

Natural Environment Survey and Biodiversity Conservation by Gap Analysis in Hokkaido, Japan

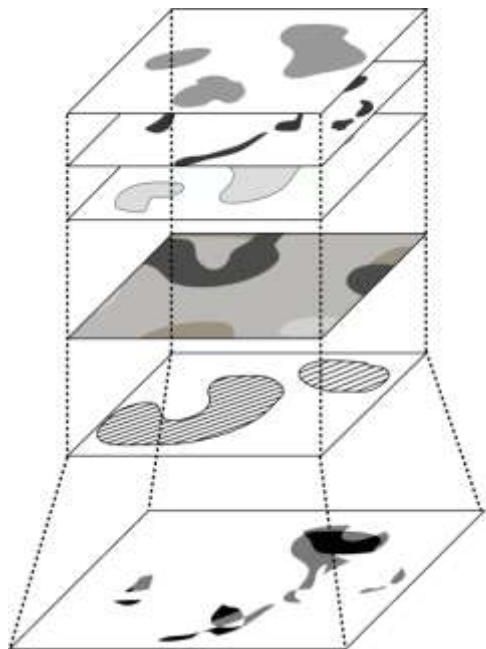
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Gap Analysis?

Identify differences, or gaps,

between habitats and existing protection networks by superimposing various geographical information using GIS.



Species distribution or (potential) habitat information

Distribution – Species A

Distribution – Species B

Distribution – Species X

Landcover (vegetation, soil map)

Land ownership and stewardship (Nature reserves, land ownership map)

Overlaid – gap analysis

Association map of biodiversity and protection status

Characteristics of Gap Analysis

Proposal of proactive conservation policies

- Can reduce economical and biological costs compared with traditional reactive approach

“Coarse-filter” approach

- Complements “fine-filter” approach for protecting particular species.

Utilize ***remote sensing and GIS***
to their maximum potential

Natural Environment Survey in JAPAN

Ministry of the Environment

National Surveys on the Natural Environment

- Vegetation map (Land cover map)
- Animal Distribution (Mammal, Bird, Fish, etc.)

Natural Environmental Information GIS

環境省 自然環境局
生物多様性センター
Biodiversity Center of Japan

Biodiversity Center of Japan, Nature Conservation Bureau, Ministry of the Environment, has been conducting basic researches on vegetation, flora and fauna in Japan. The Center has also been monitoring various ecosystems, including forests, grasslands, alpine, rivers, lakes, marshes, tidal flats and coral reefs.

This is a part of the artwork illustrated by Nobuyuki Nagata. The entire illustration is displayed in the exhibition hall of the Center.
Illustration/Nobuyuki Nagata

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National Survey on the Natural Environment

The National Biodiversity Strategy of Japan 2012-2020

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GIS data on the natural environment

Bird Banding Survey

Red Data Book / List

News

Announce 16th meeting of the Network of Organization for Research on Nature Conservation (NORNAC16) to be held on 2013.10.28 **NEW!!**

Watch List

Monitoring Sites 1000

J-IBIS Japan Integrated Biodiversity Information System

Natural Environment Survey in JAPAN

Animal Distribution Map



the distribution of mammals, birds, amphibians & reptiles, freshwater fish and insects.

2nd Survey (1978), 3rd Survey(1983)
4th Survey(1988-92), 5th Survey(1993,94)
6th Survey(1999-2002)

Natural Environment Survey in JAPAN

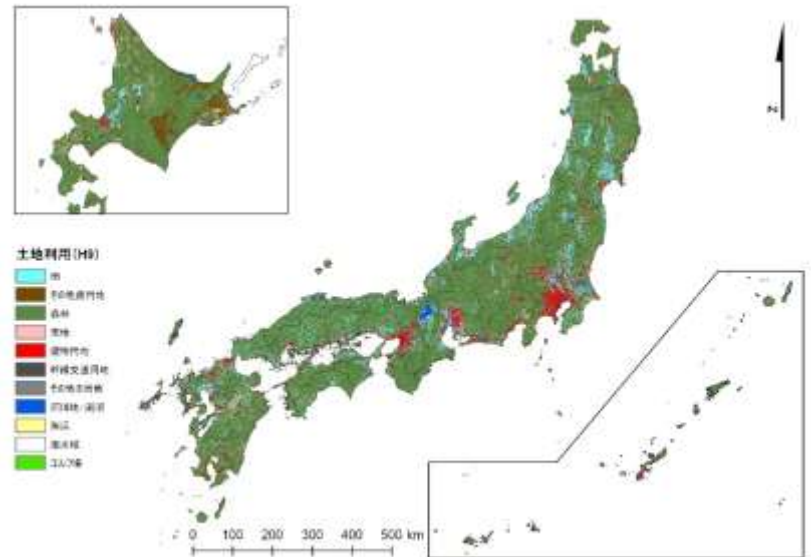
Vegetation map (Land cover map)

plant community units classified
according to plant sociology

2nd Survey (1978-79)

5th Survey (1993-98)

6th-7th Survey (1999-)



Land use map (National Land Numerical Information)

