State of Conservation Report of Shiretoko

(Japan) (N1193)

in Response to the World Heritage Committee Decision 45 COM 7B. 84

The Government of Japan

November 2024

1. The executive summary of the report

In response to the issues raised in the World Heritage Committee Decision 45 COM 7B.84 (hereinafter "the Decision") and with the collaboration of the Ministry of the Environment, the Forestry Agency, the Agency for Cultural Affairs, Hokkaido Prefectural Government, and other related organizations and based on scientific reviews at the Shiretoko Natural World Heritage Site Scientific Council, the Government of Japan reports as follows:

- Regarding paragraph 3 of the Decision, the Adaptive Management Strategy for Climate Change in the Shiretoko Natural World Heritage Site was developed in October 2024. The strategy takes into consideration the expected impact of climate change on the attributes of the Outstanding Universal Value (OUV) of Shiretoko and identifies specific adaptation measures that are to be implemented.

- Regarding paragraph 4 of the Decision, the Basic Management Policy, which sets out the basic approach to managing Steller sea lions (*Eumetopias jubatus*) that migrate to the waters around Japan, was revised in 2024 with the aim of both reducing damage to fisheries and conserving the sea lion population. The revised policy covers the entire Japanese coastal area (and offshore waters) where sea lions migrate, including the Sea of Japan, the Sea of Okhotsk, Nemuro Strait, and the Pacific Ocean, as target waters that are to be managed, and dynamic models have been developed for the two sea lion populations.

- Regarding paragraph 5 of the Decision, under the revised policy, catch limits for the two breeding populations of Steller sea lions in the Sea of Okhotsk and the Kuril Islands were set below the potential biological removal level, based on an assessment using population dynamics models for each population. This ensures that the Steller sea lion catches are based on the precautionary principle and are implemented through adaptive management.

- Regarding paragraph 6 of the Decision, since it is not known what has caused the populations to halve of certain seabird species, i.e. Japanese cormorants (*Phalacrocorax capillatus*), black-tailed gulls (*Larus crassirostris*), and slaty-backed gulls (*Larus schistisagus*), potential causes will be identified through ongoing monitoring and examining the relationships with other indicators that are being monitored.

- Regarding paragraph 7 of the Decision, the Phase II Long-Term Monitoring Plan was revised in March 2024 to maintain the OUV through adaptive management. The plan identifies the monitoring items that are necessary to assess the status and specifies concrete assessment methods.

- Regarding paragraph 8 of the Decision, the various monitoring measures of Rusha River, where six years of improvement works have been completed, will be continued. Improvements in the natural spawning environment for salmons and the reproduction efficiency of fry after dam improvements have been performed will be assessed, and further improvement measures will be implemented as necessary. As for wooden debris from the upper reaches of the river, it has been confirmed that the debris gets trapped in the wide sediment areas where the river curves, when the water level rises. The potential for utilizing this phenomenon as a method for capturing the wooden debris will be studied as necessary while closely monitoring the occurrence of wooden debris after dam improvements have been performed. With regard to fish runs, various monitoring measures will be continued, including the use of the riverbed path as a route for salmonids to migrate upstream, and further improvement measures will be implemented as necessary.

- Regarding paragraph 9 of the Decision, the current state of conservation of the property and the implementation status of the Decision are described in this report.

Regarding other conservation issues and large-scale development projects that may affect the OUV of the property, Japan replied in August 2024 about the development of mobile phone communication bases in response to an enquiry from the UNESCO World Heritage Centre in accordance with paragraph 174 of the Operational Guidelines.

Public access of the conservation report is accepted.

2. In response to the issues raised in the 45th World Heritage Committee Decision 45 COM 7B. 84, the Government of Japan reports in good faith as follows:

2-1. The Response to Paragraph 3 of the Decision

3. Noting that effects of climate change are generating greater concern and that there is a lack of data to monitor climate change impacts, welcomes the planned development by 2024 of an adaptive management strategy that minimizes climate change-driven impacts on the Outstanding Universal Value (OUV) of the property, and reiterates its request for the State Party to submit the final strategy to the World Heritage Centre and to ensure that full support is provided for its implementation and the ongoing protection of the OUV of the property;

The Adaptive Management Strategy for Climate Change in the Shiretoko Natural World Heritage Site was developed in October 2024 (Annex 1). The strategy takes into consideration the expected impact of climate change on the attributes of the OUV of Shiretoko and identifies specific adaptation measures that are to be implemented. The strategy will be improved according to the results of the monitoring while adaptive management against climate change will be implemented to protect the OUV of Shiretoko.

2-2. The Response to Paragraph 4 of the Decision

4. Also noting that Stellar sea lions, including their impacts on fisheries, have been managed in line with a Basic Management Policy and that research on population dynamics is underway, however reiterates its concern regarding the continued culling of sea lions in the continued absence of population data, and urges the State Party to continue to accelerate the development of a population dynamic model to inform the revision of the Basic Management Policy in 2024;

The Basic Management Policy, which sets out the basic approach to managing Steller sea lions that migrate to the waters around Japan, was revised in 2024 with the aim of both reducing damage to fisheries and conserving the sea lion populations. The revised policy covers the entire Japanese coastal area (and offshore waters) where sea lions migrate, including the Sea of Japan, the Sea of Okhotsk, Nemuro Strait, and the Pacific Ocean, as the target waters that are to be managed, and dynamic models described in the following paragraph have been developed for the two sea lion populations.

2-3. The Response to Paragraph 5 of the Decision

5. Urges again the State Party to reconsider, reduce or eliminate, if necessary, the current levels of culling of the Western Steller sea lion population, consulting the IUCN Species Survival Commission as required, and adopting a precautionary approach until accurate and comprehensive data on this subspecies become available;

Under the Basic Management Policy for the Steller sea lion populations revised in 2024, all Steller sea lions migrating to Japan are covered as target to be managed, including those in Nemuro Strait that have been excluded from management since 2014 and dynamic models have been developed for the two

breeding populations in the Sea of Okhotsk and the Kuril Islands (See the attachment). Based on an assessment using those models, the maximum number of animals that can be taken in the eastern sea area, including Nemuro Strait, for the 2024/25 migratory season was set at 31 individuals below the potential biological removal level.
Under the policy, the Steller sea lion catch will be managed adaptively based on the precautionary principle in light with past overharvesting, which led to the population declining to the point where it was listed as an endangered species.

2-4. The Response to Paragraph 6 of the Decision

6. Taking note of the Comprehensive Evaluation Report of the 2012-2021 Long-Term Monitoring Plan (LTMP) for the property, expresses concern regarding the reported decrease by half of some seabird populations since inscription and recalls that seabird populations are an important attribute of the OUV;

Since it is not known what has caused the populations to halve of certain seabird species (i.e. Japanese cormorants, black-tailed gulls, and slaty-backed gulls), potential causes will be identified through ongoing monitoring and examining the relationships with other indicators that are being monitored.

2-5. The Response to Paragraph 7 of the Decision

7. Also welcomes the planned revision of the LTMP by 2023 and that this will include biodiversity attributes under Criterion (x), and reiterates its request for the State Party to ensure that the attributes of the property's OUV are fully reflected in the LTMP to ensure aquatic biodiversity, specifically the salmonid species, seabirds and marine mammals, are all included and monitored, and requests the State Party to submit the final revised LTMP to the World Heritage Centre;

The Phase II Long-Term Monitoring Plan was revised in March 2024 to maintain the OUV through adaptive management (Annex 2). The plan identifies the monitoring items that are necessary to assess the current status and specifies concrete assessment methods.

2-6. The Response to Paragraph 8 of the Decision

8. Also takes note of the State Party's ongoing response to the 2019 mission recommendations, including the monitoring of biological variables, and also encourages the State Party to continue to: *(a) Take measures to improve the representation of biological variables in river ecosystems, to enhance the current understanding of river restoration approaches and options,* *(b) Consider alternative methodologies to capture large wooden debris as a way to better balance river restoration needs with the fishery stakeholders' concerns,*

(c) Monitor the impacts of the riverbed path pilot project, especially in relation to erosion, fish passage and disturbance to the benthic habitat, and take prompt remedial actions in relation to any identified impacts, as necessary, based on comprehensive scientific understanding;

a) Regarding Rusha River, six years of improvement works were completed by November 2024. To track changes in the river during construction and as a result of t improvement works, monitoring has been conducted on the following: changes in the riverbed topography, the numbers of salmonids running upstream, spawning beds, and juveniles going downstream. The monitoring will be continued. Analyses of the factors that affects the distribution of spawning beds, including water depth, flow velocity, riverbed materials, and the distribution of wooden debris, will be carried out to assess improvements in the natural spawning environment of salmons and the reproduction efficiency of fry after dam improvements have been performed. Further improvement measures will be implemented as necessary.

b) As for wooden debris from the upper reaches of the river, there is a wide sediment area with a curved channel 300 meters upstream of the third dam that has been confirmed to trap wooden debris when the water level rises. The effectiveness of a method for capturing the wooden debris using this curved topography will be studied as necessary while closely monitoring the occurrence of wooden debris after dam improvements have been performed.

c) With regard to fish runs, various types of monitoring including the physical environment of the river will be continued to ensure that the riverbed path remains an unobstructed route for salmonids to migrate upstream, and remedial measures will be taken as necessary.

*9. Also requests the State Party to submit to the World Heritage Centre, by **1 December 2024**, an updated report on the state of conservation of the property and the implementation of the above, for examination by the World Heritage Committee at its 47th session.*

The current state of conservation of the property and the implementation status of the Decision are described in this report.

3. Other current conservation issues identified by the State Party that may have an impact on the property's Outstanding Universal Value

There are no other conservation issues identified by the Government of Japan that may impact the Outstanding Universal Value of the property.

4. In conformity with Paragraph 172 of the Operational Guidelines, describe any potential major restorations, alterations and/or new construction(s) intended within the property, the buffer zone(s) and/or corridors or other areas, where such developments may affect the Outstanding Universal Value of the property, including authenticity and integrity.

There are no development projects in and around the property which may affects the Outstanding Universal Value of the property. The Government of Japan replied in August 2024 about the development of mobile phone communication bases in response to an enquiry from the UNESCO World Heritage Centre in accordance with paragraph 174 of the Operational Guidelines.

5. Public access to the state of conservation

Acceptable: The Government of Japan is content for the full report to be uploaded to the World Heritage Centre's State of Conservation Information System.

Appendix. Summary of assessment of Steller sea lion populations migrating to Hokkaido waters.

Population	Okhotsk	Kurile
Model applied	Pella-Tomlinson production model[1]	
Calculation method of catch limit	Potential Biological Removal[2]	
Conditions of management§[1]	Probability of $D_{Limit} = 0.6\ K^{*}$: ≥60% over 10 yrs. Probability of $D_{Extinct} < 0.05\ K^{**}$: <10% over 100 yrs.	
Estimate of K ¶†[1]	18,000	12,000
Lower limit of population estimate (N_{min}) †[1]	10,000	8,000
R_{max}	0.12	0.12
F_R	0.75	0.5
Other parameters		
Migration ratio§§ (to Japan Sea)	0.3	0.1
(to Nemuro Strait)	0	0.2
Avarage bycatch number over past 10 yrs.‡	61	
Upper limit of annual harvest number	Japan Sea: 511, Nemuro Strait: 31	

*Probability of population depletion level equal to or exceeding 60% of K [1]

**Probability of population depletion level below 5% of K [1]

§Assessed by the management strategy evaluation (MSE) simulation model[1]

†Shown as rounded numbers

¶based on past direct observations at rookeries and catch history[1],[3]−[6]

§§Based on resighting and cumulative survival estimate of branded animals [7] − [10]

‡Average for 2012-2021, based on the survey by Hokkaido Government (unpublished)

[1] Kitakado et al. (in prep.) Assessment and management framework of Steller sea lion migrating to Hokkaido waters.

[2] Wade, P. R. (1998). Calculating limits to the allowable human-caused mortality of cetaceans and pinnipeds. Marine Mammal Science, 14(1), 1-37.

[3] Burkanov, V. 2018b. Current Steller sea lion pup production along Asian coast, 2016-2017. Memorandum to T. Gelatt and J. Bengtson. Available from Marine Mammal Laboratory, AFSC, NMFS, 7600 Sand Point Way NE, Seattle, WA 98115. 3 p.

[4] Johnson, D. 2018. Trends of nonpup survey counts of Russian Steller sea lions. Memorandum for T. Gelatt and J. Bengtson, June 6, 2018. Available from NMFS Alaska Region, Office of Protected Resources, 709 West 9th Street, Juneau, AK 99802-1668.

[5] Burkanov, V. N. and T. R. Loughlin (2005). Distribution and abundance of Steller sea lions, *Eumetpias jubatus,* on the Asian coast, 1720's - 2005. Marine Fisheries Review 67: 1-62.

[6] Burkanov et al. (in prep.)

[7] Isono, T., Burkanov, V. N., Ueda, N., Hattori, K., & Yamamura, O. (2010). Resightings of branded Steller sea lions at wintering haul-out sites in Hokkaido, Japan 2003-2006. Marine Mammal Science, 26(3), 698–706. https://doi.org/10.1111/j.1748-7692.2009.00367.x

[8] Goto, Y., Isono, T., Ikuta, S., and Burkanov, V. (2022). Origin and Abundance of Steller Sea Lions (*Eumetopias jubatus*) in Winter Haulout at Benten-Jima Rock Off Cape Soya, Hokkaido, Japan between 2012-2017. Mammal Study, 47(2).

[9] Isono et al. (in prep.) Resighting, origin and migration ratio of branded Steller sea lions in Hokkaido waters

[10] Hattori, K., Kitakado, T., Isono, T. & Yamamura, O. (2021) Abundance estimates of Steller sea lions (*Eumetopias jubatus*) off the western coast of Hokkaido, Japan. Mammal Study, 46, 3-16.

The Adaptive Management Strategy for Climate Change for the Shiretoko World Natural Heritage Site

Contents

Kushiro Nature Conservation Office
Hokkaido Regional Forest Office
Hokkaido Government

1. The value of Shiretoko World Natural Heritage

(1) The value recognized as a World Natural Heritage

In July 2005, the World Heritage Committee inscribed the site on the World Heritage List as meeting Criteria ix (Ecosystem) and Criteria x (Biodiversity) for the following reasons.

- Criteria ix (Ecosystem): This site is an outstanding example of important ongoing ecological or biological processes in the evolution and development of terrestrial, freshwater, coastal, or marine ecosystems or plant and animal communities.
- Criteria x (Biodiversity): This site includes the most important natural habitats for in-habitat biodiversity conservation, such as habitats of endangered species with outstanding universal value from academic or conservation viewpoints.

[1] (Criteria (ix) Ecosystem)

The property has the lowest latitude seasonal sea ice extent in the Northern Hemisphere. It is heavily influenced by the formation of seasonal sea ice, which occurs earlier than other sea ice areas. It exhibits unique ecosystem productivity and is a remarkable example of the interrelationship between marine and terrestrial ecosystems. As one of the ecosystem processes, phytoplankton blooms occur due to nutrients provided by melting sea ice and nutrients supplied from the deep ocean through ocean circulation. The food web, which begins with the proliferation of phytoplankton and includes fish, birds, mammals, and other organisms, forms a dynamic ecosystem that spans the oceans, rivers, and forests.

[2] (Criteria (x) Biodiversity)

The property is quite crucial for many marine and terrestrial species. The property is a habitat of a wide range of species, with a mixture of northern species from the continent and southern species from the island of Honshu. It includes many rare and endemic species, such as Blakiston's fish owl and *Viola kitamiana*, as well as brown bears in one of the highest-density conditions in the world.

The property is a globally rare seabird habitat and an important area for migratory birds. Many small watersheds are habitats for Pacific salmonid species, including white-spotted char, cherry salmon, salmon, and pink salmon, as well as Dolly Varden, the world's most southerly anadromous species.

The site is the home to many marine mammals, such as Steller's sea lions, *Phoca largha*, ribbon seals, killer whales, minke whales, sperm whales, Dall's porpoises, rare fin whales, and *Berardius minimus*, which were newly inscribed after the heritage registration.

[3] Integrity

The property's boundaries coincide with the existing conservation area. It covers an area of 71,100 hectares and encompasses the entire conserved region of a complex ecosystem consisting of a vibrant coastal marine ecosystem and a pristine terrestrial ecosystem. It includes all primary terrestrial property values and major marine ecosystem areas for marine biodiversity.

The land boundary is reasonable and protects the significant land features. The marine boundary extends 3 km from the coastline and includes a depth of 200 m, which is ecologically essential for

marine biodiversity.

Fishery has been a vital local industry in the marine area for many years. Recent efforts to ensure sustainability have contributed to the conservation of the area's natural values while ensuring important economic income for the community. Through active dialogue with local stakeholders, an integrated multiple-use marine management plan has been developed to assist the management agency in achieving sustainable industry and ongoing long-term conservation objectives for the property.

The property's land boundary protects significant land features, from the coastline to a mountain ridge at 1,600 meters. Most of the land area is in primitive or quasi-primitive condition, and the property's natural scientific features continue to maintain a high level of natural integrity. The management agency has adequate resources to implement the provisions of the management plan, including strategies for high-density bear and deer populations.

(2) Other Values of Shiretoko

Besides being recognized as a World Heritage Site, the Shiretoko Peninsula has a variety of other values, including natural scenery and cultural value.

The arrival of sea ice in the ocean changes the blue ocean surface into a white ice field. The coastline is made up of sea cliffs and oddly shaped rocks created by volcanic activity and the erosion of the sea ice, creating a unique and beautiful landscape. The prehistoric ruins on the Shiretoko Peninsula tell us about the long history of people’s lives centered around fishing and hunting. The Ainu people, who emerged after the period of the Okhotsk culture around the 10th century, used many strangely shaped rocks as landmarks for fishing or as places to pray for good catches and safety. Numerous place names in the Ainu language remain where such rocks are located. The area is rich in resources such as salmonid species and Atka mackerel, and the fishing industry is still thriving as a representative industry of the region.

In the land area, various vegetation zones are formed on the steep terrain; in the autumn, when the leaves change color, a vibrant landscape can be seen. The area near Mount Io, which is roughly in the center of the Shiretoko Peninsula, once ejected large amounts of high-purity molten sulfur. Even today, there is characteristic scenery of fumaroles and streams with hot spring water flowing, retaining the historical aspect of the old sulfur mining site.

Another attraction of the natural landscape of the heritage site is that it allows visitors to observe many wild animals. In winter, seals, Steller's sea eagles, and white-tailed eagles appear on the sea ice, and in summer, many colonies of seabirds form on the sea cliffs. In autumn, we see salmonid species swimming up the rivers and brown bears preying on them.

However, not all of the ecosystem on the Shiretoko Peninsula has been preserved as pristine; in many places, some environments have been formed by the influence of human activities over a long period of time. In 1977, the "100 Square-Meter Forest Movement Trust" was launched to restore land at risk of development reaching the virgin forest through donations from supporters around the country, and the initiative is still ongoing today. In this way, Shiretoko continues to generate diverse values through the involvement of local residents and various stakeholders.

2. Basic principles for strategy consideration

This strategy summarizes measures for adaptive management of climate change to maintain the Outstanding Universal Value (OUV) of the Shiretoko World Natural Heritage Site into the future. This strategy's adaptive management is based on the Long-Term Monitoring Plan for the Shiretoko World Natural Heritage Site. It involves monitoring the impact on biological species and changes in the ecosystem and then flexibly reviewing management and utilization methods based on the results. With these in mind, and based on the Basic Concept of Climate Change Adaptation on Biodiversity in Japan (2015, Ministry of the Environment), this strategy focused on the following eight perspectives. At present, without taking adaptive measures through active intervention, the strategy focuses on grasping the current situation through monitoring and striving to conserve and restore sound ecosystems that are highly adaptable to climate change based on the actual situation.

