

JAPAN BIODIVERSITY OUTLOOK

日本の生物多様性総合評価

Assessment and indicator on biodiversity

生物多様性の指標と評価

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Background 背景

Global level グローバルレベル

2001-2005 Millennium Ecosystem Assessment
ミレニアム生態系評価

2002 Adopted 2010 target
2010年目標の採択

2006 GBO2

National level 国レベル

2007 3rd NBSAP
第3次生物多様性国家戦略

2008 The Basic Law for Biological
Diversity 生物多様性基本法

2010 NBSAP2010
生物多様性国家戦略2010

2010 GBO3

2010 Japan Biodiversity Outlook
生物多様性総合評価

Purpose of the JBO 生物多様性総合評価の目的

To raise public awareness of
“Biodiversity”

日本の生物多様性の状況を
国民に広く認識してもらう。

To promote national and
regional conservation activities
of various stake holders

環境行政その他多様な関係者の行動に
判断材料を提供する。

Target and Period of JBO 評価の対象・期間

Target of JBO 評価対象

Biodiversity throughout Japan 日本全国の生物多様性
1. Drivers of biodiversity loss 損失の要因
2. State of biodiversity 損失の状態

Assessment Period of JBO 評価の期間

from the latter half of the 1950's to the present
1950年代後半から現在まで

From the latter half of the 1950's
Rapid economic growth
1950年代後半～
高度経済成長

From the latter half of the 1970's
Stable economic growth
1970年代後半～
安定成長

From 1990's
population decrease, Low economic growth
1990年代～
低成長・人口減

Framework of JBO 評価の枠組

Indicators were set to assess biodiversity from the aspect of Driver/Pressure, State/Impact and Response.

損失の要因、状態、対策を整理し、それらの切り口から指標を設定して評価

Indirect Driver
間接的要因

Driver/Pressure 要因

Factors behind loss (degree of impact) and current trends
要因の影響力の大きさや傾向



e.g. Land use

Response 対策

e.g. Protected areas
Monitoring

State/Impact 状態

Degree of loss and current trends of biodiversity
生物多様性の損失の大きさや傾向



e.g. Reduction of distribution
Decreasing habitat quality

Drivers of biodiversity loss 損失の要因

Four biodiversity crises → 生物多様性の4つの危機ごと

(by NBSAP2010 国家戦略2010による)



First Crisis

第1の危機

Overexploitation,
development and
water pollution

開発・改変、直接的利用、
水質汚濁



Second Crisis

第2の危機

Underutilization
[*Satoyama* issue]

里地里山等の利用・
管理の縮小



Third Crisis

第3の危機

Artificially introduced factors
(Alien Species, chemicals)

外来種、化学物質



Climate Change Crisis

地球温暖化の危機

Global warming

地球温暖化



State of Biodiversity in six ecosystems


損失の状態→6つの生態系区分ごと



Forest system
森林生態系



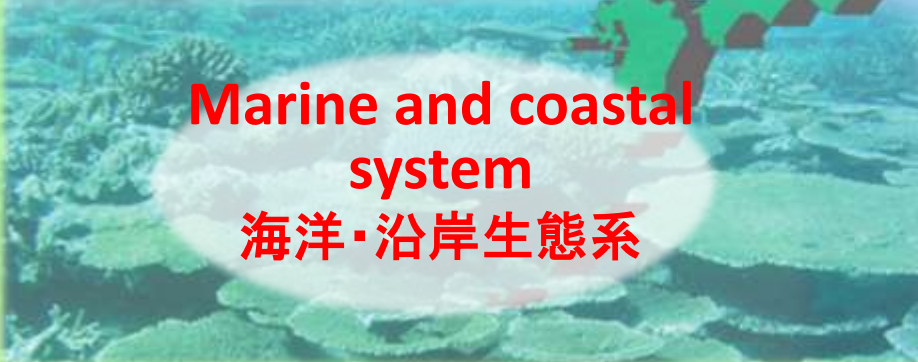
Agricultural system
農地生態系



Urban system
都市生態系



Inland water system
陸水生態系



Marine and coastal system
海洋・沿岸生態系

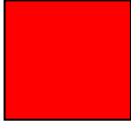
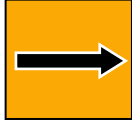


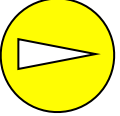


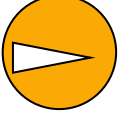



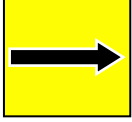
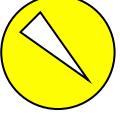




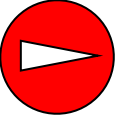





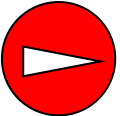




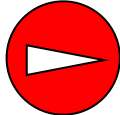




Island system
島嶼生態系

Assessment Results 評価結果

- Four biodiversity crises
生物多様性の4つの危機ごと
- Six ecosystems
6つの生態系区分ごと
- 30 indicators

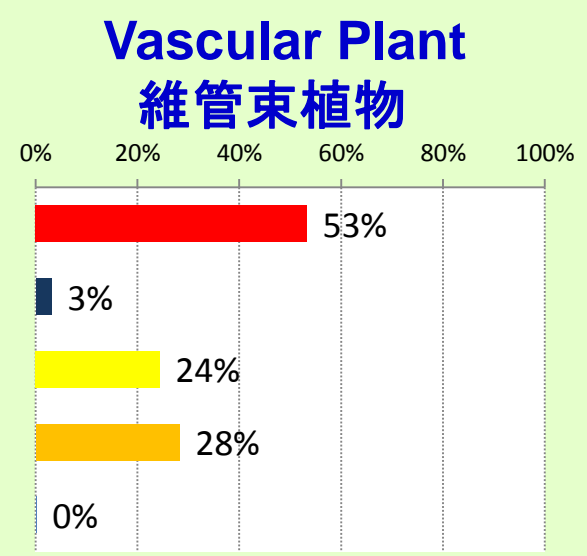
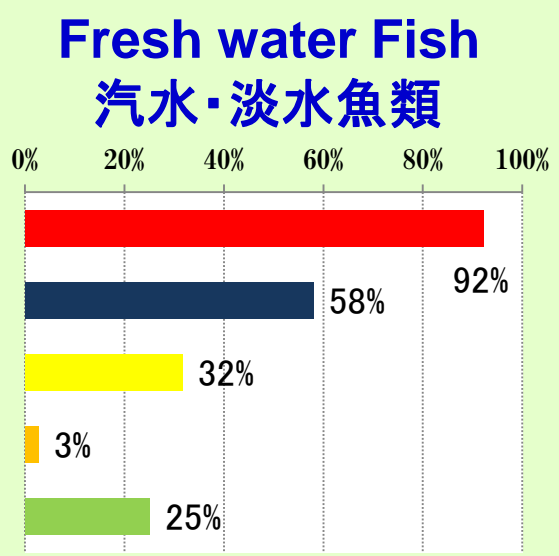
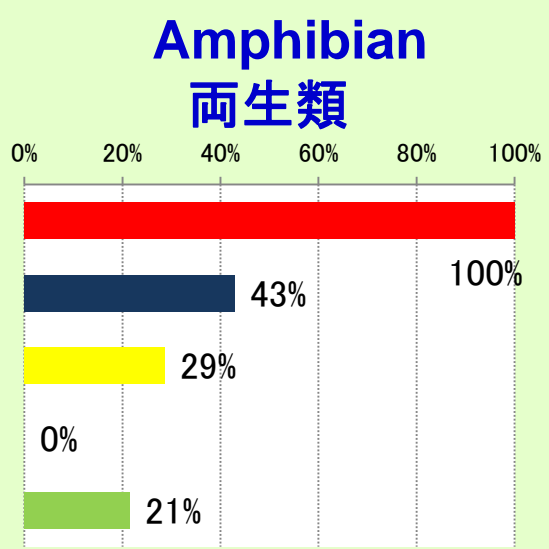
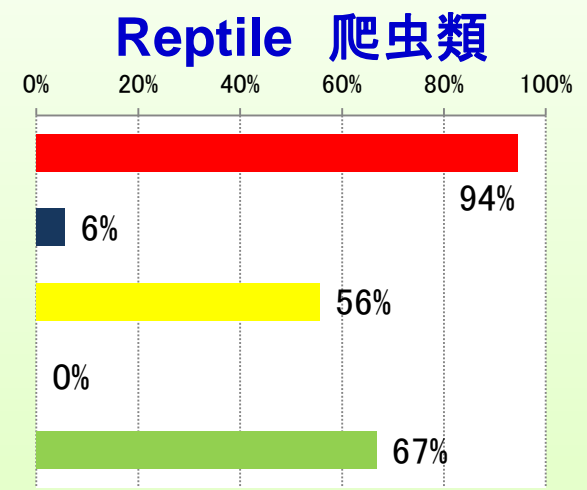
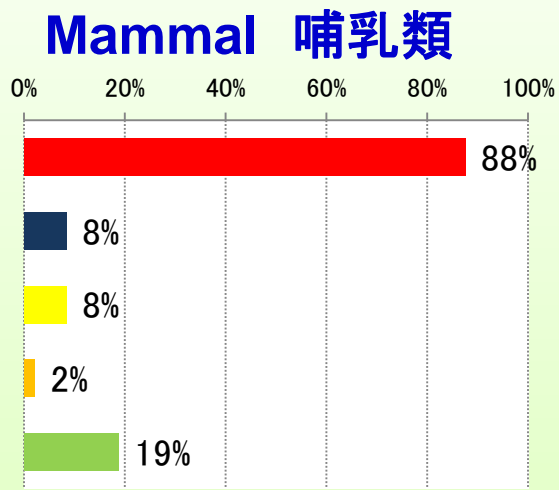
Assessment Results: 1st Crisis 評価結果: 第1の危機

