

Special lecture for Dept. of Agriculture at Kagoshima,
Ryukyu, Saga Universities, Nov. 8, 2021,

Nature Reserves and Wildlife Management after the Sustainable Development Goals Period

SDGs後の自然保護区と野生動物管理. 鹿児島大学大学院連合農学研究科農学特別講義



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(Yokohama National University)



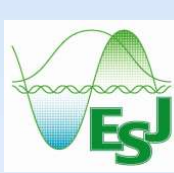
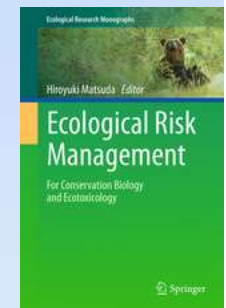
Past President (2011-12), Ecological Society of Japan

Past President , East Asian Federation of Ecological Societies

Japanese Coordinating Committee for MAB

MAB New Strategy Working Group

Urban Design Center @SEA (Yokohama)



Overview and Keywords

1. Protection of natural environment
 2. Sustainable use of natural resources
 3. SDGs – Environment, Economy, Society
Leave no one left behind
 4. Post SDGs – ?
Risk tolerant society
- Key Word: Risk-tradeoff, Sustainable development, "Man and the Biosphere" Programme, Zoonosis, Nature's contributions to people, Human-wildlife conflict, Triage,



Modified from
Masahito YOSHIDA

Protection, Conservation, Restoration: From wilderness to ecosystem services



Aldo Leopold
(1887-1948)



Rachel Carson
(1907-1964)



「自然の果報」
2016~
Nature's
Contributions
to People



1980~

Sustainable Development

1992~

Biodiversity

2005~

Ecosystem services

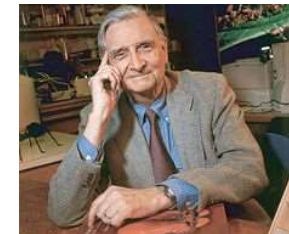
SDGs
2015~

19c ~

Protection
of wilderness



Edward O. Wilson
(1929-)



Protection

Conservation

Restoration

NWH

BR, Ramsar

NWH=Natural World Heritage
BR = Biosphere Reserve

Why do we promote “sustainable development” rather than “nature protection”?

Our ultimate goal is human well-being or happiness.

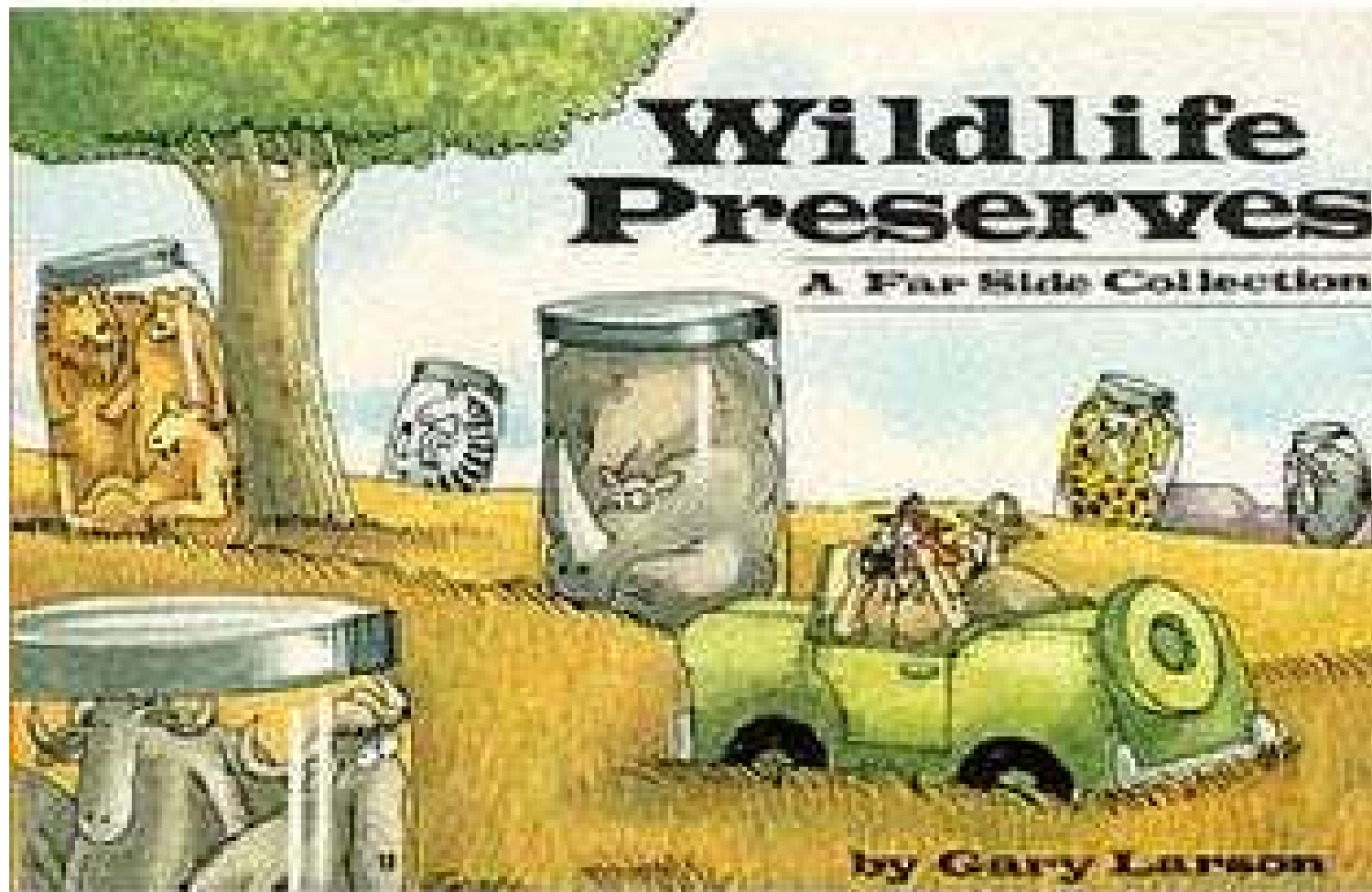


Nature protection (NP) is NOT a goal, but measures to achieve human well-being!

- Ecologists often says NP as goal and do not explain linking from NP to well-being, sometimes they exclude indigenous people from nature sanctuary.
- A Climate Change expert said, “It is an ecologist’s hobby”.



Preservation (Protection) vs. conservation



by Gary Larson (1989)





Le programme **MAB**
Vivre dans la biosphère et la protéger



UNESCO's Man and the Biosphere (MAB) Programme
Biodiversity conservation, sustainable and equitable use for human well being are at the heart of the programme since the 1970s.