[1] Grasp the current situation to evaluate the impact of climate change.
[2] Predict and evaluate climate change impact, and monitor the impact in the biodiversity field.
[3] Reduce stresses other than those caused by climate change, such as development, environmental pollution, overuse, and invasion by alien species to maintain healthy ecosystems.
[4] Further promote existing measures for the conservation of biodiversity taking into account the expected impact of climate change.
[5] Expand or connect protected areas.
[6] Regenerate nature to eliminate the division of ecosystems.
[7] Consider the impacts of climate change in planning measures related to the natural environment including park planning and management/operating plan of national parks, Evaluation of red list species and invasive alien species, and review those measures as necessary.
[8] Ensure opportunities for consensus building for the consideration and implementation of adaptation measures.

Table 1: Basic Concept of Climate Change Adaptation on Biodiversity in Japan (2015, Ministry of the Environment)

Types of measures		Policies	Examples of specific initiatives
Expansion and evaluation of the monitoring		◎ Survey of climate change impacts	○ [1] Grasp the current situation to evaluate the impact of climate change. ○ Identify and monitor areas vulnerable to climate change and shelters for organisms in the event of rising temperatures.
		◎ Promotion of research and technical development	○ [2] Predict and evaluate climate change impact, monitor the impact in the biodiversity field, and accelerate and promote research/technical development related to adaption promotion.
		◎ Survey of impacts on ecosystem services	○ Focus on initiatives to address the impact of changes in biodiversity on ecosystem services, where knowledge is lacking.
Conservation and Restoration of Sound Ecosystems with Good Adaptability to Climate Change		◎ Identifying areas less vulnerable to climate change and prioritizing their conservation	○ Identify sound ecosystems and areas less vulnerable to climate change and prioritize their conservation.
		◎ Reducing stresses other than those caused by climate change	○ [3] Reduce stresses other than those caused by climate change, such as development, environmental pollution, overuse, and invasion by alien species to maintain healthy ecosystems. ○ [4] Further promote existing measures for the conservation of biodiversity taking into account the expected impact of climate change.
		◎ Securing routes for organisms to migrate and disperse	○ [5] Expand or connect protected areas.
		◎ Promoting formation of ecosystem networks	○ [6] Regenerate nature to eliminate the division of ecosystems. ○ Restore natural conditions in areas that are difficult to maintain due to population decline, etc., and use them as protected areas or a part of an ecosystem network, based on the prediction of the social environment, such as reducing population and aging society.
Note: The necessity of the following adaptation measures shall be judged individually based on their relationship with conservation goals, the pros, and cons of interfering with or not interfering with the impact on ecosystems and ecosystem services, the existence of effective measures, feasibility, and costs/benefits.			
Active Intervention	Management to maintain existing ecosystems and species	◎ Maintenance and restoration of ecosystems	○ For key landscapes of national parks, the maintenance of which is desirable, management to control changes such as removal of invading plants, improvement cutting, and restoration of vegetation may be considered.
		◎ Reintroduction and the addition of individuals	○ Reintroduction and the addition of individuals to conserve the species in their current habitat may be considered.
	Ex situ conservation	◎ Ex situ conservation	○ If it is deemed difficult to conserve species in their current habitat due to reduced suitable habitats, you may preserve them in zoos, botanical gardens, etc.
	Management conductive to adaptation to climate change	◎ Reconstruction of the ecosystem	○ If the communities do not change soundly because of a loss of some species due to a divided ecosystem and other reasons, consider reconstruction of the ecosystem involving artificial translocation.
		◎ Conservation introduction	○ When the risk of extinction increases for certain species that cannot migrate or disperse because they are distributed in isolation at high altitudes or their habitat is artificially divided, you may very carefully consider conservation introduction by species.
Mainstreaming climate change into each policy		◎ Considering climate change in each policy	○ [7] Consider the impacts of climate change in planning measures related to the natural environment including park planning and management/operating plan of national parks. Evaluation of red list species and invasive alien species, and review those measures as necessary.
		◎ Ensuring opportunities for consensus building	○ [8] Ensure opportunities for consensus building for the consideration and implementation of adaptation measures.

3. Survey of current state of climate change

Based on the long-term data analysis and previous research results, there are concerns about the impacts of climate change in the areas surrounding the Shiretoko World Natural Heritage Site. Some examples of the analysis results are shown below.

- Rising trends in annual average temperatures (Figure 1)
- Declining trends in the ice floe period (number of days) (Figure 2)
- Future projections of winter sea ice area (total sea ice area) (Figure 3)

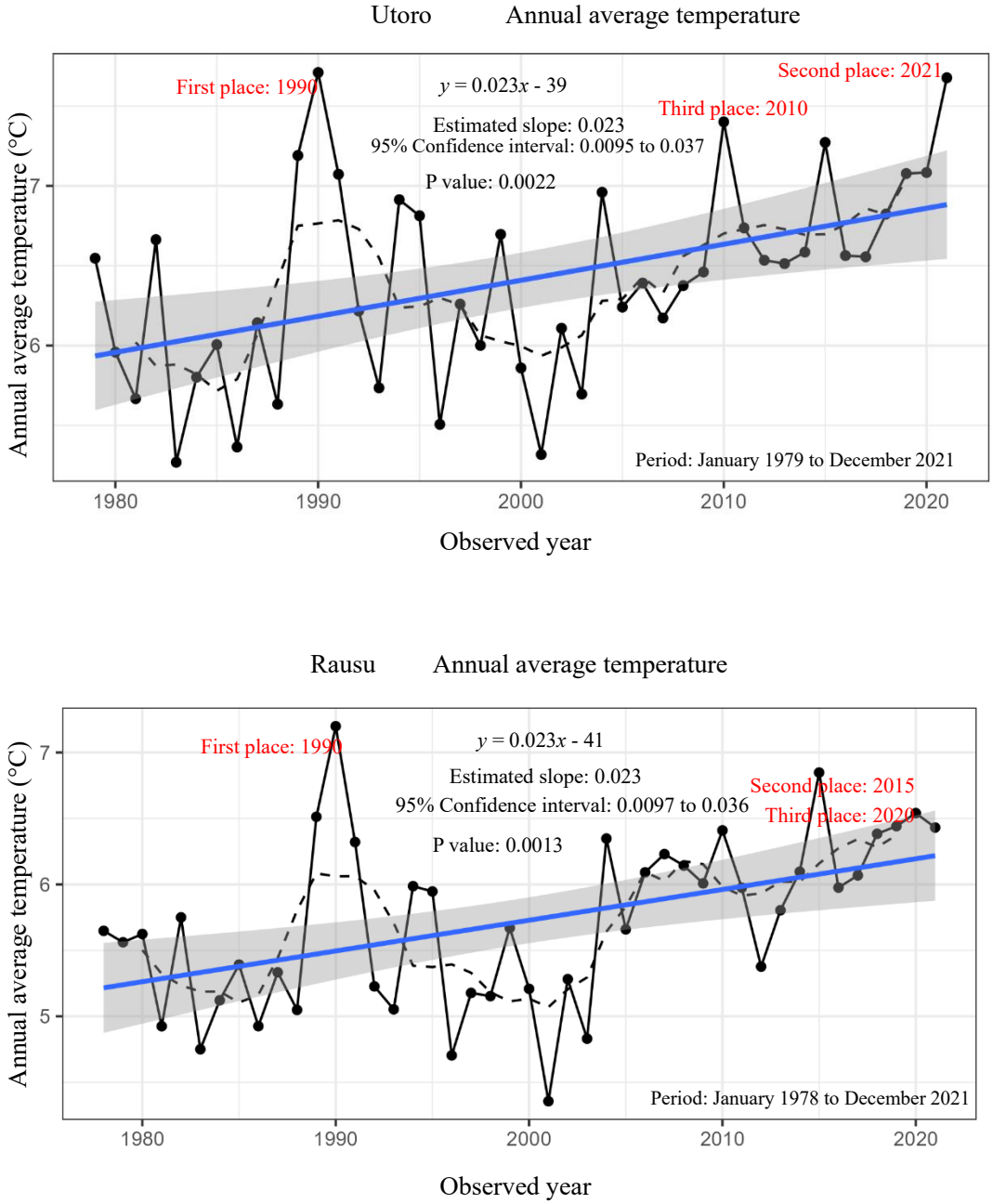


Figure 1: Changes in average annual temperature in the Shiretoko World Natural Heritage Site (upper, Utoro; lower, Rausu)

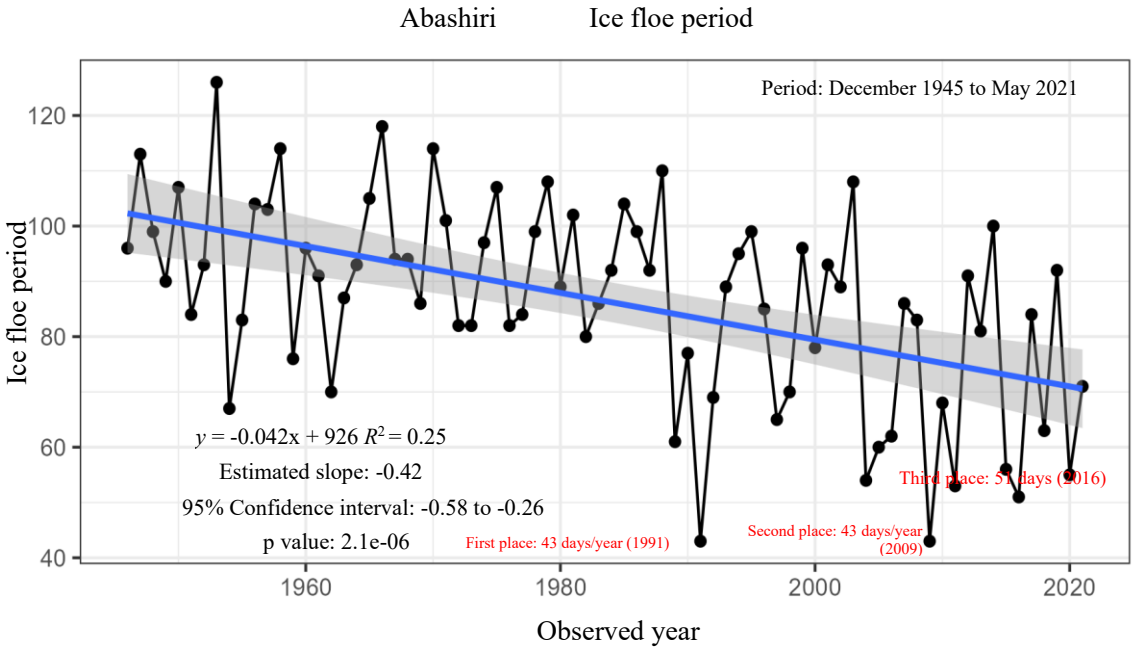


Figure 2: Changes in the duration of annual ice floe period (number of days) near the Shiretoko World Natural Heritage Site

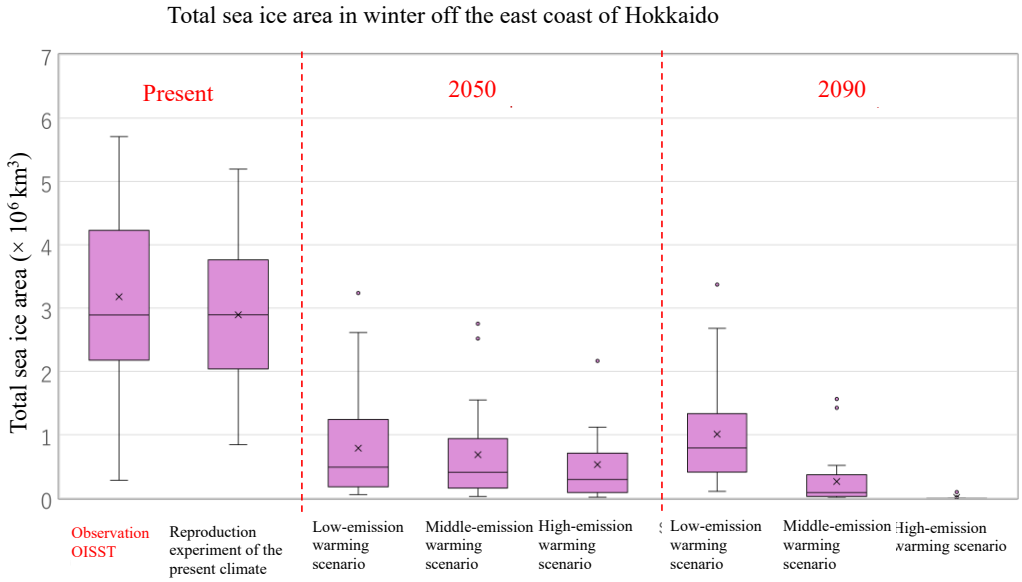


Figure 3: Box-and-whisker plots of the total (cumulative total) sea ice area estimations in the winter of 2050 and 2090 off the east coast of Hokkaido in the southern part of the Sea of Okhotsk

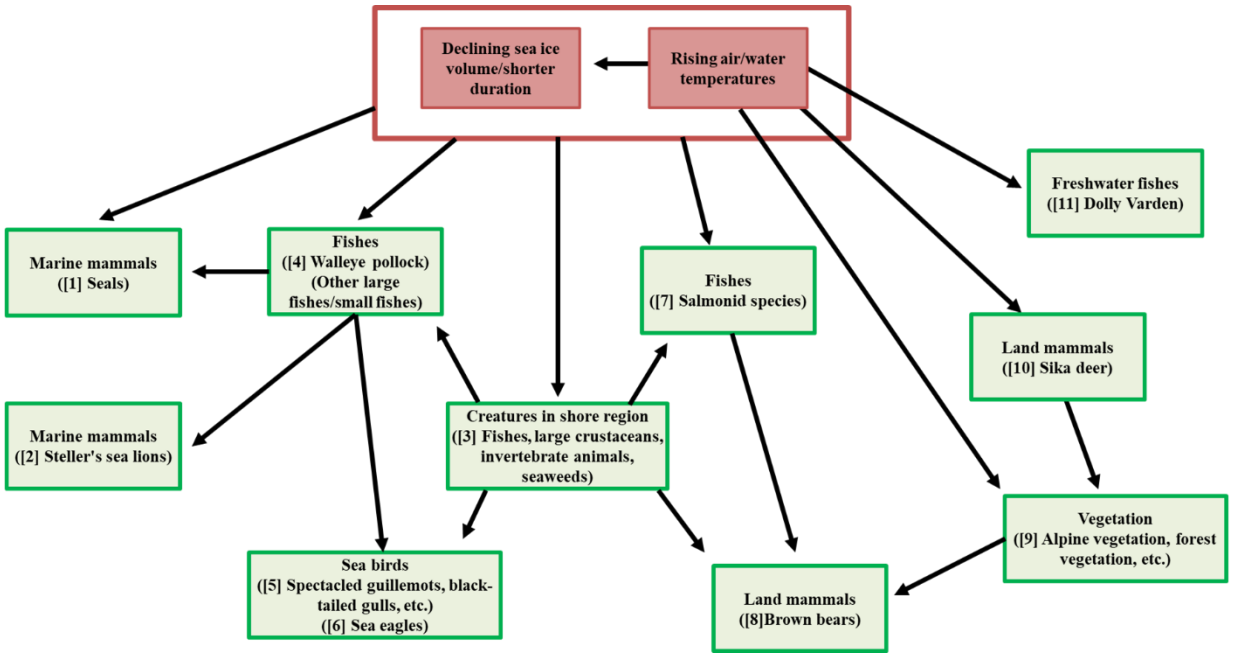
The tips of the plots represent the maximum and minimum values. The boxes represent the 25th to 75th percentiles of sea ice area (percentiles are sorted from smallest to largest and expressed as a percentage). The line inside the box indicates the median and the cross (×) indicates the mean value. The box-and-whisker plots of sea ice distribution based on NOAA's Optimal Interpolation Sea Surface Temperature (OISST) are shown as the observed values.

Source: Humio Mitsudera (Hokkaido University), 2024 Prediction of Sea Ice and Ocean Variations and Climate Change Risk Assessment on Marine Ecosystems in the Southern Sea of Okhotsk Including Shiretoko, a World Natural Heritageelopment Fund).

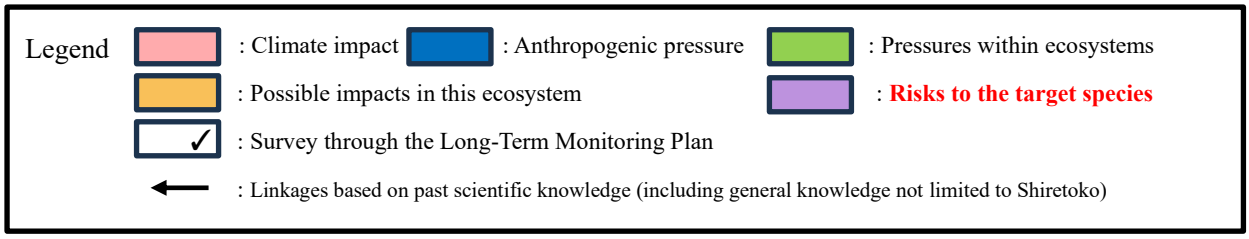
4. Assumption of climate change scenarios specific to Shiretoko

An impact chain (climate change scenario) specific to Shiretoko was created, targeting the major biological species and interspecific relationships that support OUV. An impact chain is an analytical tool for organizing the causes of a system. In the Shiretoko World Natural Heritage Site, starting from the formation of seasonal sea ice, the interrelationships among the sea, river, and land ecosystems have formed a rich biodiversity. Therefore, climate change's impacts on the Shiretoko World Natural Heritage Site are expected to affect individual OUVs directly and indirectly through inter-species interactions. In this study, the impact chain was used to visualize the relationship between ecosystem connections and climate change impacts, and monitoring items were organized to grasp the risks to target species and climate change impacts.

