NEASPEC-NEAMPAN

Report on the Management Plans and Strategies of the NEAMPAN Site in Japan

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Contents

1. Review of management plans / strategies of the selected NEAMPAN site

1.1 Basic information of the National MPA Policy in Japan

The Japanese national-level policy document on marine biodiversity conservation is the "Marine Biodiversity Conservation Strategy" (see Supp. 1). It was formulated by the Ministry of Environment in 2011 based on the "Basic Act on Biodiversity" enacted in 2008 (Supp. 2), in line with the "Basic Act on Ocean Policy" enacted in 2007 (Supp.4). The author was a member of the Drafting Committee for the Marine Biodiversity Conservation Strategy. Its objectives are as follows:

> "The Strategy aims to protect the biodiversity to support the sound structure and function of marine ecosystems, and to use ecological services of the ocean, or its blessings, in a sustainable manner. The Strategy provides a basic view and direction of measures for conservation and sustainable use of the marine biodiversity."

This Strategy includes the Japanese definition of Marine Protected Areas (MPAs) described as follows;

> "Marine areas designated and managed by law or other effective means, in consideration of use modalities, aimed at the conservation of marine biodiversity supporting the sound structure and function of marine ecosystems and ensuring the sustainable use of marine ecosystem services."

Therefore, in Japan, the harmony between the biodiversity conservation and sustainable uses are the prerequisite of the marine environmental policies. To be more specific to the MPA discussions, the No-take sanctuary is only one of many important types of the MPAs , same as the definition of marine protected areas by the Convention on Biological Diversity (CBD) or International Union for Conservation of Nature and Natural Resources (IUCN).

As the Attachment to this Strategy, Government of Japan officially published the list of "Existing Systems in Japan that may correspond with Marine Protected Areas", so called, "Japanese MPA system"（https://www.env.go.jp/nature/biodic/kaiyo-hozen/other/pdf.html）.

In this list, the Japanese MPA system is consisting of three categories by objectives; 1) Protection of

natural scenery (implemented by Ministry of Environment), 2) Protection of natural environment or habitats and growing areas for organisms, (implemented by Ministry of Environment), and 3) Protection, cultivation etc. of aquatic animals and plants (implemented by Ministry of Agriculture, Forestry and Fisheries). Table 1 shows these 3 types of MPAs, although they can coincide within the same geographic areas with differing protection targets as in Shiretoko MPA. With this definition of MPA, 8.3% of the Japanese Exclusive Economic Zone (EEZ) is covered by the MPAs.

Table 1. Japanese MPA System

(1) Protection of natural scenery (administered by the Ministry of Environment)

Area (System)	Purpose of designation	Description of major regulations
Natural Park (Natural Parks Act)	Protection of outstanding natural scenery and promotion of its use	Mainly regulation on developments, such as landfills (Ordinary Zone: notification system; Marine Park Zone: license system or harvest control in some zones). A Special Area (license system) may be set in brackish water zones.
Natural Coastal Protected Zone (Act on Special Measures Concerning Conservation of the Environment of the Seto Inland Sea)	To maintain the state of nature so that seashores and ponds, could be used for bathing, shellfish gathering and so forth in the future.	Regulation on developments, such as the construction of new structures, the transformation of land properties, the mining of minerals, and earth and rock quarrying (the prefecture concerned must be notified).

(2) Protection of natural environment or habitats and growing areas for organisms (administered by the Ministry of Environment)

Area (System)	Purpose of designation	Description of major regulations
Nature Conservation Area (Nature Conservation Law)	Conservation of the outstanding natural environment requiring particular conservation.	Developments, such as land transformation, are mainly controlled (Ordinary Zone: notification system; Marine Special Zone: license system or harvest control is adopted in some zones)
Wildlife Protection Area (Wildlife Protection and Proper Hunting Act)	Protection of wildlife.	Hunting is controlled. Developments, such as the construction of structures, are also controlled in Special Protection Zones, and the use of power-driven vessels is additionally controlled in Special Protection Designated Zones.
Natural Habitat Conservation Area, etc. (Act on Conservation of Endangered Species of Wild Fauna and Flora)	Conservation of national endangered species of wild fauna and flora.	Development is controlled in Monitored Zones (by notification system). In Controlled Zones, the harvest of designated species and the use of power-driven vessels are regulated in addition to development control (license system). Additionally, access is restricted for Restricted Entry Zones
Natural Monument (Act on Protection of Cultural Properties)	Protection of animals, plants, geographic features and minerals of high scientific value.	License systems on acts that change the current state or adversely affect its conservation.

(3) Protection, cultivation etc. of aquatic animals and plants (administered by the Ministry of Agriculture, Forestry and Fisheries)

Area (System)	Purpose of designation	Description of major regulations
Protected Water Surface (Act on the Protection of Fishery Resources)	Protection and cultivation of aquatic animals and plants.	Development, such as landfill and dredging (license system), and the harvest of designated aquatic animals and plants are controlled for water surfaces suitable for egg laying and the growth of juvenile fish
Coastline Marine Resource Development Area, designated sea area (Marine Resources Development Promotion Act)	To promote the streamlining of the development and use of marine fishery resources through measures to promote the multiplication and aquaculture of aquatic animals and plants systematically.	Development, such as sea bed transformation and digging, is controlled (it must be notified to the governor or the Minister of Agriculture, Forestry and Fisheries). Prefectures must formulate a "Coastline Marine Resource Development Plan".
Area designated by prefecture, fishery operator group, etc.	To protect and cultivate aquatic animals and plants, and to secure their sustainable use.	Control over harvest of specified aquatic animals and plants, etc.
(Underlying systems) Harvest Control Zone (Fishery Act and Act on the Protection of Fishery Resources), water surfaces covered by the Resource Management Regulations and voluntary efforts by fishery cooperatives (Fishery Cooperative Act)		
Common fishery right area (Fishery Act)	To enhance fisheries productivity (protecting and cultivating aquatic animals and plants, and ensuring their sustainable use), etc.	The harvest of aquatic animals and plants (area, period, fishing method, number of vessels, etc.) is controlled by the Rules about the Exercise of Fishery Rights (approved by the governor). A right to petition based on real rights, a right to claim compensation or damages, and, at the same time, a charge of the infringement on fishery rights will apply to infringement by any third party.

(Source: https://www.env.go.jp/nature/biodic/kaiyo-hozen/pdf/pdf_eng_shiryo.pdf)

However, this is not enough to protect the Japanese marine ecosystems. For instance, Nature conservation area (in the second category above) is less than 0.01% of Exclusive Economic Zones (EEZ) in Japan. The majority of MPA in Japan is the fisheries-related MPAs (the third category in the Table 1). Also, these existing MPAs are targeting mostly the coastal shallow waters. Additional institutional framework specific to the protection of the offshore deep-water areas are needed, such as sea mountains, hydrothermal vents, trenches, etc. So, the amendment of the "Nature Conservation Law" has been submitted to the Parliament on March 1st of 2019, passed the Lower House on April 9th, and passed the Upper House on 24th (I was in the drafting committee). Based on this amendment, we will set additional MPAs at the Offshore areas, and will achieve the Aichi Biodiversity Target (10% of EEZ)[2].

Other relevant acts relating to MPAs

In Japan, two Acts are important from the viewpoint of MPAs, i.e., the **Basic Act on Ocean Policy** of 2007 (Supp.4) and the **Basic Act on Biodiversity** of 2008 (Supp.2).