BIODIVERSITÉ

CONSERVATION

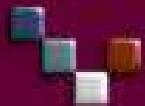
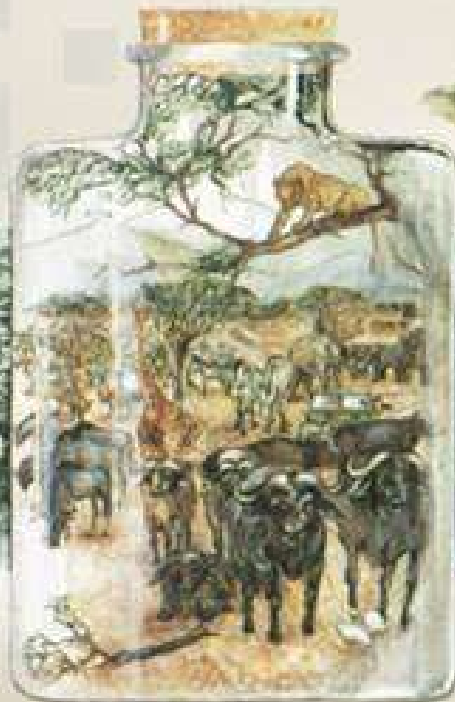
RECHERCHE

SURVEILLANCE
CONTINUE

ÉDUCATION

FORMATION

DÉVELOPPEMENT
DURABLE



Global fashion in nature conservation

1. Protection of nature (do not use primeval nature!)

- But human can live by using natural resources and natural capitals.

2. Conservation of nature (sustainable use) for the next generation

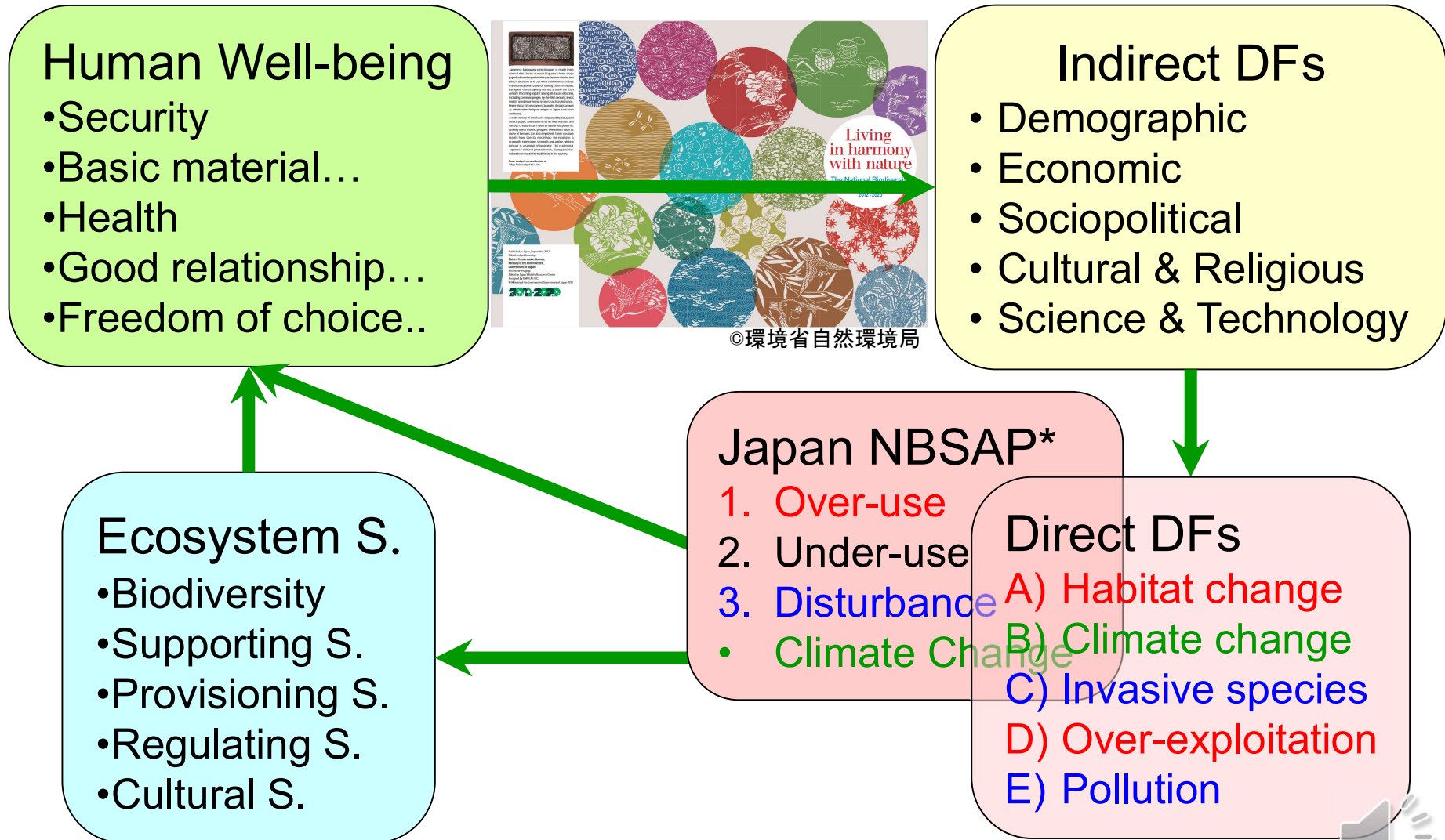
3. Education for Sustainable Development (ESD)

- Our goal is NOT to protect nature by foreign activities, BUT to **educate local people** who conserve local natural resources and arrange consensus building.
- Respect diversity in nature and culture (**biocultural diversity**)



Millennium Ecosystem Assessment (MA) scheme

National Biodiversity Strategy of Japan



*NBSAP = National Biodiversity Strategy & Action Plan

Why do I criticize the idea of ecosystem services?

- Not including under-use, *e.g.*,
 - Shift from self-sufficient agriculture to imports.
 - Fuel revolution before the depletion of wood biomass
 - Ban on bushmeat results in human-wildlife conflict
- Not including negative impact on people
 - We must know the awe of nature (disaster, disease, ...)
 - We must “manage” the sustainable use of natural resources, while complete control is not possible.
- I said in 2011, “The theory of ecosystem services may be extinct within 20 years.” (Invited talk at Japan Landscape Ecology Annual Meeting, 2011)



