

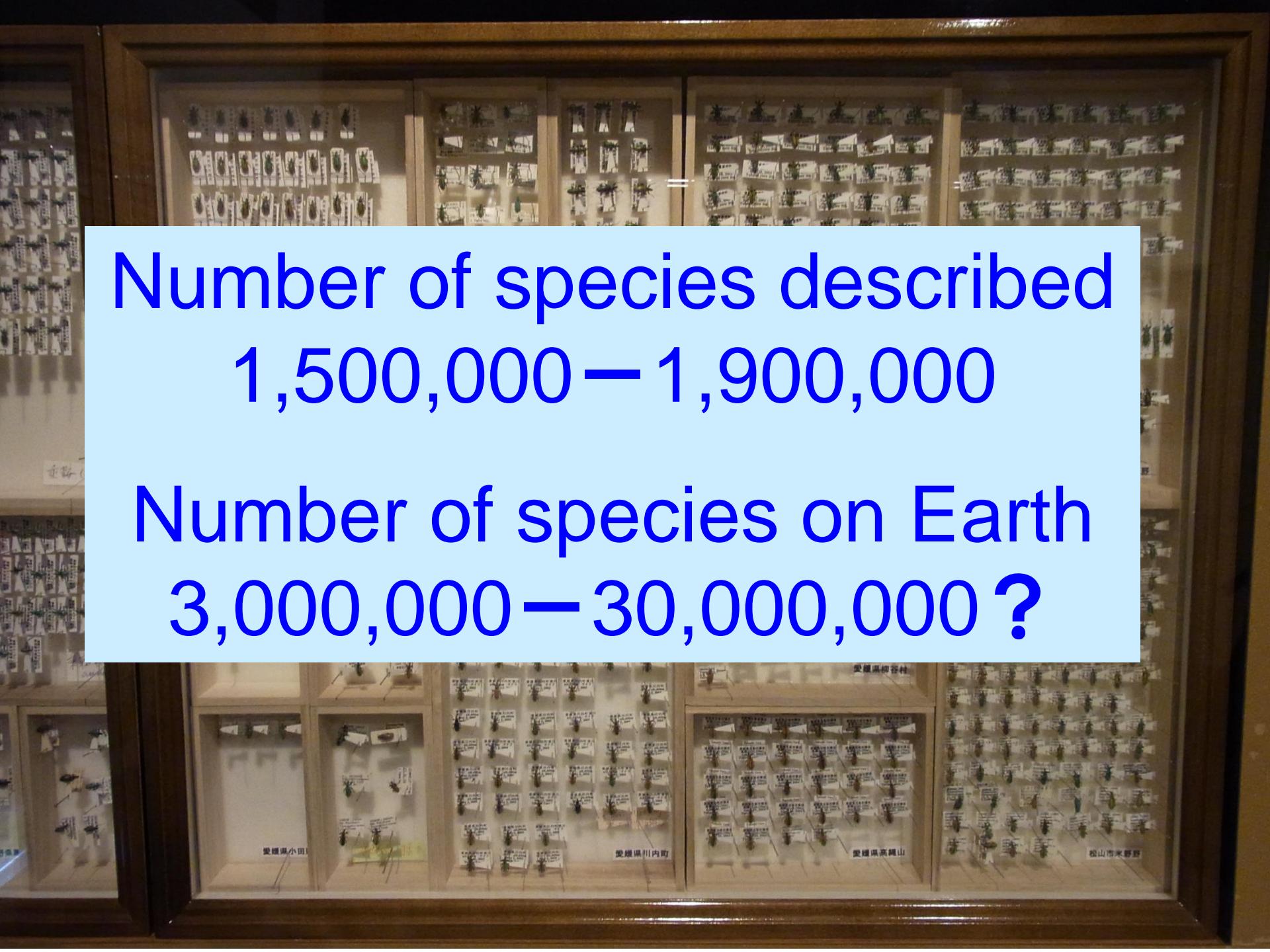
Biodiversity 2

Conservation and Management of Wildlife



"Biological diversity" means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

Convention on Biological Diversity, Article 2



Number of species described
1,500,000 – 1,900,000

Number of species on Earth
3,000,000 – 30,000,000 ?