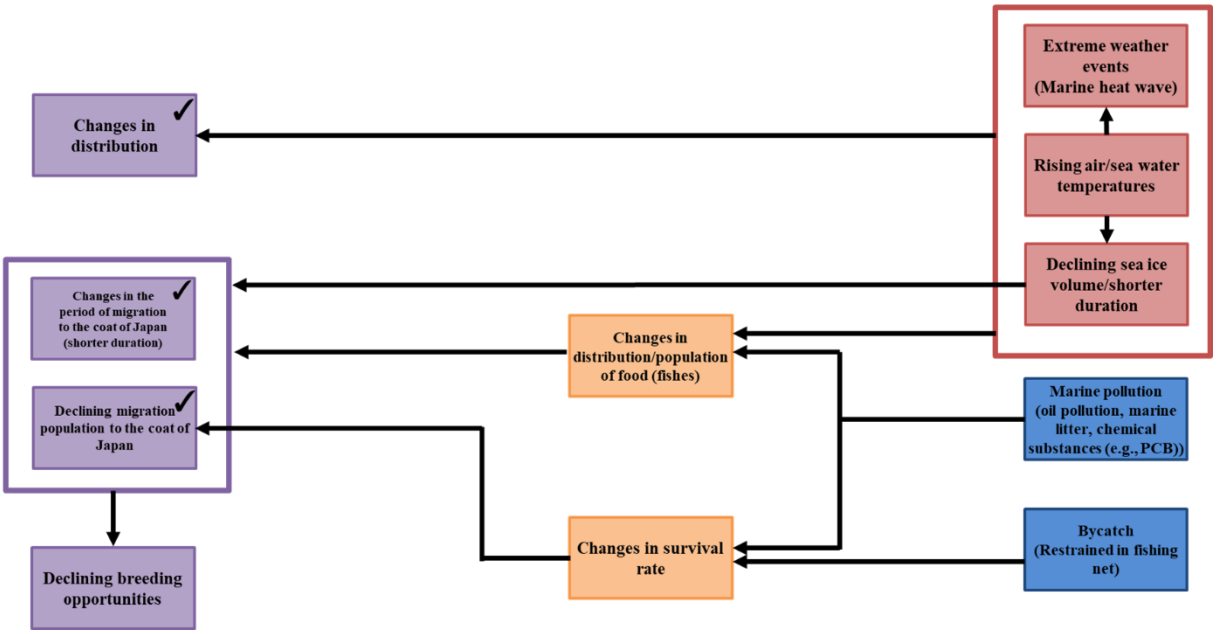
[Linkage of the impacts within the ecosystem caused by rising air and water temperatures (Overall picture in Shiretoko)]



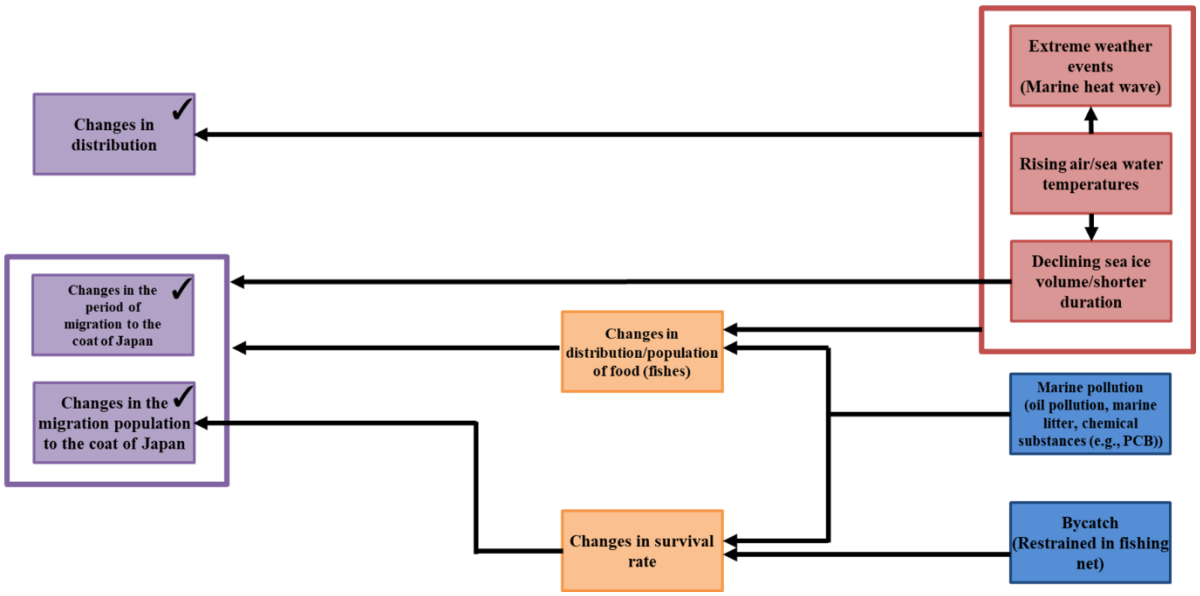
Note: In particular, the linkages within the ecosystem were examined, focusing on [1] to [11], which are the main biological species that support the OUV in the Shiretoko World Natural Heritage Site.



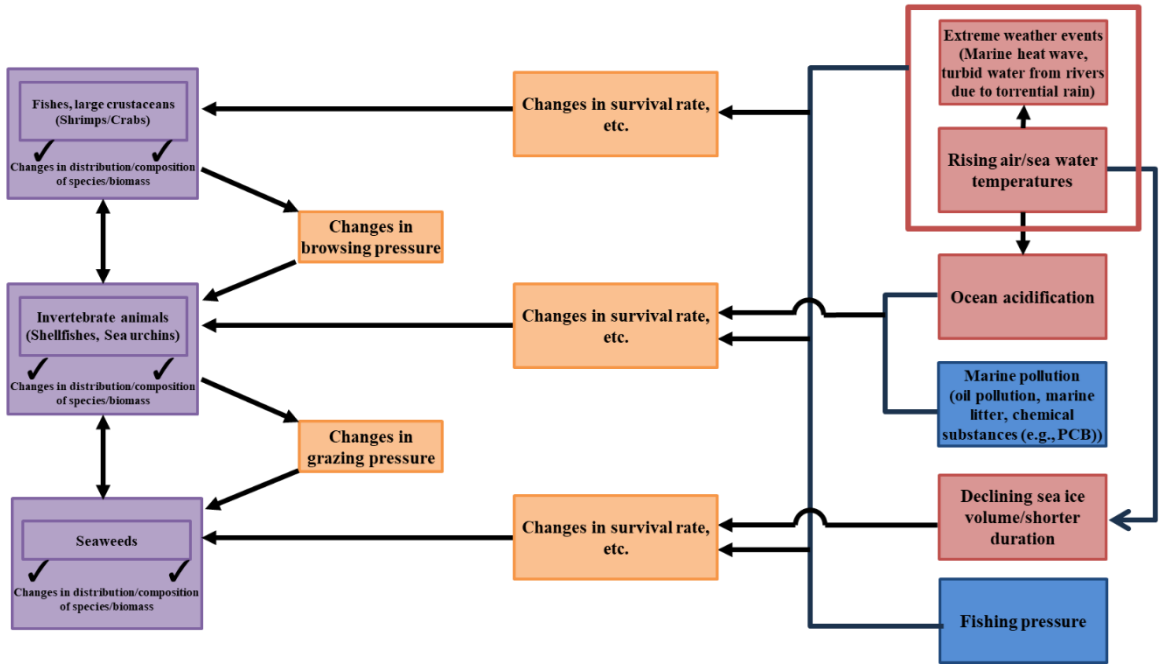
[1] Seals (Phoca largha)



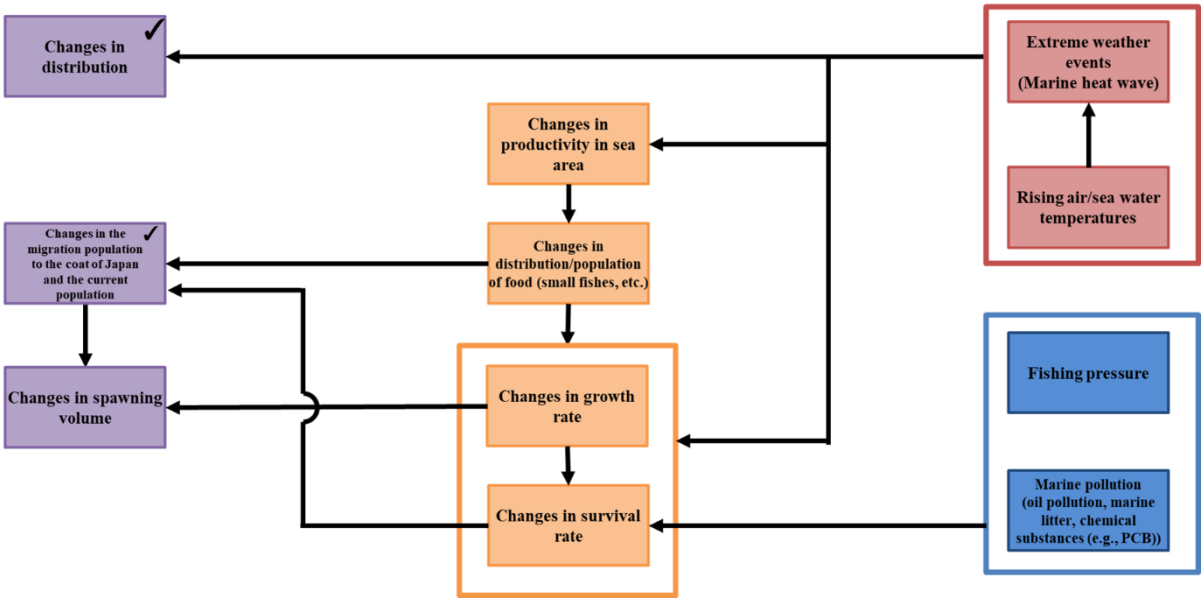
[2] Steller's sea lions



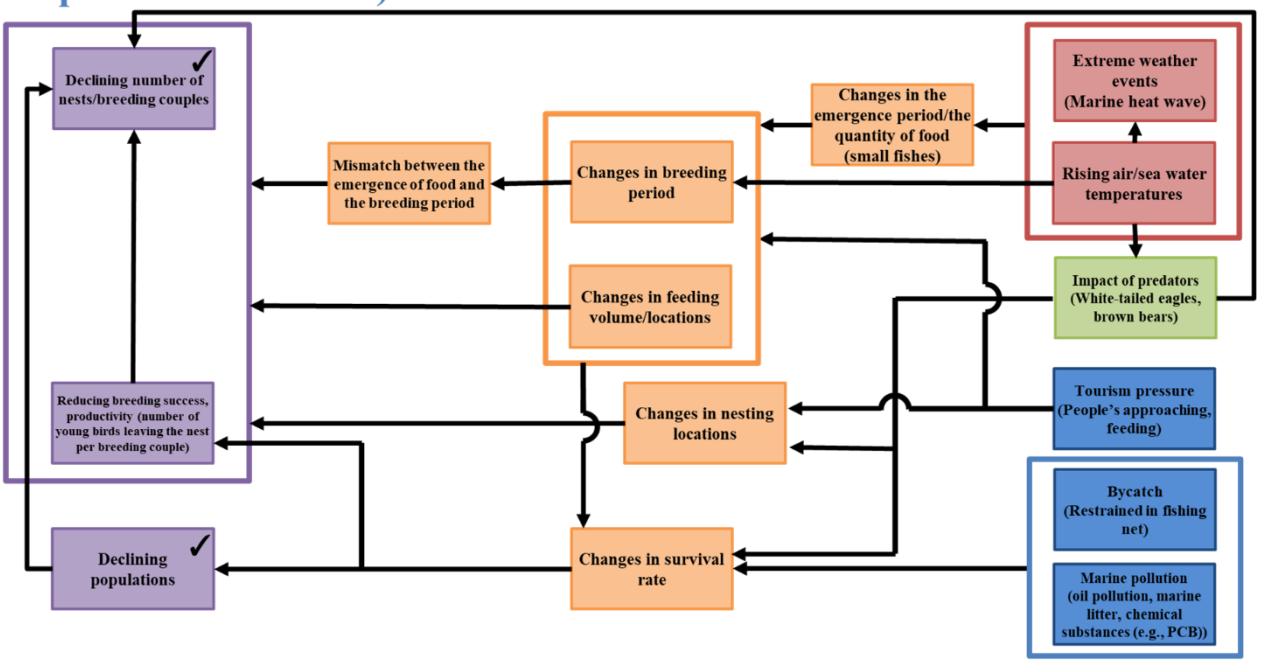
[3] Creatures in shore region (fishes, large crustaceans, invertebrate animals, seaweeds)



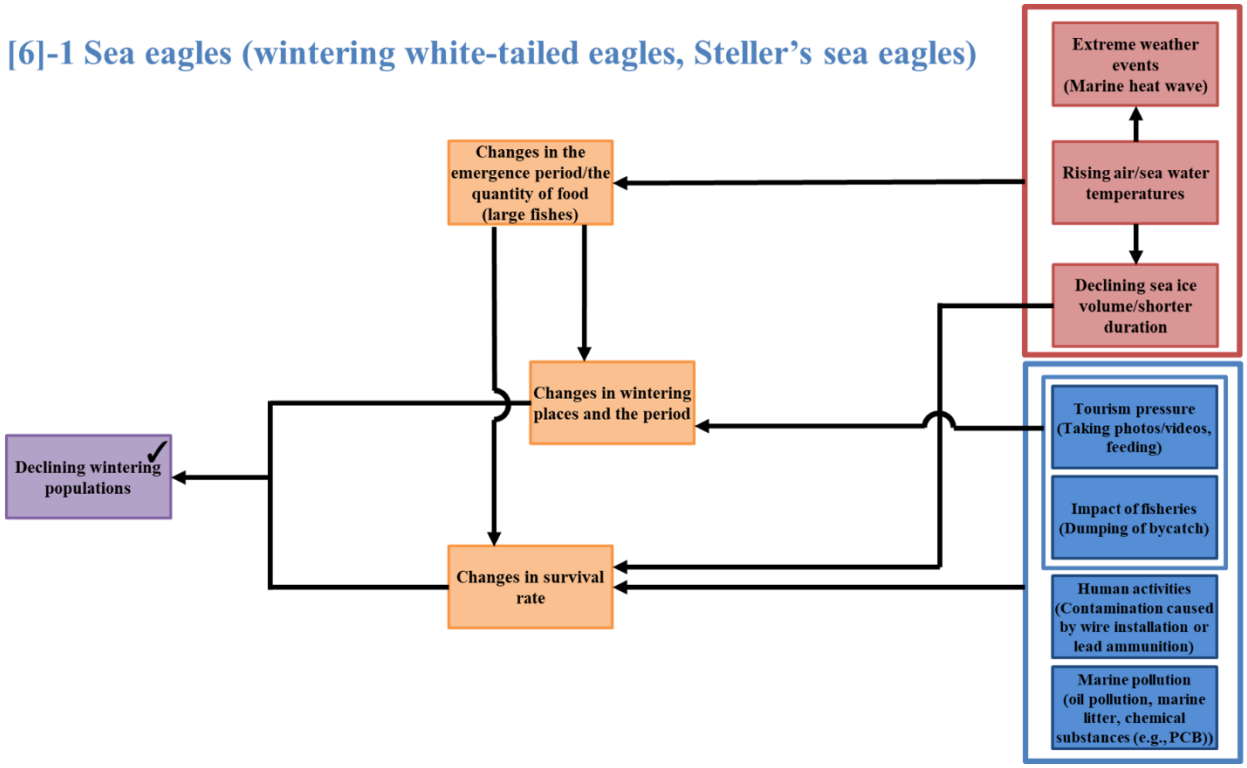
[4] Fish (Walleye pollock)



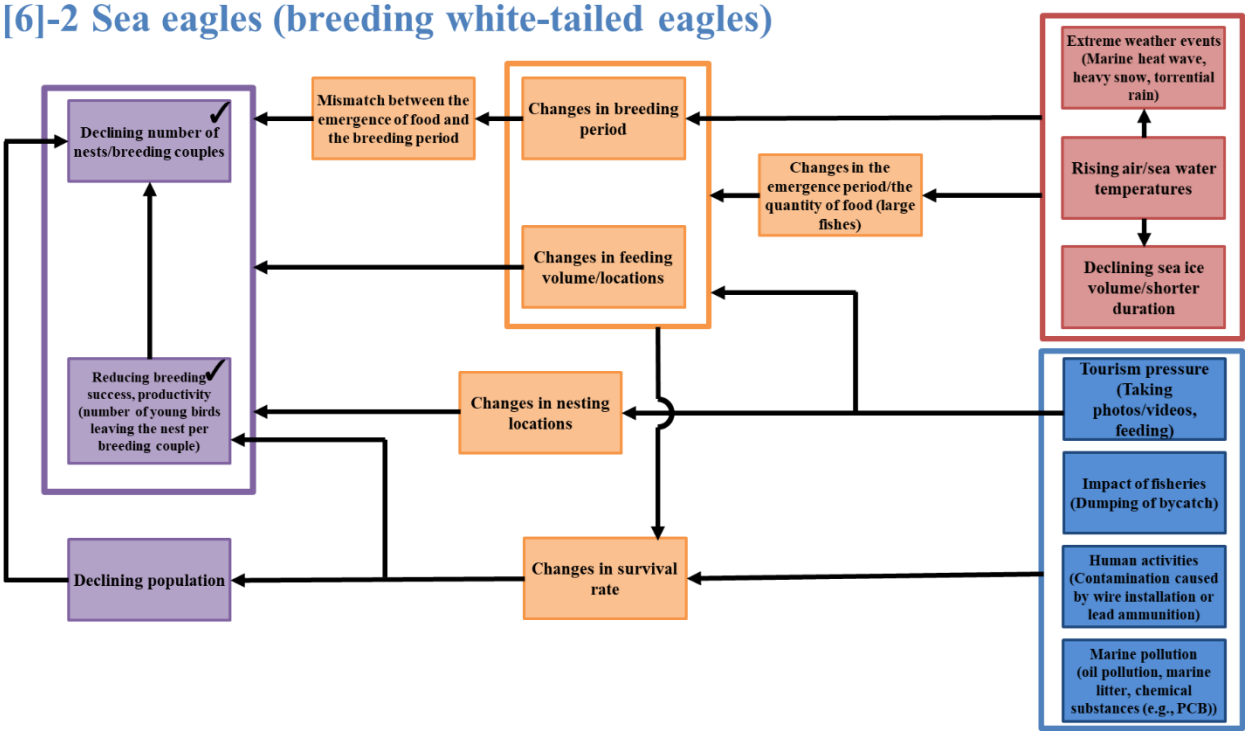
[5] Sea birds (spectacled guillemots, black-tailed gulls, slaty-backed gulls, Japanese cormorants)



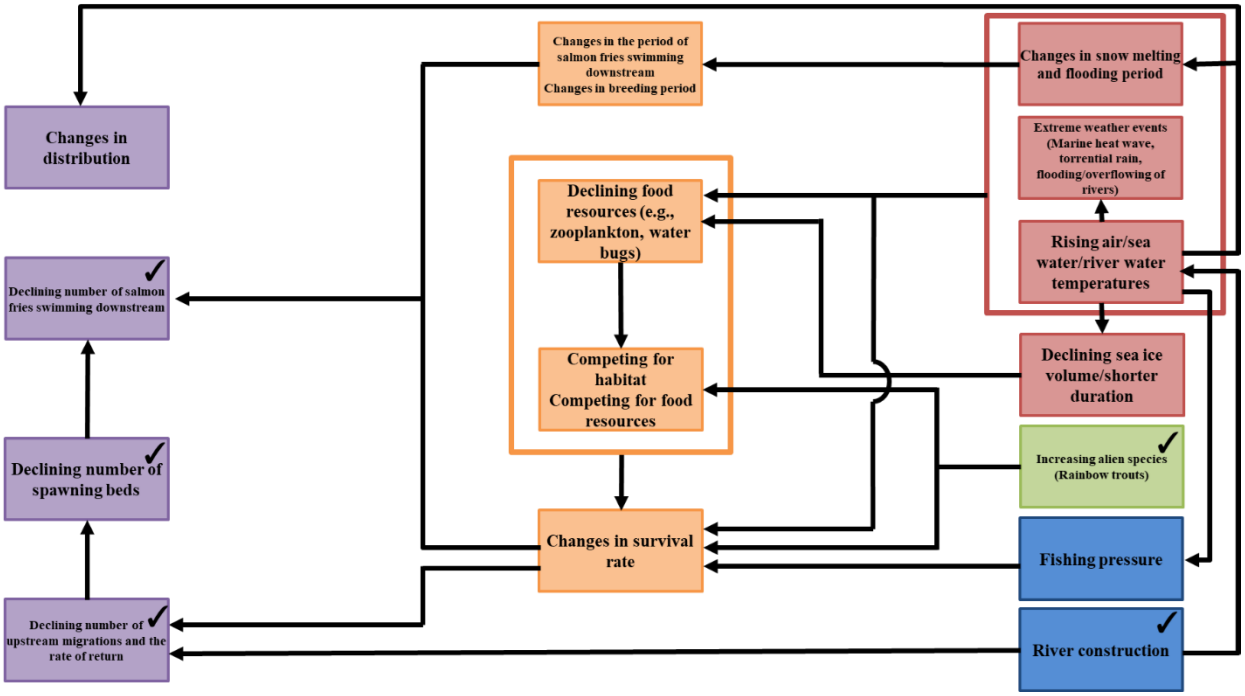
[6]-1 Sea eagles (wintering white-tailed eagles, Steller's sea eagles)