The end of the Oil Age

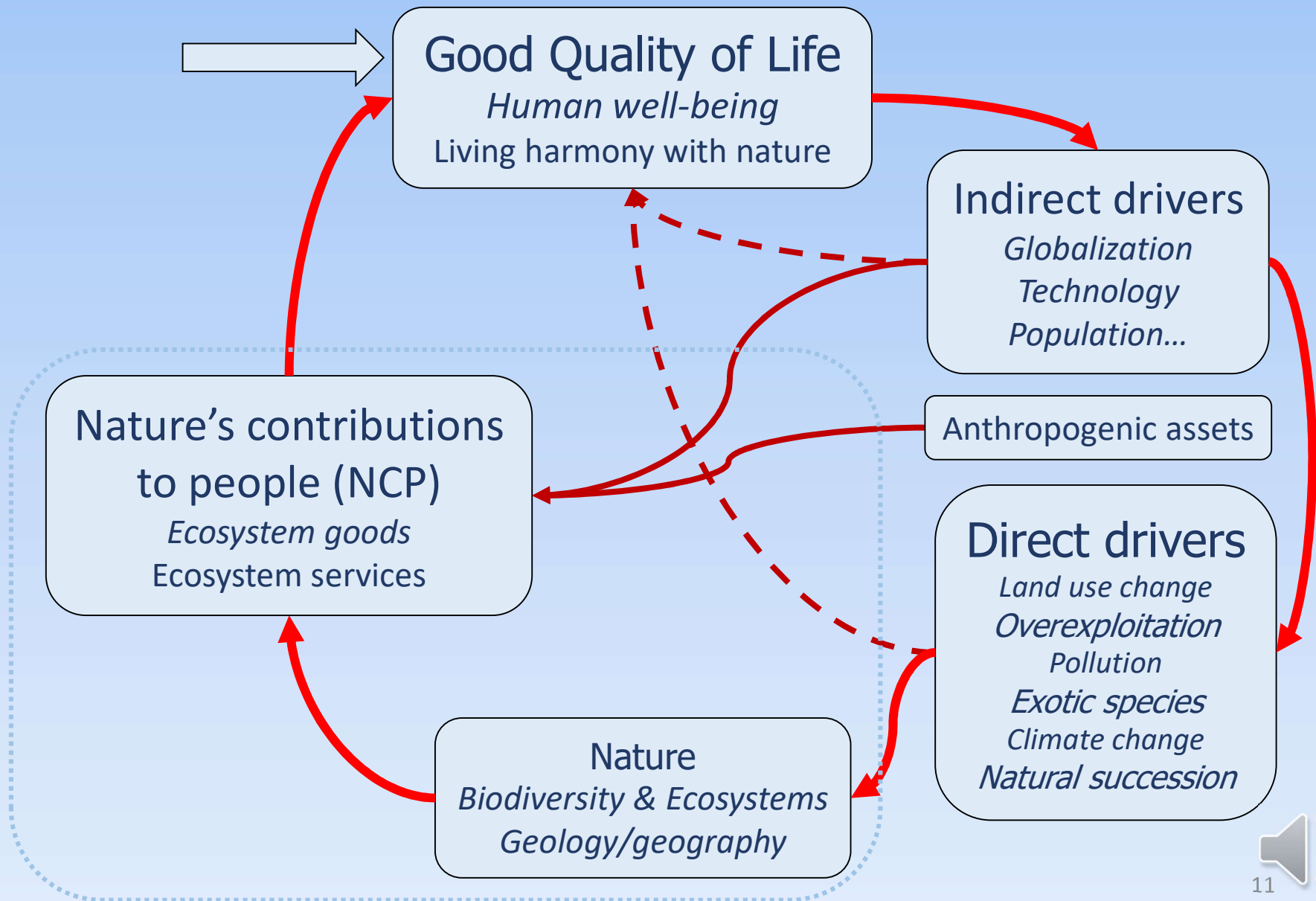
www.economist.com Oct 23rd 2003



- “The Stone Age did not end for lack of stone, and the Oil Age will end **long before** the world runs out of oil,” the quotation is from Sheikh Zaki Yamani, a past oil minister of Saudi Arabia (in 1970’s).
- Because he believes that something fundamental has shifted since that first oil shock. Finally, advances in technology are beginning to offer a way for economies, especially those of the developed world, to diversify their supplies of energy and reduce their demand for petroleum, thus loosening the grip of oil and the countries that produce it.

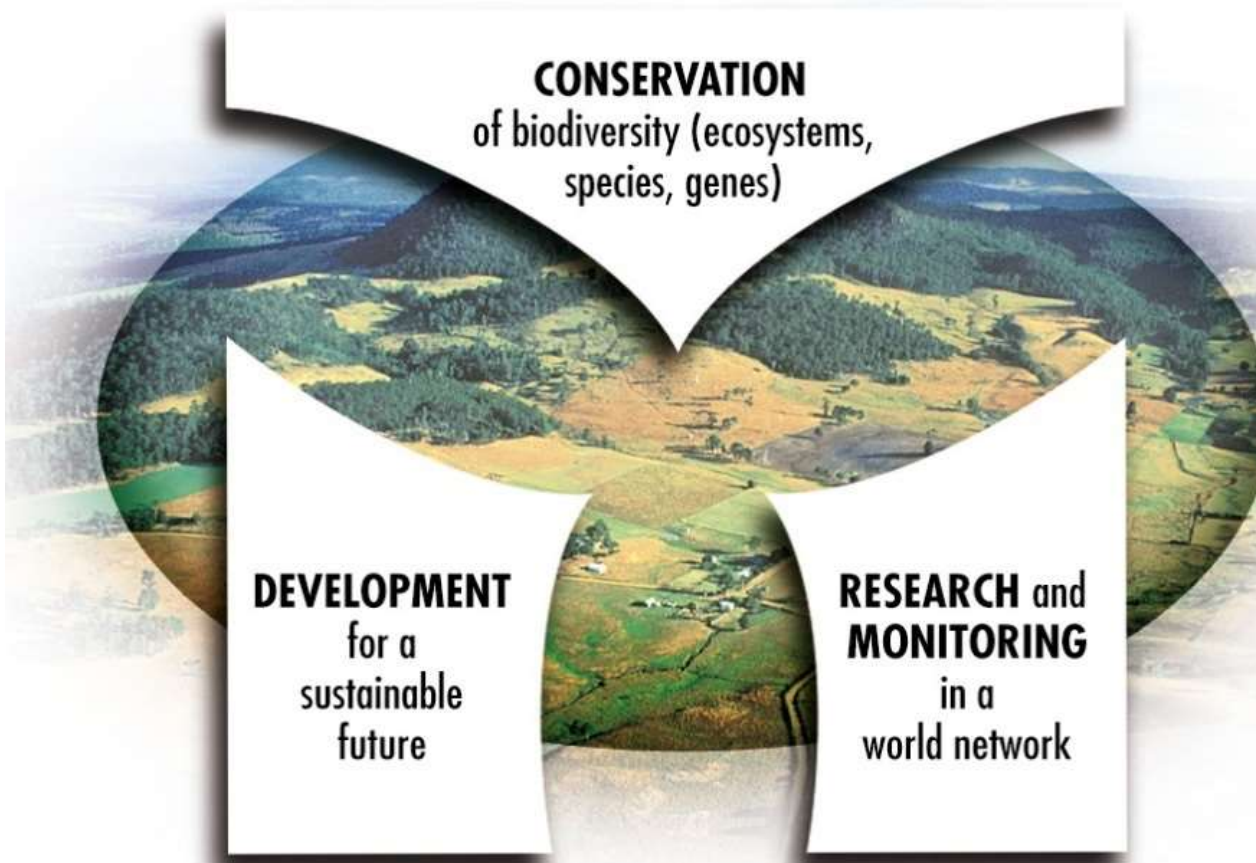


Why do we conserve nature?



