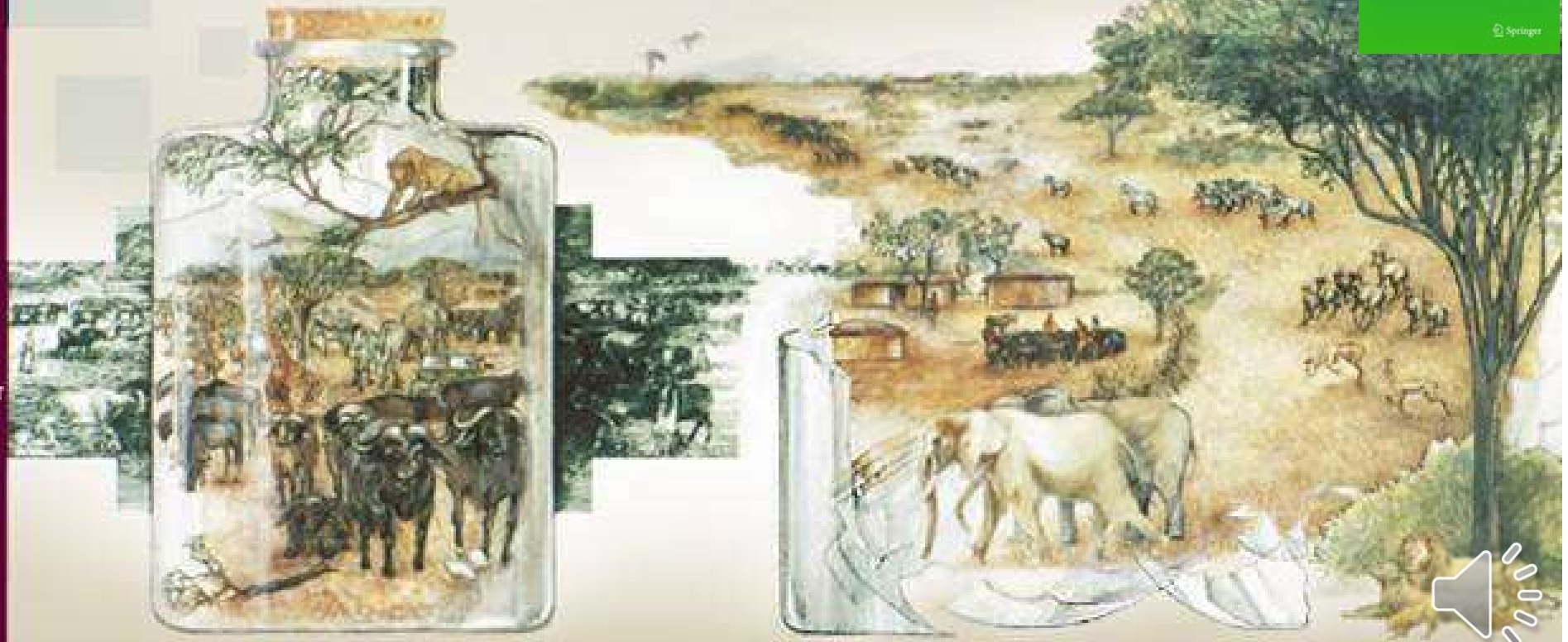
BIODIVERSITÉ
CONSERVATION
RECHERCHE
SURVEILLANCE CONTINUE
ÉDUCATION
FORMATION
DÉVELOPPEMENT DURABLE

UNESCO Chair on Education in Biosphere Reserves for Sustainable Societies
YNU-EBRoSS
since 2022
Yokohama National University