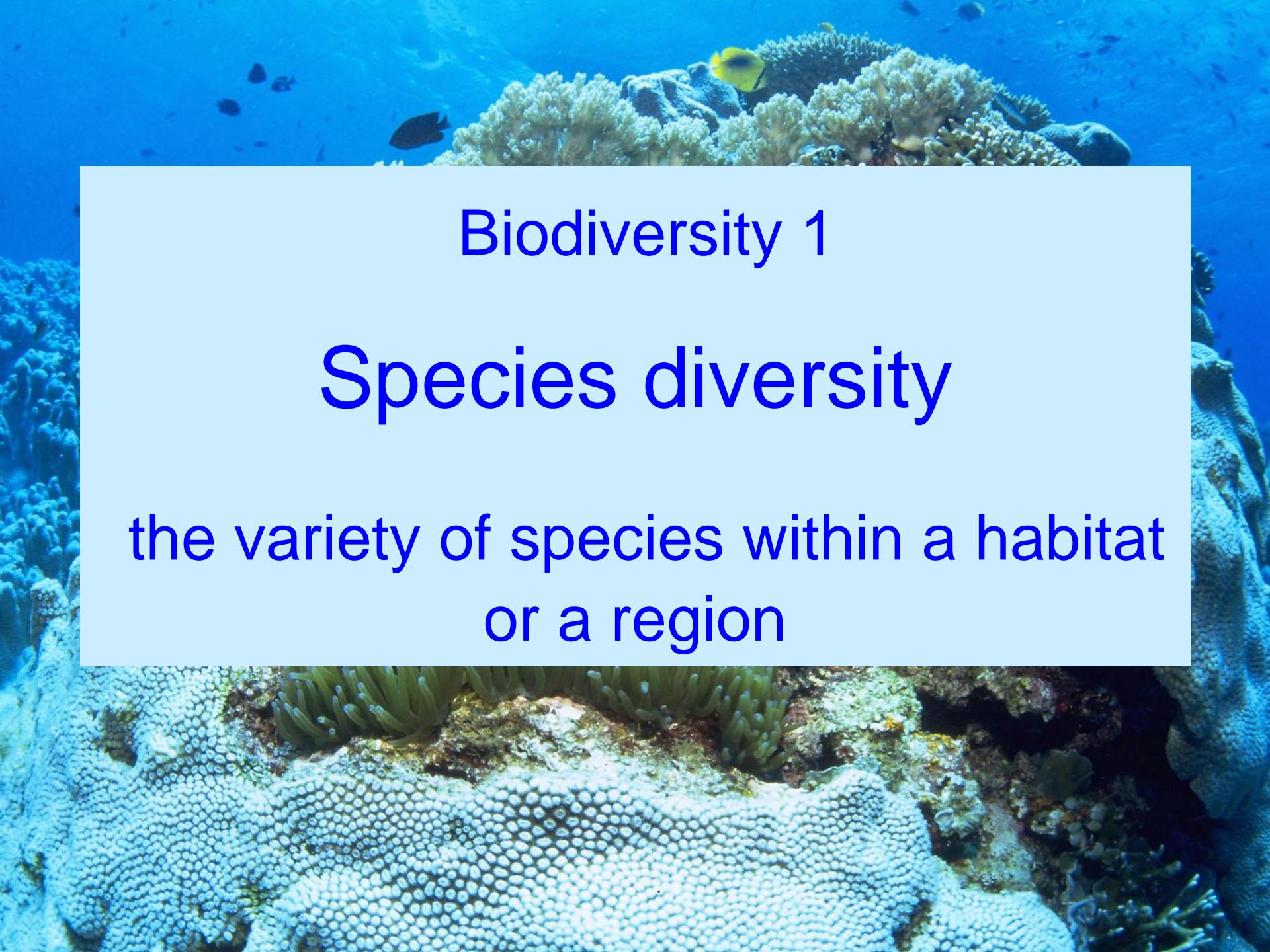
Recent estimates:

8.7 million \pm 1.3 million eukaryotic species
(Mora et al. 2011)

5 \pm 3 million, of which 1.5 million are named
(Costello et al. 2013)

There are a number of undescribed (undiscovered) species.





Biodiversity 1

Species diversity

the variety of species within a habitat
or a region

The background image shows a wide river with clear, greenish-blue water flowing from the bottom left towards the top right. The riverbank on the left is sandy and dotted with green bushes. In the distance, there are hills covered in dense green trees. The sky above is a clear, pale blue with a few wispy white clouds.

Biodiversity 2

Ecosystem diversity

the variety of ecosystems within an area

Biodiversity 3

Genetic diversity

the variety of genes within a species



Three levels of biodiversity

1. Ecosystem diversity
2. Species diversity
3. Genetic diversity

Healthy ecosystems with
high biodiversity provide
humans with various
benefits.

Ecosystem services

1. Provisioning Services:

Food, medical resources etc.

2. Regulating Services:

Purification of water and air, climate regulation etc.

3. Cultural Services

Motif in painting, religion, recreation, education etc.

4. Supporting Services:

Nutrient cycling, primary production, soil formation, habitat provision etc.



Biodiversity serves as a basis of the life and culture of human beings.

Biodiversity is rapidly declining worldwide



IPBES (Intergovernmental Science–Policy Platform for Biodiversity and Ecosystem Services)

May 2019

An average of around 25 per cent of species in assessed animal and plant groups are threatened (Figure SPM.3), suggesting that around 1 million species already face extinction

I

PBES (2019): Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science–Policy Platform on Biodiversity and Ecosystem Services.

Red List: An inventory of the conservation status of biological species

- IUCN Red List

- Species threatened with extinction: 30,178 (Dec. 2019)

- JAPAN (Ministry of the Environment Red List 2020)

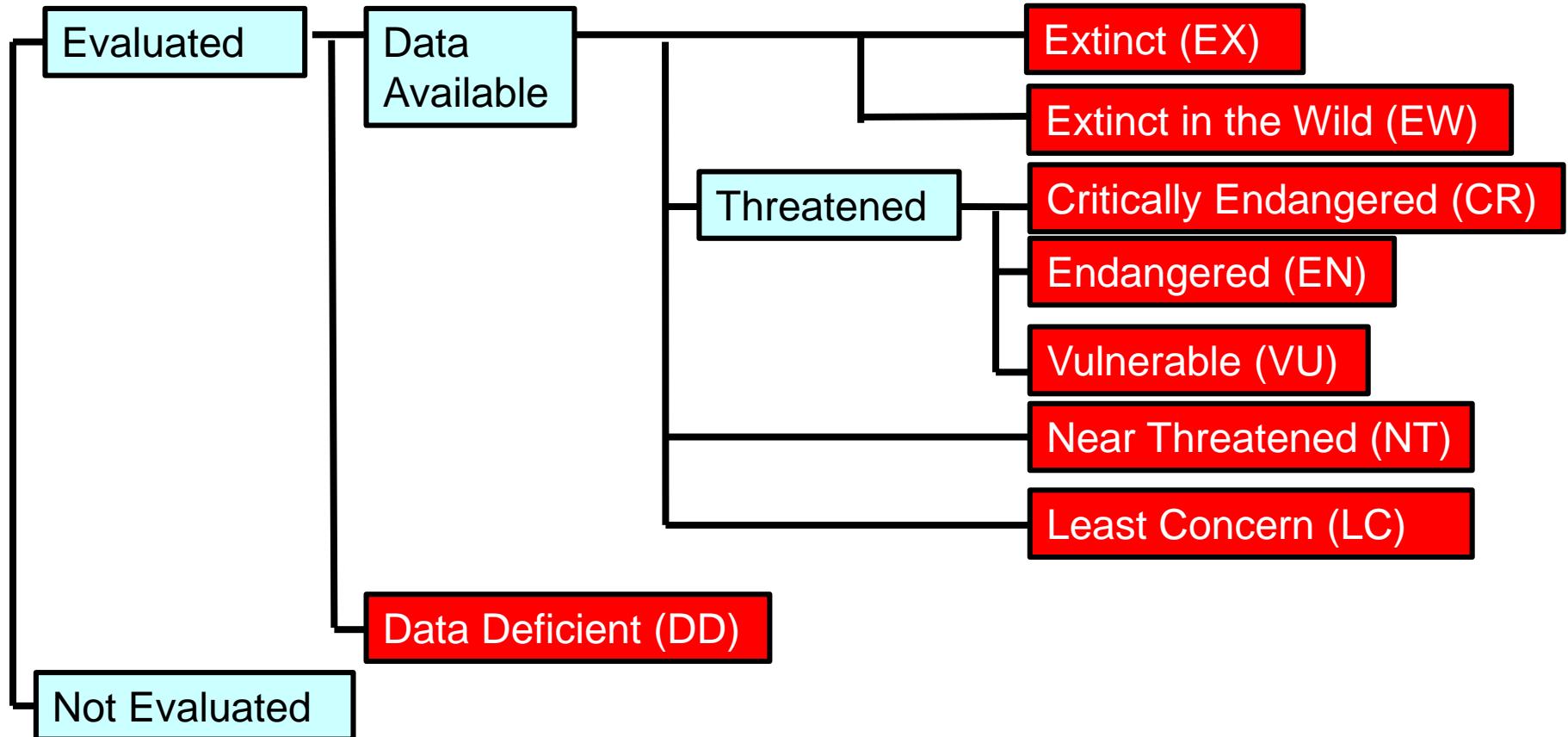
- Species threatened with extinction CR+EN, VU: 3,716