MAB & World Network of Biosphere Reserves (WNBR)

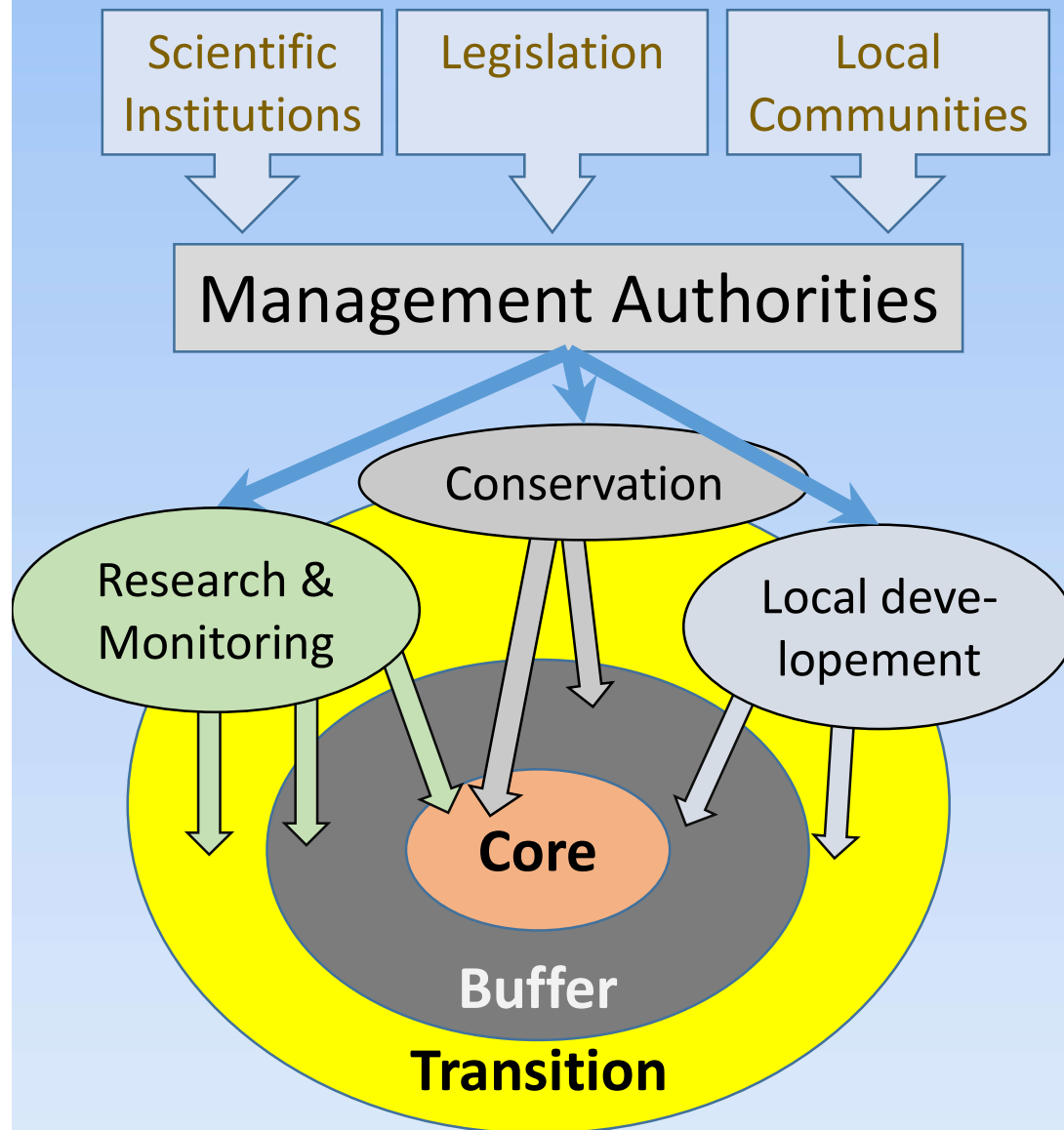
**Biosphere reserves: field tool for interdisciplinary
MAB work with a triple function:**



- Conserve biological *and* cultural diversity
- Propose *innovative approaches* to sustainable development
- Promote research, monitoring, *education and training*

Biosphere Reserves – Key Features

Modified from
Chung Il Choi



Zoning – means to meet the challenges of biodiversity management in multi-use areas with the objective of sustainable development.

Organizational/governance arrangements – enabling involvement of all actors in management and decision-making processes.

New forms of **institutional cooperation** and links between different levels of economic and political decision making.

Engagement of all the relevant stakeholders.



Zonings in Jeju Is., Korea



WORLD NETWORK OF BIOSPHERE RESERVES

RESEAU MONDIAL DES RESERVES DE BIOSPHERE
 RED MUNDIAL DE RESERVAS DE BIOSFERA
 WELTNETZ DER BIOSPHARENRESERVATE

2021-2022



727

Biosphere Reserves
 Réserves de biosphère
 Reservas de Biosfera
 Biosphärenreservate