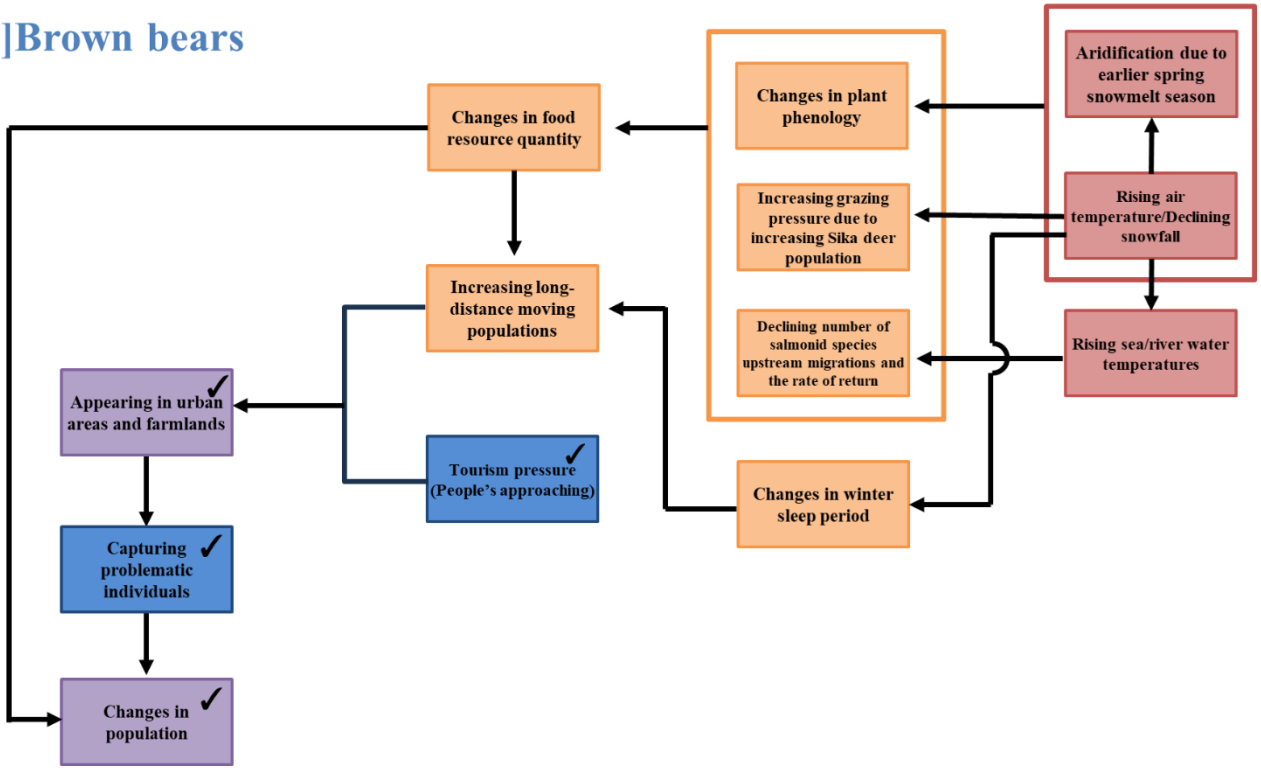
[6]-2 Sea eagles (breeding white-tailed eagles)



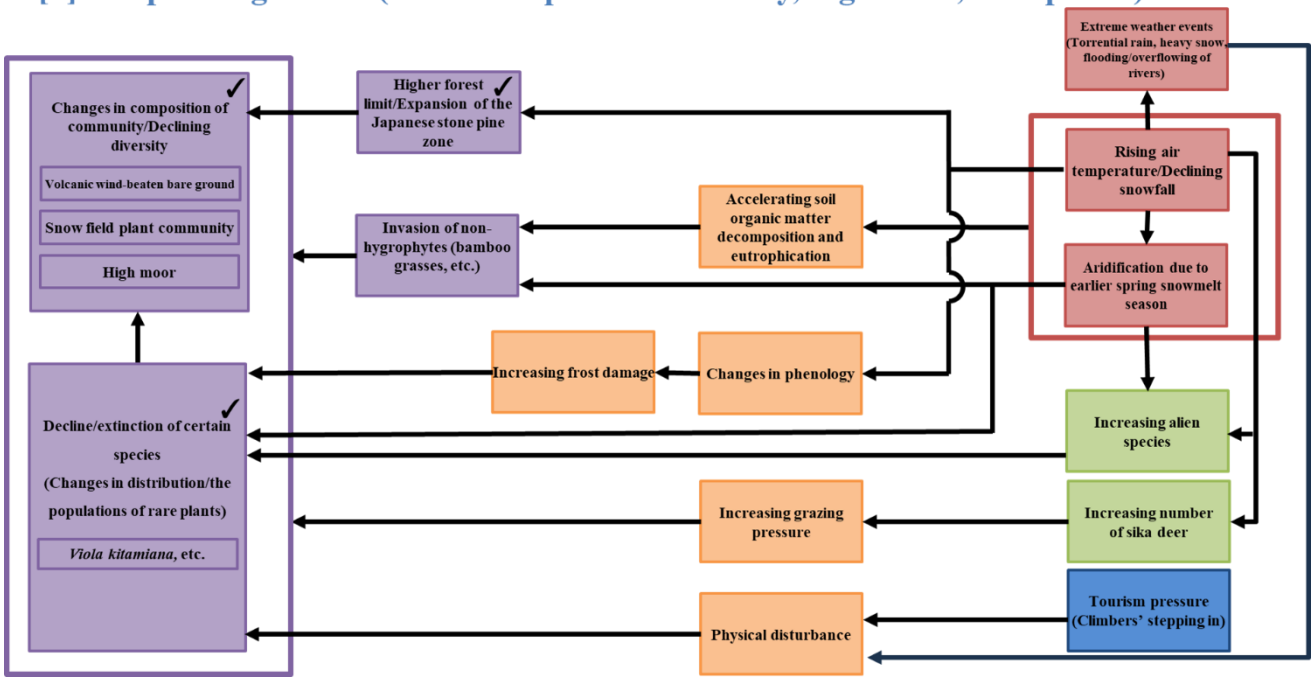
[7] Salmonid species (Salmon, pink salmon, cherry salmon)



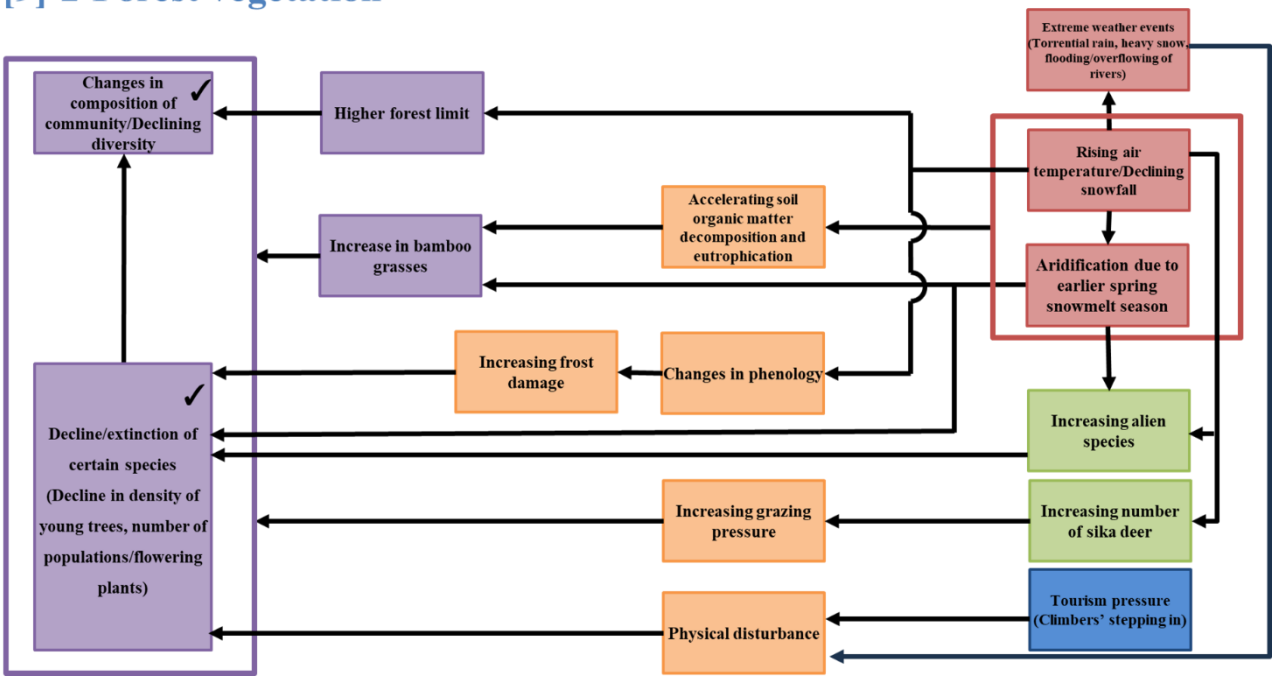
[8]Brown bears



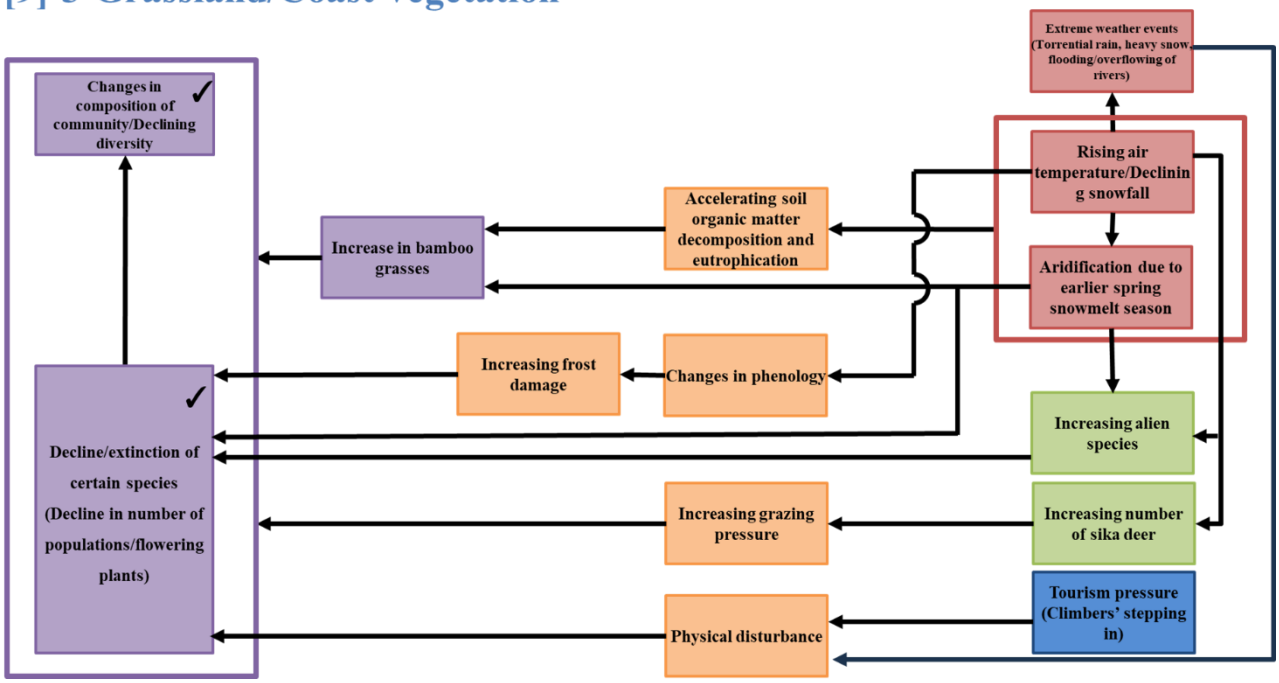
[9]-1 Alpine vegetation (snow field plant community, high moor, rare plants)



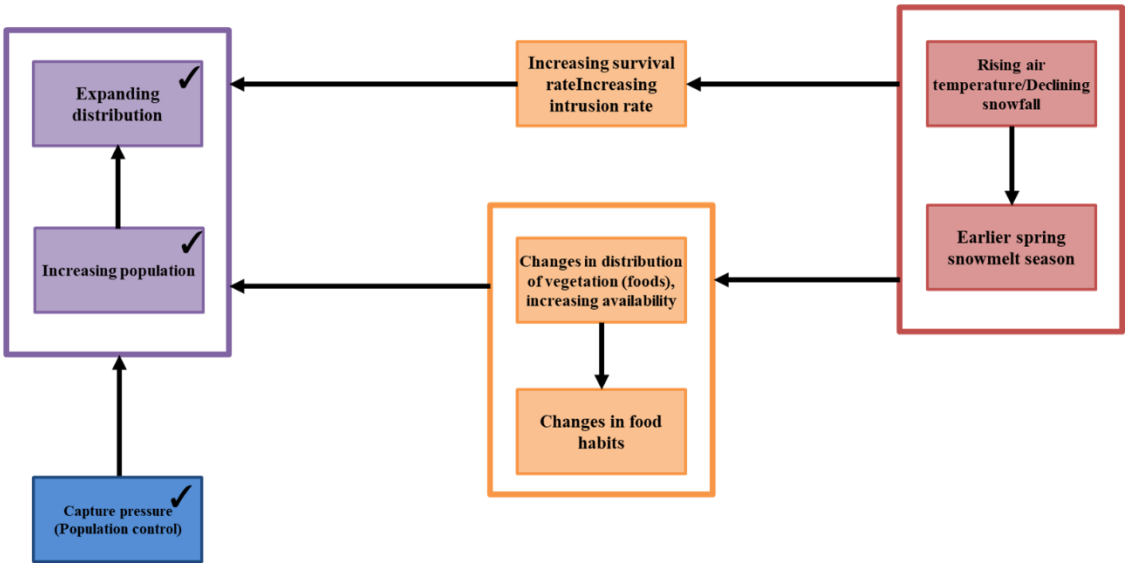
[9]-2 Forest vegetation



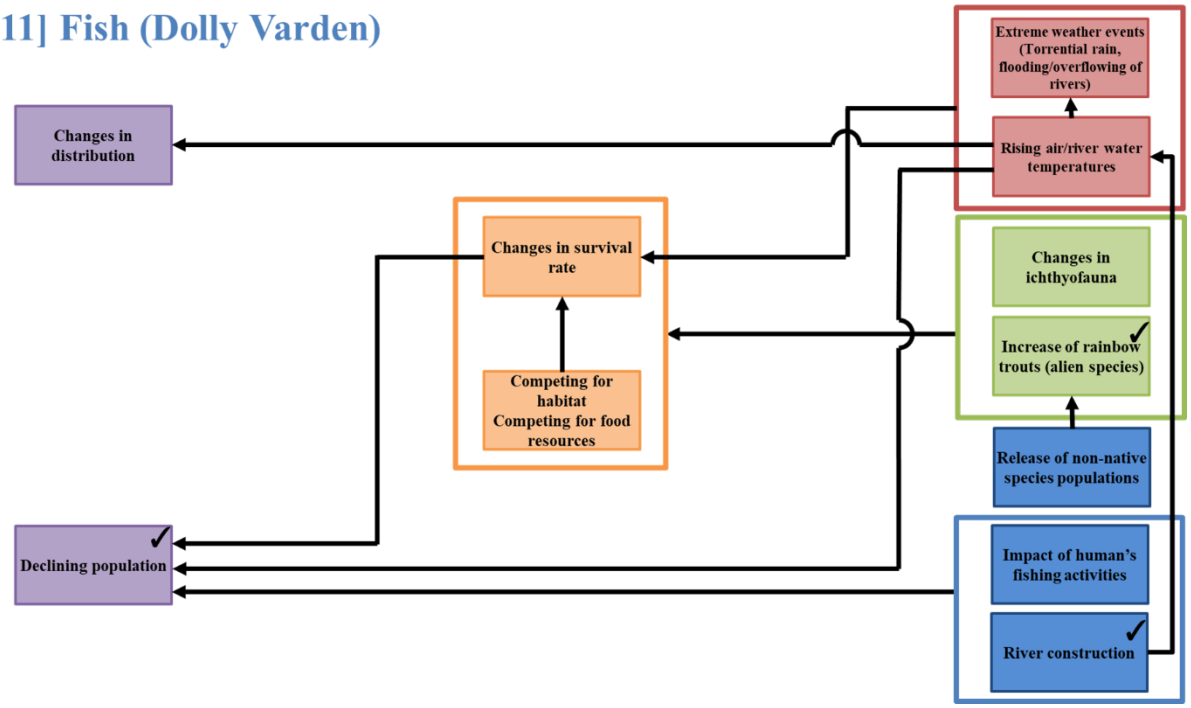
[9]-3 Grassland/Coast vegetation



[10] Sika deer



[11] Fish (Dolly Varden)



5. Evaluation of risks of impact due to climate change

Considering climate change scenarios (impact chains), the risks to ecosystems for each species that are currently anticipated were compiled from the following perspectives. The data shall be updated periodically and any impacts shall be determined based on a comprehensive Evaluation of the Long-Term Monitoring Plan.

[1] Impacts caused by climate change (possibility based on general knowledge)

- Based on the findings obtained from various past studies, the possibility of impacts caused by climate change is evaluated on a three-step scale: High, Medium, and Low.

[2] Impacts caused by climate change (possibility based on knowledge obtained at Shiretoko)

- Based on the knowledge obtained from the past research and monitoring at the Shiretoko Peninsula and surrounding areas, the possibility of impacts caused by climate change is evaluated on a three-step scale: High, Medium, and Low.

[3] Significance of the impact (Significance of the impact on the value of the Shiretoko Heritage Site)

- The severity is rated as "High" when it becomes difficult to maintain the criteria (ecosystem/biodiversity) or when the impact on other species is significant.
- Also, monitoring items linked to Evaluation items A, B, and C in the Phase 2 Long-Term Monitoring Plan, for which maintenance of Criteria is evaluated, are rated as "High" in terms of severity.
- In addition, a "Medium" or "Low" rating is relatively determined based on factors, such as the relationship with other species.

[4] Recent trends in Shiretoko (current state of each species based on the 2022 comprehensive Evaluation)

- Referring to the results of the comprehensive Evaluation of the Phase 1 Long-Term Monitoring Plan, recent trends are compiled (not limited to the trends due to climate change impacts).
- Findings from research results on Shiretoko are added.

[5] Determination of whether or not there is an impact

- Determine whether or not there is an impact based on the results of a comprehensive Evaluation of the Long-Term Monitoring Plan.
- However, regardless of the timing of the comprehensive Evaluation (Note), if the results of various monitoring indicate that the impacts of climate change are significant and the severity is "High," measures shall be taken at that time, such as accelerating the implementation of adaptation measures.