- Local governments

- Red Data Book Hiroshima 2021 (March 2022)

- Ex: 41 CR+EN: 272 Total number of listed species: 1161

The IUCN (International Union for Conservation of Nature) Red List Categories

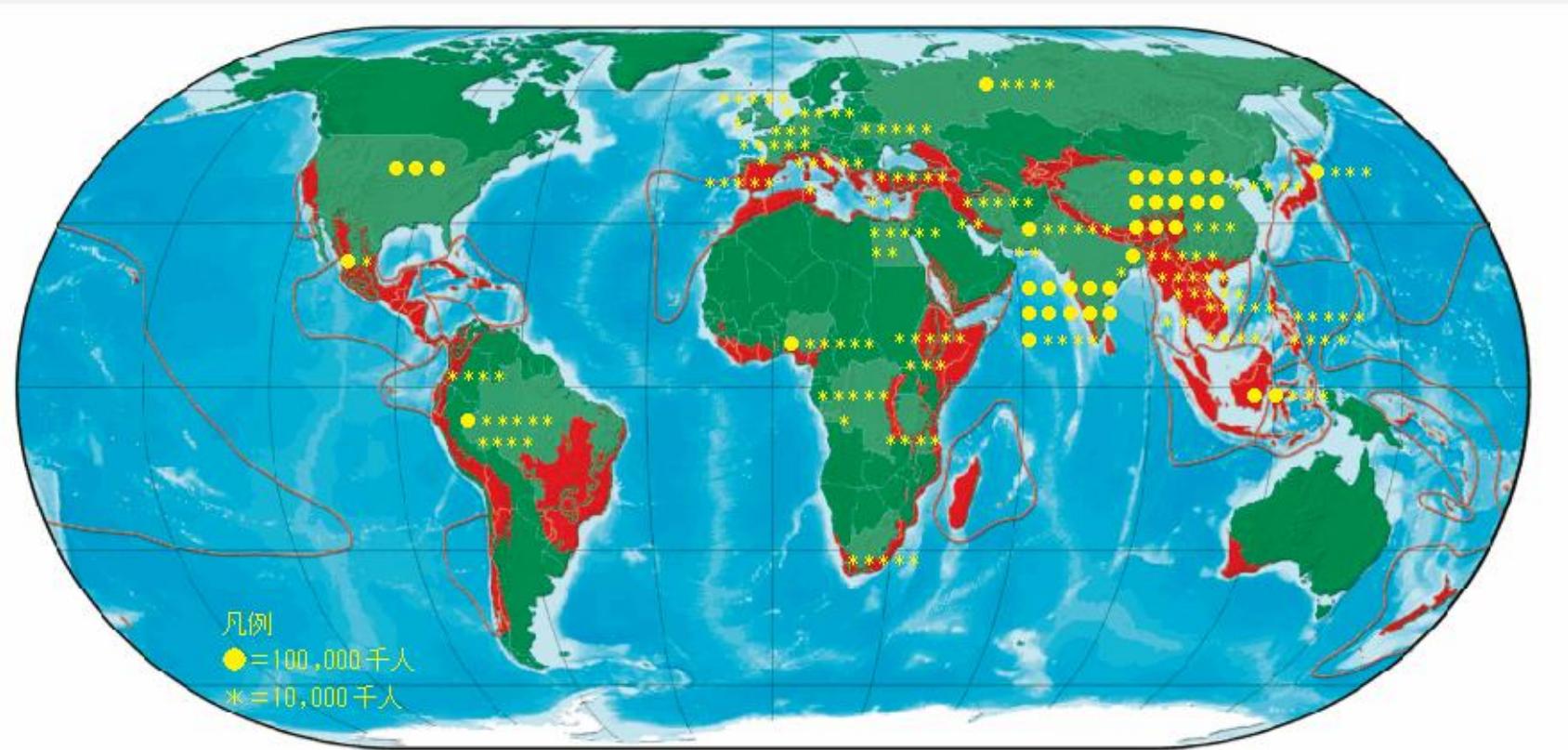


Causes of biodiversity loss

1. Habitat destruction and degradation
2. Overexploitation
3. Invasive alien species
4. Climate change
5. Others, unknown