	State and trends 損失の状態と傾向		Drivers and trends 損失の要因(影響力の大)と現在の傾向				
	From original 本来の生態系から	Since late 1950s 1950年代後半から	Over Use 第1の危機	Under use 第2の危機	Alien Species 第3の危機	Climate change 温暖化の危機	Others その他
Forest 森林							
Agriculture 農地	—						▪ Decline of crop and livestock genetic diversity
Urban 都市	—			—			
Inland water 陸水							
Marine and Coastal 沿岸・海洋				—			▪ Deforestation of seaweed bed ▪ Plague of coral-eating animals
Island 島嶼				—			

Drivers of biodiversity loss – 1st Crisis 損失の要因 – 第1の危機

Factors threatening RL species 絶滅危惧種の減少要因

- Development** 開発
- Pollution** 水質汚濁
- Exploitation** 捕獲・採取
- Succession** 遷移等
- Invasive spp.** 外来種

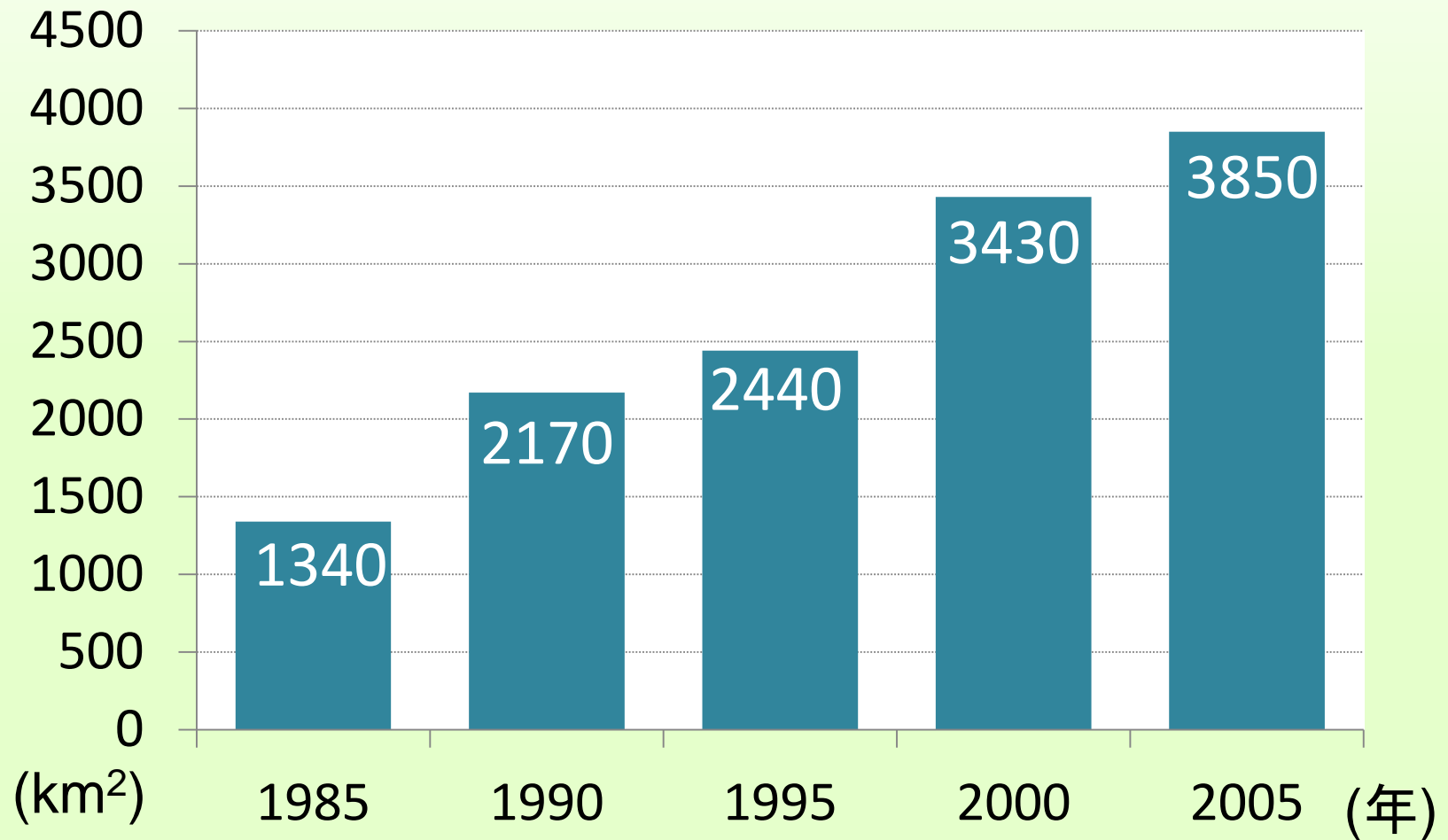


Assessment Results: 2nd Crisis 評価結果: 第2の危機





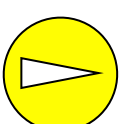


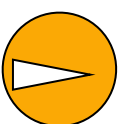



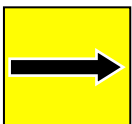
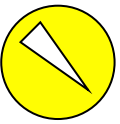










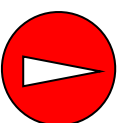




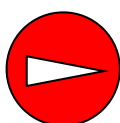


	State and trends 損失の状態と傾向		Drivers and trends 損失の要因(影響力の大)と現在の傾向				
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Forest 森林							
Agriculture 農地	—						▪ Decline of crop and livestock genetic diversity
Urban 都市	—			—			
Inland water 陸水							
Marine and Coastal 沿岸・海洋				—			▪ Deforestation of seaweed bed ▪ Plague of coral-eating animals
Island 島嶼				—			

Drivers of biodiversity loss – 2nd Crisis 損失の要因 – 第2の危機

Area of abandoned farmland 耕作放棄地面積の推移



Assessment Results: 3rd Crisis 評価結果: 第3の危機

	State and trends 損失の状態と傾向		Drivers and trends 損失の要因(影響力の大)と現在の傾向				
	From original 本来の生態系から	Since late 1950s 1950年代後半から	Over Use 第1の危機	Under use 第2の危機	Alien Species 第3の危機	Climate change 温暖化の危機	Others その他
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Agriculture 農地	—						▪ Decline of crop and livestock genetic diversity
Urban 都市	—			—			
Inland water 陸水							
Marine and Coastal 沿岸・海洋				—			▪ Deforestation of seaweed bed ▪ Plague of coral-eating animals
Island 島嶼				—			

