

Fisheries in the *Shiretoko* World Natural Heritage, Japan



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Today's talk

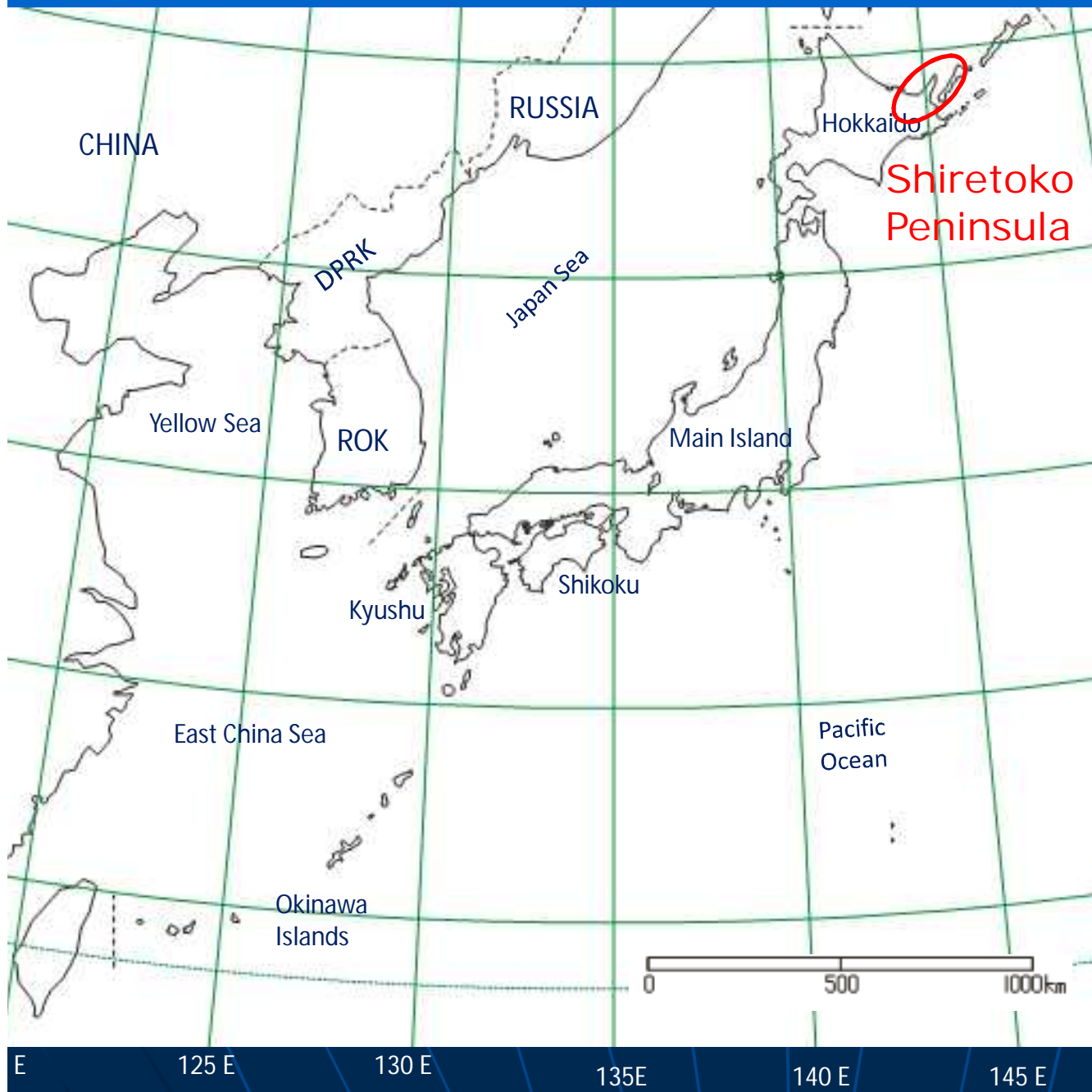
1. Introduction to the fisheries in Japan
2. Coastal fisheries management in the *Shiretoko WNH* area
3. New activities after the inscription to the UNESCO Heritage List
4. Future perspectives

1. Introduction to the Fisheries in Japan



Abarone
+
Halfbeak
+
Plum flower
+
Poetry

UKIYOE of abalone and halfbeak by UTAGAWA HIROSHIGE (late 19th Century)



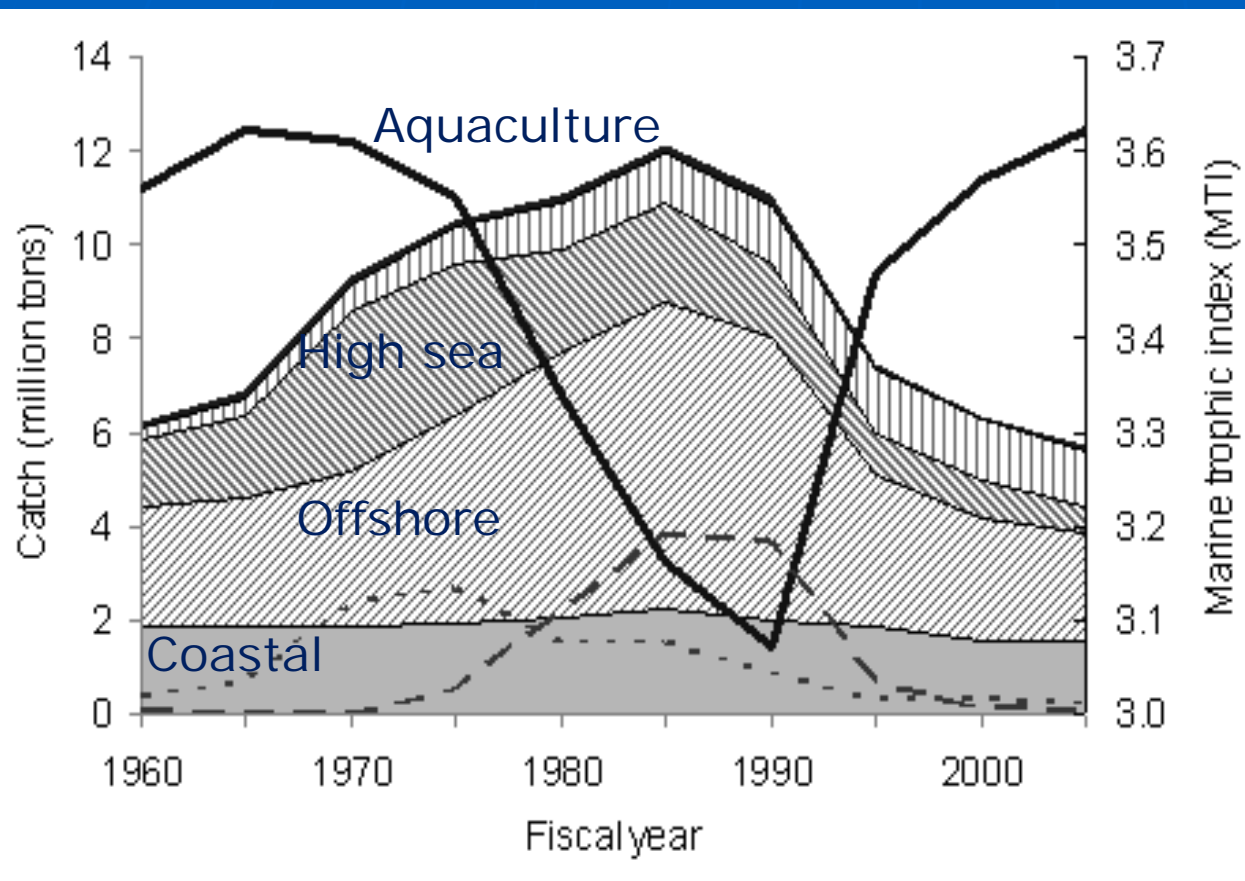
- Consists of 6852 islands

- Wide types of marine ecosystems, from tropical to sub-arctic.