131

countries
 pays
 países
 Staaten

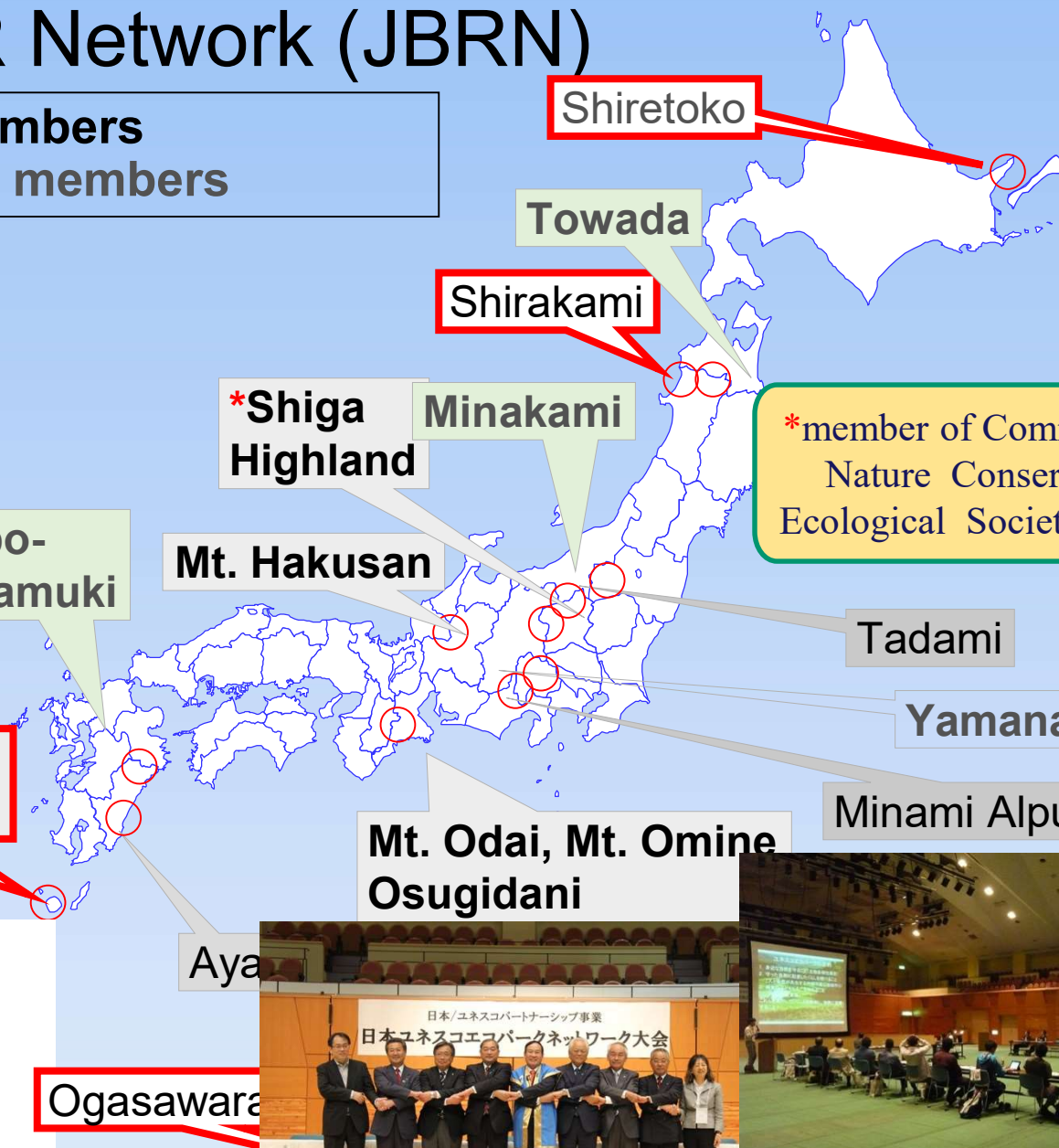


No.	Name	Country	Year	Category	Area (km²)	Population	UNESCO Code
1	Abisko	Sweden	1980	Geobotanical	1,100	10,000	001
2	Abisko	Sweden	1980	Geobotanical	1,100	10,000	002
3	Abisko	Sweden	1980	Geobotanical	1,100	10,000	003
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5	Abisko	Sweden	1980	Geobotanical	1,100	10,000	005
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7	Abisko	Sweden	1980	Geobotanical	1,100	10,000	007
8	Abisko	Sweden	1980	Geobotanical	1,100	10,000	008
9	Abisko	Sweden	1980	Geobotanical	1,100	10,000	009
10	Abisko	Sweden	1980	Geobotanical	1,100	10,000	010
11	Abisko	Sweden	1980	Geobotanical	1,100	10,000	011
12	Abisko	Sweden	1980	Geobotanical	1,100	10,000	012
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51	Abisko	Sweden	1980	Geobotanical	1,100	10,000	051
52	Abisko	Sweden	1980	Geobotanical	1,100	10,000	052
53	Abisko	Sweden	1980	Geobotanical	1,100	10,000	053
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99	Abisko	Sweden	1980	Geobotanical	1,100	10,000	099
100	Abisko	Sweden	1980	Geobotanical	1,100	10,000	100



Japanese BR Network (JBRN)

- ■ ■ JBRN members
- JBRN research members



*member of Committee for Nature Conservation, Ecological Society of Japan

□ World Natural Heritages Network

Yakushima-Kuchinoerabujima



UNESCO's MAB Programme encourages
Sustainable development in transition areas of BRs

Rhön BR (Germany)

A good model for sustainable
development using brand of
agricultural products in BR



Introduction to the Rhön Biosphere Reserve Strategies for Sustainable Regional Development in a Rural Area

Dr. Doris Pokorny, deputy coordinator
Rhön BR (Bavarian administration unit)

Biosphärenreservat
Rhön



Economic activities using natural resources



Suspension walking bridge approaching to wilderness area

Certification for ecosystem-oriented agricultural products

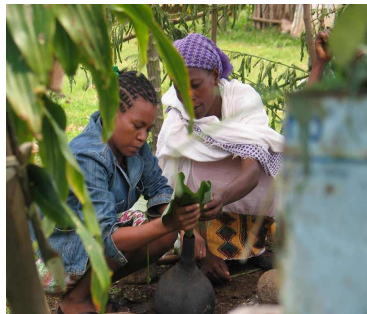
- Eco-tourism
- Organic agriculture
- Handicrafts



Lessons for human living in harmony with nature



Biodiversity and ecosystem services are central to economic, social and cultural development of local populations



A variety of Japanese food

Source: Kyoto Univ. ERC

Food Supply Service Dinner dishes at a hot spring inn

Vegetables: 25 kinds, Animals: 13 kinds, Mushrooms: 3 kinds or more **Total: 41 kinds or more**