Drivers of biodiversity loss – 3rd Crisis 損失の要因 – 第3の危機

侵略的な外来生物の分布の拡大 Expansion of Invasive alien species

1950's

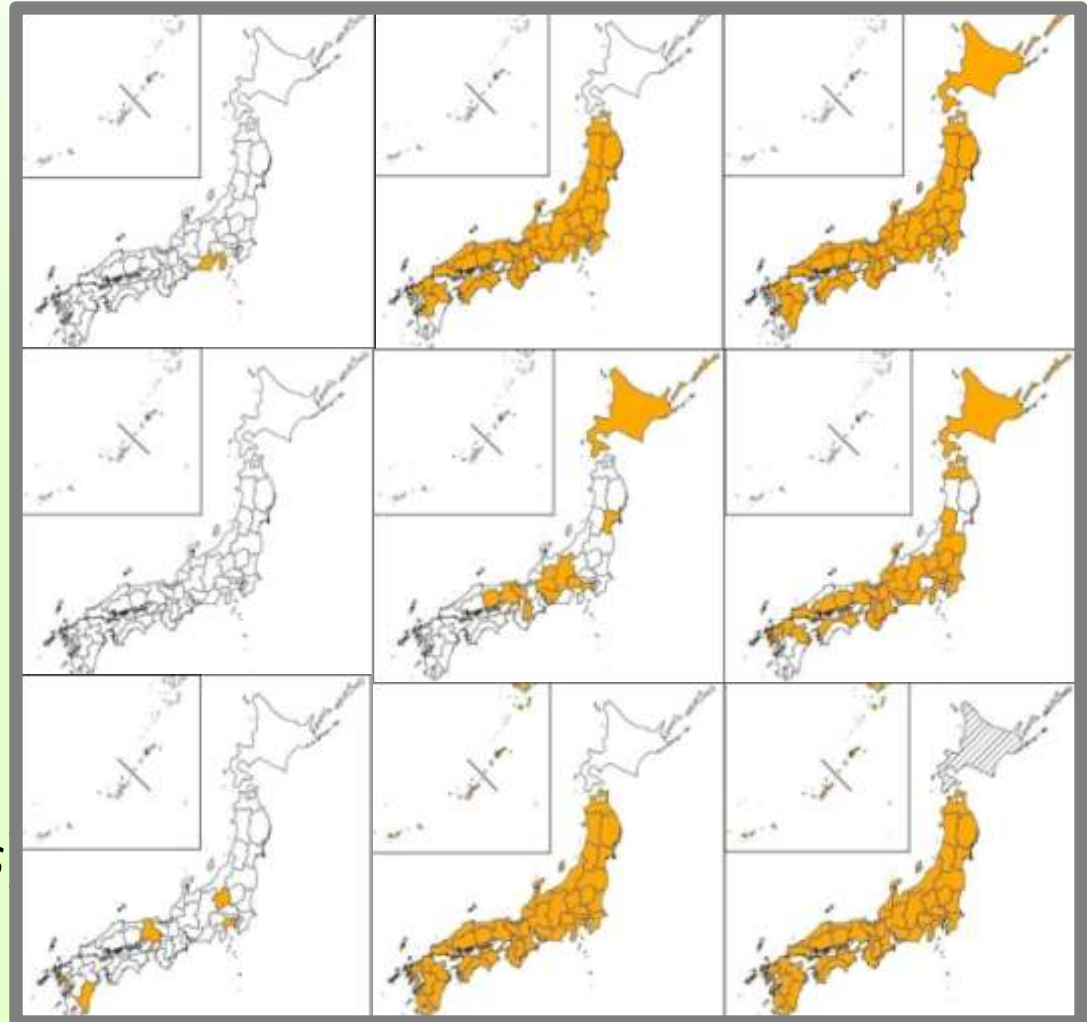
1990's

2000's

Burr cucumber
(*Sicyos angulatus*)
アレチウリ

Raccoon
(*Procyon lotor*)
アライグマ

Large mouth bass
(*Micropterus salmoides*)
オオクチバス



Orange box: Prefectures where the distributions are verified Hatched box: Eradication is completed

Assessment Results: Climate change 評価結果: 温暖化の危機

	State and trends 損失の状態と傾向		Drivers and trends 損失の要因(影響力の大)と現在の傾向				
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Inland water 陸水							
Marine and Coastal 沿岸・海洋				—			• Deforestation of seaweed bed • Plague of coral-eating animals
Island 島嶼				—			

Drivers of biodiversity loss – Climate change crisis

損失の要因－地球温暖化の危機

Decrease and loss of ecosystems

生態系の縮小・消失への影響

Decreasing alpine plants in Mt. Apoi

アポイ岳の高山植物の減少

Changes in abundance and distribution

生物の分布の変化

Distribution change of Great Mormon, Common Flangetai and Southern green stink bug
ナガサキアゲハ、タイワンウチワヤンマ、ミナミアオカメムシの分布の変化

Phenology

フェノロジーの変化

Changes in the egg-laying season and clutch size of Red-cheeked Starlings

Red-cheeked Starlings

コムクドリの産卵時期の変化

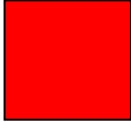



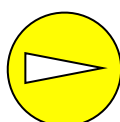


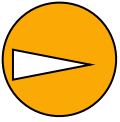




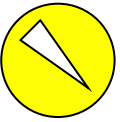
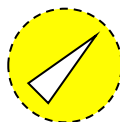

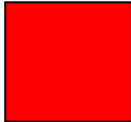

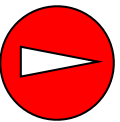













Changes in population number

個体数の変化

Changes in population size of Bewick's Swan during winter Season in Japan

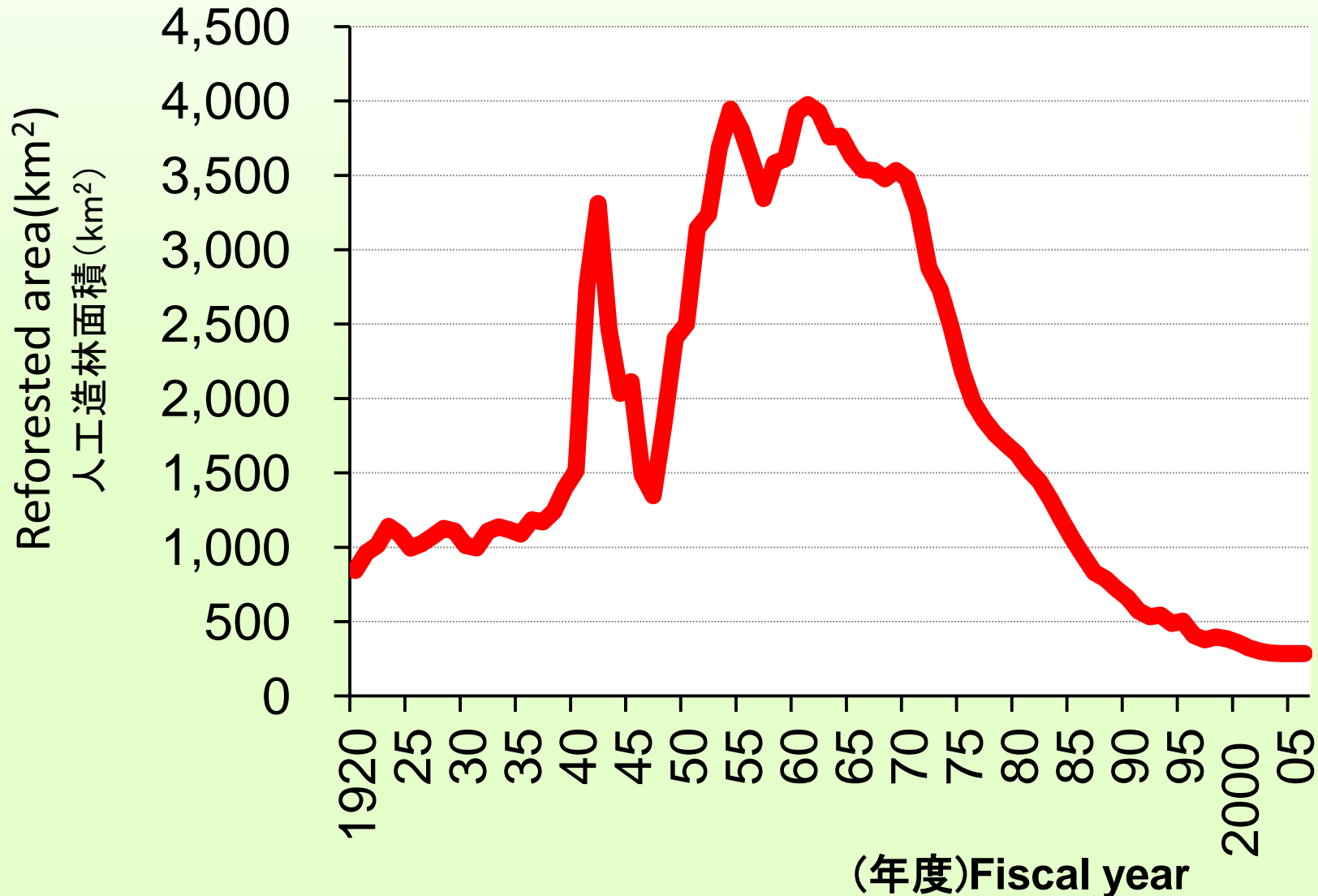
越冬期におけるコハクチョウの全国の個体数の変化

Assessment Results: Forests S. 評価結果

	State and trends 損失の状態と傾向		Drivers and trends 損失の要因(影響力の大)と現在の傾向				
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Marine and Coastal 沿岸・海洋				—			▪ Deforestation of seaweed bed ▪ Plague of coral-eating animals
Island 島嶼				—			