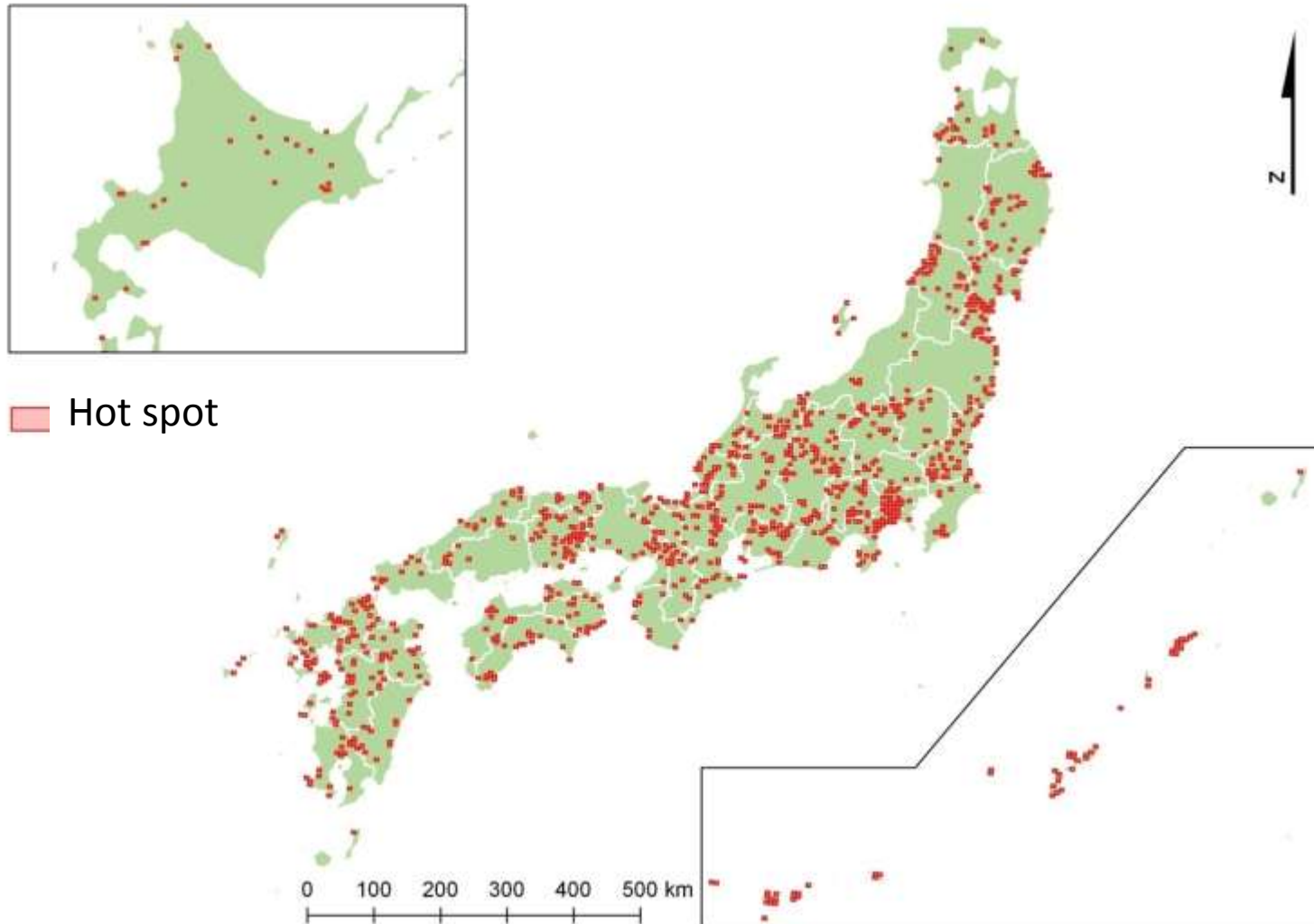
Natural Environment Survey in JAPAN

Parks (30 National Parks, 56 quasi-national park)