Hot pot
ズワイガニ・ハクサイ・ミズナ
エノキダケ・ネギ・ダイズ・コムギ

Fried dish
エビ・ヤマイモ
シシトウ・レモン

Side dish (Refreshment)
ニワトリ・トマト・ダイコン
パセリ・サラダナ

Soup
イワシ・ネギ
ヤマイモ
シイタケ
ショウガ

Simmered dish
ダイズ
インゲンマメ
ニワトリ
サトイモ
キャベツ
カツオ

Miso soup
コムギ
ダイズ
シメジ
ミツバ
カツオ

Vinegared dish
ウシ
イネ
ダイコン

Pickles
ハクサイ
ノザワナ
コンブ
ニンジン
キュウリ

Dessert
ダイコン
ブルー
ベリー
ミント



Relish
サケ・エビ
ショウガ

Appetizer
ホヤ・コンブ・シメジ
メンタイ・ダイズ

Aperitif
ウメ

Sashimi
マグロ・タイ・アマエビ
ホタテ・シソ・ダイコン

Plant as medicine



Spikenard

Headache/
Toothache



Schizocodon soldanelloides
var. *magnus*

Gastroenteritis



Dogtooth violet

Cold/Diarrhea



Eastern Skunk Cabbage

Insect bites



Osmunda japonica

Diuresis/
Anemia



Vitex rotundifolia

Nutritional
fortification



Hydrangea serrata
var. *megacarpa*

Cold/
Defervescence



Lindera umbellata
var. *membranacea*

Gastritis/
Enteritis



Dianthus superbus var.
longicalycinus

Diuresis



Cymbidium goeringii

Chapped skin



Willow-leaved magnolia

Empyema



Camellia rusticana

Stomachic prosperity/
Intestinal regulation



Corydalis ambigua

Stomachache/
Gastric pain



Gastrodia elata

Headache



Stachyurus praecox

Diuresis



Daylily

Cold



Japanese Rowan

Scabies/
Heat rash



Hamamelis japonica var.
obtusata

Hemorrhoids/
Eczema



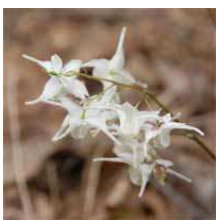
Gentiana triflora
var. *japonica*

Anorexia



Patrinia scabiosifolia

Diarrhea



Epimedium
sempervirens

Nutritional
fortification



Field Horsetail

Diabetes



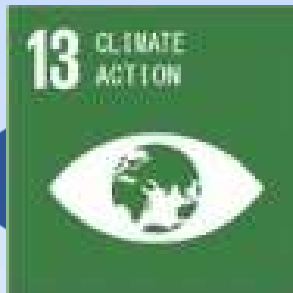
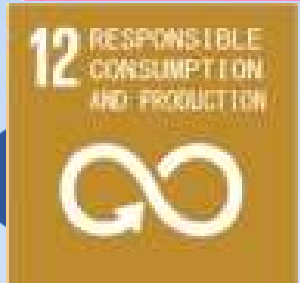
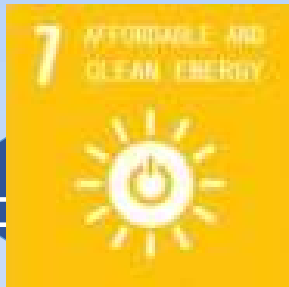
Far East Amur adonis

Cardiac
stimulant



Scabiosa japonica

Prevention from
cerebral thrombosis



UN SDGs (Sustainable Development Goals)



The trouble when a Maasai boy was killed by a buffalo and an officer from the KWS [Kenya Wildlife Service] blamed the killing on the Maasai [in 2012].

- ...the Maasai receive only a small proportion of the revenue from the park, which covers 300,000 acres of the two million-acre Amboseli ecosystem, and most of the animals regularly move in and out of the unprotected areas where the Maasai live. On most nights, three quarters of Amboseli's elephant population will be outside the park, destroying crops and creating conflict with the surrounding human population.
- As we were going to press, order had been restored after the KWS called in reinforcements and community leaders ordered an end to the killing spree.



How to treat wildlife in developing and developed countries

Y. Iwai 『 Why do elephants attack our village? What does it mean to coexist with wild animals? 』(2017 in Japanese)



- "In Tanzania, only hunting ban was initiated, but then residents were forced to relocate,". "The Ikoma tribe, which originally did not hunt elephants, is also relocated."
Serengeti was a "human land" before becoming a "wild kingdom".



Dozens of people per year have been killed by elephants throughout Tanzania for about 10 years.

HEC = Human Elephant Conflict



Wakazi wa visiwa vya Buchosa Mwanza waaga kero ya usafiri.

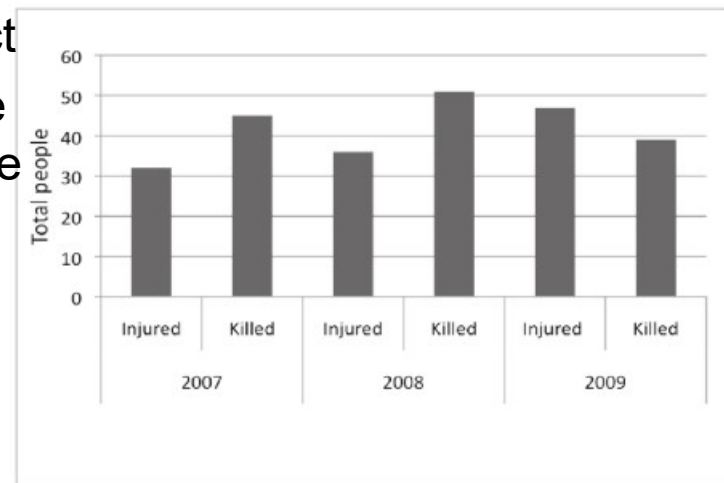
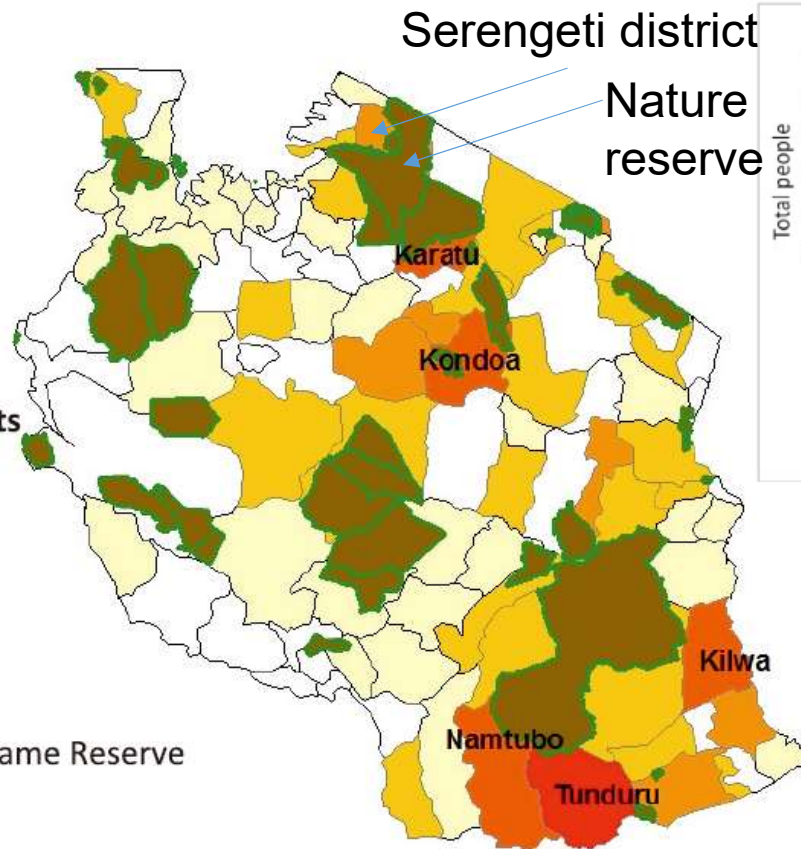
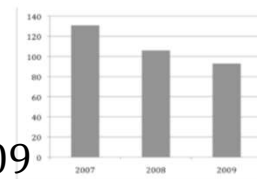


Figure 14. Reported human mortality and injuries caused by elephants, 2007-2009.

Figure 15. Human mortality and injuries caused by elephants, by district 2007-2009

Fig.16. Reported problem elephants shot, by year, 2007-2009

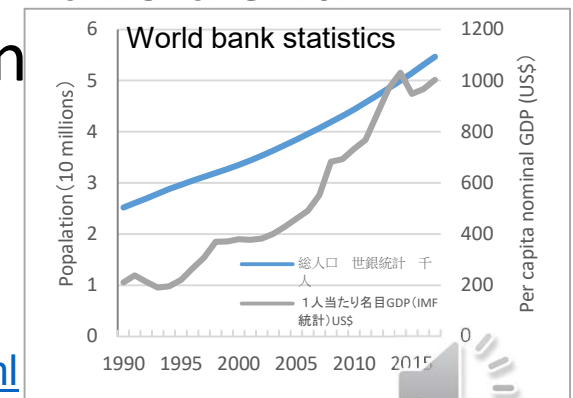


Tanzania Elephant Management Plan 2010

Q2 What is the reason for the decrease in areas where African elephants are decreasing?