State of Biodiversity -Forests S.損失の状態－森林生態系

Trend in reforested area 人工造林面積の推移

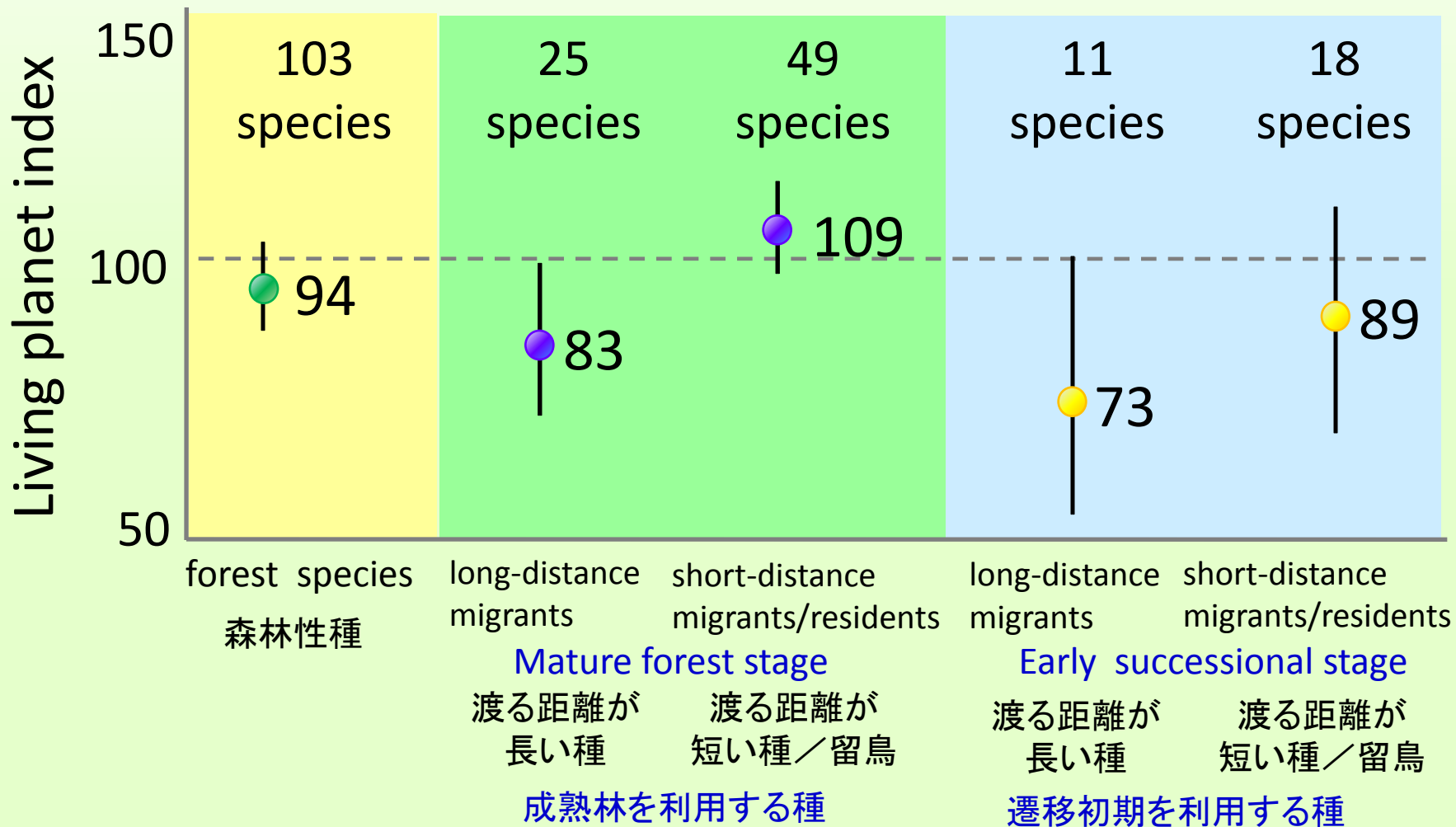


State of Biodiversity -Forests S. 損失の状態－森林生態系





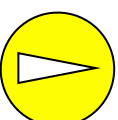






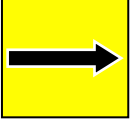
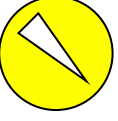




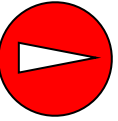





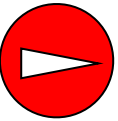




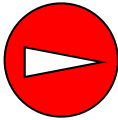


Distribution change of birds at 1997-2002(1978 as base year)

Living Planet Index 「生きている地球指数」

1978年に対する1997-2002年の鳥類の分布範囲の変化



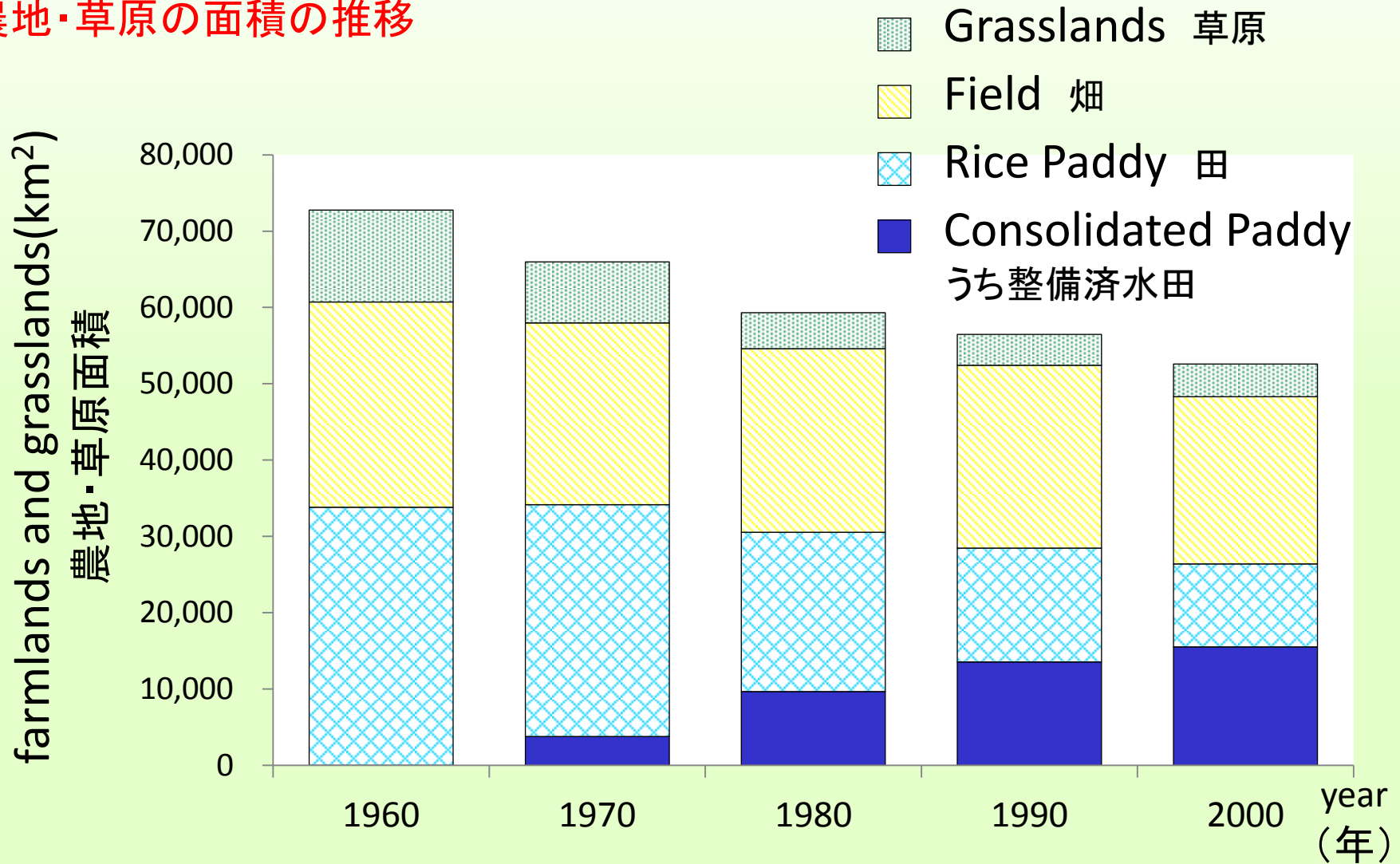
Assessment Results: Agricultural S. 評価結果