Hot Spot: a biogeographic region with significant levels of biodiversity that is threatened by human habitation

図3-3-2 ホットスポットと人口集中地域

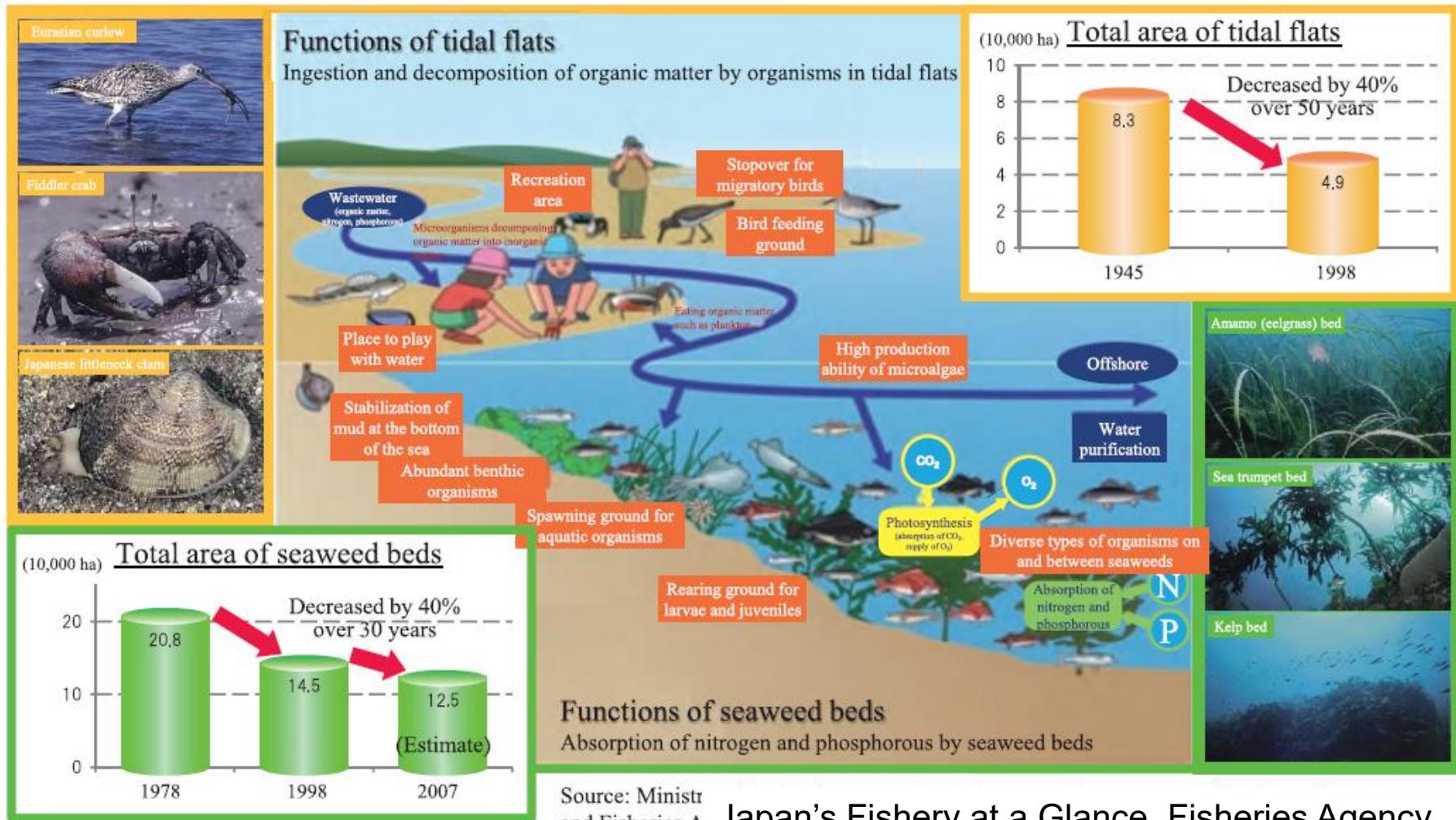


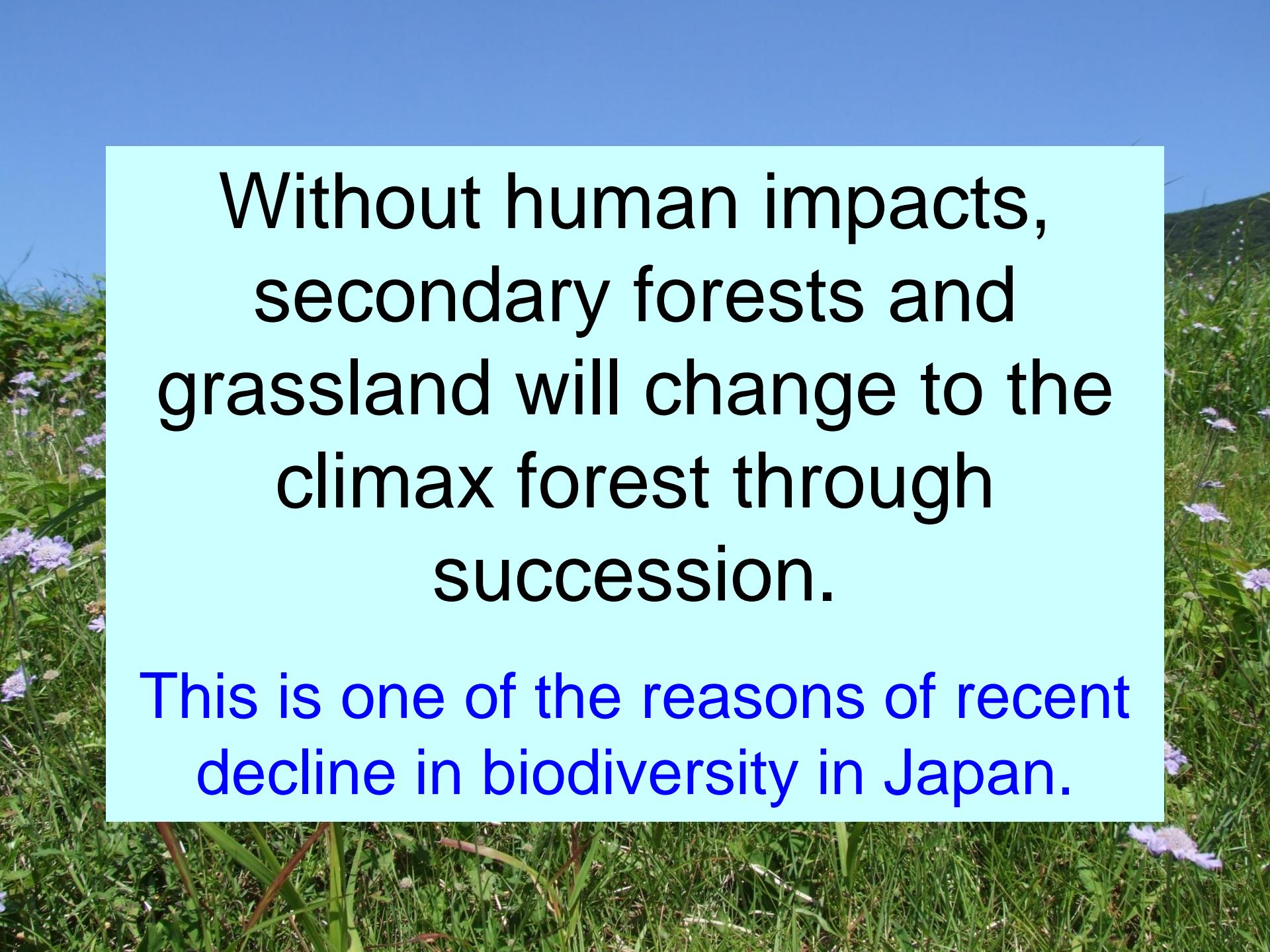
注: 人口集中地域／世界の人口上位30か国（中国、インド、アメリカ、インドネシア、ブラジル、パキスタン、バングラデシュ、ナイジェリア、ロシア、日本、メキシコ、フィリピン、ベトナム、ドイツ、エジプト、エチオピア、トルコ、イラン、タイ、コンゴ、フランス、英国、イタリア、ミャンマー、南アフリカ、韓国、ウクライナ、スペイン、コロンビア、タンザニア）

資料: コンセベーション・インターナショナル資料 (www.conservation.or.jp) より環境省作成

The areas of sea weed beds and tidal flats have decreased substantially due to development of coastal areas.

The areas of seaweed beds and tidal flats, which are grounds for fish spawning and growth as well as places that have water