- “poaching for ivory and meat has traditionally been said to be the main cause of African elephant decline, and illegal hunting remains a significant factor in some regions, especially in Central Africa.
- A bigger factor is the loss and fragmentation of the habitats due to rapid land development associated with population growth. Specific signs of this trend are reported to be an increase in human-elephant conflicts, which exacerbates the threat to elephant populations. *”

<https://www.globalnote.jp/post-2805.html>



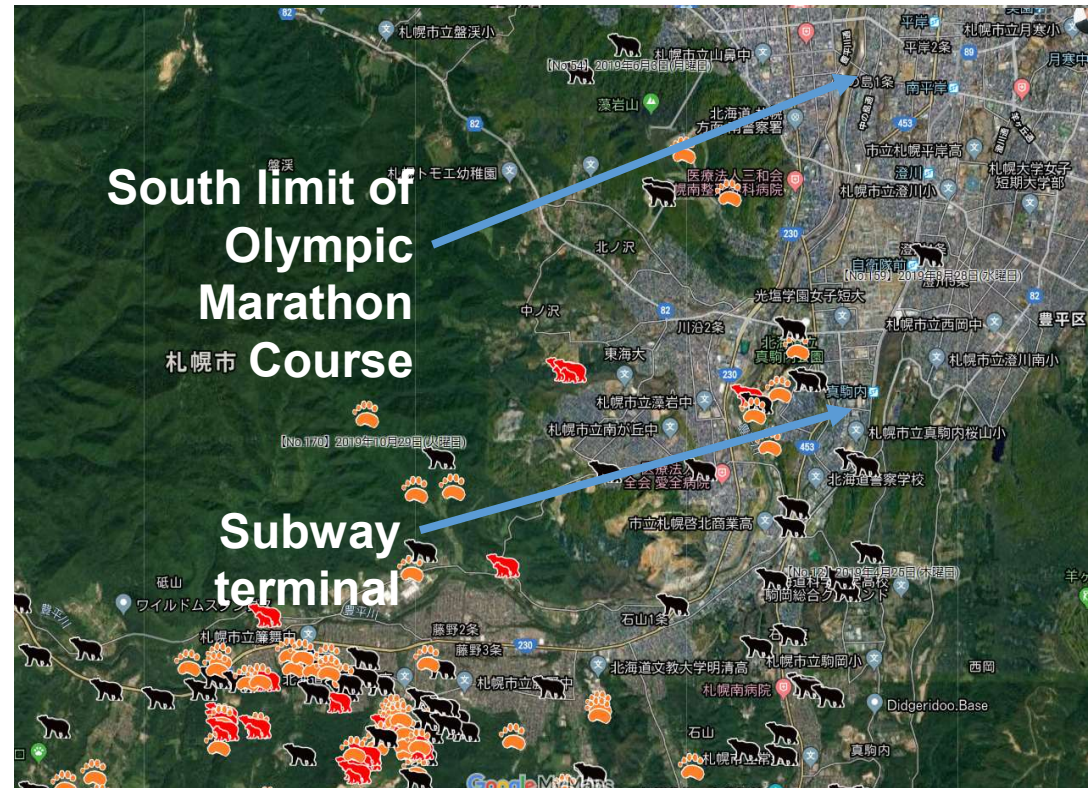
* IUCN Redlist <https://www.iucnredlist.org/species/12392/3339343#threats>

How do residents think of elephants?

- It is a pest animal that destroys farmland and tramples people
- Developed nations value elephants more than local people (if the Gov't have the budget to keep elephants alive, UNICEF fundraising will allow dozens of children to go to school.)
- The use of ivory of culled elephant is not allowed (The “north wind” policy)
- People are first, but local people cannot live without the gift of nature. I want to coexist with wild animals (The “Sun” Policy)
- Keep elephants away from farmland where elephants can easily get food (killing is the most realistic measures = elephants are wise and does not respond to iterated intimidation)



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 the their home range to avoid encountering brown bears", even where in residential urban areas.

最近の日本や欧米ではシカが増えすぎている



Department of
Environmental
Conservation

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.

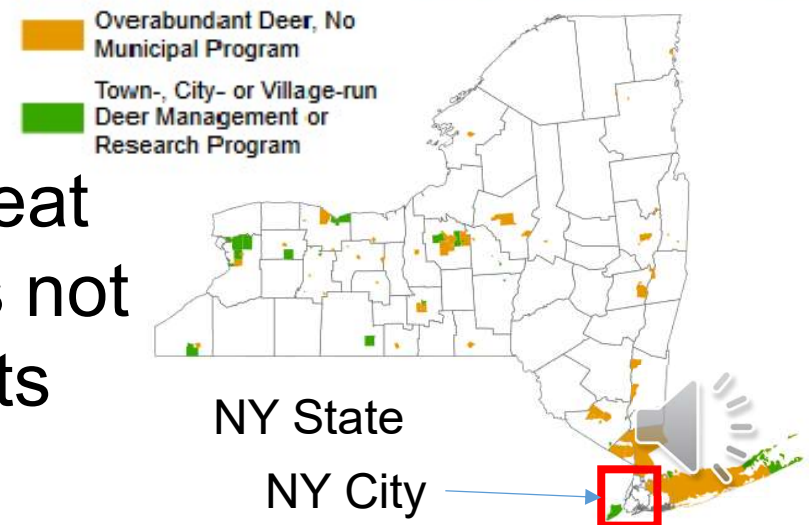
DEER MANAGEMENT IN URBAN AND SUBURBAN NEW YORK

A Report to the New York State Senate and Assembly

December 31, 2018



People kill deer and eat deer meat while NY mayor (≠ not state) says not to use ivory taken from elephants that kill people in Africa.



A logic of animal welfare & ethics

- Avoid lethal use of wild animals (most criticisms of ivory, tortoiseshell and whaling are from this perspective)
- eating livestock 🐷 → Vegetarians 🥕 🍼 from 1990s in USA → Recently Vegan diet 🥕 → (Future) reject orange from farms under nuisance control???
- Would you prefer farmland crops where wildlife was cleaned?
- People determine the scope of protection (It's humanism)
Monkeys 🐒 > dogs & cats 🐱 > deer & bears 🐻 > fish 🐟 > shrimp 🍤 > Sea Urchin 🌺 ...
- I respect for the diversity of personal values
← **Do not force your value on others** (cultural diversity)
- Bears are caught alive. ← A huge number, unrealistic. NYS also control deer by game hunting and culling.