- population : 127.7 milli. (2008)

- GDP: US\$ 6.4 trilli. (2007), Fisheries 0.3%.

Fisheries Production (2007)



- 5.7 million tons, US\$ 20.4 billion.

- 204 thousand fishers, with about 200 thousand fishing vessels (>98% small scale).

Profile of Fisheries Industry; comparison

Country	# fisher	# vessel	SSF ratio
Iceland	6,300	826	0.63
Norway	22,916	8,664	0.89
Denmark	4,792	4,285	0.86
UK	19,044	9,562	0.82
France	26,113	6,586	0.78
Canada	84,775	18,280	0.74
NZ	2,227	1,375	0.74
Spain	75,434	15,243	0.76
USA	C.A. 290,000	27,200	0.53
Korea	180,649	50,398	0.9
Japan	278,200	219,466	0.98
AU	13,500	C.A. 5,000	N.A.

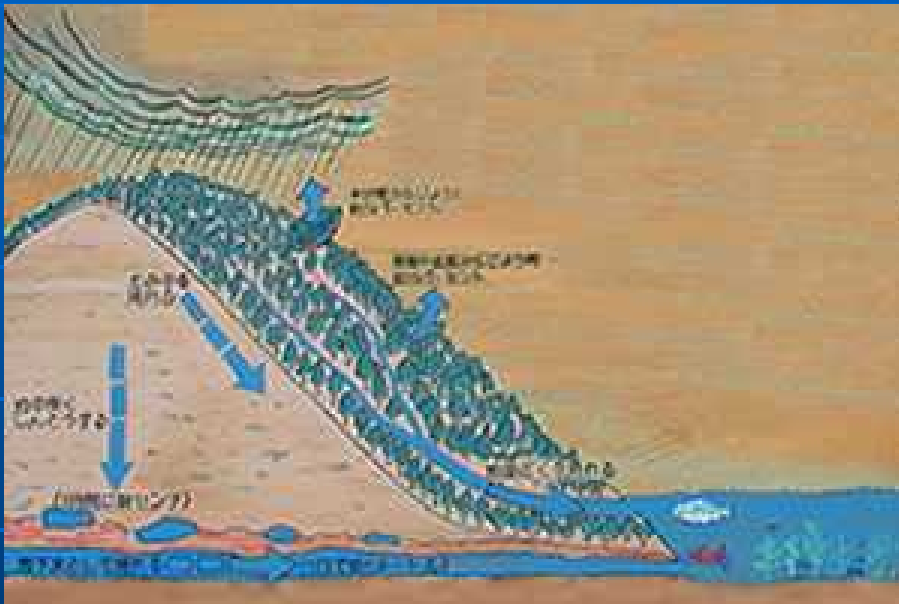
SSF < ISCFV 25 (the International Statistic Classification of fishery Vessels)

Coastal fisheries co-management in Japan

- Organization of coastal fishers, **Fisheries Cooperative Associations (FCAs)**, have **Fishing Rights** based on Fisheries Law of 1949.
- **Only the members of FCAs can operate coastal fisheries** specified by the Fishing Rights (**exclusion of outsiders**). Offshore fisheries are managed by licenses.
- Govt provides broad and simple regulations. On top of that, **each FCAs make detailed and fine tuned rules and regulations in autonomous basis** according to the social and ecological conditions.

Local fishers are one of the main stewards of fisheries resources

Examples of local fishers' autonomous activities



Local legend says

“Forests are the roots of coastal fish”

(<http://www.jf-net.ne.jp/amhiranaigyokyo/>)



Forestation activities by local fishers' wife

(<http://www.jf-net.ne.jp/hkyubetsu/sigen.htm>)



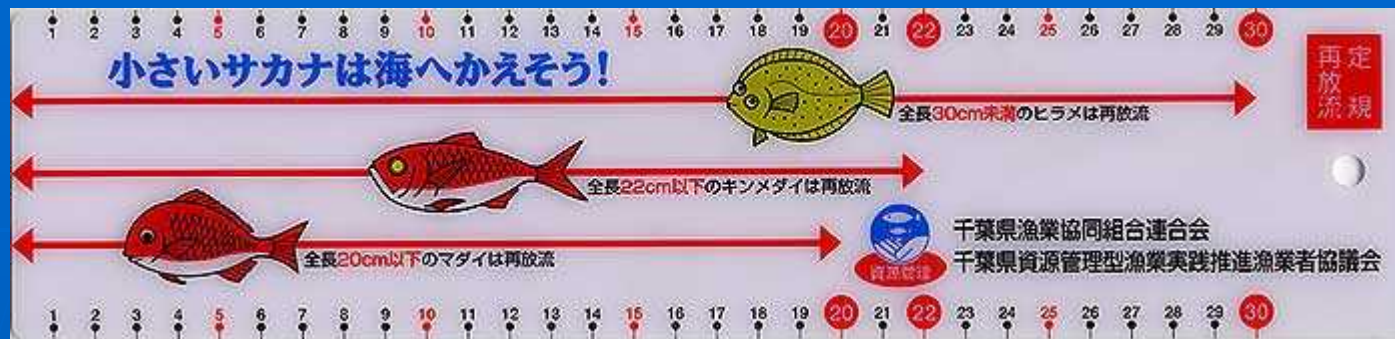
Promotion of environmentally-friendly detergent produced by the Federation of FCAs.

(<http://www.jf-net.ne.jp/fsgyoren/work1.html>)



Cleanup activities by FCA members' family

(<http://www.minato-j.fks.ed.jp/seito/gyouji/shizen/shizen.html>)



Fish scale produced by local FCA
 (<http://www.jf-net.ne.jp/cbgyoren/sigen.html>)



Autonomous resource assessment or setting
 Individual catch Quota for some species

Meetings and discussions at FCA



<http://www.pref.aomori.jp>



<http://www.pref.mie.jp>



<http://www.pref.iwate.jp>

Seafood consumption

- Seafood is consumed everyday in Japan.
- 61.5 kg/capita/year. Spending US\$1100/household (2008).
- The 2nd largest source of total protein intakes, the largest source of animal protein intakes.
- Positive correlation btw rice consumption volume.

My son (18 months old)