[2] https://www.cbd.int/sp/targets/rationale/target-11/

The Basic Act on Ocean Policy of 2007 was legislated with the following motivation: marine policies must deal with many cross-sectoral issues but vertical segmentation by ministries is the serious problem. Therefore, the main objective of this act is the integration/coordination of marine-related policies. There are six basic principles such as 1) harmonization of the development and use of the oceans in ways that conserve the marine environment, 2) securing safety and security on the oceans, 3) improvement of scientific knowledge of the oceans, 4) sound development of ocean industries, 5) comprehensive governance of the oceans, and 6) international partnership with regard to the oceans. The Headquarters for Ocean Policy, headed by the Prime Minister of Japan, was established in the Cabinet, and the Basic Plan on Ocean Policy was formulated in 2008. Revised in 2013 and 2018 (Supp. 5). This Basic Plan prescribes in more detail the direction of ocean policy in Japan, including the Marine Protected Areas. So, this document is the legal base of the Japanese MPA system (mentioned earlier).

The **National Biodiversity Strategies** have been published in 1995, 2002, 2007, and 2010. But no strong legal basis until the legislation of the **Basic Act on Biodiversity** in 2008. Also, the biodiversity conservation policy measures are implemented in Japan based on specific acts to each issue, such as "**Species Protection Act**", or "**Invasive Alien Species Act**", etc. This is the first act to integrate them and conserve the ecosystem and biodiversity as a whole. The basic concepts in this Act are the Harmony of use and conservation, Precautionary Principle, Adaptive Approach, Long-term perspective, coordination with the climate change policies.

1.2 Basic information of the Shiretoko WNH

The Shiretoko National Park is only site in Japan included in the NEAMPAN (Figure 1). As shown in the table (Table 2), it is one type of natural parks defined under **Natural Parks Law** (1957), administered by the national government.

Table 2. Classification of natural parks

	Designated by	**Administered by**
National Parks (e.g. Shiretoko National Park)	National Government	National Government
Quasi-national Parks	National Government	Prefectural Government
Prefectural Natural Parks	Prefectural Government	Prefectural Government

Reference: Natural Parks Law; Ministry of Environment and Hokkaido Prefectural Government (2007), The Multiple Use Integrated Marine Management Plan and Explanatory Material for Shiretoko World Natural Heritage Site

Because many endangered and rare species live in this pristine natural ecosystems (Figure 2), it was inscribed to the UNESCO World Natural Heritage list in 2005. Since then, very rigid science-based management system was introduced, as explained below.

The marine area of the heritage site is the southernmost region of the seasonal sea ice that is found in the northern hemisphere and is affected by the East Sakhalin cold current and the Soya warm current. This area has a complicated marine character created by these two currents together with the intermediate cold water derived from the Sea of Okhotsk and forms the marine ecosystem where welter of organisms migrate and live. (Figure 2)

The heritage site is an outstanding example of the interaction of marine and terrestrial ecosystems. In early spring, when sea ice melts earlier than in other areas, blooms of ice algae and other phytoplankton occur in the Shiretoko. As shown in Figure 4, diverse marine life, including a wide variety of fish such as salmonids and walleye pollock, live in the waters surrounding Shiretoko based on a food web that starts from phytoplankton, seaweeds and sea grass, and detritus.

A lot of anadromous salmonids return to rivers in Shiretoko for spawning. Wild salmonids (including hatchery-derived chum and pink salmon that reproduce naturally in the rivers) running upstream serve as an important source of food for terrestrial mammals (e.g., brown bear) and birds of prey (e.g., Blakiston's fish-owl), and contribute to the biodiversity and the material circulations from the marine ecosystems to the terrestrial ecosystems. Salmonids are also important as marine living resources in the region, where the hatchery programs of chum and pink salmon are carried out (Ministry of Environment and Hokkaido Prefectural Government 2007).

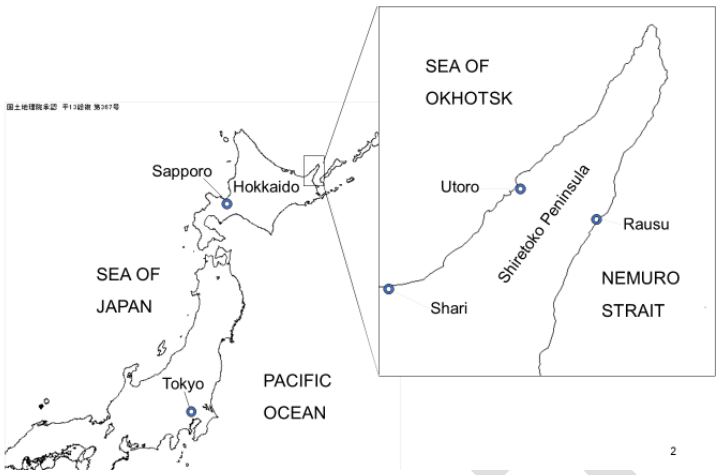

Figure 1 Location of the Shiretoko National Park (modified from Makino et al. 2009)

From top left, clockwise, Shiretoko Cape, Sealions (Eumetopias jubatus) , killer whale (orcinus orca) , sesame seal (phoca largha) , sperm whale (Physeter microcephalus)

Figure 2. Endangered/rare species in the Shiretoko National Park

This area is also a productive fisheries ground. Many types of commercial fisheries operations are conducted and producing variety of seafood for local markets and other major domestic markets (Figure 3). In 2016, the total fish landing was 44 thousand ton (22 million yen), which corresponds to 1.4% of the national total fisheries production. Figure 4 shows that human being (fisheries) is a part of the Shiretoko ecosystem and located at the top of the food web. As the figure shows, local fisheries are

utilizing almost all of the functional groups of this food web, including whales, salmon, pollock, atka mackerel, squid, kelp, sea urchin, etc. Therefore, utilizing wide ranging species in sustainable manner is very close to the conservation of ecosystem structure and functions in this area. In other words, the local coastal fishery is a “keystone species”.

Another distinguished features of this ecosystem is that, the sea ice from Russia (Amur River) is bringing rich nutrients to the Shiretoko coastal areas (Figure 5) and they become one of the most important bases of the high productivities in the area. Note that, the Amur River is flowing from the Eastern part of China. Therefore, the Shiretoko ecosystem is closely linked to the Russian and Chinese ecosystems.

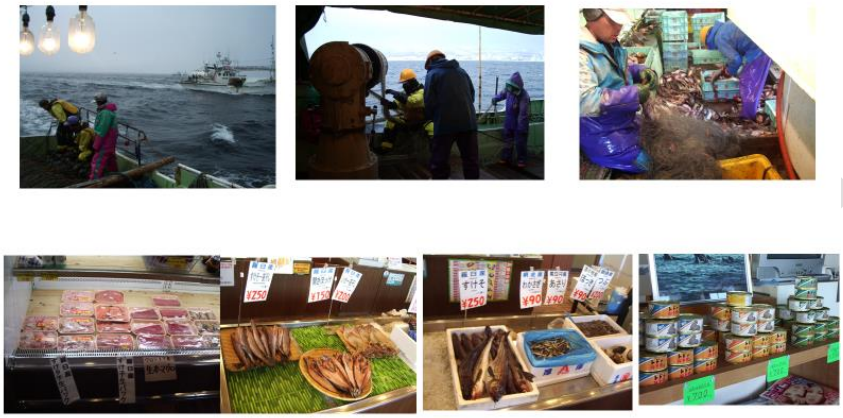

Figure 3 Fisheries operations and products in the Shiretoko National Park
(Photo by M. Makino)