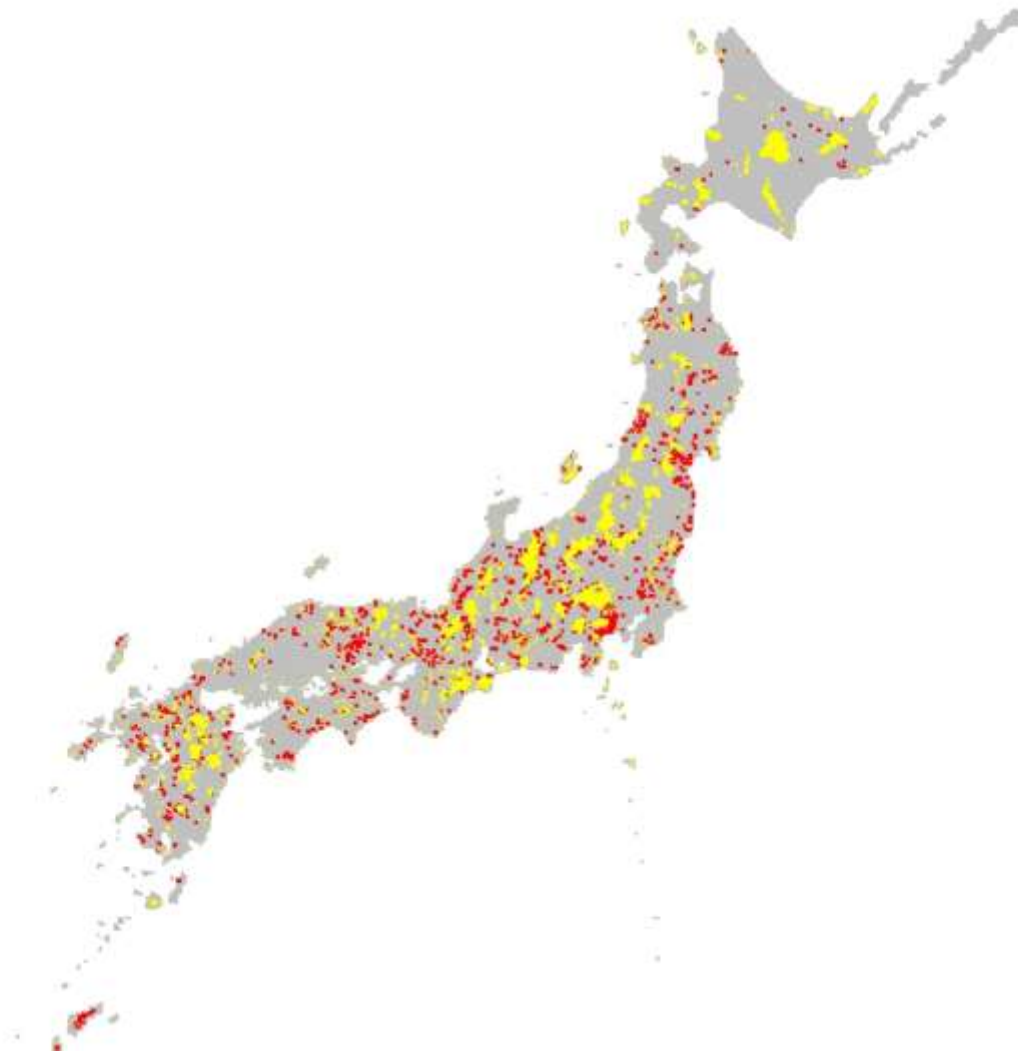
Gap Analysis in JAPAN

Hotspot Estimated from Species Richness



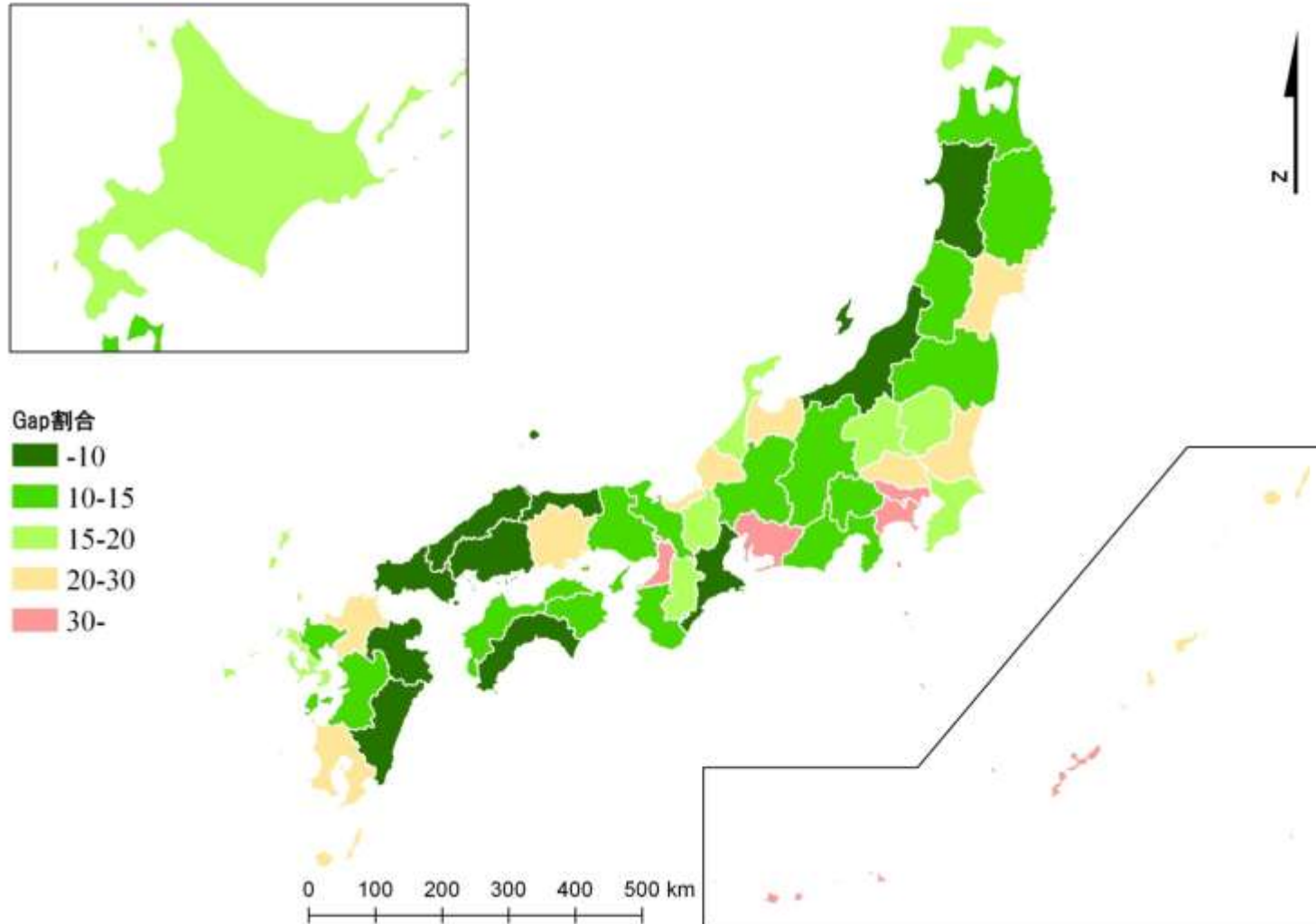
Gap Analysis in JAPAN

Hotspot of Species Richness and Parks



Gap Analysis in JAPAN

Percentage Gap Calculated for each Prefecture



Gap Analysis in JAPAN

Percentage gap calculated for each prefecture

Hokkaido had a relatively low gap percentage despite its large gap area, because its protected area is relatively large.