Dried sardine juvenile on rice

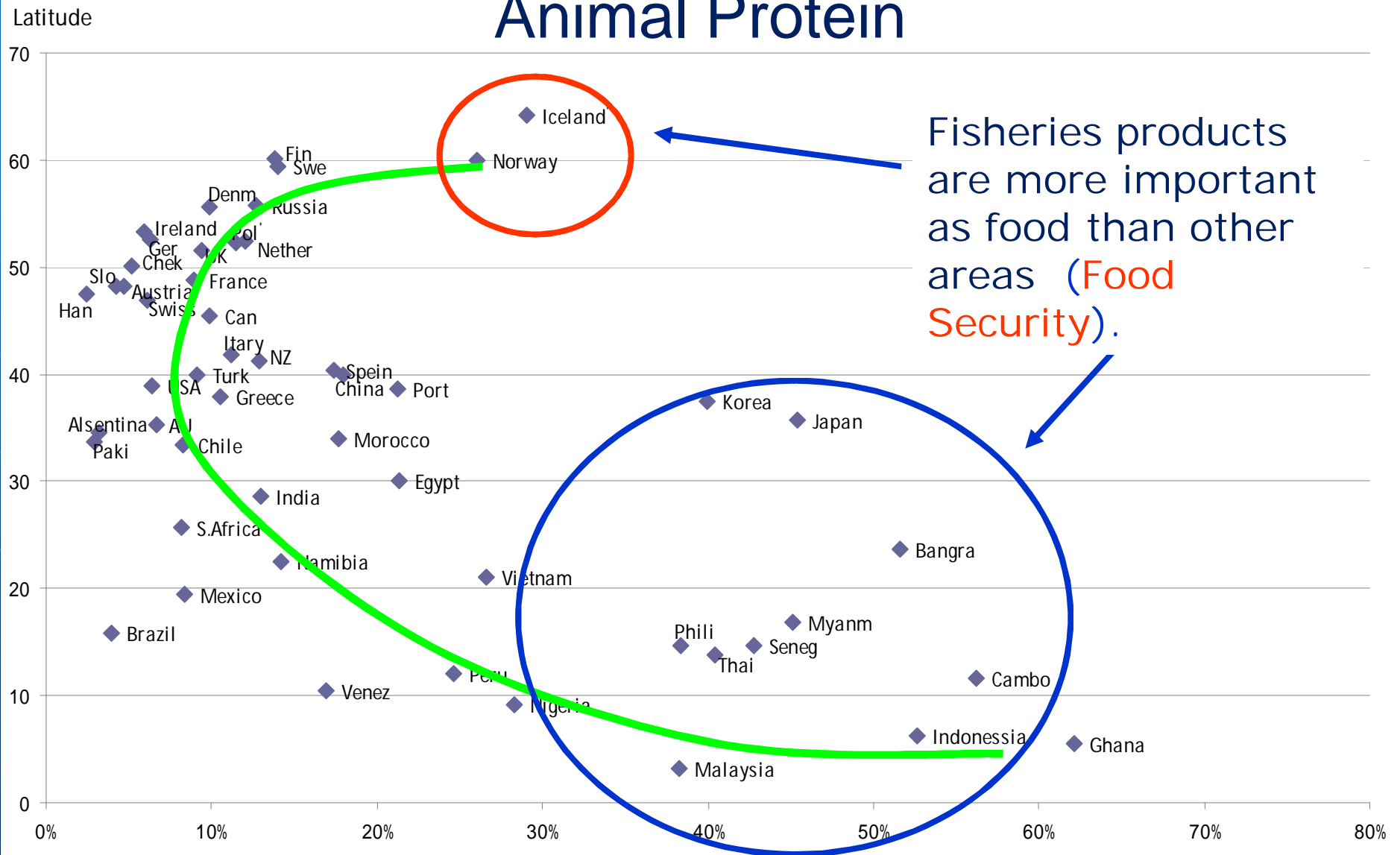
Seaweed soup

Boiled mackerel

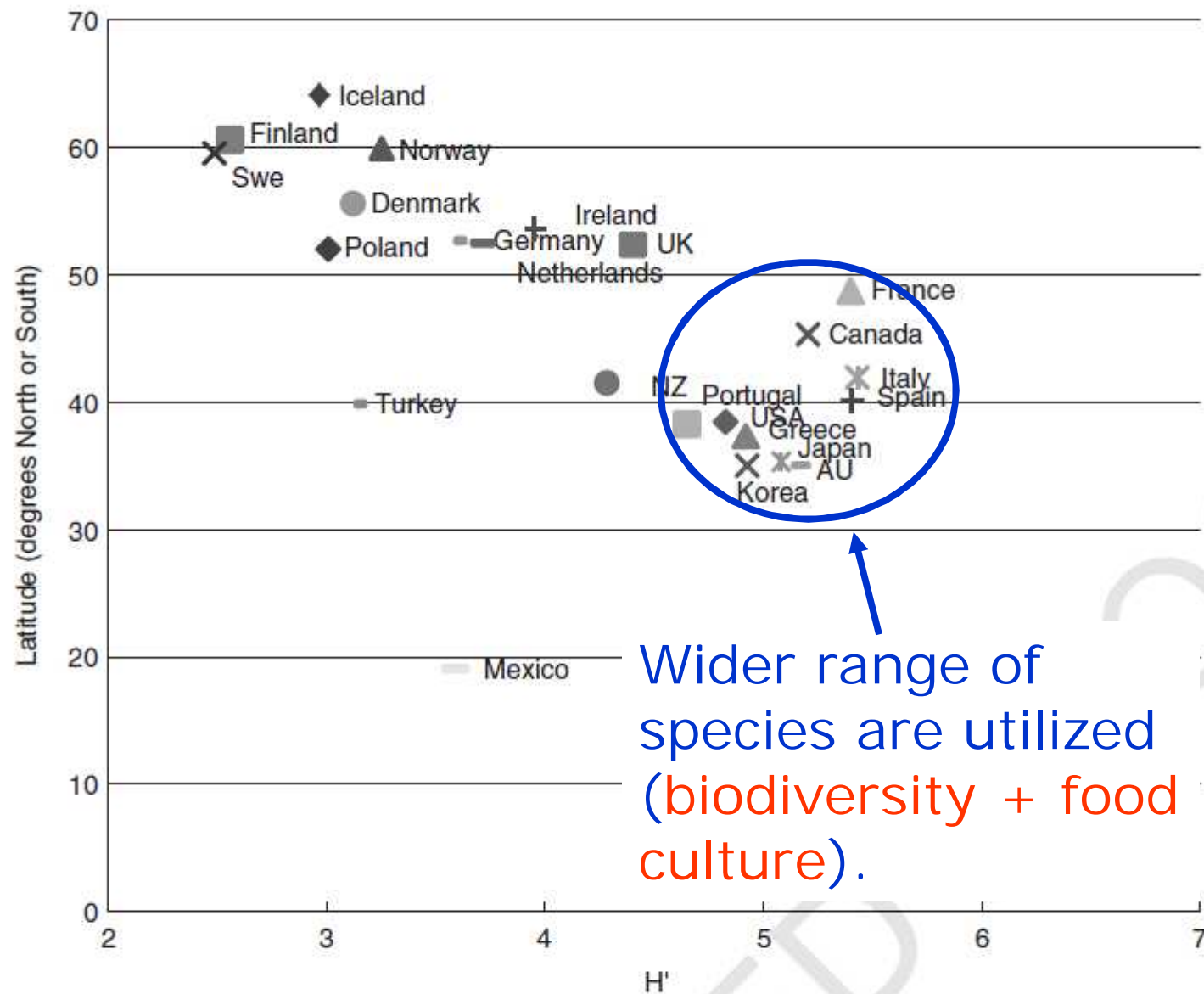
Dried bonito on boiled spinach

Pumpkin

Percentage of Seafood as the source of Animal Protein



Fisheries products are more important as food than other areas (Food Security).



Wider range of species are utilized (biodiversity + food culture).

Fig. 19.2 Diversity of fish taxa caught, with diversity calculated using the Shannon function H' , for OECD countries arranged by latitude of their capital city (Source: FAO FISHSTAT).