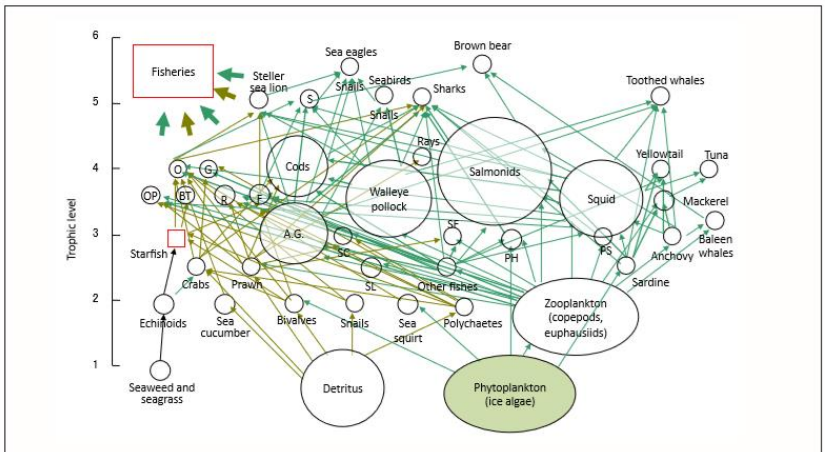

FIGURE 1. Food web in the Shiretoko World Natural Heritage (WNH) area (as depicted by the Shiretoko WNH Site Scientific Council). AG: arabesque greenling; BT: bighand thornyhead; F: flatfishes; G: greenlings; O: octopus; OP: ocean perch; PH: Pacific herring; PS: Pacific saury; R: rockfish; S: seals; SC: saffron cod; SF: sandfish; SL: sand-lance.

Figure 4. Food web in the marine area of the Shiretoko National Park. (modified from Makino et al. 2011)

Figure 5. Sea ice from Russia (Amur River)

Given the importance of the marine area of the Shiretoko National Park from the perspectives of both biodiversity conservation and fishing ground for the local fishers, the development of a Marne Management Plan for the site was part of the conditions for the inscription to the UNESCO World Natural Heritage List. Thus, the development of the Plan, reporting on the implementation, as well as review of the Plan was a part of the commitment made by the Government of Japan[3], and a strict management system has been implemented since then. Management structure of the Shiretoko World Heritage site consists of 3 major groups, i.e., administrators (Ministry of environment, Forestry Agency and Hokkaido prefecture government), Regional Liaison Committee and Scientific Council. The Scientific Council is the scientific advisory body of the management with four expert groups as of 2018. (Figure 6). The Marine Area Working Group is in charge of the marine aspects. The author is a member of the Scientific Council and the Marine Working Group.

In addition to the Scientific Council, the Shiretoko Natural World Heritage Site Regional Liaison Committee and the Joint Committee on Appropriate Use and Ecotourism are formulated to coordinate various issues and management measures across administrative organizations and interest groups including national and local governments, local townships, fishery cooperative, and local community organizations[4].

[3] http://whc.unesco.org/en/list/1193

[4] Reference: http://www.neaspec.org/sites/default/files/%EF%BC%88160615NEAMPAN%EF%BC%89Shiretoko_Maeda_E.pdf

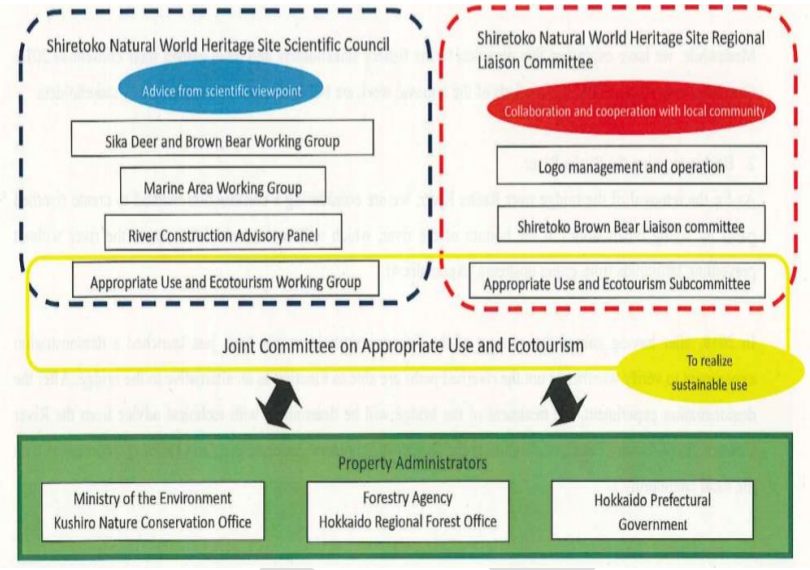

Figure 6. Institutional framework for the management
of the Shiretoko World Natural Heritage.
(modified from Miyazawa and Makion 2012)

Many laws and administrative bodies are related to the management of the Shiretoko World Natural Heritage, as summarized in Table 3. For the marine part, Fisheries Agency, Coast Guard, Ministry of Environment, are in charge of laws and policy measures for the management. It should be noted, however, that varying elements of ecosystem of the Shiretoko site fall under varying legislation. For instance, both Fisheries Law and Wildlife Protection and Appropriate Hunting Law apply in the park area in view of protection of marine mammals and controlling of their population to minimize damage to local fisheries.

Table 3. Legal basis and administrative authorities for the management
of the Shiretoko World Natural Heritage (modified from Makino et al. 2009).

Public services	Legal basis	Administrative authority
Management of Shiretoko National Park, Natural landscape	Natural Parks Law (Multiple Use Integrated Marine Management Plan)	- Forestry Agency (Hokkaido Regional Forestry Office) - Min. of Environment (Kushiro Nature Conservation Office)[5] - Hokkaido Prefecture

[5] https://www.env.go.jp/en/nature/nps/park/shiretoko/index.html

		- Local townships (Rausu and Shari)
Marine Protected Area	Basic Act on Biodiversity (2008) Basic Act on Ocean Policy (2007/2018)	- Ministry of Environment - Cabinet Office -
Fisheries Management	Fisheries Law (1949/2006) Fisheries Resources Protection Law (1951/2006) The Law Concerning the Conservation and Management of Marine Life Resources (1995/2001) Fisheries Basic Act (2001) Regulations of Sea Fisheries Adjustment in Hokkaido (1964/2006)	- Fisheries Agency (Ministry of Agriculture, Forestry and Fisheries) Hokkaido prefecture??
Pollution control	Law Relating to Prevention of Marine and Air Pollution from Ships and Maritime Disaster (1970/2007) Waste management and Public Cleansing law (1970/2006) Water Pollution Control Law (1970/2006)	- Japan Coast Guard (Ministry of Land, Infrastructure, Transport and Tourism affiliate) - Ministry of Environment - Ministry of Land, Infrastructure, Transport and Tourism
Landscape conservation and material circulation	Law on the Administration and management of Natural Forest (1951/ Natural Parks Law (1957/2006) Nature Conservation Law (1972)	- Ministry of Environment - Forestry Agency (Ministry of Agriculture, Forestry and Fisheries)
Species protection	Law for the Protection of Cultural Properties (1950/2006) The Law for Conservation of Endangered Species of Wild Fauna and Flora ("the Species Conservation Law"). (1992) Species Protection Act Invasive Alien Species Act The Wildlife Protection and Appropriate Hunting Law (2002/2006)	- Ministry of Environment, - Ministry of Education, Culture, Sports, Science and Technology (MEXT)

In addition to these official management measures implemented by the governmental bodies based on legal act, many autonomous management measures are implemented, especially relating to the fisheries management. Table 3 shows the cascade structure of the fisheries management coordinating bodies at various scales in Japan. At the national level, the Fisheries Policy Council discuss the national level issues, and made advice to the Fisheries Agency of MAFF (national government). At the prefecture level, the Area Fisheries Coordinating Committees (AFCCs) introduces the broad regulations to be applied to all the related fishers in the prefecture. The most detailed and specialized measures are designed and introduced at the local level. The local Fisheries Cooperative Associations (FCAs), and the Fisheries Management Organizations (FMOs) organized within or across the FCAs, are the main body for such autonomous regulations.