	State and trends 損失の状態と傾向		Drivers and trends 損失の要因(影響力の大)と現在の傾向				
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Urban 都市	—			—			
Inland water 陸水							
Marine and Coastal 沿岸・海洋				—			<ul style="list-style-type: none"> Deforestation of seaweed bed Plague of coral-eating animals
Island 島嶼				—			





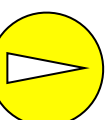






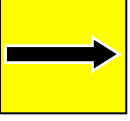
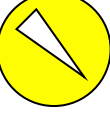


















State of Biodiversity-Agricultural S.損失の状態－農地生態系

Trend in farmlands and grasslands in area

農地・草原の面積の推移

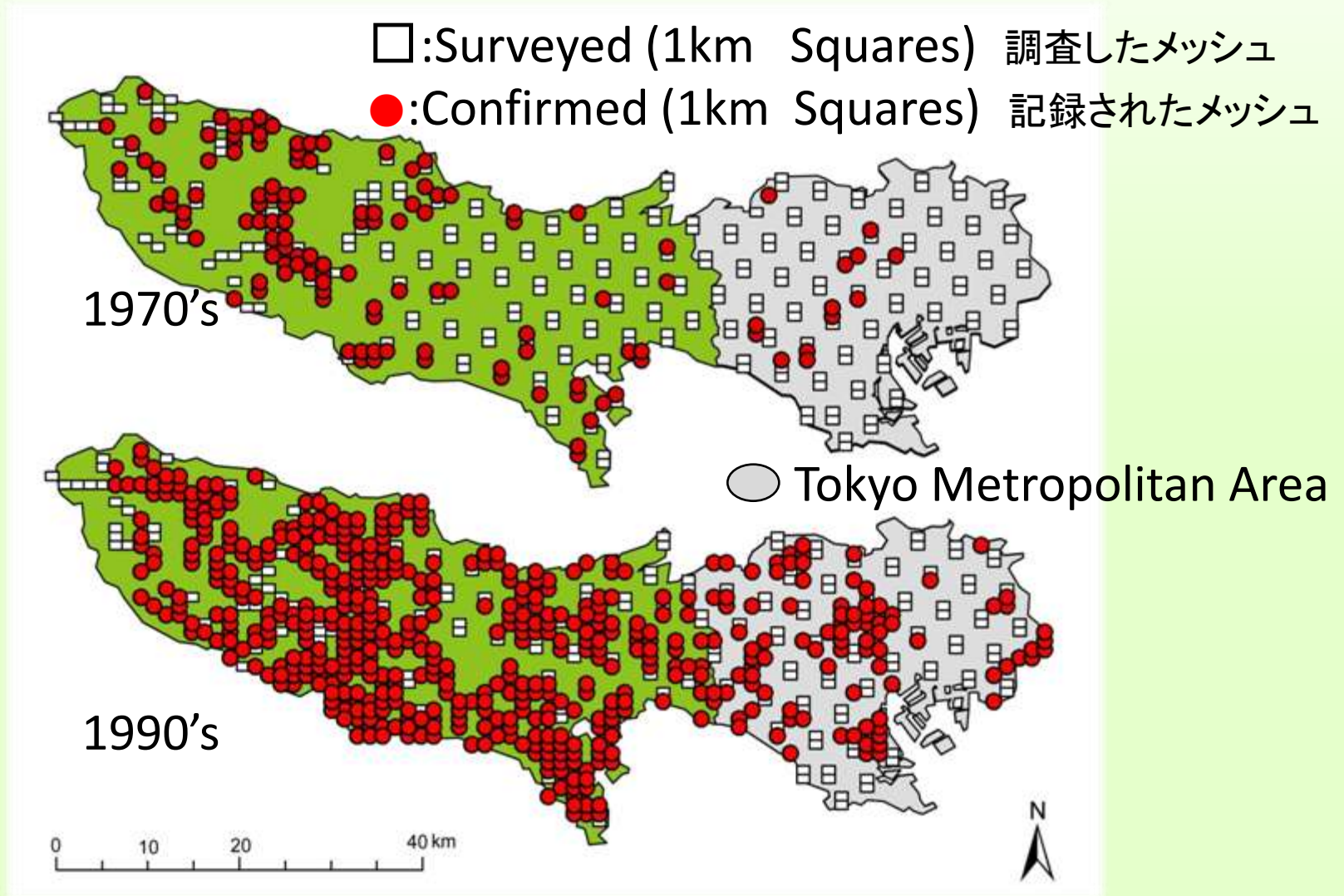


Assessment Results: Urban S. 評価結果

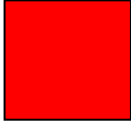



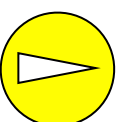


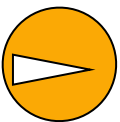



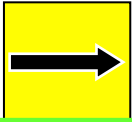



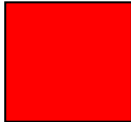

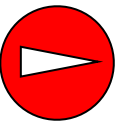













	State and trends 損失の状態と傾向		Drivers and trends 損失の要因(影響力の大)と現在の傾向				
	From original 本来の生態系から	Since late 1950s 1950年代後半から	Over Use 第1の危機	Under use 第2の危機	Alien Species 第3の危機	Climate change 温暖化の危機	Others その他
Forest 森林							
Agriculture 農地	—						▪ Decline of crop and livestock genetic diversity
Urban 都市	—			—			
Inland water 陸水							
Marine and Coastal 沿岸・海洋				—			▪ Deforestation of seaweed bed ▪ Plague of coral-eating animals
Island 島嶼				—			

State of Biodiversity-Urban S. 損失の状態－都市生態系

Distribution change of Japanese White-eye *Zosterops japonicus* in Tokyo 東京都におけるメジロの分布の変化



Assessment Results: : Inland water S. 評価結果

	State and trends 損失の状態と傾向		Drivers and trends 損失の要因(影響力の大)と現在の傾向				
	From original 本来の生態系から	Since late 1950s 1950年代後半から	Over Use 第1の危機	Under use 第2の危機	Alien Species 第3の危機	Climate change 温暖化の危機	Others その他
Forest 森林							
Agriculture 農地	—						▪ Decline of crop and livestock genetic diversity
Urban 都市	—			—			
Inland water 陸水							
Marine and Coastal 沿岸・海洋				—			▪ Deforestation of seaweed bed ▪ Plague of coral-eating animals
Island 島嶼				—			