2. Coastal fisheries management in the *Shiretoko WNH* area



Spring festival for the God of Water

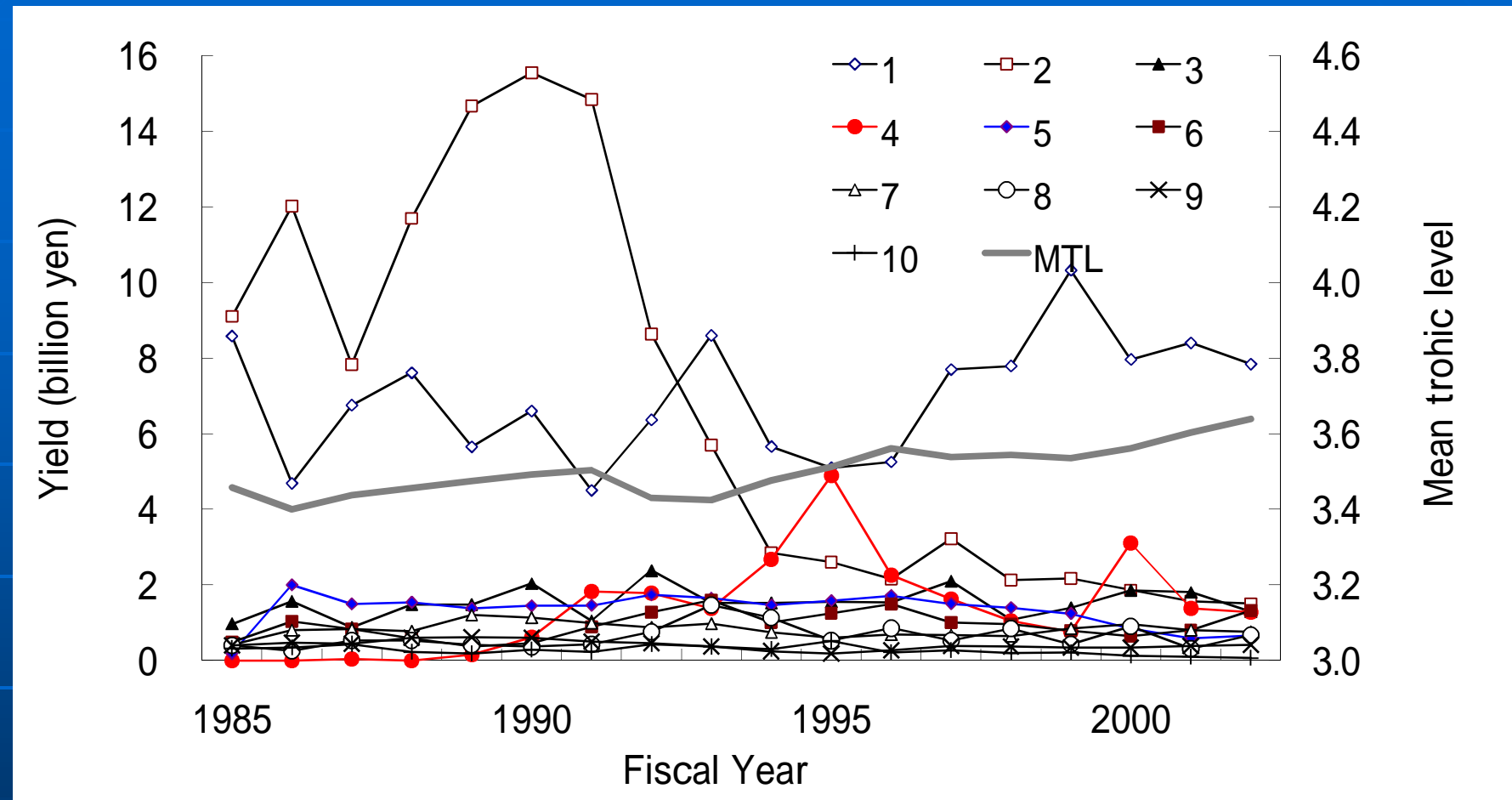


TAIRYO (big fish) flags celebrating the festival

The *Shiretoko* WNH area

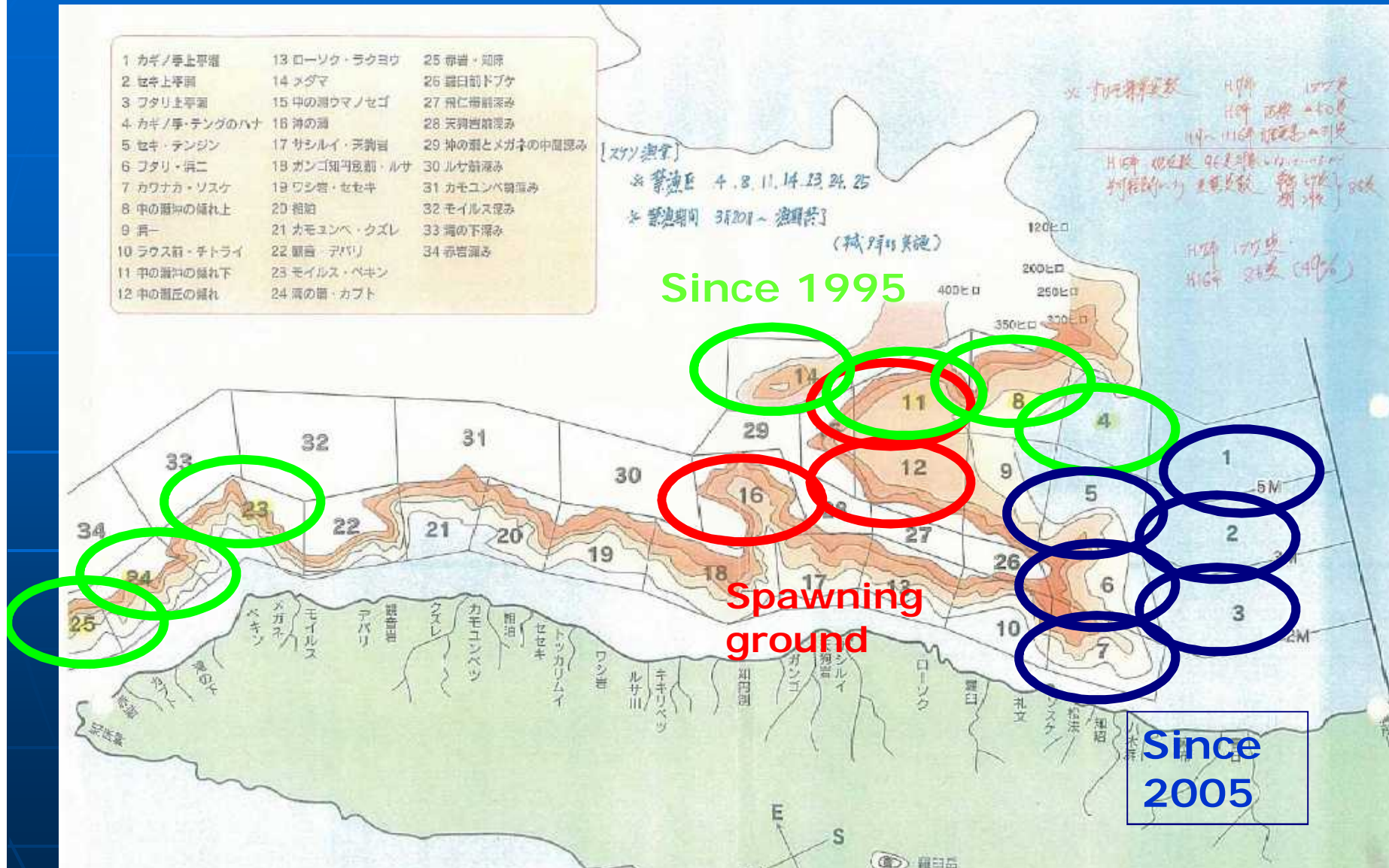


- Southernmost limit of seasonal ice floes
- Main industries: Fisheries & Tourism
- Fisheries production (2006):
73,641 tons, US\$ 28.4 million.
- There are 3 FCAs, with 851 members.
- About 20% of local people works for fisheries industry.



1. Chum salmon, 2. Walleye pollock, 3. Kelp, 4. common squid, 5. thornyhead, 6. Pacific cod, 7. greenling, 8. pink salmon, 9. sea urchin, 10. Octopus dofleini

Autonomous MPAs to protect Walleye Pollack SSB



(Bottom trawlings are legally prohibited at the coastal area)

Some other autonomous measures for Walleye pollock

- Rules on fishing season, operation time, #nets, etc.
- Enlargement of gillnet mesh size based on the results of academic research (Ueda, 1992)
- Vessel buyback program. Compensation costs, US\$13.5milli, are paid by residual fishers and FCA.
- Collecting biological data (e.g. maturity)
- (TAC is set by the govt.)



- Local fishers are engaged **not only in fishery operations, but also in resource mgmt and a part of EBFM.**
- The core fishers are attending **15-20 meetings per month for their autonomous management** (a part of fisheries operation).
- The next task is scientific assessment on these autonomous activities.