Table 4. Fisheries coordinating organizations at various spatial scales

Coordinating organizations in Japan

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 of fishing grounds, etc.
More specialized purpose	Fishery Management Organizations (FMOs)	Autonomous body of fishermen. FMO rules are more detailed and more strict than the FCA regulations.

1.3 Preliminary review of the management plan of the Shirtoko World Natural Heritage area

Management plans for the Shiretoko World Natural Heritage area

There is a long history in the conservation of the Shiretoko peninsula, which was designated as the National Park in 1964 and inscribed to UNESCO World Natural Heritage in 2005 (Table 5).

Table 5. Chronology of the conservation activities in the Shiretoko peninsula

Year	Event
1953	The first scientific field investigation in Shiretoko area
1960	A movie about Shiretoko released (big hit)
1964	Designated as **the National Park**
1971	A song about Shiretoko released (big hit)
1977	The Japanese **National Trust** (100 Square-meter Forest Movement Trust) started
1978	The Shiretoko Museum open
1982	Designation to the Wildlife Protection Area

1988	Establishment of the **Shiretoko Foundation**
1994	**Start of the activities for the nomination to the World Heritage List**
2004	Submission of the nomination list to UNESCO, UNESCO/IUCN monitoring mission
2005	**Inscription** to the UNESCO World Natural Heritage List
2007	Issuing **Shiretoko WNH Multiple Use Integrated Marine Management Plan**
2009	Issuing **Management Plan for the Shiretoko World Natural Heritage Site**

The latest management plan for the Shiretoko WNH area is "The Management Plan for the Shiretoko World Natural Heritage Site of 2009" (Supp.6. Hereafter, the Management Plan). This document, prepared by Ministry of Environment, Forestry Agency, Agency for Cultural Affairs (of MEXT) and Hokkaido Prefecture, is for the management of all the Heritage site, including the land and marine areas. The main text of the Management Plan is included in the Supplemental Materials attached to the end of this report. In this plan, the objective of the management is stated as follows;

> "In preserving the value of the heritage site in good form for future generations, the Management Plan for the Shiretoko World Natural Heritage Site was developed to appropriately conserve and manage the extremely diverse, unique, and valuable natural environment of the heritage site."

Besides the Management Plan, a specific plan for the marine areas is developed, named "The Multiple Use Integrated Marine Management Plan and Explanatory Material for Shiretoko World Natural Heritage Site" ("the Marine Management Plan" (Supp.7)). Its' objective is stated as follows;

> "The objective of this plan is to satisfy both of conservation of the marine ecosystem and stable fisheries through the sustainable use of marine living resources in the marine area of the heritage site"

As briefly described above, the Marine Management Plan was part of the government's commitment to respond to the concerns on fishing activities in the area at the time of inscription to UNESCO WNH, thus it was developed before the Management Plan for the entire Shiretoko Park. The Marine

Management Plan emphasizes that fisheries are an element of the sustainable foodweb (as shown in Table 4 above) and do not jeopardize the ecosystem. The relationships between the Marine Management Plan and Shiretoko Park Management Plan, and the timeline of their revisions are summarized in Table 6. Note that, the Marine Management Plan was revised last year (Supp.8), and the Long-term Monitoring Plan is now under revision, and the Marine monitoring scheme will be integrated into the new Long-term Monitoring Plan.

Table 6. Relationship and timeline of the the Management Plan for the Shiretoko World Natural Heritage Site and the Multiple Use Integrated Marine Management Plan

Area	Management Plan	Issued by
World Heritage Area as a whole (All the Herigate areas: terrestorial, river, and marine)	Management Plan for the Shiretoko World Natural Heritage Site (2009) + The Long-term Monitoring Plan (2012) **Now under the mid-term assessment and the revising process. The revised Long-term Monitoring Plan (more simple) and the assessment results of 8 Evaluation Items (I-VIII) will be released in late 2019 or early 2020.**	- Ministry of Environment - Forestry Agency - Agency for Cultural Affairs - Hokkaido Prefecture
Marine areas only	Multiple Use Integrated Marine Management Plan (revised about every 5 years: 2007, 2013 and 2018) ➔ Explanatory material for the Multiple Use Integrated Marine Management Plan (2007) provides list of Monitoring Parameters, responsible bodies, etc ➔ **Revised in 2018**	- Ministry of Environment - Hokkaido Prefecture

As indicated in Table 5, the Marine Management Plan and the Monitoring Parameters for Marine management Plan was revised in 2018. (Attached as Supp.8) The changes in the new plan can be summarized as following. First, at the beginning of the new plan, the summary of 10-year monitoring results since 2007 is inserted. Then, a strong emphasis was made on the importance of the Adaptive Management and declared that management measures would be changed adaptively within the duration of this plan (2018-2022). As for monitoring scheme, the importance of the stakeholder participation (fishers, local citizen, tourists, etc.) and outreach to the public were emphasized. Also, new monitoring items are added, i.e., the symbolistic marine mammal: Killer whale, and an additional important fisheries

resource: Common squid.

Importance of the management objective

The management objective of the Shiretoko World Natural Heritage is NOT to go back to the original "wilderness" of centuries ago but achieving the balance of conservation and uses. Therefore, utilizing wide ranging species in sustainable manner is very close to the conservation of ecosystem structure and functions in this area.
In other words, the local coastal fishery is a "keystone species" (Makino et al. 2009, Matsuda et al. 2009, Miyazawa and Makino 2012).

For example, figures 7 (a) and 7(b) are the works of woodblock prints (*Ukiyo-e)* artist of 19th century, Hiroshige Utagawa. They depict the Japanese concept of the harmony of people's life and the coastal ecosystems and suggest a desired relationship between people and the sea. Unless the objective of ecosystem conservation is to go back to the original wilderness hundreds of years ago, local people's life is not something to be eliminated from the "original" ecosystems, but the indispensable component of the local ecosystem (Makino et al. 2011).

Figures 7 (a) and (b) Ukiyoe of people's life and coastal ecosystems in the Edo Era.

With such a conceptual framework of harmony between human life and coastal ecosystem, following three unique features in the inscription processes to the WNH List can be pointed out, i.e., the stakeholder participation, science-based consensus building approach, and the mutual trust between the leading scientist and the local stakeholders.

First, the stakeholder participation: Local fishers (local Fisheries Cooperative Associations: FCAs) and tourism sector have been participating to the discussions/planning from the very beginning. Also, via this process, the communications between fisheries and tourism were facilitated. Next is the science-based consensus building approach. There was a strong emphasis on scientific information to bridge the differences/gaps amongst stakeholders, Ministries, and UNESCO/IUCN. It is especially important about the controversial issues relating to Sea Lion, River construction, etc. Finally, mutual trust between the leading scientist and the local stakeholders. Prof. Sakurai, a fisheries scientist was the key actor to achieve the smooth communications and unanimous decisions. Professor Sakurai is now the Chair of the WNH Scientific Council.