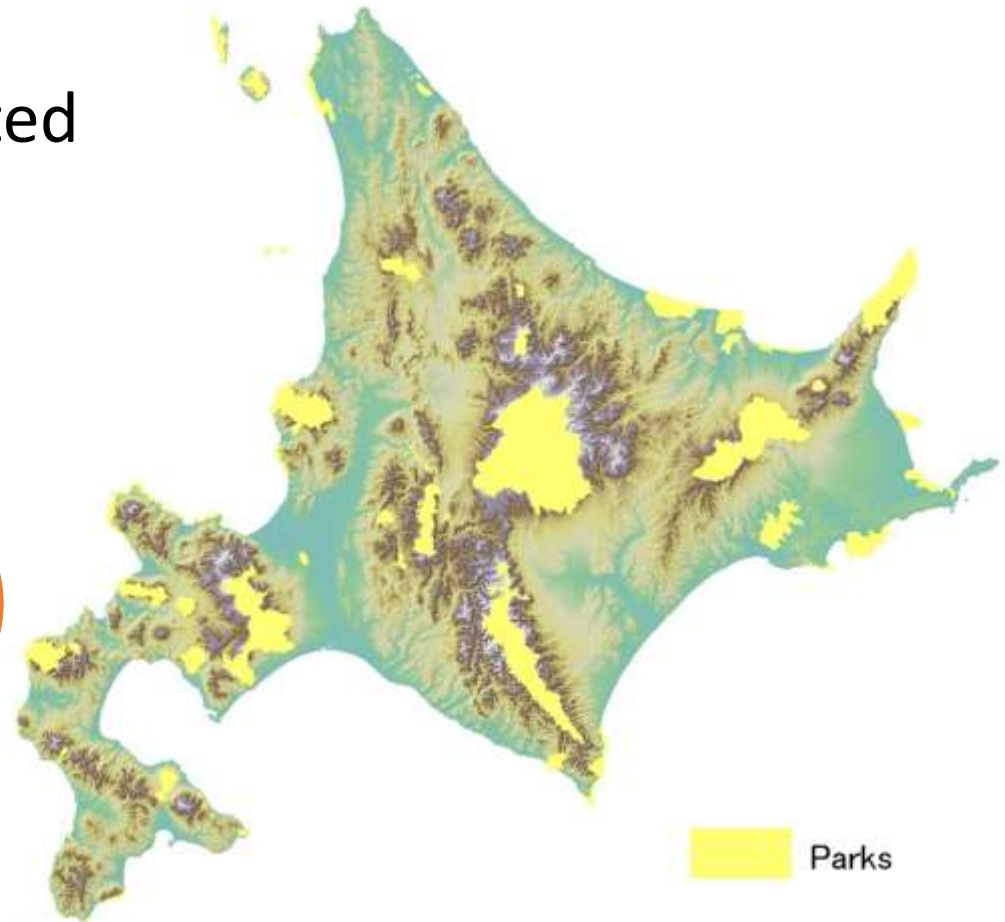
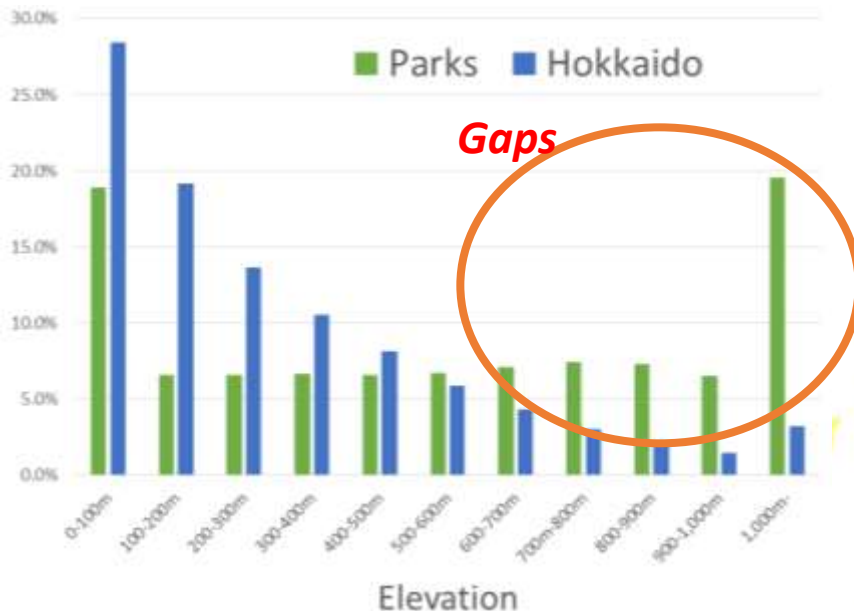
Rank	Prefecture	Gap %	Rank	Prefecture	Gap %
1	Kanagawa	50.55	11	Toyama	21.38
2	Okinawa	48.72	12	Fukuoka	20.77
3	Osaka	42.65	13	Okayama	20.52
4	Tokyo	37.35	14	Chiba	18.18
5	Aichi	31.66	15	Nara	17.99
6	Saitama	27.59	16	Hokkaido	16.70
7	Ibaraki	24.26	17	Shiga	15.69
8	Fukui	22.64	18	Ishikawa	15.57
9	Miyagi	21.68	19	Gunma	15.45
10	Kagoshima	21.49	20	Tochigi	15.38

Parks in Hokkaido, JAPAN

23 Parks in Hokkaido

(6 National Parks, 5 quasi-national park, 12 Prefectural Natural Park)

Many parks were designated
in **high altitude**.