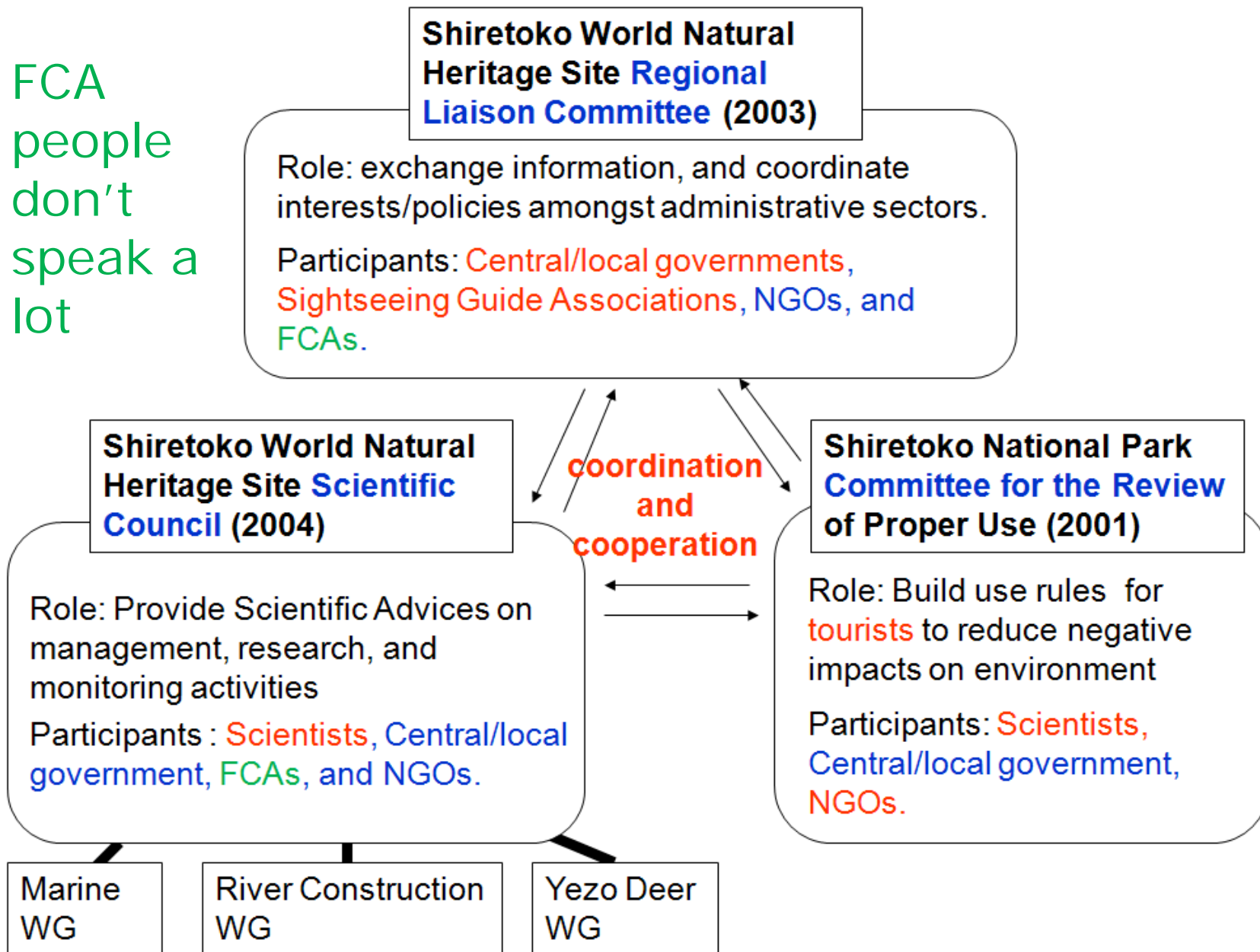
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How this fisheries co-management regime was expanded to EBM

1. New coordinating org.s for multi-sector

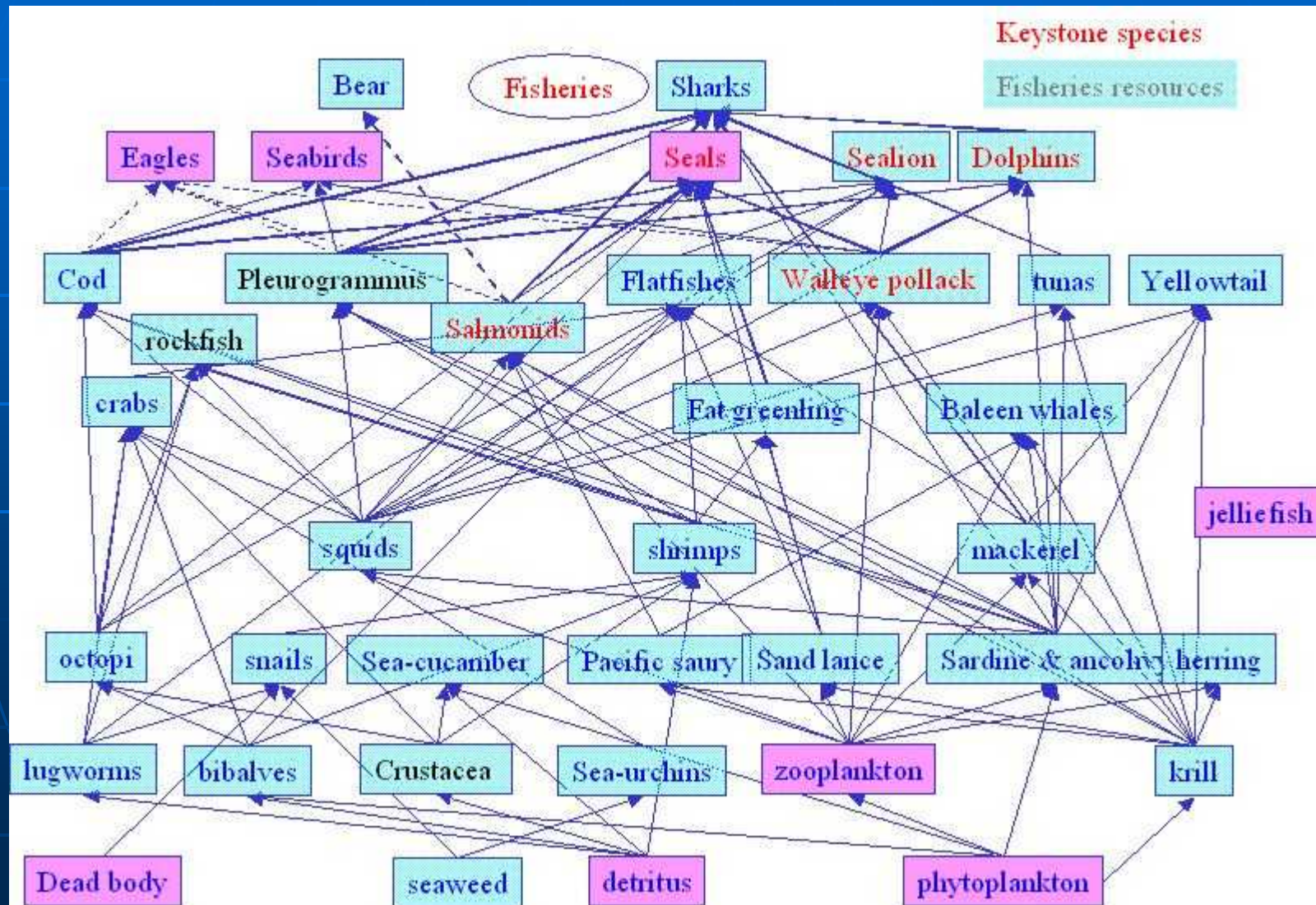
FCA
people
don't
speak a
lot



2. WNH marine management plan (WNH MP)

- **Objective:** to satisfy both conservation of the ecosystem and sustainable use of resources.
- WNH MP defines adaptive management and **monitoring of coastal ecosystem**.
- WNH MP officially incorporated autonomous measures by local fishers as a part of EBM.