2. Monitoring and assessment of designated MPAs

2.1 Basic information of the monitoring plan in the Shiretoko World Natural Heritage

The monitoring activities in the Shiretoko World Natural Heritage are prescribed in "The Long-Term Monitoring Plan for the Shiretoko World Natural Heritage Site", hereafter called as "the Monitoring Plan". The outline of this plan is included in the Supplemental Materials at the end of this report (Supp.9). In this monitoring plan, the objective of the monitoring activities are stated as follows;

> "Long-term monitoring is implemented for adaptive management of the heritage site based on scientific knowledge, within the scope of the management measures stipulated in the Management Plan for the Shiretoko World Natural Heritage Site. This Plan was formulated in order to define the monitoring items and contents required for "effective and efficient" implementation of adaptive management"

The point here is that all the monitoring activities are conducted for the implementation of adaptive management of the heritage site. Monitoring is integral part as adaptive management requires review and adjustment of management and use of site, based on the prediction and monitoring of the changes in ecosystem along with the feedback function and involvement of relevant parties. As for marine area, fisheries are supposedly introduced adaptive management, as seen in the Total Allowable Catch system

for walleye pollock and autonomous closure of some fishing areas to protect spawning fish[6]. I will back to this point in Section 3 of this report.

2.2 Monitoring parameters (Items) in the Shiretoko World Natural Heritage

Based on the prescriptions in the Monitoring Plan, we have 42 monitoring items for terrestrial and marine ecosystems These 42 items can be categorized into the following 3 types defined by the monitoring bodies/organizations

i) 25 Monitoring items implemented by the relevant government agencies. The "relevant government agencies" refers to three main government agencies in charge of the management of the heritage site, i.e., the Ministry of the Environment, the Forestry Agency, and the Hokkaido Prefecture Government.

ii) 12 Monitoring items implemented in cooperation with local governments, related bodies, experts, and other government agencies besides those mentioned in i)

iii) 5 other surveys and research: surveys and research that does not fit the above two classifications.

Following table shows the total of 42 monitoring items grouped into three types as described above.

Table 7. The list of 42 monitoring items categorized by 3 types in the Monitoring Plan

i) Monitoring items implemented by relevant government agencies

1	Observation of water temperature and chlorophyll-a using satellite remote sensing
2	Fixed-point observation of water temperature using marine observation buoys
3	Seal habitation survey
4	Marine flora and fauna and habitation survey (periodic shallow-sea survey)
5	Shellfish quantative survey in shallow seas
6	Survey of spectacled guillemot, black-tailed gull, slaty-backed gull, and Japanese cormorant populations, nesting site distribution, and number of nests
7	Survey of recovery of vegetation from sika deer impact (Forestry Agency 1ha enclosure)

[6] The Multiple Use Integrated Marine Management Plan for Shiretoko World Natural Heritage Site, Ministry of Environment (2007)

8	Survey of recovery of vegetation from sika deer impact (Ministry of the Environment enclosure at Shiretoko Cape)
9	Survey of sika deer browsing pressure in experimental density manipulation zones
10	Wide-area vegetation survey to gauge sika deer feeding pressure
11	Periodic growth and distribution surveys of *Viola kitamiana*
12	Wide-area aerial count of wintering sika deer populations
13	Survey of habitation of terrestrial invertebrates (primarily insects) (including survey of alien species)
14	Survey of habitation of land birds
15	Survey of habitation of large, medium-sized and small mammals (including survey of alien species)
16	Preparation of wide-area vegetation map
17	Monitoring of number of salmon running upstream, spawning grounds, and number of spawning beds in rivers
18	Survey of habitation of freshwater fish, in particular the Dolly Varden (Salvelinus malma) that characterizes the freshwater fish fauna in Shiretoko (including survey of alien species)
19	Site utilization survey
20	Survey of sighting and encounters with brown bears, including any damage incurred
21	Meteorological observation
22	Survey of wintering population of sea eagles
23	Survey of population, breeding status, reproductive rate and number of fledglings, and food sources of Blakiston's fish-owl. Tracking of migration and distribution through tagging and attachment of transmitters. Number of dead, sick and injured and investigation of causes
24	Tracking of project implementation status through preparation of annual reports
25	Tracking of social environment through preparation of annual reports

ii) Monitoring items implemented in cooperation with local governments, related bodies, experts, and other government agencies besides those ministries

①	Aerial observation of sea ice distribution
②	Biological survey of ice algae
③	Tracking of changes in fish catches compared to Hokkaido Suisan Gensei [Statistics on Fisheries in Hokkaido]
④	Ascertainment and assessment of walleye pollock stock (survey used to set total allowable catch [TAC])
⑤	Walleye pollock spawning survey
⑥	Survey of number of Steller sealions migrating to Japan seacoast, number killed due to human actions (by gender), characteristics
⑦	Survey of damage caused by Steller sealions
⑧	Status of reproduction at white-tailed eagle nesting sites and monitoring of fledglings

⑨	Survey of total wintering population of sea eagles throughout Hokkaido
⑩	Analysis of oil, cadmium, mercury, etc. in seawater
⑪	Ground population count survey at major sika deer wintering grounds (including habitation surveys of other mammals)
⑫	Qualitative survey of sika deer population through observation of body weight, pregnancy rate etc. among culled and naturally deceased sika deer

iii) Other surveys and research

(1)	Observation and prediction of changes in sea ice volume
(2)	Capture, reproduction, population estimates, migration and distribution patterns, and damage caused by brown bears
(3)	Survey on current status and changes to genetic diversity of salmonid species
(4)	Survey of seasonal migration of wintering sea eagle populations and consumption of human-provided and naturally occurring food resources
(5)	Survey of damage caused by seals

The monitoring items above correspond to eight cross-sectoral evaluation items set out in the Long-term monitoring plan (please see the next section and Table 9 for detail) developed in connection with the Management Plan. are associated with overall evaluation criteria, 20 monitoring items are closely relating to the marine ecosystems.

Monitoring of these parameters are conducted by various entities as described above, while evaluation of the monitoring results falls under the responsibility of relevant working groups or councils formed for management of Shiretoko WNH (see Figure 6 above). Table 8 below describes marine related monitoring items and their relationships with the eight Evaluation Items, their monitoring bodies, and monitoring frequencies. For instance, Fixed-point observation of water temperature is conducted by the national agency (Ministry of Environment) in connection with the three evaluation criteria (I, IV, and VIII), evaluated by the Marine Area Working Group.