purification capabilities, have decreased substantially due to such reasons as development of coastal areas.





Without human impacts,
secondary forests and
grassland will change to the
climax forest through
succession.

This is one of the reasons of recent
decline in biodiversity in Japan.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) ワシントン条約

An international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. The species covered by CITES are listed in three Appendices: according to the degree of protection they need.

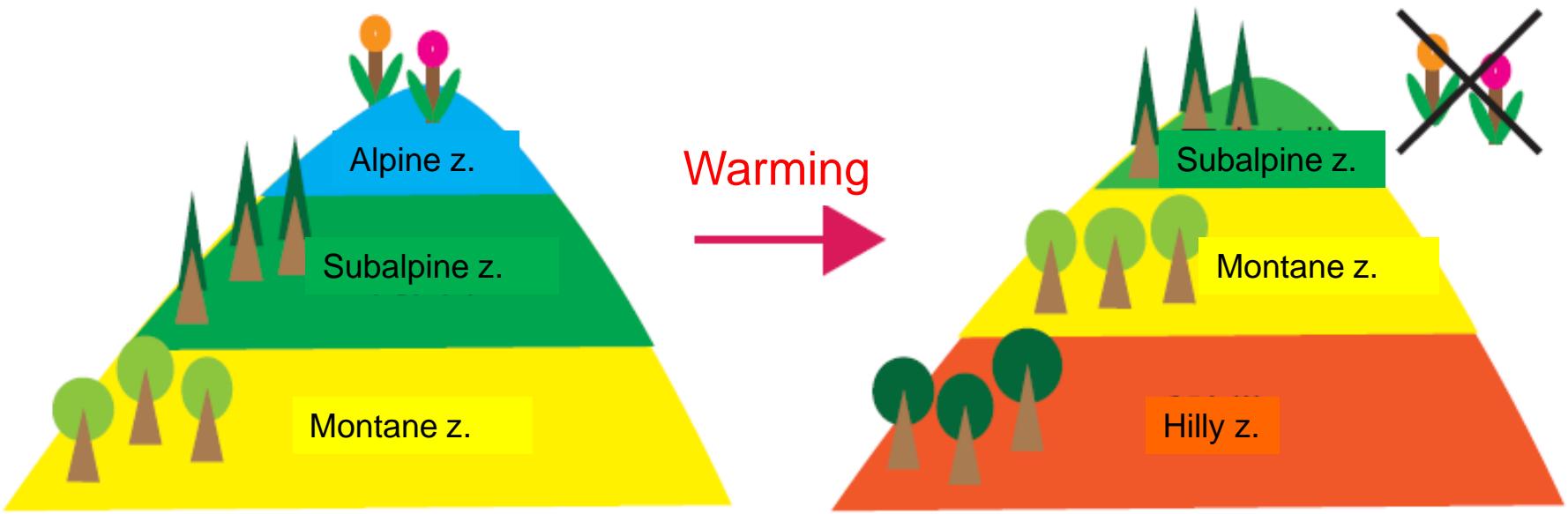
The species covered by CITES are listed in three Appendices: according to the degree of protection they need.