Coastal Food web at Shiretoko WNH area (WNH Scientific Council, 2005)



The objective matters

- unless the **objective** of the EBM in *Shiretoko* WNH is set to go back to the original “**wilderness**” of centuries ago, utilizing wide ranging species in sustainable manner is very close to the conservation of ecosystem structure and functions in this area.
- Coastal fishery is a keystone species

Fisheries production statistics (tons) at Shiretoko WNH, compiled by 3 FCAs.



Very informative time-series data for monitoring the changes in ecosystem structure/functions



Therefore

- Fisheries information was integrated into the official ecosystem monitoring framework.
- Non-target species and other physical indicators (drift ice, water temperature, etc) are monitored by the government agencies.
- This is a **social role-sharing** of ecosystem monitoring

3) Endangered species

Sea lion

(IUCN Red-list Species)



From www.sizenken.biodic.go.jp/

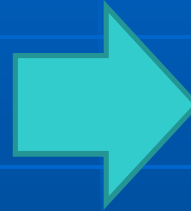
- Traditionally, local people eat sea lions.

- Local population of Sea lion is increasing, and causing fisheries damage by destroying set-nets

- Potential Biological Removal (PBR) theory was applied and the catch limit was calculated as 120/year to reduce fisheries damages.

4) inter-connection btw land and sea

Anadromous species protection



- There were a lots of artificial constructions along the rivers in this area.
- Some of them were removed, as far as it does not increase the disaster risk for local residents. Others were modified (e.g., fish pass)

How much did the government have to pay ? (in FY 2006)

Cost item	Amount (1000 yen)
Running costs for Scientific Council	17,548
Running costs for the Review Committee and Eco-tourism Association	15,120
Research and monitoring	54,731
River improvement	284,927
Personnel	101,778
Total	470 million

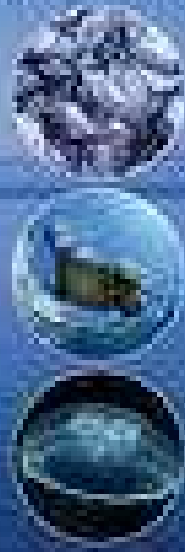
- Fisheries production: 22,966 million yen

- Tourists spent: estimated 36,617 million yen.

- the total administrative cost corresponds to **0.8%** of the sum of two principal industries.

- The Japanese fisheries management framework (**community-based co-management**) led to a different EBM from, for example, that in Iceland or New Zealand, where market-based ITQs are the central policy tool.
- A **careful assessment on the existing institutional framework** is one of prerequisites for better EBM.

JASON S. LINK
**Ecosystem-Based
Fisheries
Management**
Confronting Tradeoffs



Author: Jason Link

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Preface;

Part I. Context:

1. Admit the problem;
2. Why is an ecosystem approach now strongly heralded and merited?;
3. Being audacious;
4. Framework for scientific information to support EBFM;
5. When does it make sense to do EBFM?;

Part II. Making EBFM Operational - Technical Considerations:

6. Ecosystem indicators;
7. Expanding the stock focus: what we should have been doing yesterday;
8. A systemic focus: what we can do now;
9. Assessing risk: a different view of ecosystem information;

Part III. Institutional Considerations:

10. Why most fisheries biologists become amateur social scientists;
11. Management institutions regarding EBFM;
12. It's all about tradeoffs;

JASON S. LINK

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Confronting Tradeoffs



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You need professionals!

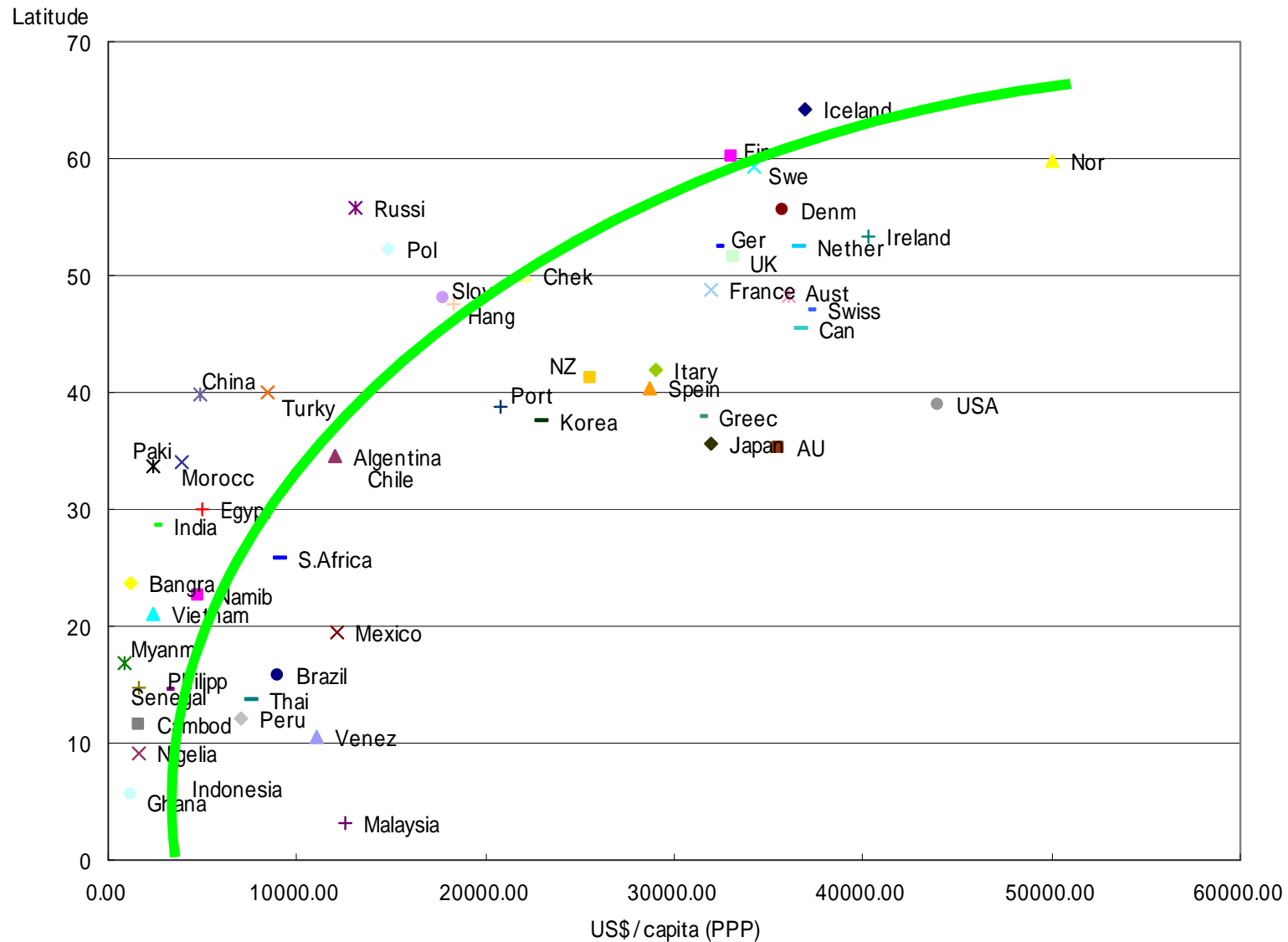
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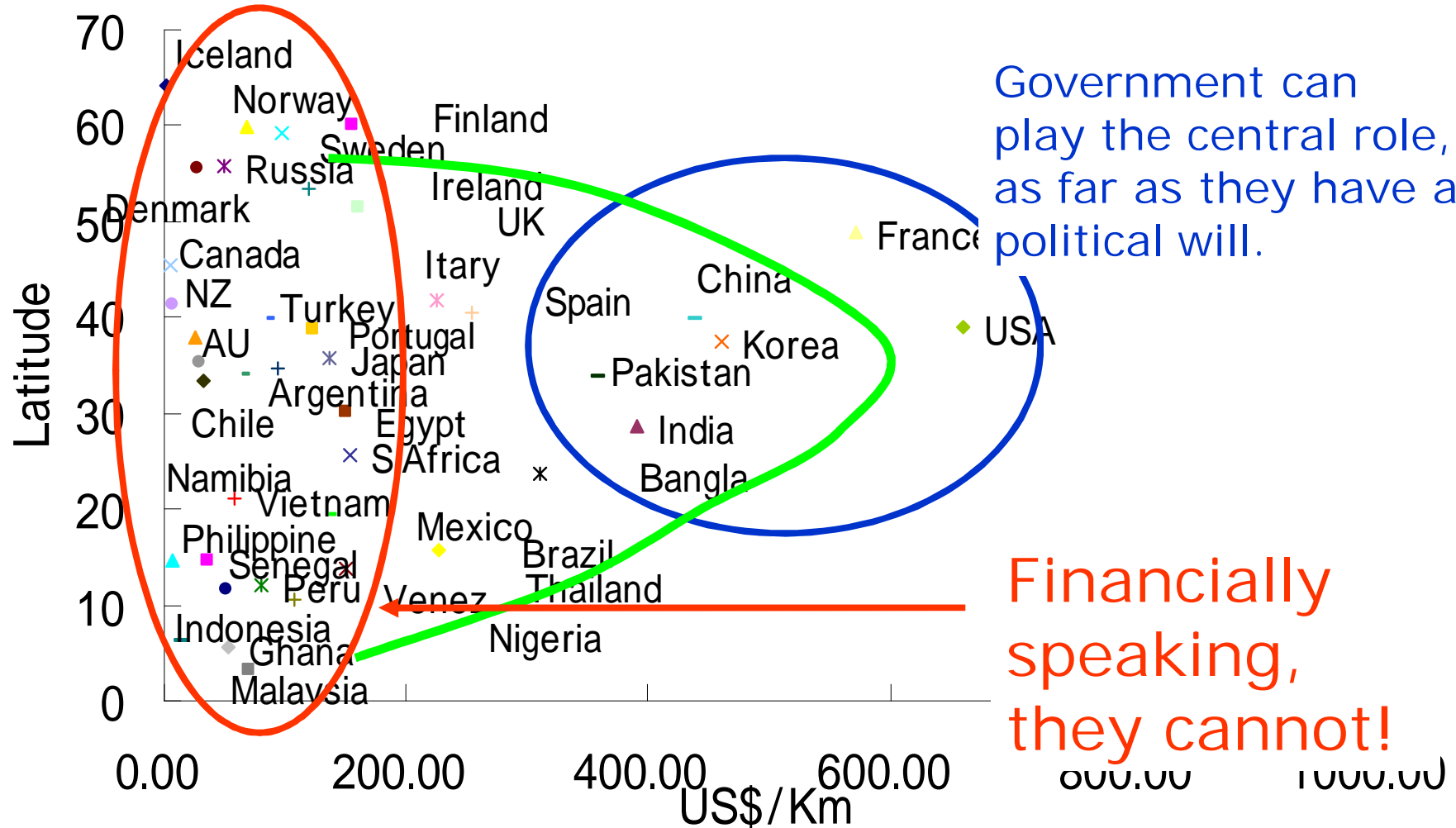
- 1) Implication
- 2) Future challenges