State of Biodiversity-Inland water S.損失の状態－陸水生態系

River beds degradation, sands and gravels taken from river channel

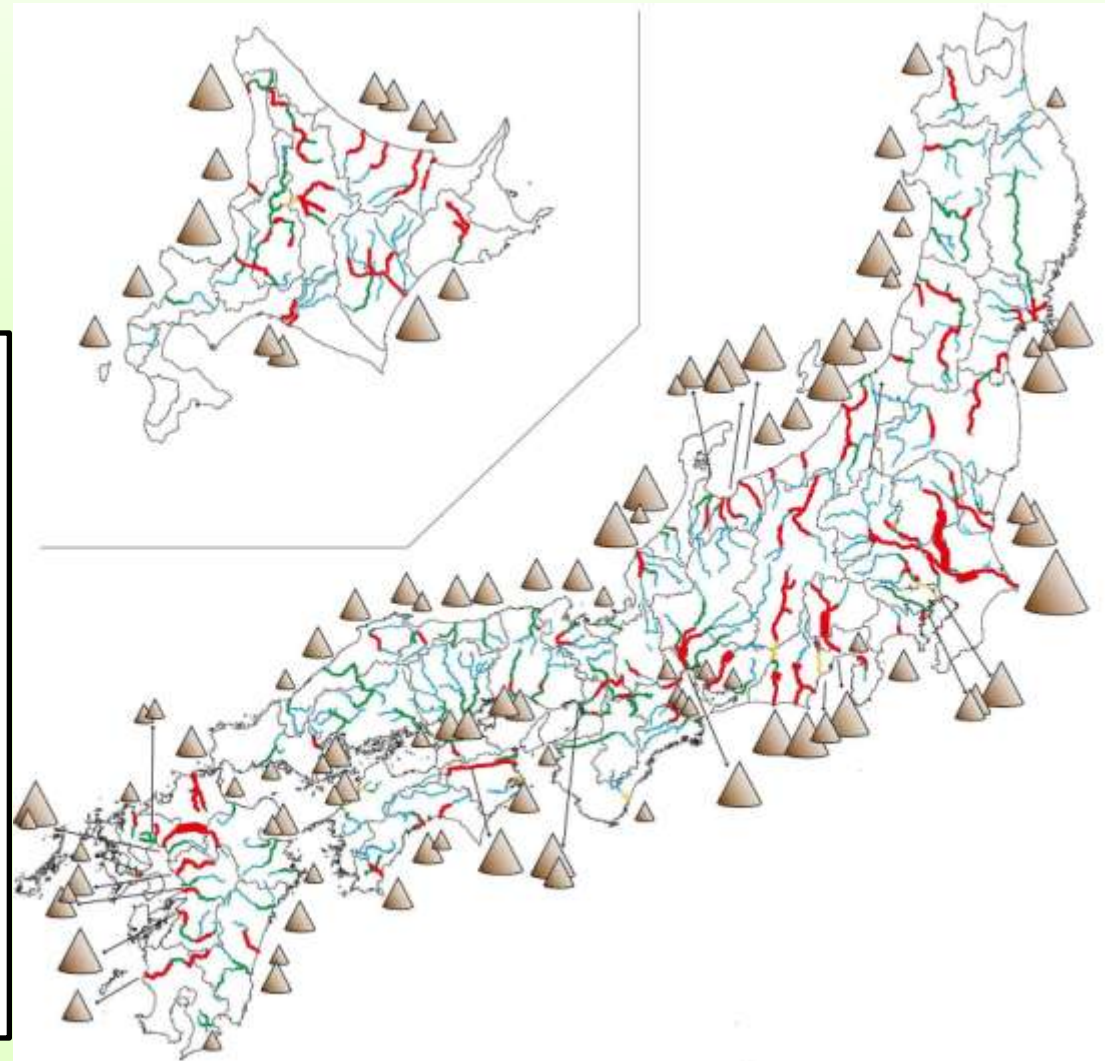
河床の低下及び河道外への土砂の搬出

River beds degradation since 1945

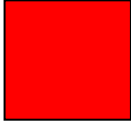



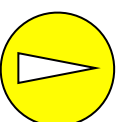


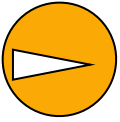




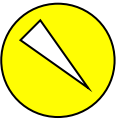


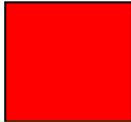

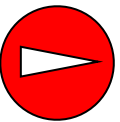













- Decreased
- No trend
- Increasd

Sands and gravels taken from river channel past 30 years

- 100 millon tons
- 10 millon tons
- 1 millon tons



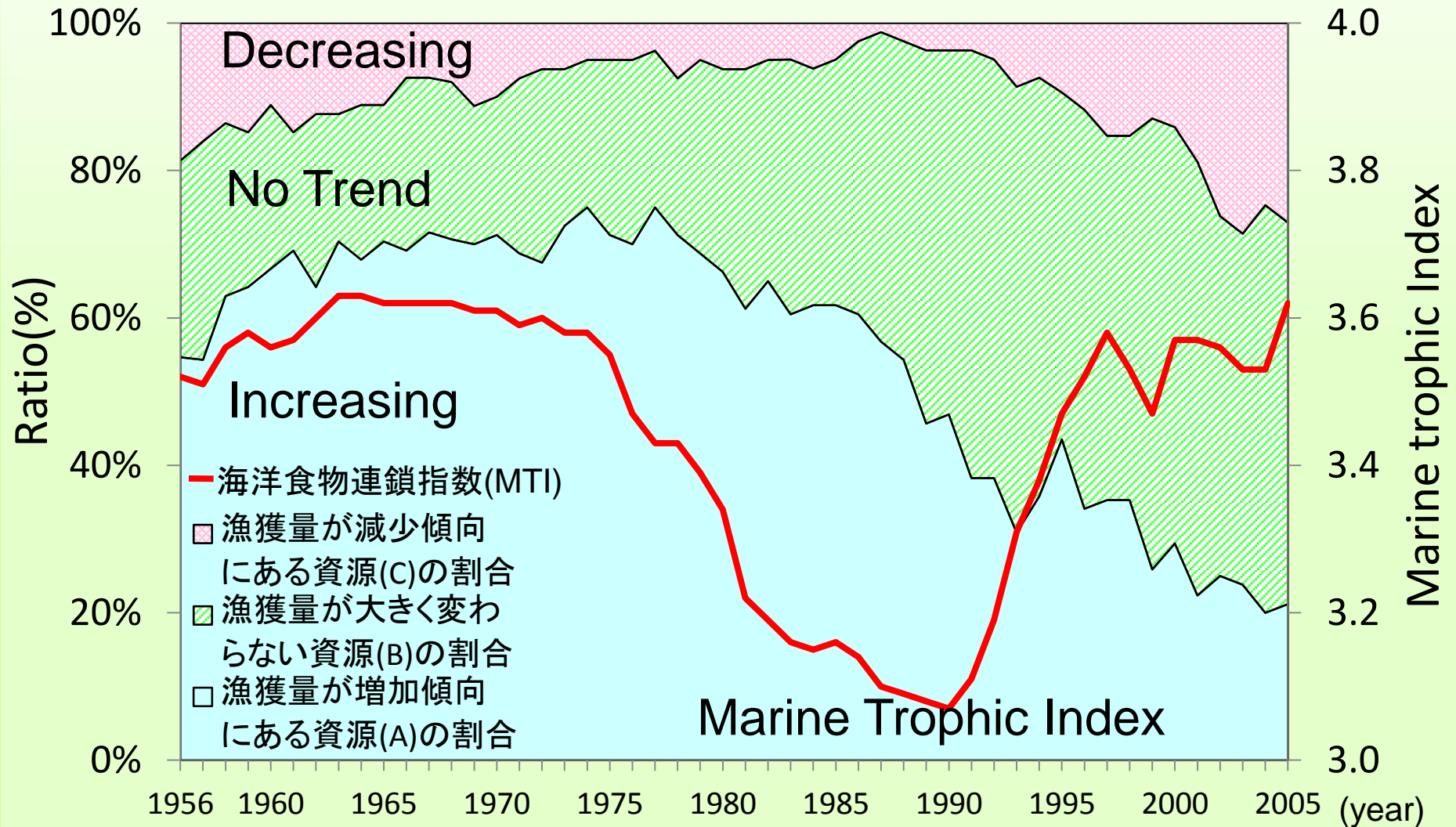
Assessment Results: Marine and Coastal S. 評価結果

	State and trends 損失の状態と傾向		Drivers and trends 損失の要因(影響力の大)と現在の傾向				
	From original 本来の生態系から	Since late 1950s 1950年代後半から	Over Use 第1の危機	Under use 第2の危機	Alien Species 第3の危機	Climate change 温暖化の危機	Others その他
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Agriculture 農地	—						▪ Decline of crop and livestock genetic diversity
Urban 都市	—			—			
Inland water 陸水							
Marine and Coastal 沿岸・海洋				—			▪ Deforestation of seaweed bed ▪ Plague of coral-eating animals
Island 島嶼				—			