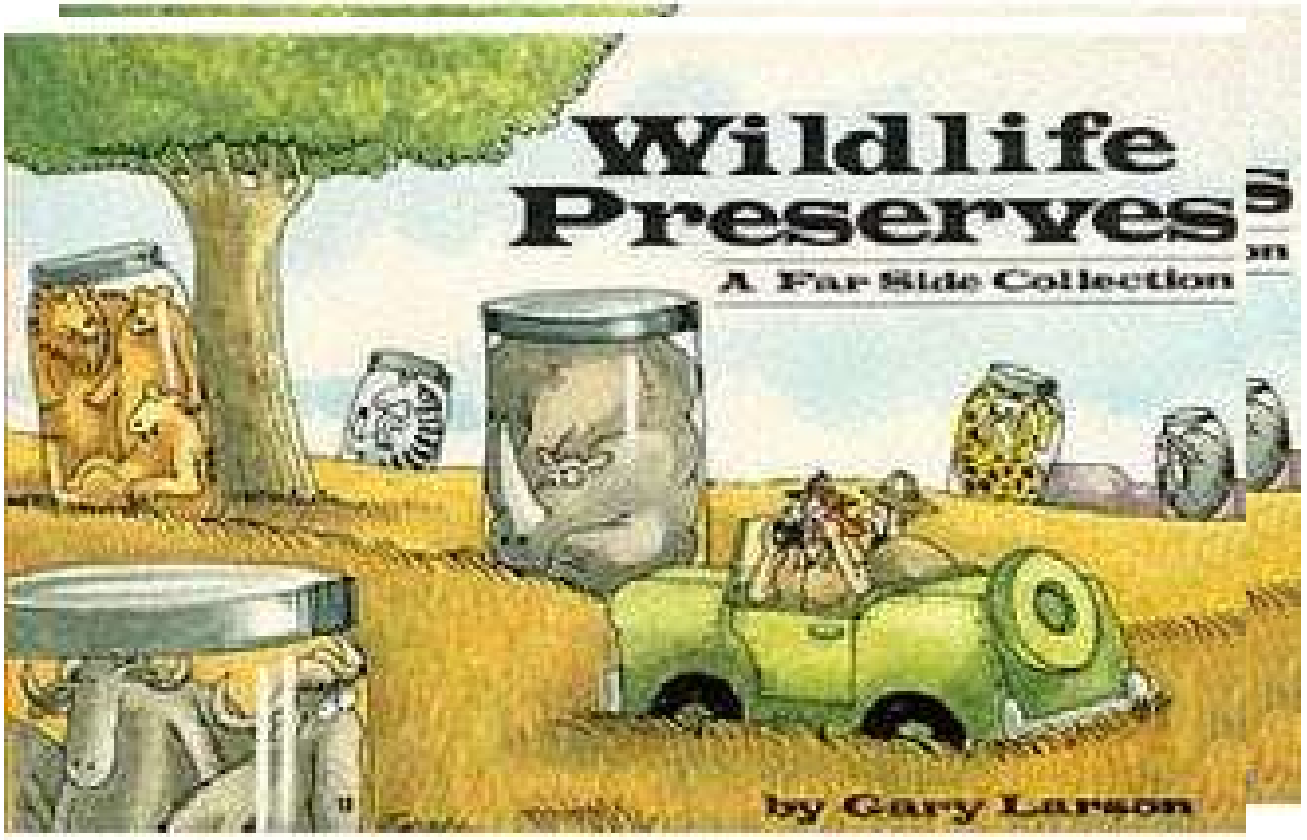
New Deal for Nature and People in 2023

- [Values of nature are] enriched when we recognise that we are embedded in Nature. …[It is a fault to] consider ourselves to be external to Nature. – Dasgupta Report (2021)
- People and bears can coexist in fear of each other –Matsuda (2016)
- People and wildlife utilize each other –Matsuda (2021)

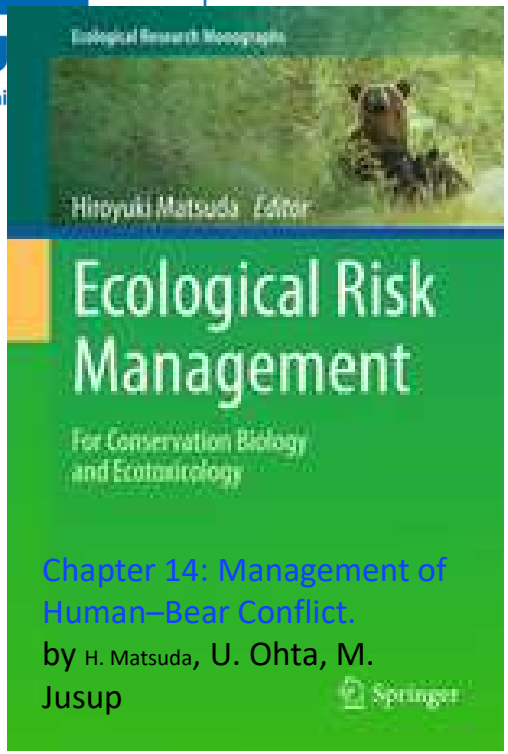




Preservation (Protection) vs. conservation

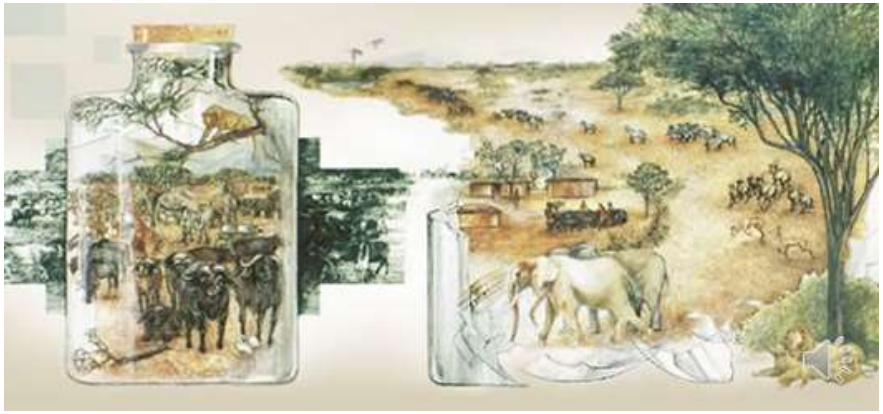


by Gary Larson (1989)



Biosphere consists of nature and people, [with "ecological distancing"]

- "If farming is to coexists with wild birds and beasts, … the human–wildlife conflict is inevitable in agriculture, forestry and fisheries."



- People are inseparable from the biosphere, and thus not only use wildlife but are sometimes being used by wildlife too.

Public Symposium of the Society for Wildlife and Society Conference November 6, 2021
Keynote Speech by Matsuda, "Mutual Use Relationship between People and Wildlife"