Per Capita GDP (PPP, US\$)

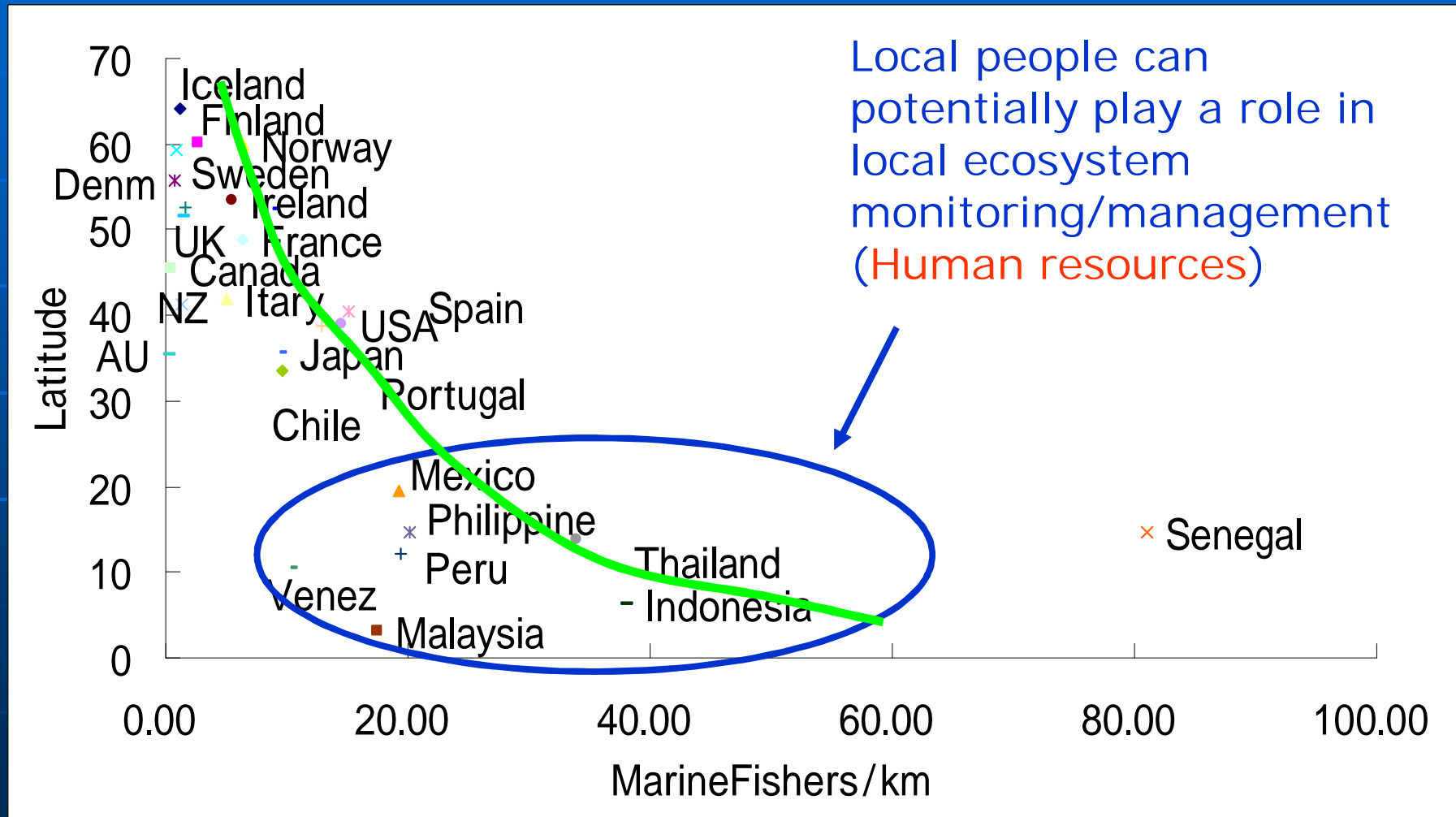


Financial background: GDP per 1km of coast line

(index for feasible public expenditure on marine policy)



Average number of marine fishers per 1km of coast line.



Implications from the Shiretoko case for EBM in the mid-low latitude countries.

- Due respects paid to the local fishers' knowledge and their autonomous activities;
- No exclusion of local fishers from the heritage area (they are the core of the EBCM).
- No destruction of local norms and livelihoods;
- Participation by local fishers to all the D/M processes;
- No expensive measures by the government.

The deputy director of the UNESCO World Heritage Center, Mr. Kishore Rao remarked "this is a new model of environmental conservation under the World Heritage Program " (Mainichi 2008).