Table 8. Details of 20 Monitoring Items closely relating to marine ecosystems

Working Group (WG) responsible for evaluation		Monitoring item (referred in Table 6)	Evaluation Item								Moni	Monitoring body	Frequency
			I	II	III	IV	V	VI	VII	VIII			
			Productivity	interaction between marine and terrestrial ecosystems	Biodiversity	Balance of conservation and sustainable fisheries	Less impacts from river constructions (e.g. dams) to salmonid species	Sika deer (cervus nippon yesoensis)	Balance of conservation and recreation uses	Impacts / potential impacts of climate change	A. Monitoring by relevant government agencies B. Monitoring in cooperation with local governments, related bodies,		
Marine area WG	1	Observation of water temperature and chlorophyll-a using satellite remote sensing	X			X				X	A	To be decided	TBD
Marine area WG	2	Fixed-point observation of water temperature using marine observation buoys	X			X				X	A	Ministry of Environment	Every week from May to Oct.
Marine area WG	3	Seal habitation survey	X		X	X				X	A	Hokkaido Prefecture	Every year (from a vessel and a
Marine area WG	4	Marine flora and fauna and habitation survey (periodic shallow-sea survey)	X	X	X						A	Ministry of Environment	Not every year
Marine area WG	5	Shellfish quantative survey in shallow seas	X	X							A	Ministry of Environment	Not every year
Marine area WG	①	Aerial observation of sea ice distribution	X			X				X	B	Coast Guard	Every year (about 15-50 days observation from Coast Guard airplane)
Marine area WG	②	Biological survey of ice algae	X			X					B	Tokai Univ. and Hokkaido Univ.	TBD (Not yet monitored)
Marine area WG	③	Tracking of changes in fish catches compared to Hokkaido Suisan Gensei [Statistics on Fisheries in Hokkaido] Common Squid will be added	X		X	X					B	Hokkaido Prefecture	Every year
Marine area WG	④	Ascertainment and assessment of walleye pollock stock (survey used to set total allowable catch [TAC])	X			X					B	Fisheries Agency	Every Year
Marine area WG	⑤	Walleye pollock spawning survey	X			X					B	Rausu Fisheries Cooperative Association and Hokkaido Prefecture	Every Year
Marine area WG	⑥	Survey of number of Steller sealions migrating to Japan seacoast, number killed due to human actions (by gender), characteristics	X		X	X				X	B	Japan Fisheries Research and Education Agency	Every Year
Marine area WG	⑦	Survey of damage caused by Steller sealions				X					B	Rausu Fisheries Cooperative Association and Hokkaido Prefecture	Every Year
Marine area WG	⑩	Analysis of oil, cadmium, mercury, etc. in seawater				X					B	Coast Guard	Every Year
Marine area WG	(Add	(addition in the revised plan) Orca survey	Not yet decided									(maybe Hokkaido Univ. and tourism sector)	TBD (new item)
~~Appropriate use~~ and ecotourism WG	19	Site utilization survey							X		A	Ministry of Environment	Every Year
Scientific Council	21	Meteorological observation								X	A	Forestry Agency, and Ministry of Environment	TBD (Not yet monitored)
Scientific Council	22	Survey of wintering population of sea eagles		X							A	Ministry of Environment	Every Year
Scientific Council	24	Tracking of project implementation status through preparation of annual reports			X				X		A	Ministry of Environment	Every Year (but to be deleted in the new plan)
Scientific Council	25	Tracking of social environment through preparation of annual reports			X				X		A	Ministry of Environment	Every Year (but to be deleted in the new plan)
Scientific Council	⑨	Survey of total wintering population of sea eagles throughout Hokkaido		X							B	Joint research team	Every Year

(Source: NEAMPAN secretariat, modified by the author)

As can be seen, most of the monitoring activities are about the natural ecosystems, and the human use aspects are covered in only a few items, such as survey of visitors (item 19. Site utilization survey) and general socio-economic statistics such as demographics and industrial activities (item 25, tracking of social environment). More monitoring items relating to the human dimensions should be included. Also, the climate change is the most emerging issue for the heritage site, and monitoring items relating to the adaptation to the climate change could be more strengthened in the future (Makino and Sakurai 2012).

Also, most of the monitoring activities are not catered to the management of the World Heritage site. They are the combination of the existing monitoring activities by relevant offices (this is a source of big challenge, to be discussed later). One of the reasons is the budget. We have got several large ad-hoc and non-regular budgets for the research activities /monitoring for Shiretoko WNH, but no big regular budget specific to the WNH. This is also a big issue. Finally, the most serious issue is that we have not fully utilized the monitoring results to the adaptive management (to be discussed later).

2.3 Assessment of the Data in the Shiretoko WNH

Under the Monitoring Plan, there are eight “Evaluation Items” to be assessed (Table 9) based on the various Monitoring Items described in the previous section (full list of monitoring item in Table 8). In the process of developing monitoring plan, the Evaluation Items Task Team was organized under the Scientific Council in 2007, in order to discuss the appropriate Evaluation Items. Local stakeholders (e.g., fishers) were unofficially interviewed by this Task Team (the author was not the member at that time).

The relationships among Monitoring Items and Evaluation Items are shown in Table 7. For instance, to evaluate the criteria “II. The interaction between marine and terrestrial ecosystems is being maintained”, monitoring results of Marine flora and fauna and habitation survey (item 4), Shellfish quantitative survey in shallow seas (item 5), Survey of wintering population of sea eagles (item 22) and Survey of total wintering population of sea eagles throughout Hokkaido (⑨) should be reviewed.

Table 9. Eight Evaluation Items and their justifications.

	Evaluation Items	Justification	Reference
I	Extraordinary ecosystem **productivity** is maintained	Criteria for inscription in UNESCO Natural World Heritage	Criterion (ix) on ecosystem
II	The **interaction** of marine and terrestrial ecosystems is maintained		
III	**Biodiversity** at the time of inscription is maintained		Criterion (x) on biodiversity
IV	Marine biodiversity and stable fisheries by **sustainable use of marine resources** are achieved within the marine area of the WNH site	Recommendation in UNESCO/IUCN Report of the monitoring mission in 2005	Recommendation 4 and 6
V	**River ecosystem** is maintained which enables reproduction of salmonid, through such measures as reducing the impact of structures on the river		Recommendation 7 and 9
VI	Biodiversity in the site is not excessively impacted due to a high population density of **sika dear**		Recommendation 10
VII	Human activities such as **recreational use** and conservation of environment are well balanced	Mention in the Management Plan	4. Basic policies of management, (2) Viewpoints required for management, f. Recreational use and conservation of the natural environment
VIII	**Climate change** impact or estimation of impact are understood at an early stage		4. (2). g/ Management from a broad perspective

The procedure for the evaluation is shown in Figure 8. Each Working Group (in case of the marine ecosystem, the Marine WG) assess its assigned monitoring items every year. Then, based on these results, the Scientific Council judge the 8 Evaluation Items for every 5 years. Now, the first judgement by the Scientific Council is ongoing. The real evaluation documents for monitoring of 2016 developed by the Marine WG in 2018 (in Japanese) were attached to this report as the appendix.

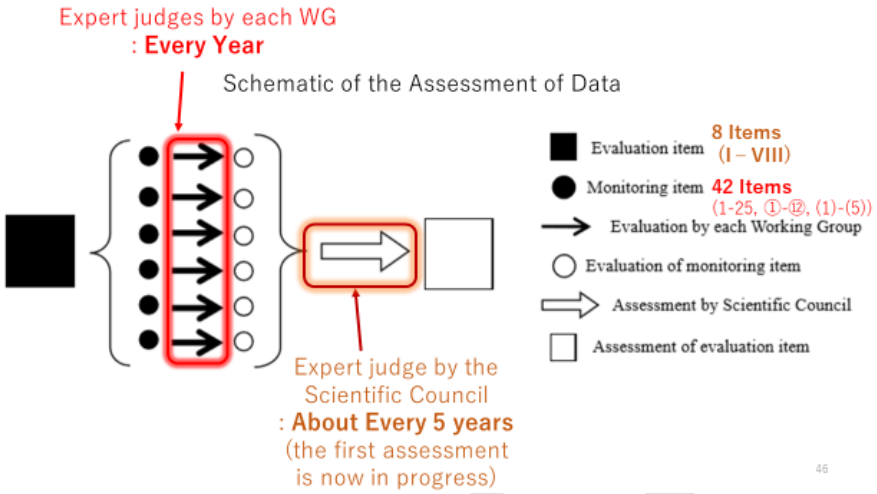

Figure 8. The schematic diagram of evaluation procedure

2.4 Links between monitoring / assessment results and management in the Shiretoko WNH

How assessment results are used for future management (e.g., for action, for planning, etc.)?

For the moment, as far as the author understand, these Monitoring Items and Evaluation Items are used only for the reporting of the current status to UNESCO and the general public. The author thinks this is not enough, and the results should be utilized to adaptively modify the management measures for the conservation of the heritage area.

What is the institutional framework / stakeholder engagement in the monitoring and assessment of the site, and utilization of the assessment results?