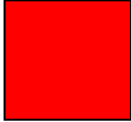



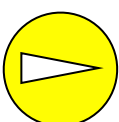


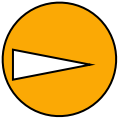




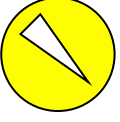


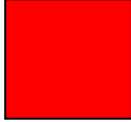

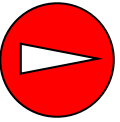





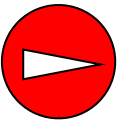




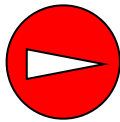


State of Biodiversity-Marine S. 損失の状態ー沿岸・海洋生態系

Trends in fish catches and Marine Trophic Index

漁獲量の長期トレンドと海洋食物連鎖指数



Assessment Results: Island S. 評価結果

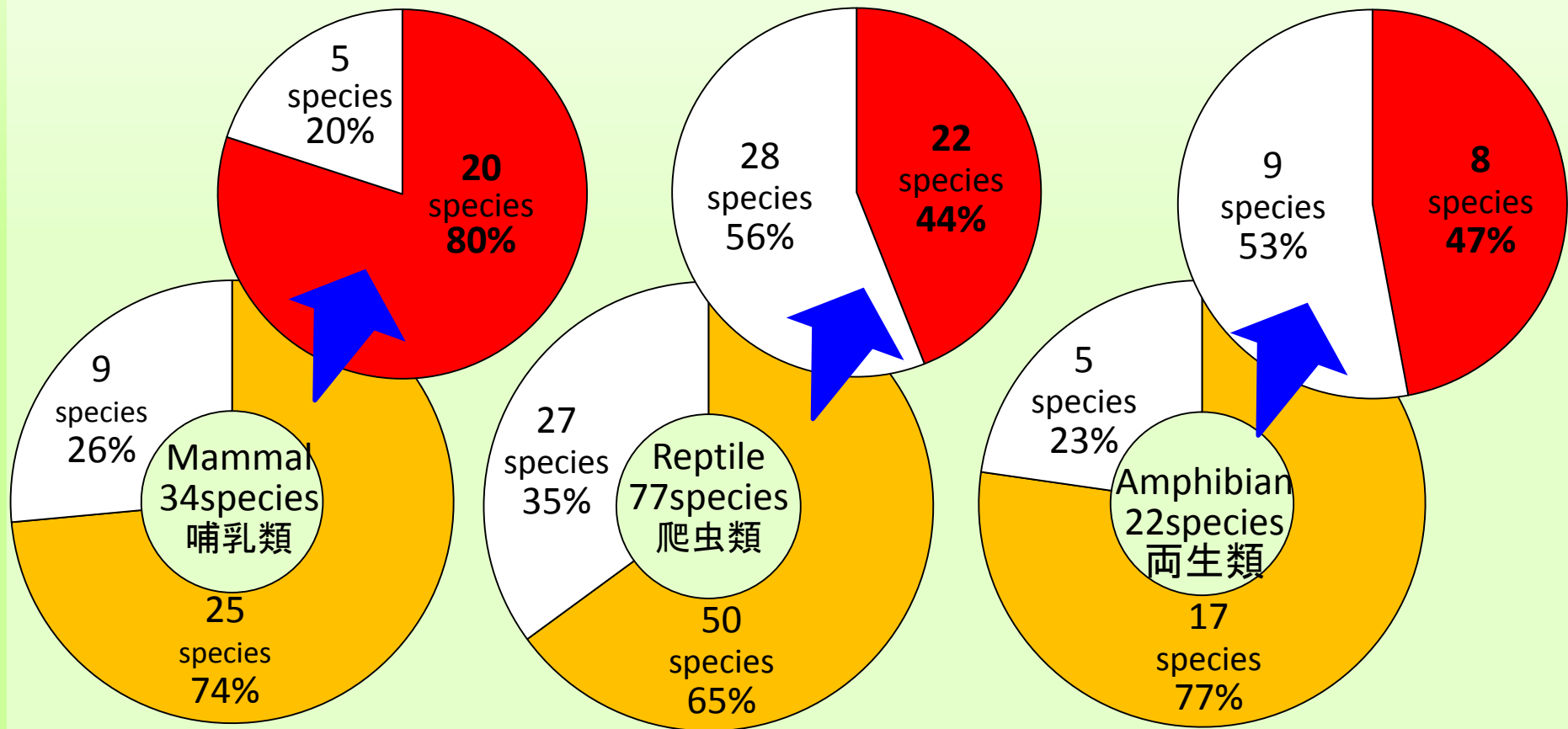
	State and trends 損失の状態と傾向		Drivers and trends 損失の要因(影響力の大)と現在の傾向				
	From original 本来の生態系から	Since late 1950s 1950年代後半から	Over Use 第1の危機	Under use 第2の危機	Alien Species 第3の危機	Climate change 温暖化の危機	Others その他
Forest 森林							
Agriculture 農地	—						▪ Decline of crop and livestock genetic diversity
Urban 都市	—			—			
Inland water 陸水							
Marine and Coastal 沿岸・海洋				—			▪ Deforestation of seaweed bed ▪ Plague of coral-eating animals
Island 島嶼				—			

State of Biodiversity – Island S. 損失の状態 – 島嶼生態系

Proportion of endemic species in Nansei Islands and
Proportion of endangered species among those endemic species
南西諸島における固有種率とその絶滅危惧種の割合

■ : Endangered species among endemic species 固有種のうち絶滅危惧種

□ : Others among endemic species 固有種のうち絶滅危惧種以外



■ : Endemic species 固有種 □ : Others 固有種以外

Summarizing statements

■ State of biodiversity

Biodiversity has been lost in every ecosystem, and is still being lost in general.

Freshwater, marine, coastal and island ecosystems are still in large threat.

■ Factors of biodiversity loss

Development pressures had largest impacts, though its speed is slightly declined.

Crisis by underuse is gradually increasing.

Invasive species cause great threat.

Global warming is serious threat for particular vulnerable ecosystems.

■ Responses

Responses have been enhanced, though they are not efficiently working since impacts of indirect drivers are intensive.

It is necessary to prioritize the responses.

■ Evaluation in terms of 2010 Target

Only two targets have been achieved

Responses beyond 2010

- **For crisis by overuse**

- Promote strategic assessment and restoration
 - Enhancing ecosystem network
 - Protection of marine and coastal ecosystems

- **For crisis by underuse**

- Sustainable use of local resources
 - Management of abandoned forests
 - Large scaled wildlife management

- **For crisis by invasive spp.**

- Monitoring and management of invasive species population
 - Concentrated management scheme for prioritized targets

- **For crisis by global warming**

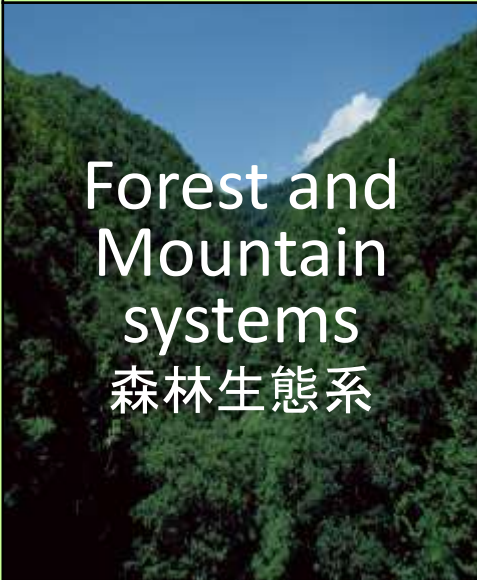

- Enhancement of monitoring
 - Develop adaptation methods

- **Mainstreaming**

- Local or regional decision making
 - Economic evaluation and introduction of economic measures

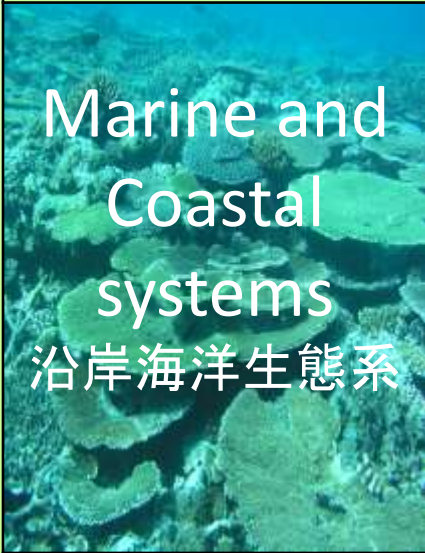

Responses to loss beyond 2010 Irreversible changes

2010年以降の損失への対策 不可逆的な変化

Ecosystems 生態系区分	Possible examples of irreversible changes 不可逆的な変化を生じさせる損失の例
 <p>Forest and Mountain systems 森林生態系</p>	<p>Impact of climate change on alpine vegetation 高山帯への地球温暖化の影響</p> <p>Effects of destruction of forest vegetation due to increasing population and expanding distributions of deer シカの個体数増加・分布拡大による森林植生の破壊の影響</p>
 <p>Inland water systems 陸水生態系</p>	<p>Impact of river bed degradation and river basin fragmentations 河川における連続性の低下や河床低下の影響</p> <p>Impact of invasive alien species on rivers, lakes, ponds and marshes 河川・湖沼等における侵略的外来種の影響</p>