Gap Analysis for Rare Species

Mountain Hawk Eagle (*Spizaetus nipalensis*)

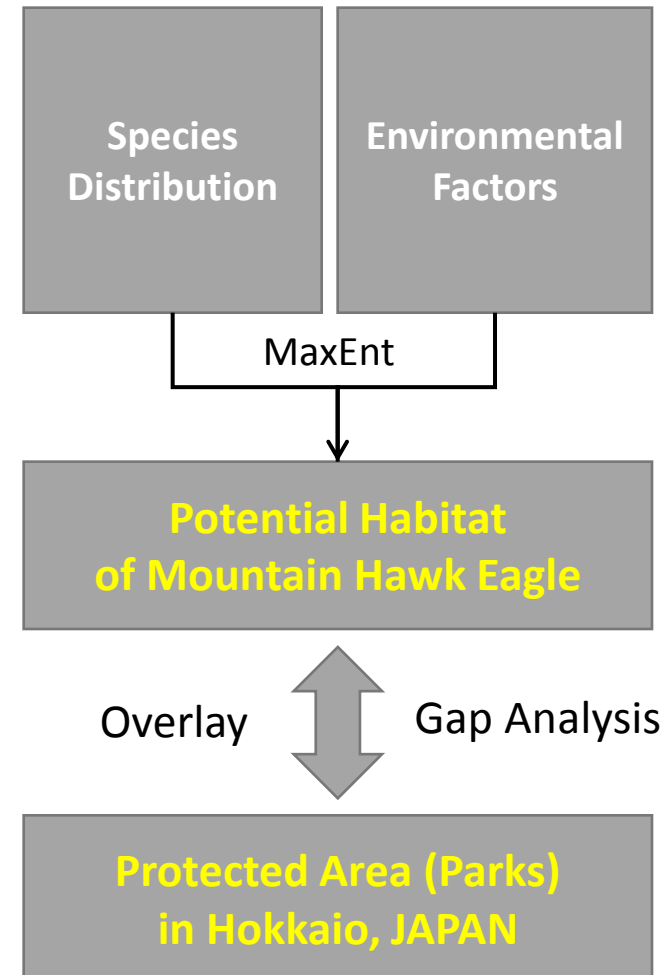
a Large-sized Raptor

a Endangered Species

Little Information in Hokkaido, JAPAN

Identify Conservation Gaps

between Potential Habitat and Parks