(Note) The time of the comprehensive evaluation in the Phase 2 Long-Term Monitoring Plan

- Interim evaluation: Fiscal 2027
- Comprehensive Evaluation: Fiscal 2032

Table 2: Compilation of the risk evaluation

	Assumed impacts	Impacts caused by climate change		[3] Significance of the impact on the value of the Shiretoko Heritage Site	[4] Recent trends in Shiretoko (current state of each species based on the 2022 comprehensive evaluation) Note: Not limited to the trends due to climate change impacts
		[1] Possibility based on general knowledge	[2] Possibility based on knowledge obtained at Shiretoko		
[1] Seals (*Phoca largha*)	Changes in distribution	High	High	Medium	Maintained the status quo at the time of heritage registration
	Changes in the period of migration to the coat of Japan (shorter duration)	High	High	High	
	Declining migration population to the coat of Japan	High	High	High	
	Declining breeding opportunities	High	High	High	
[2] Steller's sea lions	Changes in distribution	Medium	Unknown	Medium	Lack of information
	Changes in the period of migration to the coat of Japan	High		Medium	
	Changes in the migration population to the coat of Japan Changes in the habits (food habits)	High		High	
[3] Creatures in shore region (Fishes, large crustaceans, invertebrate animals, seaweeds)	Changes in distribution	High	Unknown	High	Maintained the status quo at the time of heritage registration
	Changes in the composition of species	High		High	
	Changes in biomass	High		Medium	
[4] Walleye pollock	Changes in distribution	Medium	Unknown	High	Maintained the status quo at the time of heritage registration
	Changes in the migration population to the coat of Japan and the current population	Medium		High	
	Changes in spawning volume	Medium		High	
[5] Sea birds (Spectacled guillemots, black-tailed gulls, slaty-backed gulls, Japanese cormorants)	Declining number of nests/breeding couples	High	Unknown	High	Declining number of Japanese cormorants and gulls
	Reducing breeding success, productivity (number of young birds leaving the nest per breeding couple)	High		High	
	Declining population	Medium		High	
[6]-1 Sea eagles (wintering white-tailed eagles, Steller's sea eagles)	Declining wintering populations	Low	Unknown	High	Maintained the status quo at the time of heritage registration
[6]-2 Sea eagles (breeding white-tailed eagles)	Declining number of nests/breeding couples	High	Unknown	High	Has been improved since the time of heritage registration
	Reducing breeding success, productivity (number of young birds leaving the nest per breeding couple)	High		High	
	Declining population	Medium		High	
[7] Salmonid species (Salmon, pink salmon, cherry salmon)	Changes in distribution	High	Unknown	High	Upstream and downstream migrations have been promoted because of the improved river construction
	Declining number of salmon fries swimming downstream	High		High	
	Declining number of spawning beds	High		High	
	Declining number of upstream migrations and the rate of return	High		High	
[8] Brown bears	Appearing in urban areas and farmlands	High	Unknown	High	Maintained the status quo at the time of heritage registration
	Changes in population	High		High	

	Assumed impacts	Impacts caused by climate change		[3] Significance of the impact on the value of the Shiretoko Heritage Site	[4] Recent trends in Shiretoko (current state of each species based on the 2022 comprehensive evaluation) Note: Not limited to the trends due to climate change impacts
		[1] Possibility based on general knowledge	[2] Possibility based on knowledge obtained at Shiretoko		
[9]-1 Alpine vegetation	Changes in composition of community/Declining diversity	High	Unknown	High	Maintained the status quo at the time of heritage registration
	Decline and extinction of certain species (Changes in distribution and the population of rare plants)	High		High	
[9]-2 Forest vegetation	Changes in composition of community/Declining diversity	High	Unknown	High	
	Decline and extinction of certain species (Decline in density of young trees, number of populations, and flowering plants)	High		High	
[9]-3 Grassland/Coast vegetation	Changes in composition of community/Declining diversity	High	Unknown	High	
	Decline and extinction of certain species (Changes in distribution and the population of rare plants)	High		High	
[10] Sika deer	Expanding distribution	High	Unknown	High	Maintained the status quo at the time of heritage registration
	Increasing population	High		High	
[11] Dolly Varden	Changes in distribution	Low	Unknown	High	Although some rivers show an increasing trend, the overall trend is on a decrease.
	Declining population	Medium to High		High	

[5] Determination of whether or not there is an impact
Determine whether or not there is an impact based on the results of a comprehensive evaluation of the Long-Term Monitoring Plan.

6. Consideration of specific and feasible measures

Based on the assumed risks, specific and feasible adaption measures were examined. The basic policy is to further promote existing measures, focusing on reducing stress factors other than climate change and strengthening adaptability while considering whether anthropogenic measures against risks are possible.

Target species	Adaptation measures to climate change
[1] Seals (*Phoca largha*) [2] Steller's sea lions	● Reducing existing stress source (pressure caused by human activities, such as litter and oil contamination) ● Building collaborative relationships with stakeholders ● Protection by laws and regulations
[3] Creatures in shore region (fishes, large crustaceans, invertebrate animals, seaweeds) [4] Walleye pollock	● Promoting sustainable fishery based on the integrated multiple-use marine management plan, considering the changes in distribution and food resource amounts ● Reducing existing stress source (pressure caused by human activities, such as litter and oil contamination)
[5] Sea birds (spectacled guillemots, black-tailed gulls, slaty-backed gulls, Japanese cormorants)	● Reducing existing stress source (pressure caused by human activities, such as litter, oil pollution, and tourism) ● Conserving breeding sites considering the impact of predators, tourism pressure, etc. ● Protection by laws and regulations ● Raising awareness to foster conservation momentum
[6]-1 Sea eagles (wintering white-tailed eagles, Steller's sea eagles) [6]-2 Sea eagles (breeding white-tailed eagles)	● Reducing existing stress source (pressure caused by human activities, such as litter, oil pollution, and tourism) ● Conserving breeding sites based on tourism pressure, etc. ● Protection by laws and regulations ● Rising public awareness (strict ban on lead ammunition) ● Rescuing injured or sick birds
[7] Salmonid species (Salmon, pink salmon, cherry salmon)	● Reducing existing stress source (fishing pressure) ● Improving river construction to ensure the continuity between sea areas and rivers and controlling rising water temperature ● Protection by laws and regulations
[8] Brown bears	● Reducing existing stress source (tourists' approach) ● Conserving and improving habitat/growing environment for primary food resources (salmonid species and nuts of Japanese stone pine and *Quercus crispula*) ● Strengthening and improving measures to prevent the intrusion into urban areas (avoiding extermination as problematic individuals)
[9]-1 Alpine vegetation [9]-2 Forest vegetation [9]-3 Grassland / Coast vegetation	● Reducing existing stress resources (trampling by tourists, grazing pressure of sika deer) ● Exterminating/controlling alien species ● Protection by laws and regulations and conservation of rare species

Target species	Adaptation measures to climate change
[10] Sika deer	● Reasonable population control based on the habitat status ● Promoting measures to prevent intrusion to protect vegetation Note: Adaptation measures for sika deer include managing target species and reducing the impact on other target species.
[11] Dolly Varden	● Reducing existing stress source (fishing) ● Improving river construction to ensure the continuity between sea areas and rivers and controlling rising water temperature ● Exterminating/controlling alien species (rainbow trouts) ● Rising public awareness (strictly prohibit the release of non-native species populations)

7. Implementation system

(1) Systems for administrative authority of the Heritage site and local governments

The conservation and management of the heritage site are executed by related administrative organizations under close cooperation based on the Management Plan for the Shiretoko World Natural Heritage Site while sharing necessary information. In implementing this strategy, necessary adaptation measures shall be conducted in cooperation with relevant organizations.

(2) Systems for taking adaptive management based on scientific advice

The Management Plan for the Shiretoko World Natural Heritage Site stipulates that a Scientific Council shall be established to evaluate the natural environment in the heritage site and promote adaptive management based on scientific data. Expert committees (working groups and advisory councils) shall also be established under the Committee to advise from a scientific perspective. This strategy also utilizes appropriate advice from the Scientific Council and the expert committees to properly evaluate the risks of climate change impacts and reflect the advice in promoting specific adaptive measures and reviewing the strategy.

In addition, based on the discussions at the Scientific Council, a Long-Term Monitoring Plan has been formulated, and based on this monitoring plan, relevant administrative organizations, local governments, related organizations, and experts are working together to conduct monitoring and research to accumulate scientific knowledge. Such monitoring and research results are used to grasp the occurrence of climate change impacts quickly.

(3) Systems for cooperation among stakeholders

When considering the conservation and management of the heritage site, adjustments are expected to balance the demands of natural environment conservation with local lifestyles and industries. In implementing this strategy, while utilizing forums, such as the Shiretoko World Natural Heritage Site Regional Liaison Committee, which aims to foster practical cooperation and collaboration among relevant government agencies, local governments, and related organizations, a wide range of opinions and proposals from residents and related organizations shall be considered and the local knowledge of those who have traditionally used nature shall be utilized.

In addition, in advancing adaptive measures to climate change, collaborative relationships with local civic organizations shall be established, and based on these relationships, activities shall be developed in the entire site with active participation and cooperation of residents to build activities.

The Phase Ⅱ Long-term Monitoring Plan for the Shiretoko World Natural Heritage Site

Table of contents

Kushiro Nature Conservation Office
Hokkaido Regional Forest Office
Hokkaido Government

1. Objectives of the plan

This plan aims to position the monitoring items necessary to evaluate the current status and define the methods to evaluate them to adaptively manage the heritage values based on the Management Plan for the Shiretoko World Natural Heritage Site.

2. Period of the plan

The period of the Plan shall be from April 2022 to March 2032.

3. Timetable of the evaluation

Interim and comprehensive evaluations shall be conducted in the years indicated below.

<Timetable of the evaluation>

Fiscal year	2012~ 2021	2022	2023	2024	2025	2026	**2027**	2028	2029	2030	2031	**2032**
Period of the Plan	Phase Ⅰ	**Phase Ⅱ**										(Phase Ⅲ)
Evaluation	Phase Ⅰ Comprehensive evaluation						**Phase Ⅱ Interim evaluation**					**Phase Ⅱ Comprehensive evaluation**
Monitoring data												

- The interim evaluation shall be conducted in FY2027, covering the period from FY2022 to FY2026 (5 years).
- The comprehensive evaluation shall be conducted in FY2032, covering the period from FY2022 to FY2031 (10 years).
- The interim and overall evaluation shall be conducted based on the monitoring data obtained during each target period.

4. Framework of the evaluation

The heritage values' current status evaluation (comprehensive evaluation) shall be conducted based on the evaluation results of the evaluation items (A–L: 12 items) linked to each item according to the evaluation perspective defined for each of the four subjects eligible for evaluation.

Each evaluation item shall be evaluated based on the evaluation result linked to each monitoring item.

Table 1 shows the framework of the Evaluation mentioned above, Table 2 shows the list of monitoring items, and Table 3 shows the summary for the evaluation.

[History of Phase Ⅱ Plan]
April 2022, establishment
March 2024, revision

[Table 1] Framework of the evaluation

Subjects eligible for the evaluation	Viewpoints of the evaluation	Evaluation items	
1State of conservation (States)	Are the ecosystems and biodiversity of Shiretoko maintained, which is the criteria for registration as a World Natural Heritage site?	A	Is the productivity of the ecosystem at the time of heritage registration maintained? (Criteria (ix) Ecosystem)
		B	Are the interrelationships between marine and terrestrial ecosystems maintained? (Criteria (ix) Ecosystem)
		C	Is the biodiversity of the ecosystem at the time of heritage registration maintained? (Criteria (x) Biodiversity)
2Environmental pressure - Tourism pressure (States, Trends)	Are there any environmental or tourism pressures that impact the value of Shiretoko as a World Natural Heritage site?	D	Are there any signs of climate change in the heritage site?
		E	Are there any effects or signs of impact of climate change on the value of Shiretoko as a World Natural Heritage site?
		F	Are there any effects or signs of the impact of human activities for recreation or similar purposes on the value of Shiretoko as a World Natural Heritage site?
3 Management results (Results)	Is the Site managed following the Management Plan for the Shiretoko World Natural Heritage Site?	G	Have management efforts been made to reduce the environmental impact caused by human activities to the extent possible?
		H	Has the response to the recommendations based on the field survey by UNESCO World Heritage Centre and IUCN progressed? (Is the response to each recommendation in progress)?
4 Management effects (Effects)	Are there any effects of the management based on the Management Plan for the Shiretoko World Natural Heritage Site?	I	Is there a balance between conserving marine ecosystems in the sea area within the heritage site and stable fisheries through sustainable use of marine resources?
		J	Is the river ecosystem capable of reproducing salmonid species maintained or restored by improving river constructions and other measures?
		K	No excessive impact on the ecosystem in the heritage area, caused by the high density of Sika deer, was observed.
		L	Is the ecology and population of brown bears maintained while protecting residents' livelihoods and industries and ensuring safe and quality nature experiences?

[Table 2] List of the monitoring items

(1) Items to be monitored mainly by relevant administrative agencies

No.	Monitoring items	Evaluation bodies	Corresponding evaluation items
1	Fixed-point observation of water temperature using ocean observation buoys	Ministry of the Environment	A、D、I
2	Survey of habitat status of seals and Steller sea lions	Hokkaido	A、C、E、I
3	Survey of biota in shore region	Ministry of the Environment	A、C、E
4	Shellfish quantitative survey in shore region	Ministry of the Environment	A、C、E
5	Survey of spectacled guillemot, black-tailed gull, slaty-backed gull, and Japanese cormorant populations, nesting site distribution, and number of nests	Ministry of the Environment	B、C、E、F、I
6	Survey of vegetation change (forest vegetation and grassland vegetation) in sika deer population control area	Ministry of the Environment, Ministry of Agriculture, Forestry and Fisheries	K
7	Survey of vegetation shift throughout the Shiretoko Peninsula (forest vegetation, coastal vegetation, and alpine vegetation)	Ministry of the Environment, Ministry of Agriculture, Forestry and Fisheries	C、E、K
8	Growth and distribution surveys of the rare plant Viola kitamiana	Ministry of the Environment	C、E
9	Survey of sika deer status in their main wintering grounds (aerial counting survey and terrestrial counting survey)	Ministry of the Environment	E、K
10	Survey of terrestrial insect fauna	Ministry of the Environment	C、E、K
11	Survey of terrestrial avifauna	Ministry of the Environment	C、E、K
12	Survey of habitat status of small and medium-sized mammals (including a survey of invasive alien species)	Ministry of Agriculture, Forestry and Fisheries	C
13	Preparing wide-area vegetation maps	Ministry of the Environment, Ministry of Agriculture, Forestry and Fisheries	C、E
14	Impact of users' problem behavior on brown bears' behavior	Ministry of the Environment	F
15	Management status based on the Brown Beer Management Plan in the Shiretoko Peninsula	Ministry of the Environment	L
16	The brown bear population in the Shiretoko Peninsula	Ministry of the Environment	B、C、E
17	Monitoring the number of salmonid species swimming upstream, their spawning grounds, the number of spawning beds, and the number of salmon fries swimming downstream in the river.	Ministry of Agriculture, Forestry and Fisheries, Hokkaido	B、I、J
18	Habitat status of freshwater fish, especially of Dolly Varden, which characterizes the freshwater ichthyofauna in Shiretoko (including a survey of invasive alien species)	Ministry of Agriculture, Forestry and Fisheries	C、D、E、J
19	Management and initiatives for appropriate use	Ministry of the Environment	G
20	Promotion of appropriate use and eco-tourism	Ministry of the Environment	F、G
21	Changes in the number of visitors	Ministry of the Environment	F、G
22	Survey of impact on alpine vegetation caused by climbers	Ministry of the Environment	F
23	Survey of the number of wintering sea eagles	Ministry of the Environment	B、E
24	Survey of the number of breeding couples, marked young birds, and dead/injured population of Blakiston's fish-owls.	Ministry of the Environment	C、E
25	Tracking of the project implementation status through preparation of annual reports	Ministry of the Environment	C、G、H
26	Tracking of the social environment through preparation of annual reports and so on	Ministry of the Environment	C、F、G、H、L
27	Meteorological observation	Ministry of the Environment	D
28	Meteorological observation in typical vegetation area	Ministry of the Environment	D

(2) Items to be monitored mainly by local governments, relevant organizations, experts, and other administrative agencies

No.	Monitoring items	Evaluation bodies	Corresponding evaluation items
[1]	Observing sea ice distribution status by aircraft, artificial satellites, etc.	First Regional Coast Guard Headquarters	A、D、I
[2]	Tracking of changes in fish catches based on Statistics on Fisheries in Hokkaido	Department of Fisheries and Forestry, Hokkaido	A、C、E、I
[3]	Ascertainment and assessment of walleye pollock stock (survey used to set total allowable catch [TAC])	Fisheries Agency	A、E、I
[4]	Survey of spawning volume of walleye pollock	Rausu Fisheries Cooperative Association, Kushiro Fisheries Research Institute	A、E、I
[5]	Number of Steller sea lions migrating to the coat of Japan, number of dead individuals due to human activities, and their sex and characteristics	Hokkaido National Fisheries Research Institute, etc.	A、E、I
[6]	Survey of damage caused by seals and Steller sea lions	Hokkaido	I
[7]	Survey of the reproduction status of the white-tailed eagle in their nesting sites and monitoring the number of fledglings	Monitoring survey group for white-tailed eagles	B、C、E
[8]	Survey of the number of wintering sea eagles in Hokkaido	Joint survey group	B
[9]	Analysis of oil, cadmium, mercury, etc. in seawater	Hydrographic and Oceanographic Department, Japan Coast Guard	I
[10]	Survey of habitat status of killer whales	Uni-HORP (University Alliance for Hokkaido Orca Research Project)	A、C、E、F、I

[Table 3] Summary for the evaluation

Comprehensive evaluation		Evaluation of the evaluation items		
Subjects eligible for the evaluation	Viewpoints of the evaluation		Evaluation items	Evaluation criteria
[1]State of conservation (States)	Are the ecosystems and biodiversity of Shiretoko maintained, which is the criteria for registration as a World Natural Heritage site?	**A**	Is the productivity of the ecosystem at the time of heritage registration maintained? (Criteria (ix) Ecosystem)	Compare the distribution of sea ice, which provides a growth environment for phytoplankton that supports the richness and diversity of the marine ecosystem, and the state of the biota, such as fish that feed on plankton and the aquatic animals that prey on them, with the state at the time of the heritage registration.
				Evaluation bodies: Marine Area WG

Evaluate the evaluation items based on the evaluation result of each monitoring item.

Evaluation of the monitoring items

Monitoring items	Evaluation criteria	Evaluation indicators	Monitoring method	Evaluation bodies	Evaluation bodies (Responsible WG/AP)
2. Survey of habitat status of seals and Steller sea lions	- The number of seals and Steller sea lions migrating to the Shiretoko Heritage Site and its surrounding waters is maintained.	- Number of animals using the feeding area around Lake Saroma and Lake Notori, and the breeding population off Abashiri	Conduct a visual survey from the land around Lake Saroma and Lake Nodori and visual survey from the sea off Abashiri (Note: Perform about once every 2 years)	Hokkaido	Marine Area WG
3 Survey of biota in shore region	- The population's density at the registration time is roughly maintained.	- Biota (fish, seaweed, invertebrates) - Population density	Inventory survey of fish, seaweed, and invertebrates in shore region of the coast of Shiretoko Peninsula (Note: Perform about once every 10 years)	Ministry of the Environment	Marine Area WG
4 Shellfish quantitative survey in shore region	- The population's density at the registration time is roughly maintained.	- Shellfish fauna - Population density	Inventory survey of shellfish on the coast of Shiretoko Peninsula (Note: Perform about once every 5 years)	Ministry of the Environment	Marine Area WG
[3] Ascertainment and assessment of walleye pollock stock (survey used to set total allowable catch [TAC])	- The resource states at the time of registration are roughly maintained.	- Resource level and trends	Resource level and trends of walleye pollock	Fisheries Agency	Marine Area WG
[10] Survey of habitat status of killer whales	- Human activities do not impede killer whales' habitat use.	- Identified population	Survey of identified population	Uni-HORP (University Alliance for Hokkaido Orca Research Project)	Marine Area WG

Related monitoring
(The purpose is to collect basic information, not the evaluation)

Monitoring items	Indicator	Monitoring method	Evaluation bodies	Responsible WG/AP
1. Fixed-point observation of water temperature using ocean observation buoys	- Water temperature	Install one ocean observation buoy off Kombu Beach in Rausu Town and observe water temperatures from spring to fall.	Ministry of the Environment	Marine Area WG
[1] Observation of sea ice distribution status by aircraft, artificial satellites, etc.	- Distribution of sea ice	Survey of distribution sea ice	First Regional Coast Guard Headquarters	Marine Area WG
[2] Tracking of changes in fish catches based on Statistics on Fisheries in Hokkaido	- Catches	Surveying the catch	Department of Fisheries and Forestry, Hokkaido	Marine Area WG
[4] Survey of spawning volume of walleye pollock	- Distribution amount of eggs	Survey of distribution amount of walleye pollock eggs	Rausu Fisheries Cooperative Association, Kushiro Fisheries Research Institute	Marine Area WG
[5] Number of Steller sea lions migrating to the coat of Japan, number of dead individuals due to human activities, and their sex and characteristics	- Number of Steller sea lions migrating to the coast of Japan	Survey of the number of Steller sea lions migrating to the coast of Japan	Hokkaido National Fisheries Research Institute, etc.	Marine Area WG

Comprehensive evaluation		Evaluation of the evaluation items		
Subjects eligible for the evaluation	Viewpoints of the evaluation		Evaluation items	Evaluation criteria
1 State of conservation (States)	Are the ecosystems and biodiversity of Shiretoko maintained, which is the criteria for registration as a World Natural Heritage site?	**B**	Are the interrelationships between marine and terrestrial ecosystems maintained? (Criteria (ix) Ecosystem)	Compare the state of salmonid species swimming upstream in each river and reproducing sustainably and of the brown bear population that preys on them with the state at the time of the heritage registration. Compare the habitat status and diversity of marine biota to the approximate time of the registration (or to the point that the database is available).