	Appendix I	Appendix II	Appendix III
Listing criteria	<p>Species that are threatened with extinction. Trade in specimens of these species is permitted only in exceptional circumstances.</p>	<p>Species that are not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival</p>	<p>Species that are protected in at least one country, which has asked other CITES Parties for assistance in controlling the trade.</p>
Details of control	<ul style="list-style-type: none">• Trade for scientific research purposes is allowed.• Import and export permissions from both destination and originating countries are required.	<ul style="list-style-type: none">• Trade for commercial purposes is allowed.• Export permission issued by the government of an originating country is required.	<ul style="list-style-type: none">• Trade for commercial purposes is allowed.• Export permission or a certificate of origin issued by the government of the originating country is required.
Example of controlled species	<p>Orangutans, slow lorises, gorillas, Asian arowanas, giant pandas, <i>Saussurea radix</i>, false gharials, sea turtles, etc.</p>	<p>Bears, hawks, parrots, lions, pirarucu, corals, cactus, orchids, spurge, etc.</p>	<p>Walruses (Canada), alligator snapping turtles (the United States), kolinsky (India), corals (China), etc.</p>

The Invasive Alien Species Act
was enforced in June 2005.

156 of Invasive Alien Species
(November 2020)

Breeding, cultivation, storage, transportation,
and transfer of these species are prohibited.



Climate change is the biggest threat to same alpine plants.

Convention on Biological Diversity (CBD) 生物多様性条約

was adopted in 1992 and entered into force
in December 1993.

It represents a dramatic step forward in:

- ① The conservation of biological diversity
- ② The sustainable use of its components
- ③ The fair and equitable sharing of benefits arising from the use of genetic resources (ABS: Access and Benefit Sharing)

Developing countries (South)

High biodiversity
(Bio-resources)

Traditional medical
knowledge

Developed countries (North)

Technology

Money

Sales channel
and Market



Biopiracy

Unethical or unlawful appropriation or commercial exploitation of biological materials or traditional knowledge of developing countries without providing fair financial compensation to the countries.

The 10th meeting of the Conference of Parties (COP10) to the Convention on Biological Diversity was held in Nagoya.

October 18-29, 2010



写真提供:日本政府

NAGOYA PROTOCOL 名古屋議定書

NAGOYA PROTOCOL
ON
ACCESS TO GENETIC RESOURCES AND
THE FAIR AND EQUITABLE SHARING OF
BENEFITS ARISING FROM THEIR
UTILIZATION TO THE CONVENTION ON
BIOLOGICAL DIVERSITY

NAGOYA PROTOCOL名古屋議定書

Article 1 OBJECTIVE

The objective of this Protocol is the fair and equitable sharing of the benefits arising from the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding, thereby contributing to the conservation of biological diversity and the sustainable use of its components.

第1条 目的

この議定書は、遺伝資源の利用から生ずる利益を公正かつ衡平に配分し（遺伝資源及び関連のある技術についての全ての権利を考慮に入れた上で当該遺伝資源の取得の適当な機会及び当該関連のある技術の適当な移転並びに適当な資金供与によって配分することを含む。）、これによつて生物の多様性の保全及びその構成要素の持続可能な利用に貢献することを目的とする。

NAGOYA PROTOCOL名古屋議定書

Article 5 FAIR AND EQUITABLE BENEFIT-SHARING

1. In accordance with Article 15, paragraphs 3 and 7 of the Convention, benefits arising from the utilization of genetic resources as well as subsequent applications and commercialization shall be shared in a fair and equitable way with the Party providing such resources that is the country of origin of such resources or a Party that has acquired the genetic resources in accordance with the Convention. Such sharing shall be upon mutually agreed terms.

第5条 公正かつ衡平な利益の配分

1 遺伝資源の利用並びにその後の応用及び商業化から生ずる利益は、条約第15条3及び7の規定に従い、当該遺伝資源を提供する締約国（当該遺伝資源の原産国であるもの又は条約の規定に従って当該遺伝資源を獲得した締約国であるものに限る。）と公正かつ衡平に配分する。その配分は、相互に合意する条件に基づいて行う。

名古屋議定書締結!

…研究者にも何か関係があるの?

海外からの生物サンプル(遺伝資源)の無断持出は、あなたの研究の継続、推進に大きなリスクとなります。

無断で
持ち出すと
最悪の場合

- 提供国で逮捕される
- 研究が差し止められる
- 研究費申請が受理されない
- 発表論文が承認されない

こんなことが
起こるかも
しません!

こんな場合には注意が必要です!

海外での生物サンプルの採取

生物サンプル採取に対しては各国の法令があり、事前の許可が必要です。採取前に遺伝研ABS対策チームにご相談ください。



外国人留学生による生物サンプルの持ち込み

留学生や訪問研究員が自國の生物サンプルを、自ら日本に持ち込み、研究を行う場合も生物多様性条約の対象となります。



海外の生物サンプルの持ち込み

海外の生物はその国の財産です。生物サンプルを無断で国外に持ち出すと罰に問われる可能性があります。



海外の生物サンプルの購入や受け取り

海外の共同研究者から生物サンプルを送付された場合や、日本国内で購入した外国由来の商品も、生物多様性条約の対象になる可能性があります。



海外生物サンプルの取得や研究には、生物多様性条約と名古屋議定書に基づくABS手続きが必要です。

ABS : Access and Benefit Sharing
遺伝資源の取扱いの権利及びその利用から生ずる利益の公正かつ適切な配分

遺伝研ABS学術対策チームまでご相談下さい。

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国立遺伝学研究所
知的財産
ABS学術対策チーム



大学共同利用法人
情報・システム研究機構
国立遺伝学研究所

NBRP

ナショナル
バイオリソース
プロジェクト



国立研究開発法人
日本医療研究開発機構

The River Low

- 1) Flood control
- 2) Water utilization (irrigation)
- 3) Maintenance and conservation of river environments (water quality, landscape, ecosystem etc.) 1997

The Law for the Promotion of Nature Restoration

was instituted in 2003.