Issues after COVID-19 pandemic

- Mainstreaming zoonotic disease control
- Popularity of animal welfare and vegetarianism
- Increase of **human-wildlife conflict** due to
 - Economic development in developing countries
 - Ban on hunting in developed countries
- poaching and illegal trade of endangered species
- Trophy hunting directly contributes to local economy

The poaching rate of African elephants has declined since 2011
Severin Hauenstein, Colin Bealeら、*Nature Communications* 2019

- Here we show that annual poaching rates in 53 sites (monitored by MIKE) strongly correlate with proxies of ivory demand in the main Chinese markets, whereas between-country and between-site variation is strongly associated with indicators of corruption and poverty.
- African elephant poaching since the early 2000s increased. Core populations both inside and outside protected areas decreased by 30% in seven years and the number of dead elephants found poached increased.
- Our analysis reveals a recent decline in annual poaching mortality rate from an estimated peak of over 10% in 2011 to <4% in 2017. Based on these findings, we suggest that continued investment in law enforcement could further reduce poaching, but is unlikely to succeed without action that simultaneously reduces ivory demand and tackles corruption and poverty.
- We suggest that improving law enforcement using conventional methods in many areas might reduce elephant poaching, but **reductions in poverty and corruption in communities neighbouring protected areas may have a greater effect and obvious additional benefits.**

African elephant poaching rates correlate with local poverty, national corruption and global ivory price

Severin Hauenstein^{1,2}, Mrigesh Kshatriya³, Julian Blanc^{3,4}, Carsten F. Dormann¹ & Colin M. Beale²

- The illegal trade in ivory, however, is complicated: certainly Chinese demand is important, but recently more large seizures of raw ivory were made in Thailand, with transit centres for shipping to other East Asian states such as Malaysia, the Philippines and Vietnam. Reducing demand has been seen as a crucial step in stemming poaching in Africa, yet the economics of illegal trade make this complicated: **trade bans and associated ivory seizures may even increase poaching incentives by causing price rises in elephant ivory²³.**

23 Biggs, D., Courchamp, F., Martin, R. & Possingham, H. P. Legal trade of Africa's rhino horns. *Science* 339, 1038 (2013).

Ban on wildlife use does not solve anything...

- "In 2018, Japan became the first CSF [swan fever] in 28 years and became infected with wild boars. Wild boars did not inhabit close to farms 28 yrs ago, control of the wild boar was not even ready [in 2018]. "Wildlife issues are lacking in policy makers' perception that humans and wildlife will last forever. We should switch fundamental recognition. (Shinichi Hayama 2020)
- H.M.: Recovery of wildlife will increase risks of human-wildlife conflict and zoonotic disease.

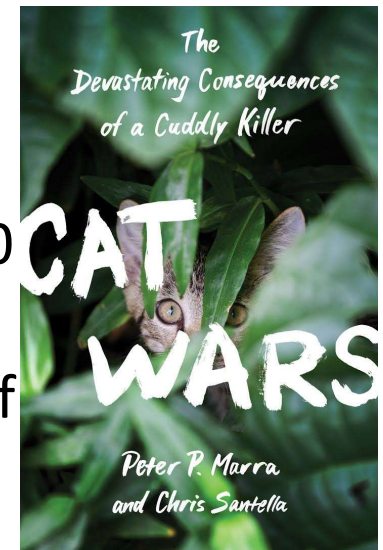
野生動物問題とはなにか

羽山伸一



“Cat wars” controversy

- The domestic cat is an alien predator in the “World's 100 Worst Invasive Alien Species”^{P35}. 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 bird-watchers and cat-lovers because wild cat 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. [The theory of nature conservation is still developing].



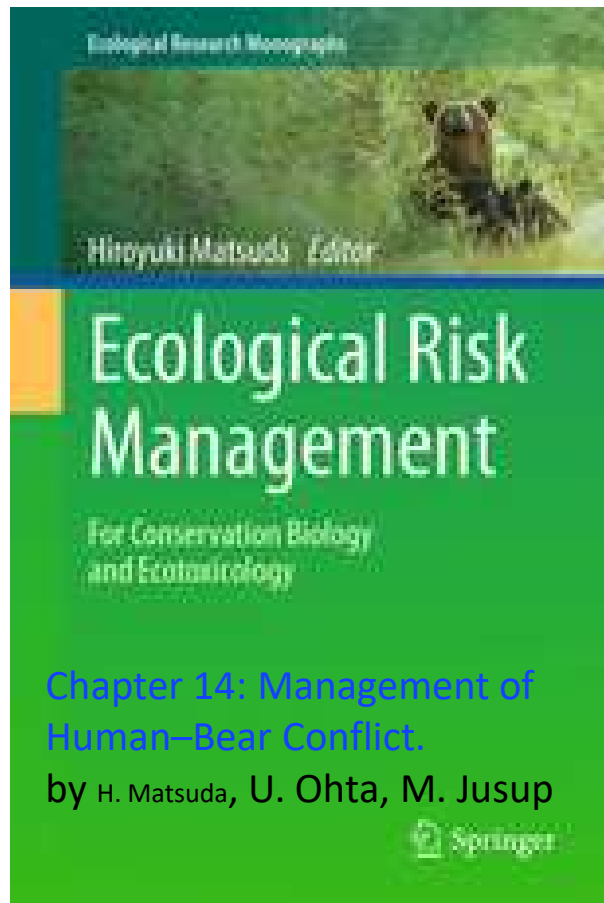
Basic concept of bear management

- “Good bears” avoid people, even if their home range includes highways and close to residential areas, which alone is not dangerous.
- Bears will not avoid people if they eat garbage left by people. “We have no choice but to remove fed bears.” “A fed bear is a dead bear” (Yellowstone National Park slogan*).
- Prevent wildlife from becoming nuisance.

People and bears are not friends, but can coexist by fearing each other (H.M.)



* http://www.yellowstone-bearman.com/B_housesafe.html



Biosphere consists of nature and people.

- “If farming is to coexist 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.**



My idea of “one-health”

- It is up to each person to decide what range of taxa to be protected, and this should be mutually respected.
- If the mountains are kept rich and there are no humans on the plains, many wild animals will live on the plains.
- If people think that eating vegetables grown on farmland free of wildlife damage is NOT really animal welfare.
- People and wild bears are not friends. They can only coexist if they fear each other.
- People are a part of the biosphere, and we not only use wildlife, but sometimes are used by wildlife.
- These idea are not only a matter of our view of nature, but a matter of management measures.



Ideas on post SDGs

- From “No one will be left behind” to “Accepting risk to seek sustainability as a member of the biosphere;
- Risk management of zoonosis, bushmeat use, and human-wildlife conflict as an integrated whole;
- View conservation and animal welfare as measures to human well-being;
- Respect cultural diversity among ethnics, which is based on biological diversity;
- Nurture young people who aim a sustainable society, rather than protecting nature with external forces;
- Understand and try to overcome the biological basis of gender, handicaps, and other diversity.



Exercises; based on scientific and socio-economic feasibility, consider and discuss on

1. The next development in animal welfare after veganism and decide conditions of bushmeat use.
2. Future vision of self-sufficiency of agricultural products and free trade.
3. How to manage risk of zoonosis and human-wildlife conflict at the same time.
4. How humans and wildlife can live separately, nature reserves, isolated human settlements, or others