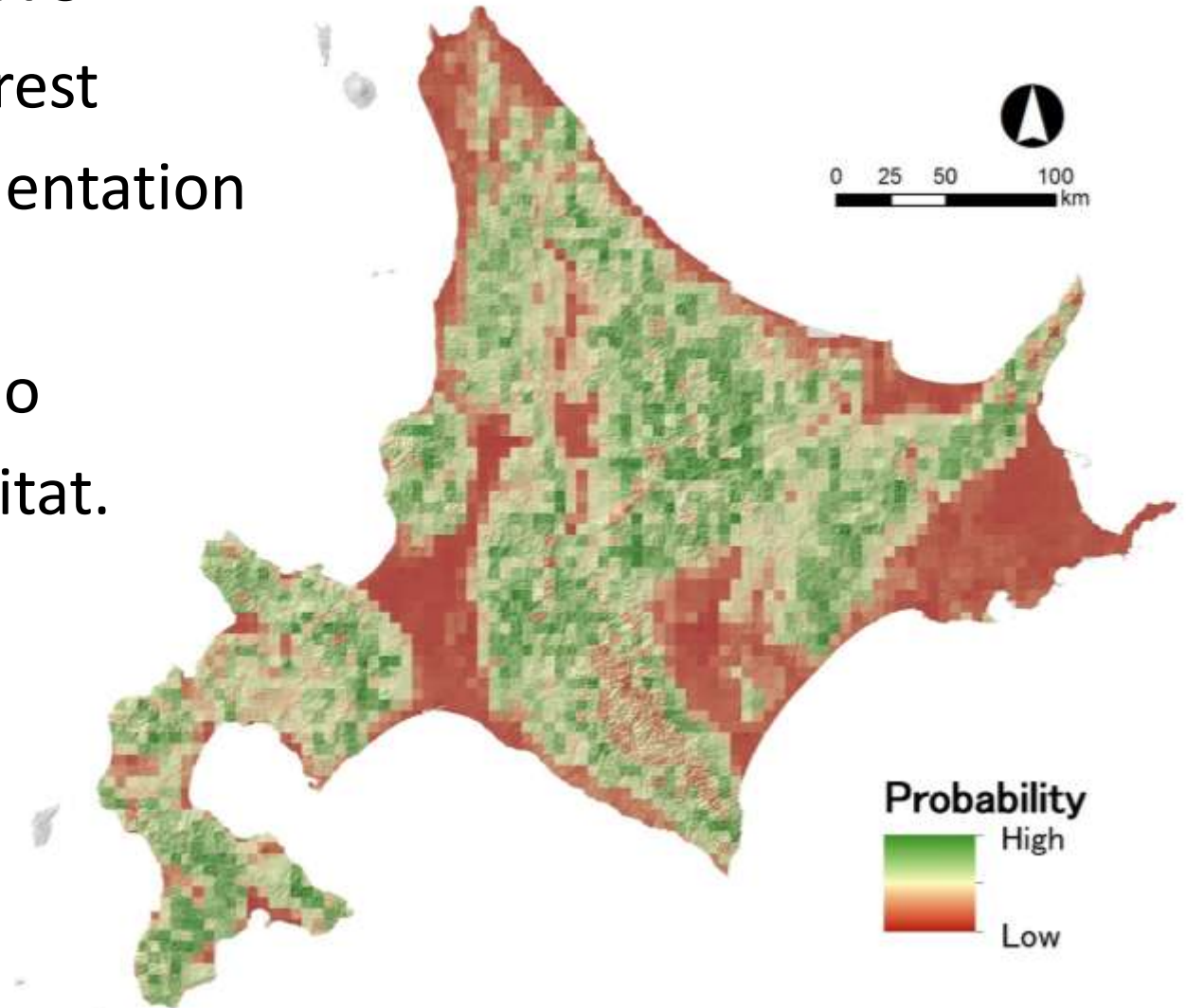


Potential Habitat of Mountain Hawk Eagle

Limiting Factors

the amount of forest
the habitat fragmentation

18.2% of Hokkaido
is a potential habitat.

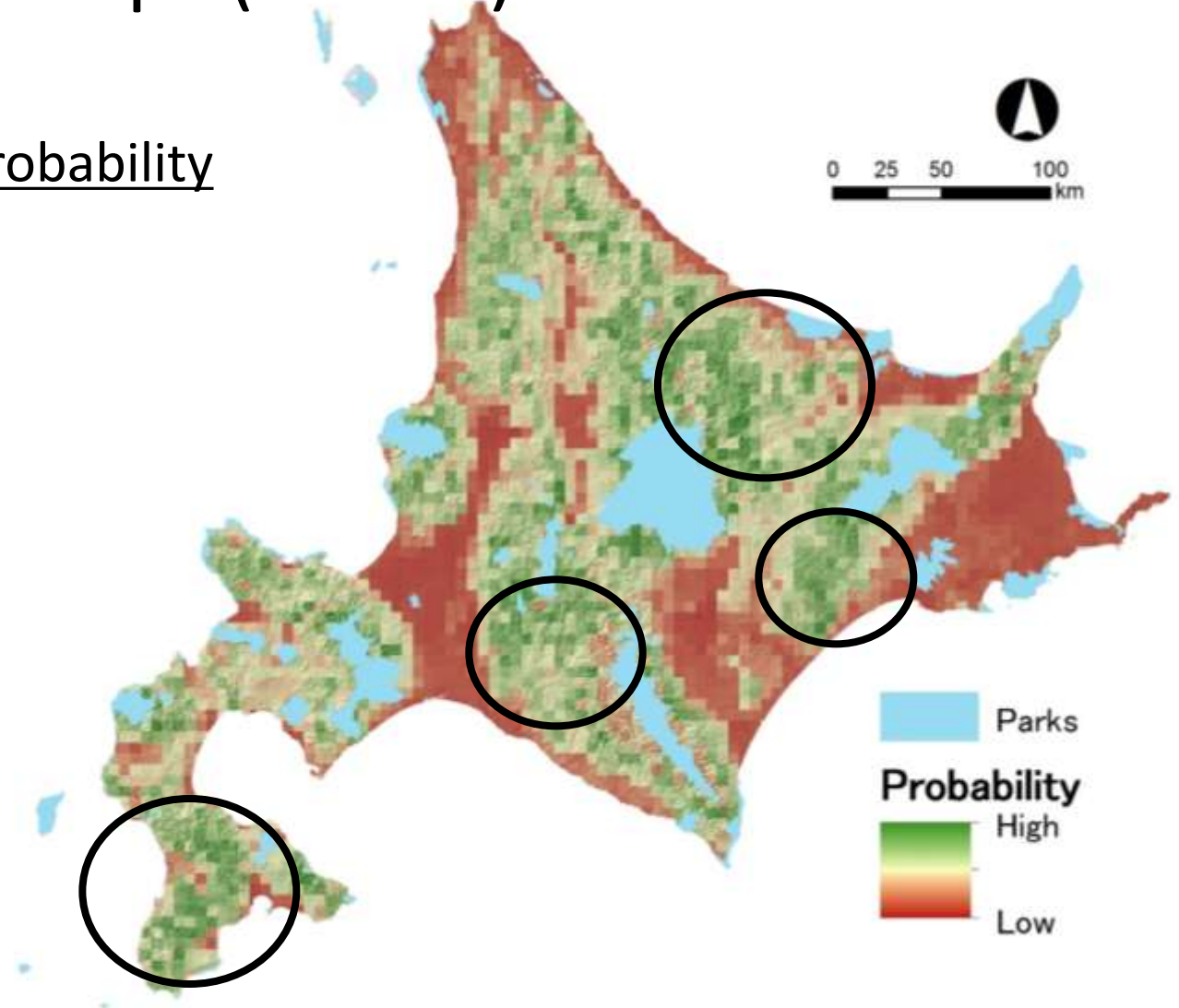


Conservation Gaps of Mountain Hawk Eagle

Conservation Gaps (Circles)