As summarized in Table 8, many monitoring items are monitored by the Ministry of Environment, Forestry Agency and the Hokkaido Prefecture (local government). The sea ice is monitored by the Meteorological Agency and Coast Guard. These are all public organizations. On the other hand, fisheries data are collected by the Fisheries Cooperative Associations (Local organization of small-scale coastal fishers) and the local government. These monitoring items are used for assessing the Evaluation Item IV (Fisheries). This is one good example of the stakeholder engagement in the monitoring activities. Indeed, the fisheries production statistics (tons) at Shiretoko WNH, compiled by Fisheries Cooperative

Associations, are very informative time-series data to understand the current situation and expected changes of the Shiretoko marine ecosystems.

Fishery production in Shari and Rausu

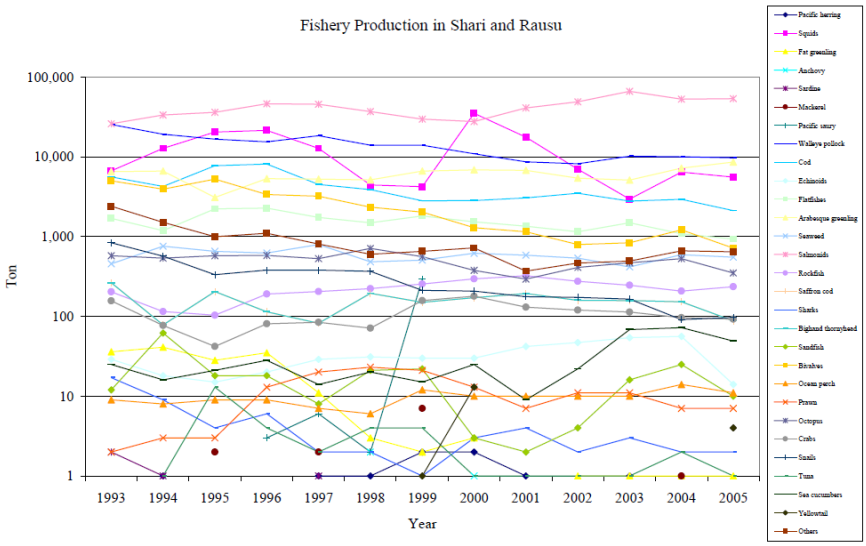

Figure 9. Time-series data of fish landing collected by local small-scale fishers

(Source: Ministry of Environment 2007, The multiple use integrated marine management plan and explanatory material for Shiretoko World Natural Heritage site)

3. Feedback of assessment results to management plans and practices

For the moment, there is NO clear feedback mechanism from the ecosystem monitoring to the management measures. This is one of the most serious and fundamental issues to be tackled for the better management of the Shiretoko WNH area and will be discussed in detail in the next section.

4. Issues and challenges in the MPA: a case of the Shiretoko WNH

4.1 monitoring items and budgets

The existing monitoring items (Table 7 and 8) are not enough for tackling the emerging issues in the Shiretoko WNH. For example, more monitoring items relating to the human dimensions, such as fisheries and marine tourism sectors, their interactions, influences from the land activities, etc., would be needed to understand the sustainable relationships between human uses and the healthy marine ecosystems. Closely relating to that, the cumulative human impact to the ecosystem (fishery, tourism,

shipping, water discharge, etc.) are not scientifically clear enough. Under the climate changes, the monitoring items relating to the resilience of coastal communities to the ecosystem changes are also important. More monitoring items about these human dimensions should be added.

Appropriate budgets should be prepared for the sustainability of the monitoring. For example, monitoring of the chlorophyll (monitoring item number 1 in Table 7) and ice algae (monitoring number ② in Table 7) have not yet conducted because of the lack of appropriate budgets and responsible bodies. This is a serious fraud for understanding the effects from climate changes to the Shiretoko marine ecosystems. Similarly, marine flora and fauna and habitation survey (monitoring item 4 in Table 7) was conducted only once in ten years, which will be not enough to track the changes in marine ecosystem structures and the effects from the climate changes. The budget can come from the government, as well as the private sectors or crowd funding. For some monitoring items, the tourists or local people can participate to the monitoring (civil science), which will decrease the costs for monitoring.

4.2 links to the management actions

As mentioned in the Section 3, there is no clear feedback mechanism from the monitoring results to the management measures. I think there are at least two root causes for that. First, the monitoring activities in Shiretoko are, mainly, the combination of the existing monitoring activities by vertically segmented authorities serving varying purposes. Data and information gathered do not cater for the evaluation and management of the world heritage site. Therefore, by nature, the integration of such monitoring results, and link to the management measures implemented by other authorities, are difficult. A lesson from this fact is that we need to show the benefits from the synergy effects of policy integration by multiple authorities (multiple ministries, multiple agencies, etc.). Maybe appropriate pressures by politics, science, UN, NGO, civil society, etc., will be needed to facilitate such integration and create the synergy effects.

The second root cause is that, because of the intrinsic fluctuations/uncertainties of marine ecosystem, the monitoring results are not so apparent and clear-cut. In other words, you cannot easily distinguish the sign of problems from the simple noise. For example, it is not necessarily clear whether the decline of catch of certain species seen in fishery data implies overfishing, long-term fluctuation of fish population, ore the degradation of fish habitats. So, stakeholders cannot clearly understand the benefit

of changing the existing measures and introducing new actions. Usually, it is costly. We need to show the benefits. A lesson is that we need the scientific logic and stakeholder participation for adaptive management under large uncertainties/fluctuations. The simple "precautionary approach" is not enough in reality.

4.3 Criteria for the assessments

There is no natural-scientific theory to identify the "good ecosystem" or "healthy ocean", etc. It is a "societal choice" (CBD Ecosystem Approach Principle 1). In other words, the criteria to be used for the assessment process (Figure 8) should not be based on just the "expert judge by the working groups/Scientific Council" but based on the consultation with the wide-ranging stakeholders. In order to select the stakeholders in the fair and equitable manners, monitoring for human dimensions are important again.

Of course, the scientific facts provided by natural science should be fully used for the consultation with stakeholders, but the final judgements are not about the natural science but about the value systems. Each society/country has its own culture and value system, and that should be respected. More human dimension studies to clarify the differences of value systems amongst countries/societies would be important (Hori and Makino 2018).

4.4 Cross-scale connections with other ecosystems

Finally, just as all the other marine ecosystems, the Shiretoko marine ecosystem structures, functions, and services are linking to Russia, China, and Korea. Therefore, international cooperation and the network of MPAs are very important. We should show the ecological, economic and social benefits from the international data sharing, exchange of lessons learnt, joint declaration, organizing international symposium, etc. In this respect, the activities such as NEAMPAN should be highly appreciated, and more resource/efforts should be put on it.

Annex

Table 1 monitoring parameters and data collection

Individual indicators	**Subjects**	**Monitoring target**	**Methodologies / remarks**	**Key data source**
Marine environment and low trophic level production	Sea ice	Sea ice distribution and long term trend	Aerial and satellite monitoring of the sea ice distribution [Mostly utilization of existing monitoring information on sea ice collected for navigation safety (Coast guard) and sea ice observation (Meteorological Agency)]	Japan Coast Guard Japan Meteorological Agency
	Water temperature, water quality, Chlorophyll a, plankton, etc	Water temperature, Chlorophyll a, plankton, etc[7]	Monitoring with fixed-point observation buoys [Monitoring associated with Shiretoko marine area management?]	Ministry of Environment
	Biota	Shellfish	Survey of shellfish in shallow waters [Monitoring associated with Shiretoko marine area management]	Ministry of Environment (Commission to Shiretoko Nature Foundation)
Coastal environment	Hazardous substances	Petroleum oil, cadmium, mercury concentration	Analysis of surface water and sediments of seabed in the sea of Okhotsk [Utilization of existing monitoring information on marine pollution issued by the Coast Guard – one chapter in the annual report dedicated to the survey in the sea of Okhotsk]	Japan Coast Guard
Fishes	Salmonids	Salmon catch	Monitoring of salmonids catch [Utilization of survey on fisheries by Hokkaido prefecture]	Hokkaido Prefecture
		Salmon run upstream and spawning	Quantitative monitoring of salmon run and the spawning in the river beds	Hokkaido Prefecture (Forestry management)