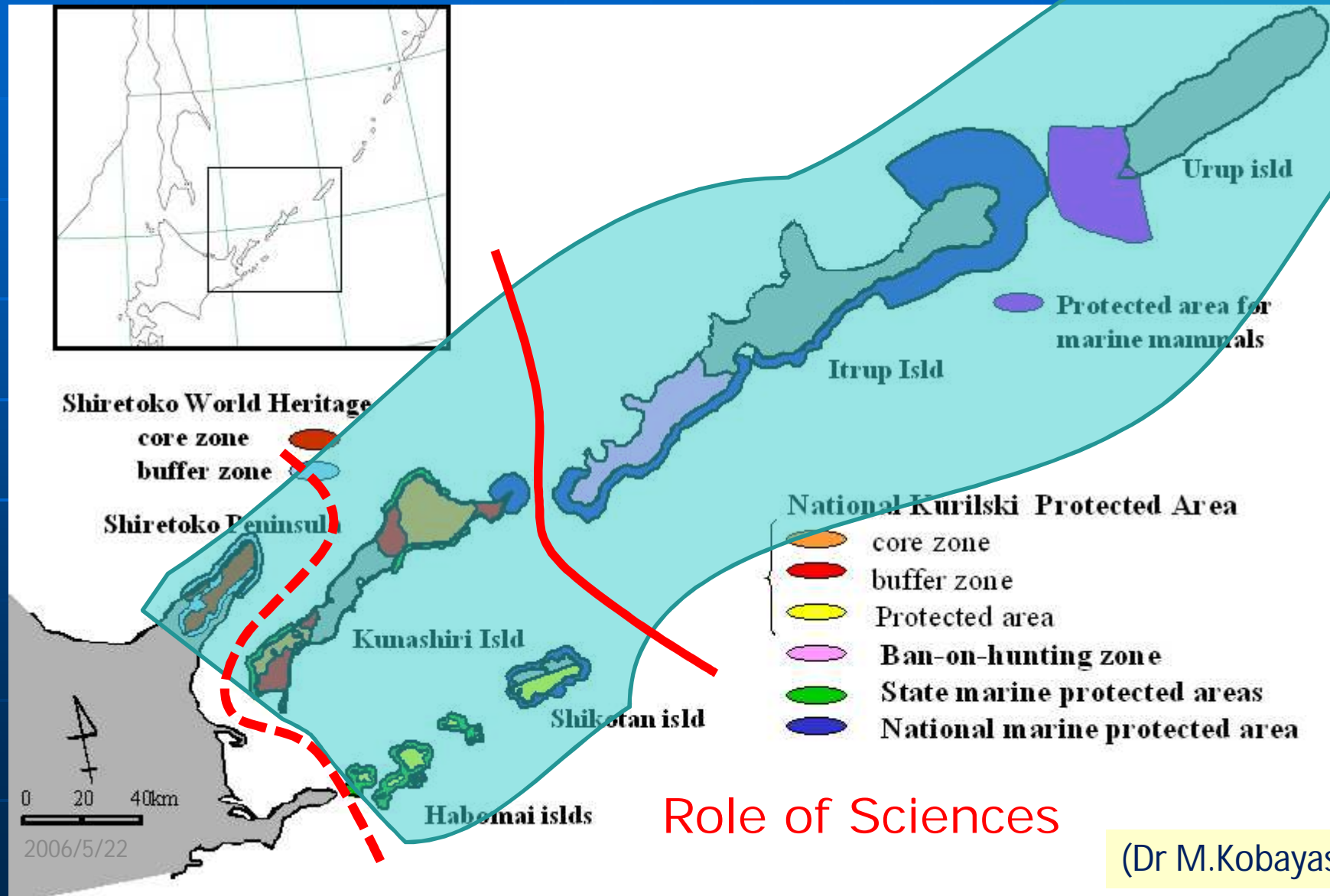
Future Challenges 1: Advice from IUCN (2008)

- Development of **practical indicators** for adaptive management, and verification of mgmt effects.
- Development of action plan for **climate change**,
- Promotion of **Eco-tourism**, etc.

Challenge 2: the scaling up

- WNH area is just a part of LME.
- On the other hand, Japan has territorial disputes at the area just next to the *Shiretoko WNH*.

Idea of cross-boundary peace park



Role of Sciences

(Dr M.Kobayashi)

Thank you very much



Traditional pole near *Shiretoko WNH*



Totem pole in Alaska

**Biological diversity and Cultural diversity
compose One Mother Nature**

Global characteristics of the Japanese Fisheries (and mid-low latitude countries in Asia)

Cond.1: Expensive policy measures are impossible
(financial condition).

Cond.2: Fisheries operations are small-scale
(industrial profile condition)

Cond.3: Diversity in resource use is high, reflecting
the high biodiversity of the surrounding sea
(marine resource condition).

Cond.4: People largely rely on seafood as a source of
animal protein (food security condition)

Cond.5: Fisheries sector is important as a source of
employment (social security condition)

Cond.6: Rich in the potential human resource in the
coastal area (human resource conditions)

Public Services	Legal basis	Administrative body
Fisheries management	-Fisheries Law of 1949, Fisheries Resource Protection Law of 1951, Law Concerning the Conservation and management of Marine Life Resources of 1996	-Fisheries Agency
Pollution control	-Law Relating to the Prevention of Marine and Air Pollution from Ships and Maritime Disasters of 1970, Waste Management and Public Cleansing Law of 1970, Water Pollution Control Law of 1970	-Coast Guard (Ministry of Land, Infrastructure, Transport and Tourism) -Ministry of Environment
Landscape conservation	-Law on the Administration and Management of National Forests of 1951, Natural Parks Law of 1957, Nature Conservation Law of 1972	-Ministry of Environment - Forestry Agency
Species protection	-Law for the Protection of Cultural Properties of 1950, Law for Conservation of Endangered Species of Wild Fauna and Flora of 1992, Wildlife Protection and Appropriate Hunt-ing Law of 2002	-Ministry of Environment -Ministry of Education, Culture, Sports, Science and Technology

Concept of fisheries management:

- The fundamental concept (Sec. 1 of the law) is “the Holistic Utilization of Sea Surfaces”.
- To arrange and coordinate various fishing operations within a certain area from an overall point of view, not from the viewpoint of each economic unit.
- Various levels and scales of coordinating organizations have been instituted.
- Fishing rights are not exclusive real rights, but limited real rights (subject to limitations set out by coordinating org.s).

Coordinating Organizations

Level	Organization	Function
National Level	Fishery Policy Council	The advisory body to the government for national level fishery coordination, design of national fishery policy, etc.
Multijurisdictional Level	Wide-Area Fisheries Coordinating Committees (WFCCs)	Coordination of resource use and management of highly migratory species. Also addresses Resource Restoration Plans.
Prefectural Level	Area Fishery Coordinating Committees (AFCCs)	Mainly composed of democratically elected fishermen. Coordination through the Fishery Ground Plan, Prefectural Fishery Coordinating Regulations, and Committee Directions.
Local Level	Local Fisheries Cooperative Associations (local FCAs)	Composed of local fishermen. They establish operational regulations (FCA regulations) that stipulate gear restrictions, seasonal/area closures, etc., according to local environment.
More Specialized Purpose	Fishery Management Organizations (FMOs)	Autonomous body of fishermen. FMO rules are more detailed and stricter than the FCA regulations.

Formal organizations

Org.

Informal

TAC species

- Saury (*Cololabis saira*)
- Walleye pollack (*Theragra chalcogramma*)
- Jack mackerel (*Trachurus japonicus*)
- Spotlined sardine (*Sardinops melanostictus*)
- Chub Mackerel (*Scomber japonicus*,
S. australasicus)
- Sagittated calamary (*Todarodes pacificus*)
- Snow crab (*Chionoecetes opilio*)