Unprotected area

with high habitat probability

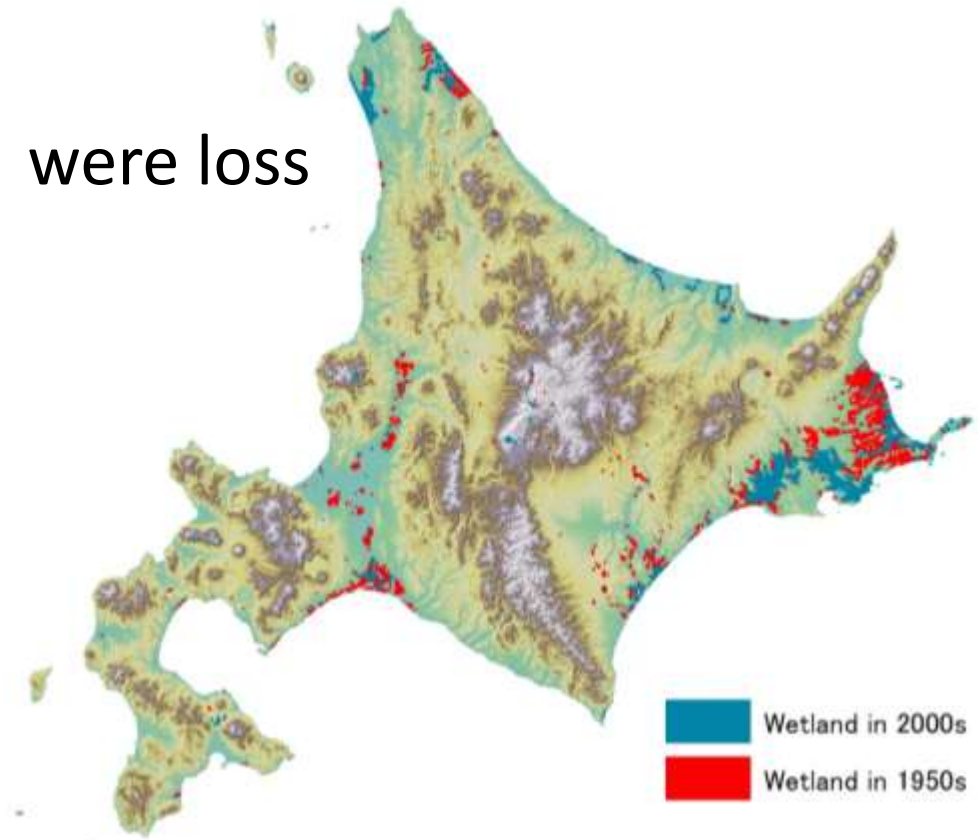


Application of Gap Analysis for Wetland Biodiversity Conservation

86% of wetlands in Japan are located in Hokkaido.

Wetlands are one of the most diverse ecosystems.

46% of wetlands were lost
in about 50 years.



Complementary Analysis for Effective Reserve Network Design

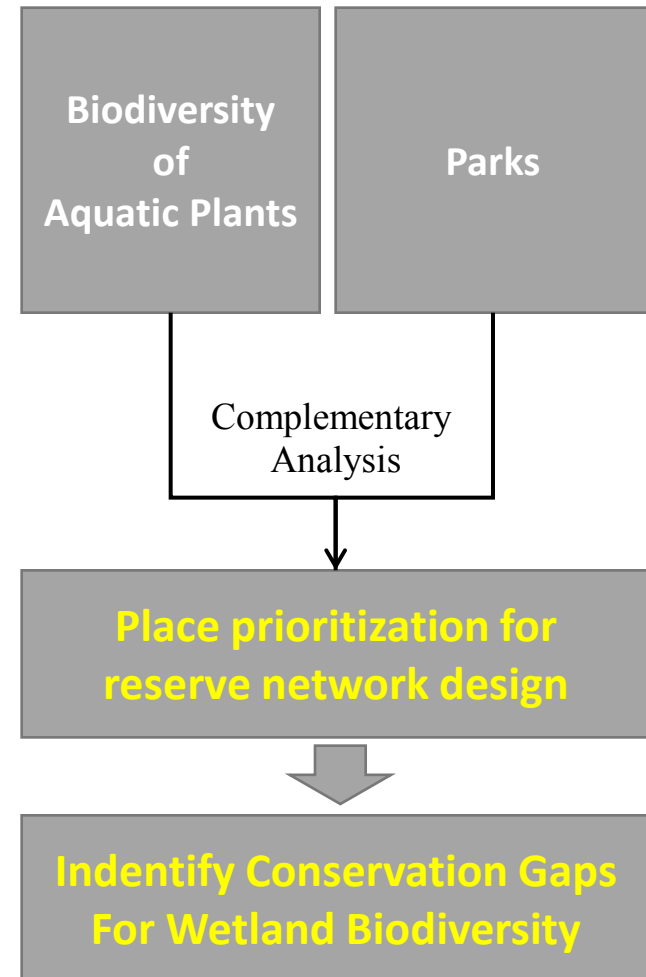
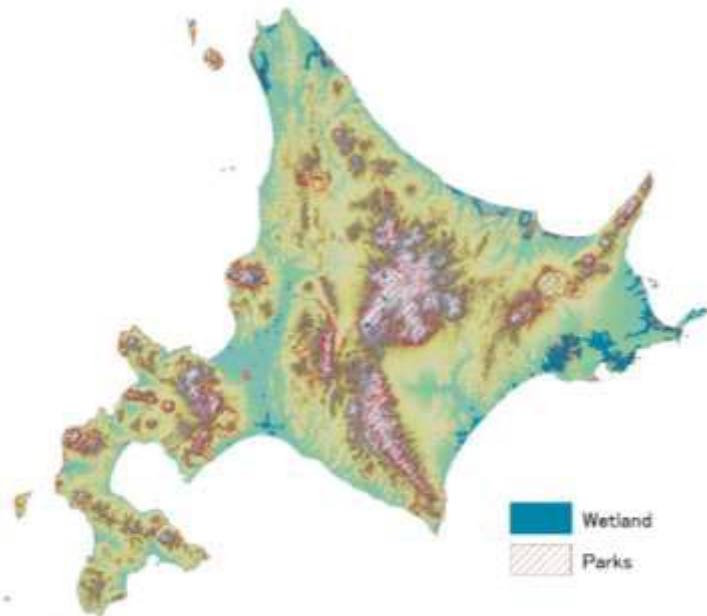
Place Prioritization for Reserve Network Design