Responses to loss beyond 2010 Irreversible changes

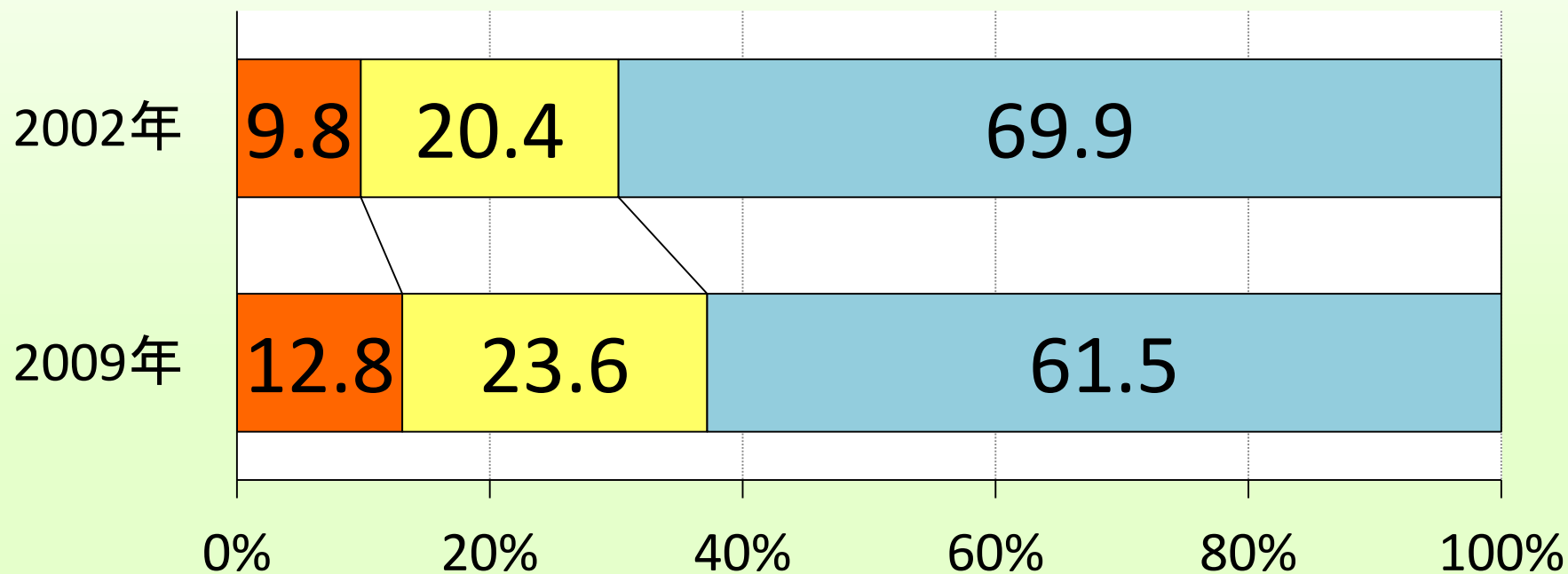
2010年以降の損失への対策 不可逆的な変化

Ecosystems 生態系区分	Possible examples of irreversible changes 不可逆的な変化を生じさせる損失の例
 <p>Marine and Coastal systems 沿岸海洋生態系</p>	<p>Combined impact on coastal systems caused by development (Including gravel extractions from sea) 沿岸生態系への開発・改変等の複合的な影響(海砂利採取を含む)</p> <p>Impact of climate change on coral reef サンゴ礁への地球温暖化の影響</p>
 <p>Island systems 島嶼生態系</p>	<p>Impact of invasive alien species on islands 島嶼における侵略的外来種の影響</p>

Responses of loss beyond 2010 Mainstreaming

2010年以降の損失への対策 生物多様性の主流化

Awareness of Biodiversity 生物多様性の認知度



Do you know what “Biodiversity” means?

■ I know the meaning of it.

■ I don't know the meaning of it but I've heard of it.

■ I've never heard of it.

■ 言葉の意味を知っている ■ 意味は知らないが言葉は聞いたことがある ■ 聞いたこともない

Responses of loss beyond 2010 Mainstreaming

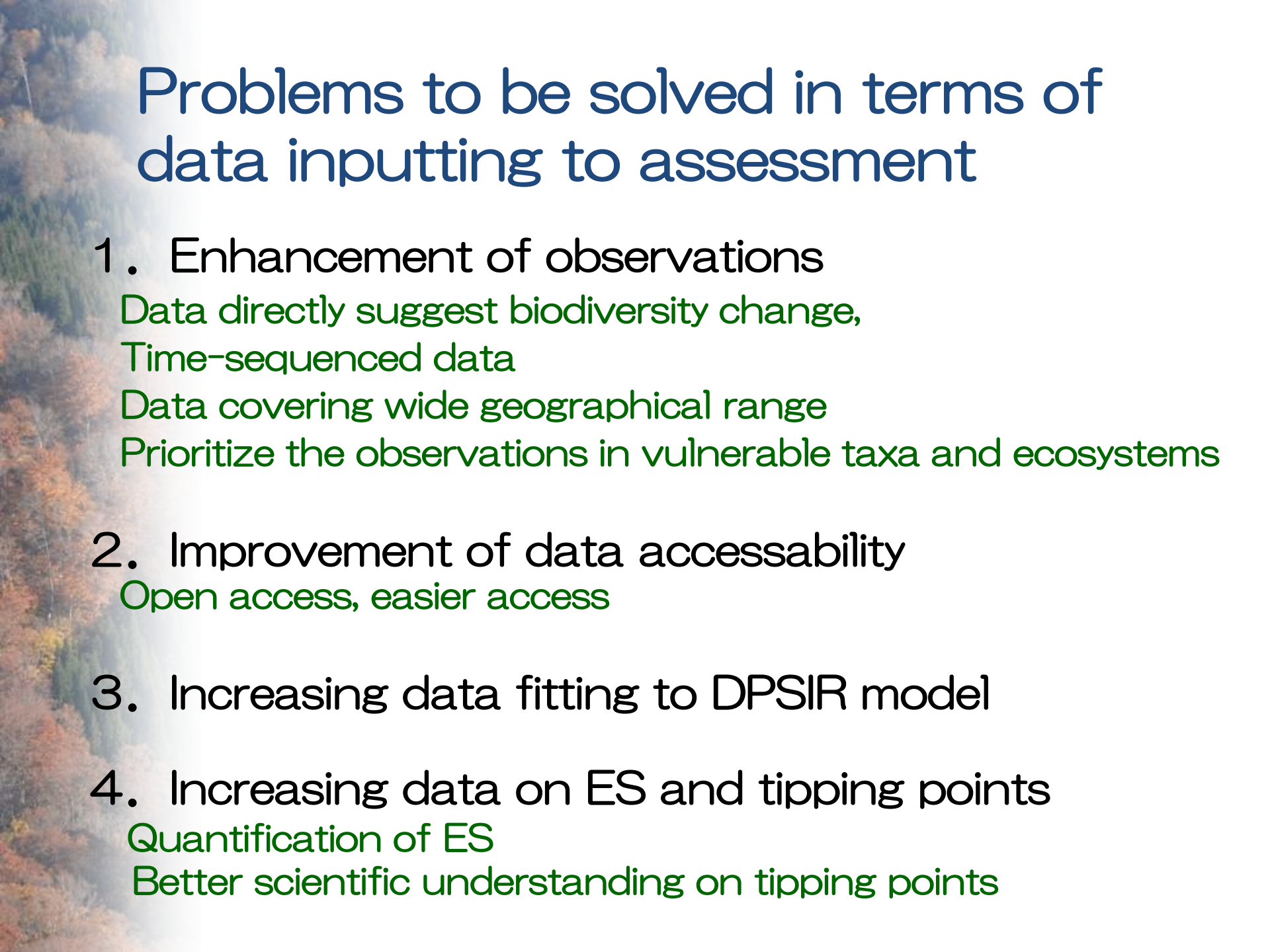
2010年以降の損失への対策 生物多様性の主流化

Economic evaluation of biodiversity

生物多様性の経済的な価値の評価

**Local or regional consensus building
over biodiversity**

自らの地域の生物多様性のあり方について
地域社会での合意形成



Problems to be solved in terms of data inputting to assessment

1. Enhancement of observations

Data directly suggest biodiversity change,

Time-sequenced data

Data covering wide geographical range

Prioritize the observations in vulnerable taxa and ecosystems

2. Improvement of data accessibility

Open access, easier access

3. Increasing data fitting to DPSIR model

4. Increasing data on ES and tipping points

Quantification of ES

Better scientific understanding on tipping points

Thank you for
your attention.

ご静聴ありがとうございました。