This law:

- 1) seeks to restore lost or deteriorated ecosystems.
- 2) employs a bottom-up approach in which regional committees conceive and plan projects.
- 3) makes adaptive management the basis of project implementation.

An example of river restoration program (nature-rich river works)



Works for nature restoration cost a lot of money.

It is important to gain taxpayer acceptance for the use of taxes



写真 5,6 : 植生付ヤシマット（ヨシ、マコモ）による再補修（1999）。この補修で低水路水際部はほぼ安定。



Oriental White Stork コウノトリ

The last individual of the Japanese population of
Oriental White Stork died in 1971.



Reintroduction of artificially-bred individuals is a last resort.

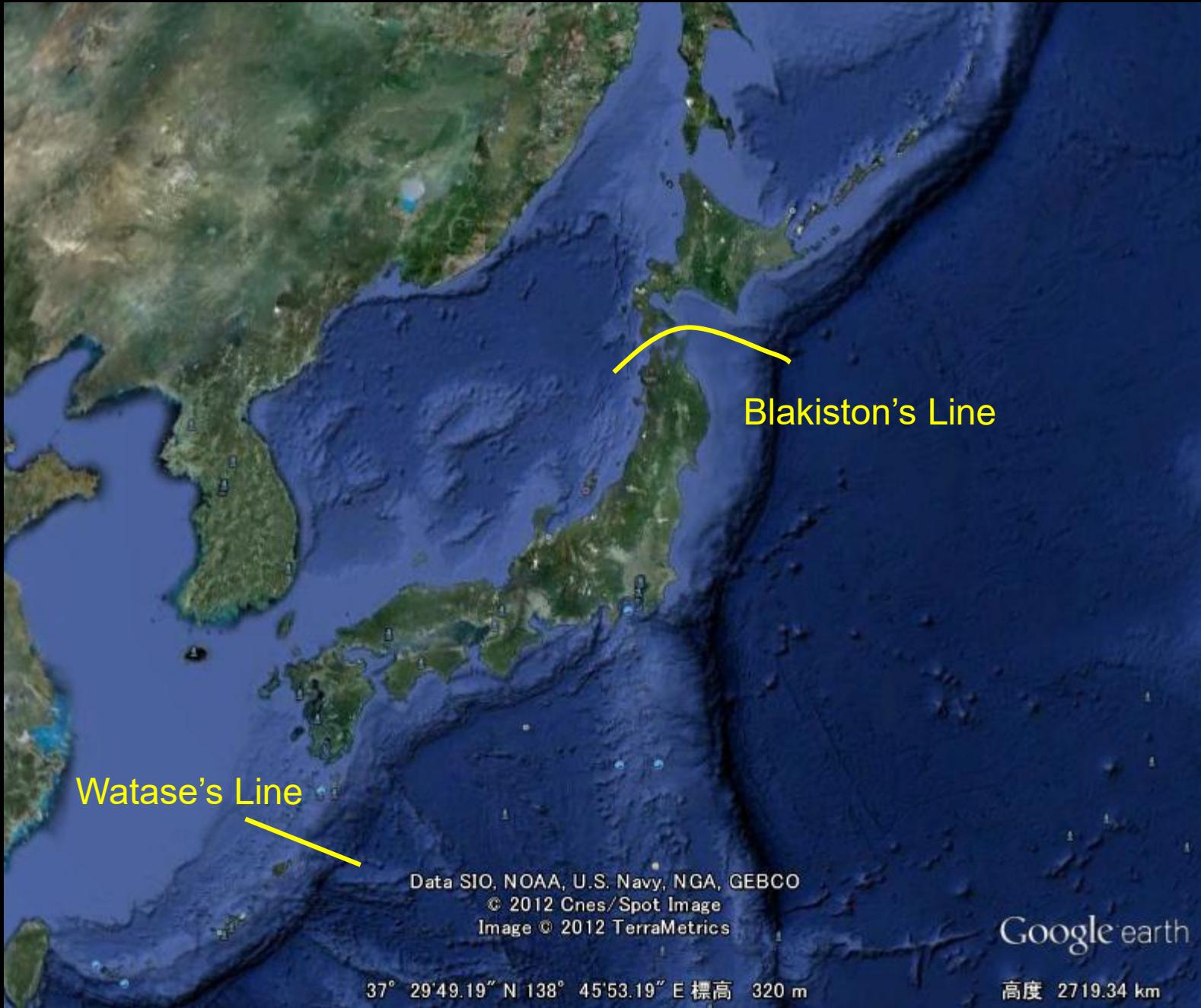
It is critically important to avoid extinction of the natural population by conserving its habitat.

There are 109 native mammals living in Japan.

Of these, 42 species are endemic to Japan.

Populations of some wild animals are rapidly increasing with the expansion of their habitats, which has caused serious damage to the ecosystem, agriculture, forestry, and the living environment.