Complementary Analysis

Native Aquatic Plants Database

Identify Conservation Gaps

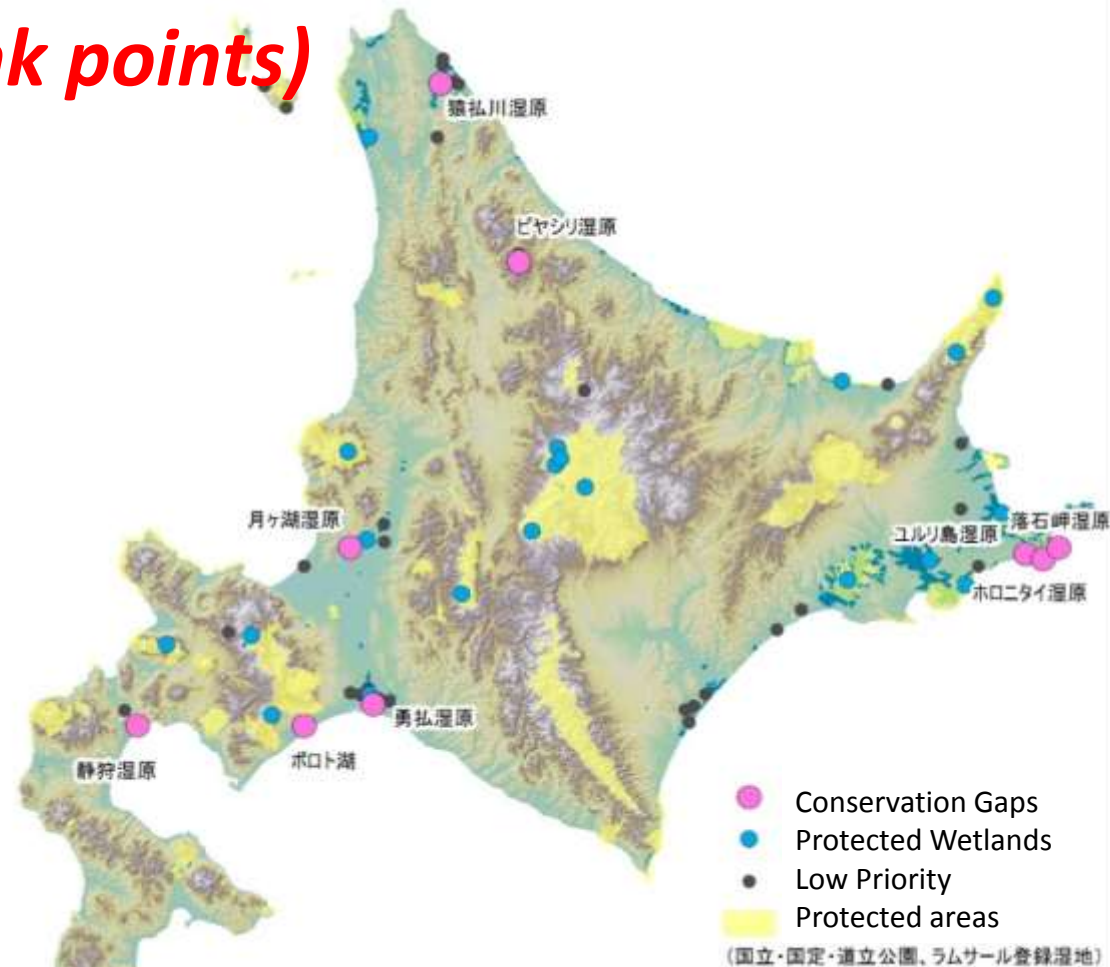
For Wetland Biodiversity



Conservation Gaps for Effective Reserve Network Design

Conservation Gaps for Effective Reserve Network Design

9 Wetlands (pink points)



Cooperation for Biodiversity Conservation

*comprehensive partnership and cooperation
focusing on the establishment
of a Conservation GIS Consortium*

- *Rakuno Gakuen University*
- *Conservation International Japan*
- *EnVision Conservation Office*
- *ESRI Japan*

<http://cgisj.jp/>