[7] Monitoring data not available online

			[Monitoring activity in compliance with management plan (monitoring plan)]	
		Effect of river structures	Study on the effect of rier structures improvement on salmon run [Monitoring associated with Shiretoko marine area management?]	Hokkaido Prefecture
	Walleye pollock	Stock and trend of walleye pollock (for setting TAC)	Stock assessment [Stock assessment conducted by Fishery Agency in connection with TAC]	Fishery Agency
		Survey of spawning	Assessment of distribution of eggs	Rausu Fisheries Cooperative Association
		Catch of walleye pollock	Survey on total catch of walleye [Utilization of survey on fisheries by Hokkaido prefecture]	Hokkaido Prefecture
Marine mammals	Steller sea lions	Fisheries damage associated with Steller sea lions	Monitoring of the migrating condition of and assessment of damage to fisheries [Use of monitoring information associated with fisheries and fishery damage]	Fishery Agency Hokkaido Prefecture
		Population and characteristics of migrating Steller sea lions	Survey of population, sex, age, size, and maturity; stomach contents of dead individuals [Use of existing information as well as some additional survey by the specialized agency of Shiretoko?]	Fishery Agency Hokkaido Prefecture Shiretoko Nature Foundation
	Seals	Population of seals and fishery damages	Monitoring population of seals (observation and aerial survey) [special survey for Shiretoko marine area management?]	Hokkaido Prefecture
		Population and culled seals in Rausu area	Survey on migration and analysis of culled seals on feed, DNA, breeding conditions etc [special survey for Shiretoko marine area management?]	Rausu township?

Seabirds and sea eagles	Sea birds (spectacled buillemot, black-tailed gull, slaty-backed gull, Japanese cormorant)	Population and breeding pairs on the Shiretoko peninsula	Survey on nesting location, number, and population [special survey for Shiretoko marine area management?]	Ministry of Environment
	Sea eagles	population of white-tailed eagles and population of wintering eagles	Survey on nesting location, number, and population of white-tailed eagle, survey on population, species etc of sea eagles (observation?) [special survey for Shiretoko marine area management?]	Ministry of Environment; White-tailed eagle monitoring survey group (Shiretoko Nature Foundation, Shiretoko Museum, Rausu township, etc)
Socio economic environment	Natural resource status, food supply, industry, culture, local community	Socio economic situation associated with natural resource extraction and use of Shiretoko park	Catch and income from fisheries, population engaged in fisheries, tourists arrivals etc [Utilization of survey on fisheries by Hokkaido prefecture]	Hokkaido prefecture

(NEAMPAN secretariat, based on the Shiretoko Marine Management Plan[8] and Marine Area Working Group reports[9])

Table 2 Key legislation, regulations, etc on marine areas of Shiretoko national park

Areas concerned	**Laws and regulations**	**Purpose of the laws and regulations**	**Remarks**
Natural landscapes	The Natural Parks Law (1957)	Protecting the places of natural scenic beauty while promoting their use for people's health, recreation, and culture[10].	

[8] Government_of_Japan (2007). The Multiple Use Integrated Marine Management Plan and Explanatory Material for Shiretoko World Natural Heritage Site. Ministry_of_Environment and Hokkaido_Prefectural_Government.

[9] Marine Area Working Group reports (in Japanese) http://dc.shiretoko-whc.com/meeting/kaiiki_wg_index.html

[10] Explanatory note 2007

Marine pollution	Water Pollution Control Law, Law Relating to the Prevention of Marine Pollution and Maritime Disaster, Regulations of Sea Fisheries Adjustment in Hokkaido	Regulation on the drainage of harmful substances into the waters from factories, businesses, ships, etc.	
	[plans and guidelines] Oil Spill Accident Disaster Control Manual (Hokkaido) Plan for Cleaning of Spilled Oil (and Hazardous and Noxious Substances) in Hokkaido Coastal Sea Area (Japan Coast Guard) Japanese National Contingency Plan for Oil and HNS Pollution Preparedness and Response as amended in 2006 (Cabinet decision)	Emergency response to oil spills	
Fishes	Fisheries Law Fisheries Resource Protection Law Law Concerning Conservation and management of Marine Life Resources Autonomous management of local fishery organizations	Proper resource management and sustainable use of salmonids and walleye pollock Sustainable use of marine living resources	Salmonids and walleye pollock as indicator species
Marine mammals Steller sealion	Fisheries Law Classification as endangered species (VU) by Ministry of Environment and IUCN	Population control for conservation and minimizing damage to fisheries	Steller sealion as indicator species
Seals	Wildlife Protection and Appropriate Hunting Law (2003)	Restriction on the capture (damage to fisheries)	Seals as indicator species Survey on the status of seals' migration and damage to the fishing industry
Seabirds and sea eagles Sea birds*	Wildlife Protection and Appropriate Hunting Law (2003) The red list of endangered species* (both MOE and IUCN)	Protection of endangered species *Japanese night heron, red-crowed crane, Blakiston's fish-owl, Steller's sea eagle, Japanese yellow bunting, white-tailed eagle, yellow-breasted bunting, long-billed murrelet, spectacled guillemot.	Spectacled Guillemot, Slaty-backed gull and Japanese cormorant selected as indicator species
Sea eagles	[for white-tailed eagles and Steller's sea eagles] Designation as Domestic Endangered Species under the Law for Conservation of Endangered Species of Wild Fauna and Flora Designation as Natural Monument under the Law for the Protection of Cultural Properties	Protection of endangered species	white-tailed eagles and Steller's sea eagles selected as indicator species.

	Hokkaido Prefecture Notification No. 754 [Programmes] Programme for Rehabilitation of Natural Habitats and Maintenance of Viable Population [for both Steller's sea eagles and white-tailed eagles] (under the Species Law)	Ban on the use of lead bullets in the hunting of large mammals to prevent lead poisoning of the eagles	[monitoring]
Marine recreation	Basic Plan on the Proper Use of the Apical region of the Peninsula Zone of Shiretoko National Park Agreement on the instructions for usage restrictions of the Shiretoko Cape area (based on the Basic Plan)	Minimizing the negative impact of pleasure boats and leisure fishing boats on sea birds and marine mammals Request for compliance on the routes of recreational boats, Request operators' attention to the potential negative impacts of tourism activities	

(Source: NEAMPAN secretariat based on The multiple use integrated marine management plan and explanatory material for Shiretoko World Natural Heritage site, Ministry of Environment, 2007, and Makino et al. 2009)

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Supplemental Materials

Supp.1 Marine Biodiversity Conservation Strategy

Supp.2 Basic Act on Biodiversity

Supp.3 Outline of the National Biodiversity Strategy of Japan 2012-2020

Supp.4 Basic Act on Ocean Policy

Supp.5 Outline of the Third Basic Plan of Ocean Policy 2018

Supp.6 The Management Plan for the Shiretoko WNH Site 2009 (the Management Plan)

Supp.7 The Multiple Use Integrated Marine Management Plan and Explanatory Material for Shiretoko World Natural Heritage Site of 2007 (the Marine Management Plan)

Supp.8 The 3rd Revised Multiple Use Integrated Marine Management Plan and Explanatory Material for Shiretoko World Natural Heritage Site of 2018 (the Marine Management Plan)

Supp.9 Outline of the Long-Term Monitoring Plan for the Shiretoko World Natural Heritage Site