Evaluation bodies: Marine Area WG
Note: Coordinate with Brown Bear WG and River Construction AP

Evaluate the evaluation items based on the evaluation result of each monitoring item.

Evaluation of the monitoring items

Monitoring items	Evaluation criteria	Evaluation indicators	Monitoring method	Evaluation bodies	Evaluation bodies (Responsible WG/AP)
5 Survey of spectacled guillemot, black-tailed gull, slaty-backed gull, and Japanese cormorant populations, nesting site distribution, and number of nests	- The number of nests at the time of registration is roughly maintained.	- Number of nests and colonies - Rapid fluctuations in specific colonies	Count the breeding number by section from Utoro Port to Aidomari Port via Cape Shiretoko. Count the number of spectacled guillemot at sea in the range where their habitat is confirmed. Record the changes in the number of nests.	Ministry of the Environment	Marine Area WG
16 The brown bear population in the Shiretoko Peninsula	- The number of female brown bears killed by anthropogenic causes is 108 or less over six years from FY2022 (based on the Phase 2 Brown Beer Management Plan in the Shiretoko Peninsula). - The brown bear population is not experiencing a significant downward trend.	- Number of male brown bears killed by anthropogenic causes - Number of brown bears	Research and survey to comprehend the number of brown bears killed by anthropogenic causes and the long-trends in the brown bear population (e.g., dynamic model based on capture, number of sightings from tourist vessels)	Ministry of the Environment	Brown Bear WS
17 Monitoring the number of salmonid species swimming upstream, their spawning grounds, number of spawning beds, and the number of salmon fries swimming downstream in the river.	- Salmonid species are swimming upstream in each river and reproducing sustainably. - Obstacle of swimming upstream due to river construction is avoided to the extent practicable	- Number of salmon swimming upstream - Number of spawning beds - Impact of river construction on salmon swimming upstream and spawning	In Rusha River, Teppanbetsu River, and Rusa River, conduct surveys on the number of parent fish swimming upstream, the number of spawning beds, and the number of salmon fries swimming downstream to estimate the number of pink salmon swimming upstream.	Ministry of Agriculture, Forestry and Fisheries Hokkaido	River construction AP
23 Survey of the number of wintering sea eagles	- The population's habitat status at the registration time is roughly maintained.	- Number of wintering sea eagles	Record the number of species, populations, and whether adult or juvenile, for eagles found along roads and rivers in the Shiretoko Peninsula coastal area and on the drift ice.	Ministry of the Environment	Marine Area WG
[7] Survey of the reproduction status of the white-tailed eagle in their nesting sites and monitoring the number of fledglings	- The population's number of breeding couples, breeding success, and productivity at the registration time is roughly maintained.	- Number of breeding couples - Breeding success - Breeding success, productivity (Number of young birds leaving the nest per breeding couple)	Visual check of the nesting site of white-tailed eagles	Monitoring survey group for white-tailed eagles	Marine Area WG

Related monitoring
(The purpose is to collect basic information, not the evaluation)

Monitoring items	Indicator	Monitoring method	Evaluation bodies	Responsible WG/AP
[8] Survey of the number of wintering sea eagles throughout Hokkaido	- Wintering carrying capacity of sea eagles	Survey of the total number of wintering sea eagles throughout Hokkaido	Joint survey group	Marine Area WG
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Comprehensive evaluation		Evaluation of the evaluation items		
Subjects eligible for the evaluation	Viewpoints of the evaluation	Evaluation items		Evaluation criteria
1 State of conservation (States)	Are the ecosystems and biodiversity of Shiretoko maintained, which is the criteria for registration as a World Natural Heritage site?	C	Is the biodiversity of the ecosystem at the time of heritage registration maintained? (Criteria (x) Biodiversity)	At land and sea areas, compare the states of biotic communities, biota, population density, and distribution, as well as the habitat status and growth of rare species and the distribution of alien species, with the state at or before the heritage registration.

Evaluation bodies: Marine Area WG
Note: Coordinate with Sika Deer WG, River Construction AP, and Brown Bear WG

Evaluate the evaluation items based on the evaluation result of each monitoring item.

Evaluation of the monitoring items

Monitoring items	Evaluation criteria	Evaluation indicators	Monitoring method	Evaluation bodies	Evaluation bodies (Responsible WG/AP)
2. Survey of habitat status of seals and Steller sea lions	- The number of seals and Steller sea lions migrating to the Shiretoko Heritage Site and its surrounding waters is maintained.	- Number of animals using the feeding area around Lake Saroma and Lake Notori, and the breeding population off Abashiri	Conduct a visual survey from the land around Lake Saroma and Lake Nodori and visual survey from the sea off Abashiri (Note: Perform about once every 2 years)	Hokkaido	Marine Area WG
3 Survey of biota in shore region	- The diversity at the time of registration is roughly maintained.	- Biota (fish, seaweed, invertebrates) - Distribution	Inventory survey of fish, seaweed, and invertebrates in shore region of the coast of Shiretoko Peninsula (Note: Perform about once every 10 years)	Ministry of the Environment	Marine Area WG
4 Shellfish quantitative survey in shore region	- The diversity at the time of registration is roughly maintained.	- Shellfish fauna - Distribution	Inventory survey of shellfish on the coast of Shiretoko Peninsula (Note: Perform about once every 5 years)	Ministry of the Environment	Marine Area WG
5 Survey of spectacled guillemot, black-tailed gull, slaty-backed gull, and Japanese cormorant populations, nesting site distribution, and number of nests	- The number of nests at the time of registration is roughly maintained.	- Number of nests and colonies - Rapid fluctuations in specific colonies	Count the breeding number by section from Utoro Port to Aidomari Port via Cape Shiretoko. Count the number of spectacled guillemot at sea in the range where their habitat is confirmed. Record the changes in the number of nests.	Ministry of the Environment	Marine Area WG
7 Survey of vegetation shift throughout the Shiretoko Peninsula (forest vegetation, coastal vegetation, and alpine vegetation)	<u>Forest vegetation:</u> - The state of the early 1980s is restored. <u>Coastal vegetation / Alpine vegetation</u>: - The state of the early 1980s is maintained or restored.	<u>Forest vegetation:</u> - Density of young trees - Density of lower branch - Composition and vegetation height of understory - Signs of feeding / Feeding amount <u>Coastal vegetation / Alpine vegetation:</u> - Composition and vegetation height of community - Signs of feeding / Feeding amount	Perform periodic vegetation surveys in fixed study areas set throughout the Shiretoko Peninsula.	Ministry of the Environment Ministry of Agriculture, Forestry and Fisheries	Sika Deer WG
8 Growth and distribution surveys of the rare plant Viola kitamiana	- The population of rare plants is maintained.	- Population and coverage of tracked plants - Signs of feeding / Feeding amount	Survey of the changes in the population of Viola kitamiana, signs of feeding, and the amount of feeding by sika deer.	Ministry of the Environment	Sika Deer WG
13 Preparing wide-area vegetation maps	- No anthropogenic change has seen due to land development or other human activities. - There is no change in high moors, forest lines, and the distribution of Japanese stone pines and Yezo spruces.	- Vegetation status - Change in high moors, forest lines, and the distribution of Japanese stone pines and Yezo spruces.	Read existing vegetation maps, aerial photographs, and satellite images and conduct field surveys to prepare a 1/25,000-scale vegetation map of alpine belts.	Ministry of the Environment Ministry of Agriculture, Forestry and Fisheries	Sika Deer WG

Related monitoring
(The purpose is to collect basic information, not the evaluation)

Monitoring items	Indicator	Monitoring method	Evaluation bodies	Responsible WG/AP
10 Survey of terrestrial insect fauna	- Insect fauna (ground prowling, butterflies, bumblebees) - Confirmed population - Alien species (*Bombus terrestris*)	Conduct by pitfall trap, fixed-point observation, and line census methods. (Note: Perform about once every five years)	Ministry of the Environment	Sika Deer WG
11 Survey of terrestrial avifauna	- Avifauna - Confirmed population	Conduct by line census method or spot census method. (Note: Perform about once every five years)	Ministry of the Environment	Sika Deer WG
12 Survey of habitat status of small and medium-sized mammals (including a survey of invasive alien species)	- Mammalian fauna - Population density - Distribution - Distribution of alien species	Install automatic cameras and comprehend and monitor new invasive alien species. Also, record the habitat status of other mammals.	Ministry of Agriculture, Forestry and Fisheries	Sika Deer WG
Tracking of the project implementation status through preparation of 2025 annual reports	- Project implementation status by related institutions and organizations	Project implementation status by related institutions and organizations	Ministry of the Environment	Science Committee (reported to the Secretariat)
Tracking of the social environment through preparation of 2026 annual reports and so on	- Population - Number of workers by industry	Compilation of various statistics on demographics, industrial activity, etc.	Ministry of the Environment	Science Committee (reported to the Secretariat)
[2] Tracking of changes in fish catches based on Statistics on Fisheries in Hokkaido	- Catches	Compilation of various statistics on catches	Department of Fisheries and Forestry, Hokkaido	Marine Area WG
[5] Number of Steller sea lions migrating to the coat of Japan, number of dead individuals due to human activities, and their sex and characteristics	- Number of Steller sea lions migrating to the coast of Japan - Sex and characteristics of Steller sea lions killed by anthropogenic causes	Survey of the number of Steller sea lions migrating to the coast of Japan	Hokkaido National Fisheries Research Institute, etc.	Marine Area WG

Comprehensive evaluation		Evaluation of the evaluation items		
Subjects eligible for the evaluation	Viewpoints of the evaluation	Evaluation items		Evaluation criteria
1 State of conservation (States)	Are the ecosystems and biodiversity of Shiretoko maintained, which is the criteria for registration as a World Natural Heritage site?	C (Continued)	Is the biodiversity of the ecosystem at the time of heritage registration maintained? (Criteria (x) Biodiversity)	At land and sea areas, compare the states of biotic communities, biota, population density, and distribution, as well as the habitat status and growth of rare species and the distribution of alien species, with the state at or before the

Evaluation bodies: Marine Area WG
Note: Coordinate with Sika Deer WG, River Construction AP, and Brown Bear WG

Evaluate the evaluation items based on the evaluation result of each monitoring item.

Evaluation of the monitoring items

Monitoring items	Evaluation criteria	Evaluation indicators	Monitoring method	Evaluation bodies	Evaluation bodies (Responsible WG/AP)
16 The brown bear population in the Shiretoko Peninsula	- The number of female brown bears killed by anthropogenic causes is 108 or less over six years from FY2022 (based on the Phase 2 Brown Beer Management Plan in the Shiretoko Peninsula). - The brown bear population is not experiencing a significant downward trend.	- Number of male brown bears killed by anthropogenic causes - Number of brown bears	Research and survey to comprehend the number of brown bears killed by anthropogenic causes and the long-trends in the brown bear population (e.g., dynamic model based on capture, number of sightings from tourist vessels)	Ministry of the Environment	Brown Bear WS
18 Habitat status of freshwater fish, especially of Dolly Varden, which characterizes the freshwater ichthyofauna in Shiretoko (including a survey of invasive alien species)	- The amount of the resource is maintained. - The expansion of distribution and population growth of alien species is sufficiently controlled. - Anthropogenic impacts, such as river construction, do not accelerate the rise in water temperature associated with climate change.	- Biomass of Dolly Varden - Habitat status of alien species - River water temperature	Survey of changes in ichthyofauna, biomass of Dolly Varden, and water temperature in the Iwaubetsu River and other rivers.	Ministry of Agriculture, Forestry and Fisheries	River construction AP
24 Survey of the number of breeding couples, marked young birds, and dead/injured individuals of Blakiston's fish-owls.	- Number of couples: the number at the time of heritage registration is roughly maintained. - Breeding success (number of breeding couples succeeded in breeding/confirmed number of couples): breeding success at the time of heritage registration is roughly maintained.	- Number of breeding couples - Breeding success (Number of marked young birds, etc.)	Attach signs for the identification of young birds to the breeding couples of which the habitat is known. Death and injured birds are investigated for cause when found.	Ministry of the Environment	Protection and Propagation Study Group
[7] Survey of the reproduction status of the white-tailed eagle in their nesting sites and monitoring the number of fledglings	- The population's number of breeding couples, breeding success, and productivity at the registration time is roughly maintained.	- Number of breeding couples - Breeding success, productivity (Number of young birds leaving the nest per a breeding couple)	Visual check of the nesting site of white-tailed eagles	Monitoring survey group for white-tailed eagles	Marine Area WG
[10] Survey of habitat status of killer whales	- Human activities do not impede killer whales' habitat use.	- Migration of killer whales including identified population	Survey of identified population	Uni-HORP (University Alliance for Hokkaido Orca Research Project)	Marine Area WG

Related monitoring
(The purpose is to collect basic information, not the evaluation)

Monitoring items	Indicator	Monitoring method	Evaluation bodies	Responsible WG/AP
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Comprehensive evaluation		Evaluation of the evaluation items		
Subjects eligible for the evaluation	Viewpoints of the evaluation		Evaluation items	Evaluation criteria
2 Environmental pressure - Tourism pressure (States / Trends)	Are there any environmental or tourism pressures that impact the value of Shiretoko as a World Natural Heritage site?	**D**	Are there any signs of climate change in the heritage site?	Evaluate whether there are signs of climate change in the changes or trends in climate data.

Evaluation bodies: Sika deer WG
Note: Coordinate with Marine WG and River construction AP

Evaluate the evaluation items based on the evaluation result of each monitoring item.

Evaluation of the monitoring items					
Monitoring items	Evaluation criteria	Evaluation indicators	Monitoring method	Evaluation bodies	Evaluation bodies (Responsible WG/AP)
1. Fixed-point observation of water temperature using ocean observation buoys	- Does it deviate from the long-term variability range?	- Sea water temperature	Install one ocean observation buoy off Kombu Beach in Rausu Town and observe water temperatures from spring to fall.	Ministry of the Environment	Marine Area WG
18 Habitat status of freshwater fish, especially of Dolly Varden, which characterizes the freshwater ichthyofauna in Shiretoko (including a survey of invasive alien species)	- The amount of the resource is maintained. - The expansion of distribution and population growth of alien species is sufficiently controlled. - Anthropogenic impacts, such as river construction, do not accelerate the rise in water temperature associated with climate change.	- Biomass of Dolly Varden - Habitat status of alien species - River water temperature	Survey of changes in ichthyofauna, biomass of Dolly Varden, and water temperature in the Iwaubetsu River and other rivers.	Ministry of Agriculture, Forestry and Fisheries	River construction AP
27 Meteorological observation	- Does it deviate from the long-term variability range?	- Temperature - Precipitation - Final snow melting day - Sea surface water temperature - Sea ice duration (Abashiri)	Utilizing observation data by Japan Meteorological Agency, etc.	Ministry of the Environment	Sika Deer WG
28 Meteorological observation in typical vegetation area	- Does it deviate from the long-term variability range?	- Ground temperature - Land surface temperature - Spring snowmelt season	Survey of soil and ground and land surface temperatures in vegetation areas representative of Shiretoko from among the vegetation survey areas listed in Monitoring Item 7.	Ministry of the Environment	Sika Deer WG
[1] Observation of sea ice distribution status by aircraft, artificial satellites, etc.	- Does it deviate from the long-term variability range?	- Distribution of sea ice	Survey of distribution sea ice	First Regional Coast Guard Headquarters	Marine Area WG

Related monitoring (The purpose is to collect basic information, not the evaluation)				
Monitoring items	Indicator	Monitoring method	Evaluation bodies	Responsible WG/AP
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Comprehensive evaluation		Evaluation of the evaluation items		
Subjects eligible for the evaluation	Viewpoints of the evaluation	Evaluation items		Evaluation criteria
2 Environmental pressure - Tourism pressure (States / Trends)	Are there any environmental or tourism pressures that impact the value of Shiretoko as a World Natural Heritage site?	E	Are there any effects or signs of impact of climate change on the value of Shiretoko as a World Natural Heritage site?	Evaluate whether there are changes in population, distribution range, phenology, species interactions, community structure, and species diversity and whether they result from climate change

Implementing bodies: Sika deer WG
Note: Coordinate with Marine WG, River Construction AP, and Brown Bear WG

Evaluate the evaluation items based on the evaluation result of each monitoring item.

Evaluation of the monitoring items

Monitoring items	Evaluation criteria	Evaluation indicators	Monitoring method	Evaluation bodies	Evaluation bodies (Responsible WG/AP)
2. Survey of habitat status of seals and Steller sea lions	- Are there any changes that could be attributed to climate change?	- Number of animals using the feeding area around Lake Saroma and Lake Notori, and the breeding population off Abashiri	Conduct a visual survey from the land around Lake Saroma and Lake Nodori and visual survey from the sea off Abashiri (Note: Perform about once every 2 years)	Hokkaido	Marine Area WG
3 Survey of biota in shore region	- Are there any changes that could be attributed to climate change?	- Biota (fish, seaweed, invertebrates) - Distribution	Inventory survey of fish, seaweed, and invertebrates in shore region of the coast of Shiretoko Peninsula (Note: Perform about once every 10 years)	Ministry of the Environment	Marine Area WG
4 Shellfish quantitative survey in shore region	- Are there any changes that could be attributed to climate change?	- Shellfish fauna - Distribution	Inventory survey of shellfish on the coast of Shiretoko Peninsula (Note: Perform about once every 5 years)	Ministry of the Environment	Marine Area WG
5 Survey of spectacled guillemot, black-tailed gull, slaty-backed gull, and Japanese cormorant populations, nesting site distribution, and number of nests	- Are there any changes that could be attributed to climate change?	- Number of nests and colonies - Rapid fluctuations in specific colonies	Count the breeding number by section from Utoro Port to Aidomari Port via Cape Shiretoko. Count the number of spectacled guillemot at sea in the range where their habitat is confirmed. Record the changes in the number of nests.	Ministry of the Environment	Marine Area WG
7 Survey of vegetation shift throughout the Shiretoko Peninsula (forest vegetation, coastal vegetation, and alpine vegetation)	- Are there any changes that could be attributed to climate change?	Forest vegetation: - Density of young trees - Density of lower branch - Composition and vegetation height of understory Coastal vegetation / Alpine vegetation: - Composition and vegetation height of community	Perform periodic vegetation surveys in fixed study areas set throughout the Shiretoko Peninsula.	Ministry of the Environment Ministry of Agriculture, Forestry and Fisheries	Sika Deer WG
9 Survey of sika deer status in their main wintering grounds (aerial counting survey and terrestrial counting survey)	- Are there any changes that could be attributed to climate change?	- Aerial counting survey: Number of animals found during wintering season (density of animals found) - Terrestrial counting survey: Number of animals found per unit distance or index	Aerial counting survey: Once every five years, a helicopter flies low over the entire Shiretoko Peninsula to count the wintering Sika deer population and record their locations. It has been conducted yearly since 2014 in part of the Peninsula (throughout the heritage area). - Terrestrial counting survey: Light census in main wintering grounds, etc.	Ministry of the Environment	Sika Deer WG
10 Survey of terrestrial insect fauna	- Are there any changes that could be attributed to climate change?	- Insect fauna (ground prowling, butterflies, bumblebees) - Confirmed population - Alien species (*Bombus terrestris*)	Conduct by pitfall trap, fixed-point observation, and line census methods. (Note: Perform about once every five years)	Ministry of the Environment	Sika Deer WG
11 Survey of terrestrial avifauna	- Are there any changes that could be attributed to climate change?	- Avifauna - Confirmed population	Conduct by line census method or spot census method. (Note: Perform about once every five years)	Ministry of the Environment	Sika Deer WG

Related monitoring
(The purpose is to collect basic information, not the evaluation)

Monitoring items	Indicator	Monitoring method	Evaluation bodies	Responsible WG/AP
8 Growth and distribution surveys of the rare plant Viola kitamiana	Population and coverage of tracked plants	Survey of the changes in the population of Viola kitamiana, signs of feeding, and the amount of feeding by sika deer.	Ministry of the Environment	Sika Deer WG
[2] Tracking of changes in fish catches based on Statistics on Fisheries in Hokkaido	- Catches	Compilation of various statistics on catches	Department of Fisheries and Forestry, Hokkaido	Marine Area WG
[5] Number of Steller sea lions migrating to the coat of Japan, number of dead individuals due to human activities, and their sex and characteristics	- Number of Steller sea lions migrating to the coast of Japan	Survey of the number of Steller sea lions migrating to the coast of Japan	Hokkaido National Fisheries Research Institute, etc.	Marine Area WG
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Comprehensive evaluation		Evaluation of the evaluation items		
Subjects eligible for the evaluation	Viewpoints of the evaluation		Evaluation items	Evaluation criteria
2Environmental pressure - Tourism pressure (States / Trends)	Are there any environmental or tourism pressures that impact the value of Shiretoko as a World Natural Heritage site?	E (Continued)	Are there any effects or signs of impact of climate change on the value of Shiretoko as a World Natural Heritage site?	Evaluate whether there are changes in population, distribution range, phenology, species interactions, community structure, and species diversity and whether they result from climate change

Implementing bodies: Sika deer WG
Note: Coordinate with Marine WG, River Construction AP, and Brown Bear WG

Evaluate the evaluation items based on the evaluation result of each monitoring item.