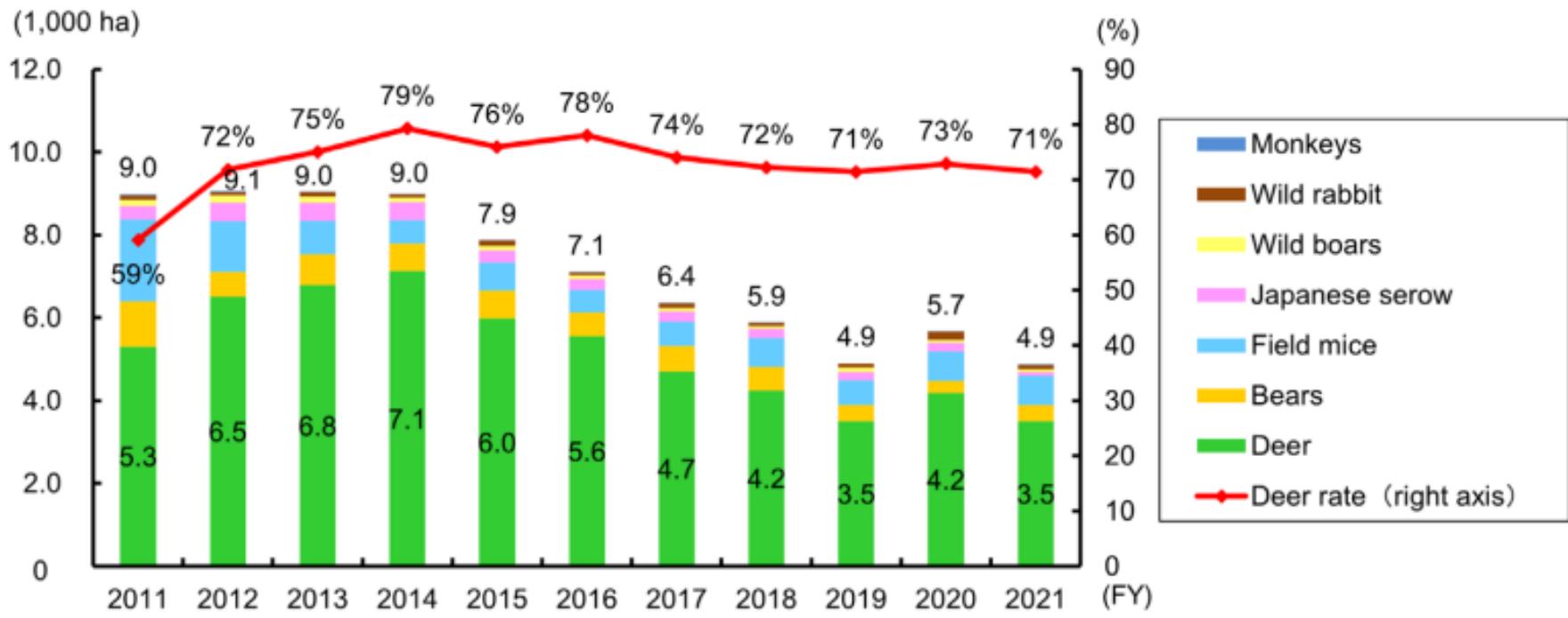


Brown bear (*Ursus arctos*) ヒグマ



Japanese black bear (*Ursus thibetanus*)

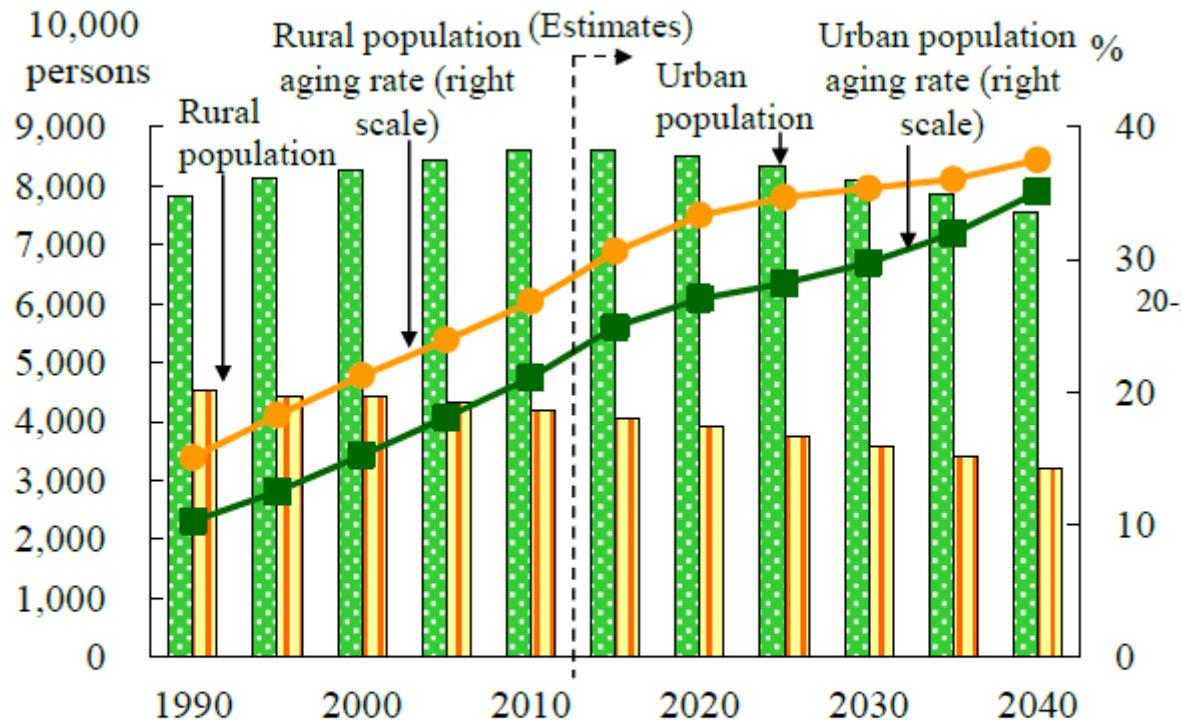
Forest damage by wildlife is still serious though it is decreasing. In FY2021, about 4,900 ha of forests were damaged by wildlife, about 70% of which was caused by deer (Fig. I-6).



Source: Survey by Forestry Agency

Fig. I-6 Area of forests damaged by major wildlife species

Population and aging trend and outlook in rural and urban areas



Sources: Estimated by MAFF based on MIC, "Population Census;" National Institute of Population and Social Security Research, "Estimates of Japan's Future Population by Region (estimated in March 2013)"

Note: Urban areas are densely inhabited districts as specified in the "Population Census" and rural areas are other districts.

Environmental issues including conservation and management of wildlife are deeply involved with social issues.

We must address these issues with a broad perspective.