Evaluation of the monitoring items

Monitoring items	Evaluation criteria	Evaluation indicators	Monitoring method	Evaluation bodies	Evaluation bodies (Responsible WG/AP)
13 Preparing wide-area vegetation maps	- Are there any changes that could be attributed to climate change?	- Vegetation status - Change in high moors, forest lines, and the distribution of Japanese stone pines and Yezo spruces.	Read existing vegetation maps, aerial photographs, and satellite images and conduct field surveys to prepare a 1/25,000-scale vegetation map of alpine belts.	Ministry of the Environment Ministry of Agriculture, Forestry and Fisheries	Sika Deer WG
16 The brown bear population in the Shiretoko Peninsula	- Are there any changes that could be attributed to climate change?	- Number of brown bears	Research and survey to comprehend the number of brown bears killed by anthropogenic causes and the long-trends in the brown bear population (e.g., dynamic model based on capture, number of sightings from tourist vessels)	Ministry of the Environment	Brown Bear WS
18 Habitat status of freshwater fish, especially of Dolly Varden, which characterizes the freshwater ichthyofauna in Shiretoko (including a survey of invasive alien species)	- The amount of the resource is maintained. - The expansion of distribution and population growth of alien species is sufficiently controlled. - Anthropogenic impacts, such as river construction, do not accelerate the rise in water temperature associated with climate change.	- Biomass of Dolly Varden - Habitat status of alien species - River water temperature	Survey of changes in ichthyofauna, biomass of Dolly Varden, and water temperature in the Iwaubetsu River and other rivers.	Ministry of Agriculture, Forestry and Fisheries	River construction AP
23 Survey of the number of wintering sea eagles	- Are there any changes that could be attributed to climate change?	- Number of wintering sea eagles	Record the number of species, populations, and whether adult or juvenile, for eagles found along roads and rivers in the Shiretoko Peninsula coastal area and on the drift ice.	Ministry of the Environment	Marine Area WG
24 Survey of the number of breeding couples, marked young birds, and dead/injured individuals of Blakiston's fish-owls.	- Are there any changes that could be attributed to climate change?	- Number of breeding couples - Breeding success (Number of marked young birds, etc.)	Attach signs for the identification of young birds to the breeding couples of which the habitat is known. Death and injured birds are investigated for cause when found.	Ministry of the Environment	Protection and Propagation Study Group
[3] Ascertainment and assessment of walleye pollock stock (survey used to set total allowable catch [TAC])	- Are there any changes that could be attributed to climate change?	- Resource level and trends	Resource level and trends of walleye pollock	Fisheries Agency	Marine Area WG
[4] Survey of spawning volume of walleye pollock	- Are there any changes that could be attributed to climate change?	- Distribution amount of eggs	Survey of distribution amount of walleye pollock eggs	Rausu Fisheries Cooperative Association, Kushiro Fisheries Research Institute	Marine Area WG
[7] Survey of the reproduction status of the white-tailed eagle in their nesting sites and monitoring the number of fledglings	- Are there any changes that could be attributed to climate change?	- Number of breeding couples - Breeding success - Breeding success, productivity (Number of young birds leaving the nest per breeding couple)	Visual check of the nesting site of white-tailed eagles	Monitoring survey group for white-tailed eagles	Marine Area WG
[10] Survey of habitat status of killer whales	- Are there any changes in the killer whales' migration status?	- Migration of killer whales including identified population	Survey of identified population	Uni-HORP (University Alliance for Hokkaido Orca Research Project)	Marine Area WG

Related monitoring
(The purpose is to collect basic information, not the evaluation)

Monitoring items	Indicator	Monitoring method	Evaluation bodies	Responsible WG/AP
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Comprehensive evaluation		Evaluation of the evaluation items		
Subjects eligible for the evaluation	Viewpoints of the evaluation	Evaluation items		Evaluation criteria
2Environmental pressure - Tourism pressure (States / Trends)	Are there any environmental or tourism pressures that impact the value of Shiretoko as a World Natural Heritage site?	F	Are there any effects or signs of the impact of human activities for recreation or similar purposes on the value of Shiretoko as a World Natural Heritage site?	Compare the current state of events considered to be affected by human activities with the states set in various plans and strategies developed during or after the heritage registration to check the changes.

Responsible for evaluation: Appropriate Use and Ecotourism Working Group WG
Note: Coordinate with Marine WG and Brown Bear WG

Evaluate the evaluation items based on the evaluation result of each monitoring item.

Evaluation of the monitoring items

Monitoring items	Evaluation criteria	Evaluation indicators	Monitoring method	Evaluation bodies	Evaluation bodies (Responsible WG/AP)
5 Survey of spectacled guillemot, black-tailed gull, slaty-backed gull, and Japanese cormorant populations, nesting site distribution, and number of nests	- The number of nests at the time of registration is roughly maintained.	- Number of nests and colonies - Rapid fluctuations in specific colonies	Count the breeding number by section from Utoro Port to Aidomari Port via Cape Shiretoko. Count the number of spectacled guillemot at sea in the range where their habitat is confirmed. Record the changes in the number of nests.	Ministry of the Environment	Marine Area WG Appropriate Use and Ecotourism WG
14 Impact of users' problem behavior on brown bears' behavior	- Based on the Phrase 2 Brown Beer Management Plan in the Shiretoko Peninsula, the number of dangerous cases related to users' problem behavior is controlled below the current level.	- Number of hazardous incidents related to users' problem behavior - The state of human's problem behavior - Facility operation status (open/closed)	Through questionnaires, reports, and brown bear countermeasure duties, etc., collect information on damage and dangerous cases caused by brown bears, human's problem behavior, and the operation status (open/closed) of facilities (Shiretoko Goko Lakes Ground pathway, Furepe Waterfall pathway)	Ministry of the Environment	Brown Bear WS Appropriate Use and Ecotourism WG
20 Promotion of appropriate use and eco-tourism	- Based on "Shiretoko Eco-tourism Strategy 5. Basic Policies (1) and (2)," appropriate use and eco-tourism promotion are being conducted.	- Implementation status of projects following the basic policies of "Shiretoko Eco-tourism Strategy." - Changes in resource using patterns - Changes in customers - Concerned for the natural environment	Comprehend the progress in proper use and eco-tourism in the area using interview surveys with people involved in the use of heritage areas.	Ministry of the Environment	Appropriate Use and Ecotourism WG
22 Survey of impact on alpine vegetation caused by climbers	- No impact expansion	- Vegetation coverage and species composition - Changes in vegetation landscape	Establish monitoring sites, record vegetation coverage and, species composition and emergent species, and take photos of the vegetation landscape.	Ministry of the Environment	Appropriate Use and Ecotourism WG
[10] Survey of habitat status of killer whales	- Human activities do not impede killer whales' habitat use.	- Migration of killer whales including identified population	Survey of identified population	Uni-HORP (University Alliance for Hokkaido Orca Research Project)	Marine Area WG

Related monitoring
(The purpose is to collect basic information, not the evaluation)

Monitoring items	Indicator	Monitoring method	Evaluation bodies	Responsible WG/AP
21 Changes in the number of visitors	- Number of visitors of each destination	Comprehend the number of users in major user facilities through the user number count based on user counting and surveys, etc.	Ministry of the Environment	Appropriate Use and Ecotourism WG
Tracking of the social environment through preparation of 2026 annual reports and so on	- Population - Number of workers by industry	Compilation of various statistics on demographics, industrial activity, etc.	Ministry of the Environment	Science Committee (reported to the Secretariat)
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Comprehensive evaluation		Evaluation of the evaluation items		
Subjects eligible for the evaluation	Viewpoints of the evaluation	Evaluation items		Evaluation criteria
3 Management results (Results)	Is the Site managed following the Management Plan for the Shiretoko World Natural Heritage Site?	**G**	Have management efforts been made to reduce the environmental impact caused by human activities to the extent possible?	Evaluate the validity of management efforts and the activities for maintenance and improvement, focusing on the relationship and interaction between the use of pressure, management efforts, and environmental impact.
				Responsible for evaluation: Appropriate Use and Ecotourism Working Group WG
		H	Has the response to the recommendations based on the field survey by UNESCO World Heritage Centre and IUCN progressed? (Is the response to each recommendation in progress)?	Evaluate the progress of each project based on the implementation of each project corresponding to the recommendations.
				Responsible for evaluation: Science Committee

Evaluation items shall be evaluated based on the evaluation result of each monitoring item

Evaluation items shall be evaluated based on the evaluation result of each monitoring item

Evaluation of the monitoring items					
Monitoring items	Evaluation criteria	Evaluation indicators	Monitoring method	Evaluation bodies	Evaluation bodies (Responsible WG/AP)
19 Management and initiatives for appropriate use	- Management and Initiatives are taken to realize "Shiretoko Eco-tourism Strategy 9. Specific Measures."	- Implementation status of management and initiatives	Extract and list necessary management and initiatives for appropriate use of the area, based on the Shiretoko White Paper, materials for appropriate use, eco-tourism study meetings, interview surveys with administrative agencies, etc.	Ministry of the Environment	Appropriate Use and Ecotourism WG
20 Promotion of appropriate use and eco-tourism	- Based on "Shiretoko Eco-tourism Strategy 5. Basic Policies (1) and (2)," appropriate use and eco-tourism promotion are being conducted.	- Implementation status of projects following the basic policies of "Shiretoko Eco-tourism Strategy."	Comprehend the progress in proper use and eco-tourism in the area using interview surveys with people involved in the use of heritage areas.	Ministry of the Environment	Appropriate Use and Ecotourism WG

Note: The Science Committee evaluates the evaluation item H based on the survey results of the related monitoring.

Related monitoring (The purpose is to collect basic information, not the evaluation)				
Monitoring items	Indicator	Monitoring method	Evaluation bodies	Responsible WG/AP
21 Changes in the number of visitors	- Number of visitors of each destination	Comprehend the number of users and the changes in major user facilities through the user number count based on user counting and surveys, etc.	Ministry of the Environment	Appropriate Use and Ecotourism WG
Tracking of the project implementation status through preparation of 2025 annual reports	- Project implementation status by related institutions and organizations	Project implementation status by related institutions and organizations	Ministry of the Environment	Science Committee (reported to the Secretariat)
Tracking of the social environment through preparation of 2026 annual reports and so on	- Population - Number of workers by industry	Compilation of various statistics on demographics, industrial activity, etc.	Ministry of the Environment	Science Committee (reported to the Secretariat)
Tracking of the project implementation status through preparation of 2025 annual reports	- Project implementation status by related institutions and organizations	Project implementation status by related institutions and organizations	Ministry of the Environment	Science Committee (reported to the Secretariat)
Tracking of the social environment through preparation of 2026 annual reports and so on	- Population - Number of workers by industry	Compilation of various statistics on demographics, industrial activity, etc.	Ministry of the Environment	Science Committee (reported to the Secretariat)

Comprehensive evaluation		Evaluation of the evaluation items			Evaluation of the monitoring items						Related monitoring (The purpose is to collect basic information, not the evaluation)				
Subjects eligible for the evaluation	Viewpoints of the evaluation	Evaluation items		Evaluation criteria	Monitoring items	Evaluation criteria	Evaluation indicators	Monitoring method	Evaluation bodies	Evaluation bodies (Responsible WG/AP)	Monitoring items	Indicator	Monitoring method	Evaluation bodies	Responsible WG/AP
4 Management effects (Effects)	Are there any effects of the management based on the Management Plan for the Shiretoko World Natural Heritage Site?	I	Is there a balance between conserving marine ecosystems in the sea area within the heritage site and stable fisheries through sustainable use of marine resources?	Evaluate the habitat states of and the damage they received from seals, Steller sea lions, and killer whales that characterize the marine ecosystems and the catch and resource states of walleye pollock.	2. Survey of habitat status of seals and Steller sea lions	- The number of seals and Steller sea lions migrating to the Shiretoko Heritage Site and its surrounding waters is maintained.	- Number of animals using the feeding area around Lake Saroma and Lake Notori, and the breeding population off Abashiri	Conduct a visual survey from the land around Lake Saroma and Lake Nodori and visual survey from the sea off Abashiri (Note: Perform about once every 2 years)	Hokkaido	Marine Area WG	1. Fixed-point observation of water temperature using ocean observation buoys	- Water temperature	Install one ocean observation buoy off Kombu Beach in Rausu Town and observe water temperatures from spring to fall.	Ministry of the Environment	Marine Area WG
					5 Survey of spectacled guillemot, black-tailed gull, slaty-backed gull, and Japanese cormorant populations, nesting site distribution, and number of nests	- The number of nests at the time of registration is roughly maintained.	- Number of nests and colonies - Rapid fluctuations in specific colonies	Count the breeding number by section from Utoro Port to Aidomari Port via Cape Shiretoko. Count the number of spectacled guillemot at sea in the range where their habitat is confirmed. Record the changes in the number of nests.	Ministry of the Environment	Marine Area WG	[1] Observation of sea ice distribution status by aircraft, artificial satellites, etc.	- Distribution of sea ice	Survey of distribution sea ice	First Regional Coast Guard Headquarters	Marine Area WG
					17 Monitoring the number of salmonid species swimming upstream, their spawning grounds, number of spawning beds, and the number of salmon fries swimming downstream in the river.	- Salmonid species are swimming upstream in each river and reproducing sustainably. - Obstacle of swimming upstream due to river construction is avoided to the extent practicable	- Number of salmon swimming upstream - Number of spawning beds - Impact of river construction on salmon swimming upstream and spawning	In Rusha River, Teppanbetsu River, and Rusa River, conduct surveys on the number of parent fish swimming upstream, the number of spawning beds, and the number of salmon fries swimming downstream to estimate the number of salmon swimming upstream of pink salmon.	Ministry of Agriculture, Forestry and Fisheries Hokkaido	River construction AP	[2] Tracking of changes in fish catches based on Statistics on Fisheries in Hokkaido	- Catches	Surveying the catch	Department of Fisheries and Forestry, Hokkaido	Marine Area WG
					[3] Ascertainment and assessment of walleye pollock stock (survey used to set total allowable catch [TAC])	- The resource states at the time of registration are roughly maintained.	- Resource level and trends	Resource level and trends of walleye pollock	Fisheries Agency	Marine Area WG	[4] Survey of spawning volume of walleye pollock	- Distribution amount of eggs	Survey of distribution amount of walleye pollock eggs	Rausu Fisheries Cooperative Association, Kushiro Fisheries Research Institute	Marine Area WG
					[9] Analysis of oil, cadmium, mercury, etc. in seawater	- It should be below the standard value.	- Concentration of contaminants such as petroleum, PCBs, and heavy metals in surface seawater and seabed sediments	Analysis of concentration of contaminants such as petroleum, PCBs, and heavy metals in surface seawater and seabed sediments	Hydrographic and Oceanographic Department, Japan Coast Guard	Marine WG	[5] Number of Steller sea lions migrating to the coat of Japan, number of dead individuals due to human activities, and their sex and characteristics	- Number of Steller sea lions migrating to the coast of Japan	Survey of the number of Steller sea lions migrating to the coast of Japan	Hokkaido National Fisheries Research Institute, etc.	Marine Area WG
					[10] Survey of habitat status of killer whales	- Human activities do not impede killer whales' habitat use.	- Migration of killer whales including identified population	Survey of identified population	Uni-HORP (University Alliance for Hokkaido Orca Research Project)	Marine Area WG	(6) Survey of damage caused by seals and Steller sea lions	- Damage situation	Survey of fishery damage caused by seals and Steller sea lions	Hokkaido	Marine Area WG
		J	Is the river ecosystem capable of reproducing salmonid species maintained or restored by improving river constructions and other measures?	Obstacle of swimming upstream due to river construction is avoided to the extent practicable.	17 Monitoring the number of salmonid species swimming upstream, their spawning grounds, number of spawning beds, and the number of salmon fries swimming downstream in the river.	- Salmonid species are swimming upstream in each river and reproducing sustainably. - Obstacle of swimming upstream due to river construction is avoided to the extent practicable	- Number of salmon swimming upstream - Number of spawning beds - Impact of river construction on salmon swimming upstream and spawning	In Rusha River, Teppanbetsu River, and Rusa River, conduct surveys on the number of parent fish swimming upstream, the number of spawning beds, and the number of salmon fries swimming downstream to estimate the number of salmon swimming upstream of pink salmon.	Ministry of Agriculture, Forestry and Fisheries Hokkaido	River construction AP	-	-	-	-	-
					18 Habitat status of freshwater fish, especially of Dolly Varden, which characterizes the freshwater ichthyofauna in Shiretoko (including a survey of invasive alien species)	- The amount of the resource is maintained. - The expansion of distribution and population growth of alien species is sufficiently controlled. ●Anthropogenic impacts, such as river construction, do not accelerate the rise in water temperature associated with climate change.	- Biomass of Dolly Varden - Habitat status of alien species - River water temperature	Survey of changes in ichthyofauna, biomass of Dolly Varden, and water temperature in the Iwaubetsu River and other rivers.	Ministry of Agriculture, Forestry and Fisheries	River construction AP					

Evaluation bodies: Marine Area WG
Note: Coordinate with River construction AP

Evaluation bodies: River construction AP

Evaluate the evaluation items based on the evaluation result of each monitoring item.

Evaluation items shall be evaluated based on the evaluation result of each monitoring item.

Comprehensive evaluation		Evaluation of the evaluation items		
Subjects eligible for the evaluation	Viewpoints of the evaluation	Evaluation items		Evaluation criteria
4 Management effects (Effects)	Are there any effects of the management based on the Management Plan for the Shiretoko World Natural Heritage Site?	**K**	No excessive impact on the ecosystem in the heritage area, caused by the high density of Sika deer, was observed.	Comparing vegetation diversity to its status in the early 1980s, sika deer diversity to the level set for each section, and the diversity of insect and terrestrial bird habitats to that at the time of heritage registration does not show a significant decline.
		L	Is the ecology and population of brown bears maintained while protecting residents' livelihoods and industries and ensuring safe and quality nature experiences?	Evaluate the survival and management implementation states of brown bears based on the criteria related to the goal of the Brown Beer Management Plan in the Shiretoko Peninsula.

Evaluation bodies: Sika deer WG

Evaluation bodies: Brown Bear WG

Evaluate the evaluation items based on the evaluation result of each monitoring item.

Evaluation items shall be evaluated based on the evaluation result of each monitoring item

Evaluation of the monitoring items

Monitoring items	Evaluation criteria	Evaluation indicators	Monitoring method	Evaluation bodies	Evaluation bodies (Responsible WG/AP)
6 Survey of vegetation change (forest vegetation and grassland vegetation) in sika deer population control area	- The state of before the early 1980s is restored.	- Density of young trees - Density of lower branch - Composition and vegetation height of community - Number of flowering plants - Signs of feeding / Feeding amount	Establish fixed survey areas and lines for forest and grassland vegetation and survey vegetation composition, vegetation coverage, signs of feeding, feeding amount, and flowering density of indicator species. Also, guess the recovery process from the survey in the enclosed area where deer are eliminated.	Ministry of the Environment Ministry of Agriculture, Forestry and Fisheries	Sika Deer WG
7 Survey of vegetation shift throughout the Shiretoko Peninsula (forest vegetation, coastal vegetation, and alpine vegetation)	<u>Forest vegetation:</u> - The state of the early 1980s is restored. <u>Coastal vegetation / Alpine vegetation</u>: - The state of the early 1980s is maintained or restored.	<u>Forest vegetation:</u> - Density of young trees - Density of lower branch - Composition and vegetation height of understory - Signs of feeding / Feeding amount <u>Coastal vegetation / Alpine vegetation:</u> - Composition and vegetation height of community - Signs of feeding / Feeding amount	Perform periodic vegetation surveys in fixed study areas set throughout the Shiretoko Peninsula.	Ministry of the Environment Ministry of Agriculture, Forestry and Fisheries	Sika Deer WG
9 Survey of sika deer status in their main wintering grounds (aerial counting survey and terrestrial counting survey)	- Aerial counting survey: To be less than 10/km^2 in Cape Shiretoko section, and less than 5/km^2 in Horobetsu-Iwaobetsu and Rusa-Aidomari section (not include Rusha section). - Terrestrial counting survey: To be less than the level at the time of the survey started in each survey site (1988 for the Horobetsu-Iwaobetsu section, 2009 for the Rusa-Aidomari section, 2007 for the Magoi section, and 2004 for the Minehama section).	- Aerial counting survey: Number of animals found during wintering season (density of animals found) - Terrestrial counting survey: Number of animals found per unit distance or index	Aerial counting survey: Once every five years, a helicopter flies low over the entire Shiretoko Peninsula to count the wintering Sika deer population and record their locations. It has been conducted yearly since 2014 in part of the Peninsula (throughout the heritage area). - Terrestrial counting survey: Light census in main wintering grounds, etc.	Ministry of the Environment	Sika Deer WG
15 Management status based on the Brown Beer Management Plan in the Shiretoko Peninsula	- Personal injury accidents caused by brown bears are not occurred. Evaluate the number of hazard cases related to users' problem behavior or fishery and damaged agricultural area in Shari Town based on the criteria associated with the goals of the Brown Beer Management Plan in the Shiretoko Peninsula.	- Number of cases of personal injury caused by brown bear - Number of hazardous incidents - The state of human's problem behavior and initiatives - Facility operation status (open/closed) - Agricultural and fishery damage caused by brown bears	Through questionnaires, reports, and brown bear countermeasure duties, etc., collect information on damage and dangerous cases caused by brown bears, human's problem behavior (e.g., improper garbage disposal, frequency of advice to the community), initiatives in the community (e.g., installation of electric fences, mowing), and the operation status (open/closed) of facilities (Shiretoko Goko Lakes Ground pathway, Furepe Waterfall pathway).	Ministry of the Environment	Brown Bear WS

Related monitoring

(The purpose is to collect basic information, not the evaluation)

Monitoring items	Indicator	Monitoring method	Evaluation bodies	Responsible WG/AP
10 Survey of terrestrial insect fauna	- Insect fauna (ground prowling, butterflies, bumblebees) - Confirmed population - Alien species (*Bombus terrestris*)	Conduct by pitfall trap, fixed-point observation, and line census methods. (Note: Perform about once every five years)	Ministry of the Environment	Sika Deer WG
11 Survey of terrestrial avifauna	- Avifauna - Confirmed population	Conduct by line census method or spot census method. (Note: Perform about once every five years)	Ministry of the Environment	Sika Deer WG
Tracking of the social environment through preparation of 2026 annual reports and so on	- Population - Nu mber of workers by industry	Compilation of various statistics on demographics, industrial activity, etc.	Ministry of the Environment	Science Committee (reported to the Secretariat)

5. Evaluation method

5.1 How to evaluate the monitoring items

(1) Evaluation policy

- Evaluation shall be conducted using monitoring data, etc., obtained during the evaluation period, based on the evaluation criteria and indicators set for each monitoring item.
- Evaluation shall be conducted by the lower Working Groups and Advisor Panel (WG/AP) of the Shiretoko World Natural Heritage Site Scientific Council, which are evaluation bodies set for each item.
- If multiple evaluation criteria are set for one monitoring item, WG/AP shall determine whether to compile the evaluation results by evaluation criteria or to compile integrally the evaluation results based on the evaluation results of each evaluation criteria.
- Monitoring items intended to collect basic information shall be "related monitoring" and not subject to the evaluation.

(2) Evaluation method

1) Items to be evaluated for conformity with the evaluation criteria

- Monitoring items linked to evaluation items A–C and F–L shall be evaluated from the conformity with the evaluation criteria and the trends in evaluation indicators during the evaluation period based on (1) to (4) below.

[1] Conformity with the evaluation criteria

- For each evaluation indicator set in each monitoring item, conformity with the evaluation criteria shall be determined as "conformed," "not conformed," or "No judgment," and indicated with marks as shown in Table 4.

Table 4: How to express the evaluation results for the conformity to the evaluation criteria

Conformed	Not conformed	No judgment
		

[2] Trends in the evaluation indicators during the evaluation period

- The time when conformity to the evaluation criteria is determined shall be used as the criterion (Note). The trends of the evaluation indicators set for each monitoring item during the evaluation period shall be evaluated as "Restored/Improved," "Maintaining the status quo," "Got worse," or "Lack of information," and expressed as shown in Table 5.

(Note) For example, if the evaluation criterion for a monitoring item is "The site maintains approximately the same state at the time of World Natural Heritage registration (2005)," the trends in the evaluation indicators during the evaluation period shall be evaluated based on the states in 2005 (Figure 1).

Table 5 How to express the evaluation results for the trends in evaluation indicators during the evaluation period

Restored/improved	Maintaining the status quo	Got worse	Lack of information
			

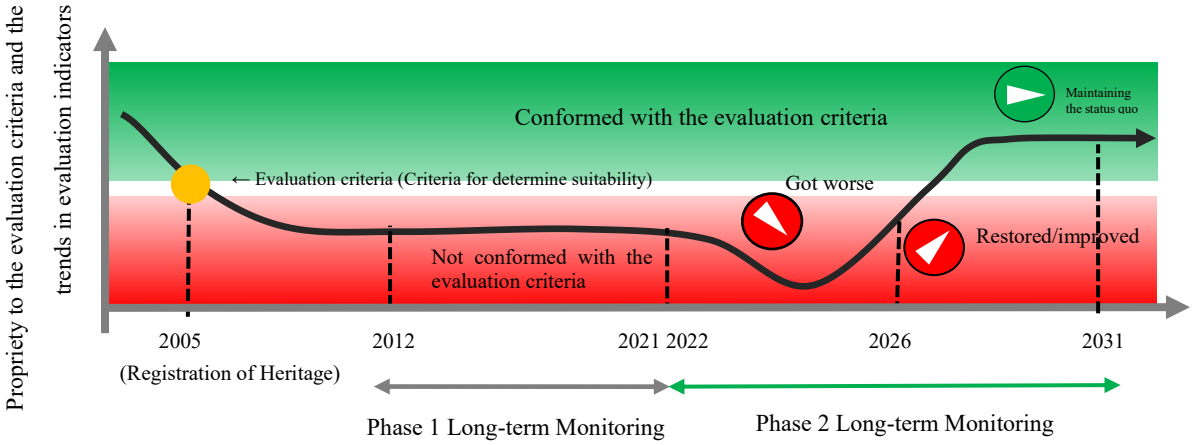

Figure 1. Conceptual diagram for the trends in the evaluation indicators

[3] Combination of the evaluation results

- Table 6 shows the combination of the evaluation results of [1] and [2].

Table 6 Combination of the evaluation results

Conformity to the evaluation criteria / Trends in the evaluation indicators	**Conformed**	**Not conformed**	**No judgment**
Restored/improved			-
Maintaining the status quo			-
Got worse			-
Lack of information			

[4] Determination of the evaluation results

- Based on the evaluation results in [1] to [3] above, judgments are made for each monitoring item on a three-step scale (Good / Caution / Need improvement), as shown in Table 7.
- Monitoring items whose conformity cannot be determined due to the lack of information shall not be judged.

Table 7 Judgment of the evaluation results

Evaluation results						
Judgement	**Good**		**Caution**		**Need improvement**	

2) Items to evaluate for changes or impacts

- Monitoring items linked to evaluation items D and E shall be evaluated for changes or impacts.
- The evaluation results shall be judged on a two-step scale: Changes or impacts or signs of them are “Seen / Not seen.”

Table 8 Judgment of the evaluation results

Evaluation results	(Changes or impact) or (signs of change or impact) is “**Seen** / **Not seen**”

(3) Compilation of the evaluation results of monitoring items

- The evaluation results of the monitoring items shall be compiled using the "Monitoring items: Evaluation Sheet" (Forms 1 and 2).”
- The results of the related monitoring shall be compiled using the “Related monitoring items: Arrangement sheet” (Form 3).

[Form 1] Monitoring items: Evaluation sheet (Example of entry)

* Examples of items to be evaluated for the conformity to the evaluation criteria

<table>
<tr><td>Monitoring items</td><td colspan="5">No. 3 Survey of biota in shore region</td></tr>
<tr><td>Evaluation bodies</td><td colspan="5">Ministry of the Environment</td></tr>
<tr><td>Evaluation bodies: (WG/AP)</td><td colspan="5">Marine Area WG</td></tr>
<tr><td>Monitoring period</td><td colspan="5">MM/20YY to MM/20YY</td></tr>
<tr><td>Monitoring method</td><td colspan="5">At six survey sites set along the Shiretoko Peninsula coastal line, comprehend the Biota (fish, seaweed, invertebrates), targeting from the intertidal to the infralittoral zone of shore reefs.</td></tr>
<tr><td>Month and year of the evaluation</td><td colspan="5">MM/20YY</td></tr>
<tr><td>Evaluation criteria</td><td colspan="5">◆ Evaluation item A
- The population's density at the registration time is roughly maintained.
◆ Evaluation item C
- The diversity at the time of registration is roughly maintained.</td></tr>
<tr><td>Evaluation indicators</td><td colspan="5">◆ Evaluation item A
- Biota (fish, seaweed, invertebrates)
- Population density
◆ Evaluation item C
- Biota (fish, seaweed, invertebrates)
- Distribution</td></tr>
<tr><td>Evaluation period</td><td colspan="5">MM/20YY to MM/20YY</td></tr>
<tr><td rowspan="3">Evaluation results (Evaluation item A)</td><td>Conformity to the evaluation criteria</td><td>■ Conformed</td><td>□ Not conformed</td><td colspan="2">□ No judgment</td></tr>
<tr><td>Trends in the evaluation indicators</td><td>□ Restored/improved</td><td>■ Maintaining the status quo</td><td>□ Got worse</td><td>□ Lack of information</td></tr>
<tr><td>Judgement</td><td>■ Good</td><td>□ Caution</td><td colspan="2">□ Need improvement</td></tr>
<tr><td rowspan="3">Evaluation results (Evaluation item C)</td><td>Conformity to the evaluation criteria</td><td>■ Conformed</td><td>□ Not conformed</td><td colspan="2">□ No judgment</td></tr>
<tr><td>Trends in the evaluation indicators</td><td>□ Restored/improved</td><td>■ Maintaining the status quo</td><td>□ Got worse</td><td>□ Lack of information</td></tr>
<tr><td>Judgement</td><td>■ Good</td><td>□ Caution</td><td colspan="2">□ Need improvement</td></tr>
<tr><td>Reasons for the evaluation</td><td colspan="5">- The monitoring results shows that the current status of ichthyofauna is ○○. In the latest survey results, ○○ and other species were also confirmed. After a close examination of the breakdown of confirmed species, no major changes over time have been observed.
~
- Given the above, none of the Biota (fish, seaweed, invertebrates) surveyed showed significant changes from heritage registration, and stable populations were maintained.</td></tr>
<tr><td>Remarks (Matters requiring attention, concerns, and other opinions, etc.)</td><td colspan="5">- Confirmed species that are difficult to collect should be kept in mind during future surveys.
- The trend of the alien species ○○, which was identified at the latest survey shall be closely monitored.</td></tr>
</table>

[Form 2] Monitoring items: Evaluation sheet (Example of entry)

* Examples of items to evaluate for changes or impacts

Monitoring items	No. 28	Meteorological observation in typical vegetation area	
Evaluation bodies	Ministry of the Environment		
Evaluation bodies: (WG/AP)	Sika Deer WG		
Monitoring period	MM/20YY to MM/20YY		
Monitoring method	Using the loggers installed at the major vegetation monitoring sections (8 points), observe the ground temperature and ground surface temperature continuously.		
Month and year of the evaluation	MM/20YY		
Evaluation criteria	◆ Evaluation item D - Does it deviate from the long-term variability range?		
Evaluation indicators	◆ Evaluation item D - Ground temperature - Land surface temperature		
Evaluation period	MM/20YY to MM/20YY		
Evaluation results (Evaluation item D)	Changes or signs of changes due to climate change	□ Seen	■ Not seen
Reasons for the evaluation	- This monitoring began in 2022, and now, XX years later, no significant interannual changes in ground or surface temperatures have been observed at any of the sites, and it does not deviate from the long-term variability range. ~ - Given the above; we can say that changes or signs of changes due to climate change are currently not seen.		
Remarks (Matters requiring attention, concerns, and other opinions, etc.)	- Among the monitored sites, only the surface temperature data of the No. X point at an elevation of about 1500 m in the alpine zone suggested that the spring snowmelt season in XX year was Y days earlier than usual. Thus, we will keep a close eye on the future trend.		

[Form 3] Related monitoring items: Arrangement sheet (Example of entry)

Monitoring items	No. [1]	Observing sea ice distribution status by aircraft, artificial satellites, etc.
Evaluation bodies	First Regional Coast Guard Headquarters	
Responsible (WG/AP)	Marine Area WG	
Monitoring period	MM/20YY to MM/20YY	
Monitoring method	Survey of distribution sea ice	
Indicator	◆ Evaluation item A, D, I - Distribution state of sea ice	
Summary of the monitoring results	- The sea ice area in the Sea of Okhotsk has been declining in the long-term perspective. - However, since 2012, the area has remained roughly the same, although it was minimal in 2015. This trend continued in the 2019-2020 winter season. - Focusing on the coast of Hokkaido and the southern part of the Sea Okhotsk and looking at the number of days when drift ice is visually observed, and the maximum sea ice area observed by satellite, drift ice reached the Shiretoko Peninsula in all years, despite repeatedly increasing and decreasing the amount. In some years, such as 2015, the visually observed days and the sea ice area were tiny; however, the sea ice area in the southern part of the Sea of Okhotsk has not shown a remarkable decline.	
Remarks (Matters requiring attention, concerns, and other opinions, etc.)	- Sea ice area data in the southern part of the Sea of Okhotsk are critical for Survey of sea ice conditions in the Shiretoko Sea. From the monitoring data so far, it is clear that to evaluate the sea ice conditions in the Sea of Okhotsk, it is necessary to monitor sea ice changes at three different scales carefully: the entire Sea of Okhotsk, the southern part of the Sea of Okhotsk, and the Hokkaido coast. - Among them, the monitoring in the southern part of the Sea of Okhotsk has required expertise in satellite data analysis. Therefore, the monitoring must rely on the benevolence of experts, and it is uncertain whether it can be continued in the future. Since this is a critical monitoring item, we will consider simple methods and cooperation with research institutions.	

5.2 Evaluation methods for evaluation items

(1) Evaluation policy

- Evaluation shall be made based on the criteria set for each evaluation item A–L (12 items in total), overlooking the evaluation result linked to each monitoring item.
- The evaluation shall be made by WG/AP, which is the evaluation entity set for each item.
- When monitoring items for which multiple WGs/APs are evaluation bodies are included, the evaluation shall be made in cooperation by sharing information.

(2) Evaluation method

- Evaluation shall be conducted following the aforementioned "5.1 How to evaluate the monitoring items."
- Evaluation items A–C and F–L shall be judged on a three-step scale (Good / Caution / Need improvement), overlooking the evaluation and judgment results linked to each monitoring item and examining the conformity with the evaluation criteria and the trends.
- Evaluation items D and E shall be judged on a three-step scale (Seen / Seen in some indicators / Not Seen), overlooking the judgment results linked to each monitoring item.

(3) Compilation of the evaluation results of monitoring items

- The evaluation results of the evaluation items shall be compiled using the "Evaluation items: Evaluation sheet" (Forms 4 and 5).

[Form 4] Evaluation items: Evaluation Sheet (Example of entry)

* Examples of items to be evaluated for the conformity to the evaluation criteria

<table>
<tr><td>Evaluation items</td><td colspan="5">A　Is the productivity of the ecosystem at the time of heritage registration maintained? (Criteria (ix) Ecosystem)</td></tr>
<tr><td>Evaluation bodies: (WG/AP)</td><td colspan="5">Marine Area WG</td></tr>
<tr><td>Month and year of the evaluation</td><td colspan="5">MM/20YY</td></tr>
<tr><td>Evaluation period</td><td colspan="5">MM/20YY to MM/20YY</td></tr>
<tr><td>Evaluation criteria</td><td colspan="5">Compare the distribution of sea ice, which provides a growth environment for phytoplankton that supports the richness and diversity of the marine ecosystem, and the state of the biota, such as fish that feed on plankton and the aquatic animals that prey on them, with the state at the time of the heritage registration.</td></tr>
<tr><td rowspan="3">Evaluation results</td><td>Conformity to the evaluation criteria</td><td>■ Conformed</td><td>□ Not conformed</td><td colspan="2">□ No judgment</td></tr>
<tr><td>Trends</td><td>□ Restored/ improved</td><td>■ Maintaining the status quo</td><td>□ Got worse</td><td>□ Lack of information</td></tr>
<tr><td>Judgement</td><td>■ Good</td><td>□ Caution</td><td colspan="2">□ Need improvement</td></tr>
<tr><td>Reasons for the evaluation</td><td colspan="5">- For the distribution of sea ice, a long-term decreasing trend in quality and quantity compared to the state at the time of heritage registration was reported. In addition, ○○ survey identified a decline in the abundance of some species, which was determined to be “Need improvement.”
- On the other hand, no appreciable changes are found in the habitat status of seals and Steller sea lions. The marine biota, such as the resource states of walleye pollock and the habitat status of shellfish in shore region, have been maintained at the time of heritage registration.
- Among the related monitoring, the status of fixed-point observation of water temperature using ocean observation buoys also indicates ○○.
～
- Given the above, this evaluation item is judged as, "Conformed" with the evaluation criteria and determined as "maintaining the status quo" concerning the ecosystem's productivity at the time of heritage registration. In addition, the judgment result is concluded as “Good,” taking into account that the evaluation results of each monitoring are ○○ and ○○.</td></tr>
<tr><td rowspan="5">Evaluation results of monitoring items used in the evaluation</td><td>No.</td><td>Monitoring items</td><td>Evaluation indicators</td><td>Evaluation results</td><td>Judgement</td></tr>
<tr><td>2</td><td>Survey of habitat status of seals and Steller sea lions</td><td>- Number of animals using the feeding area around Lake Saroma and Lake Notori, and the breeding population off Abashiri</td><td></td><td>Good</td></tr>
<tr><td>3</td><td>Survey of biota in shore region</td><td>- Biota (fish, seaweed, invertebrates)
- Population density</td><td></td><td>Good</td></tr>
<tr><td>…</td><td>○○○○</td><td>…</td><td></td><td>Caution</td></tr>
<tr><td>…</td><td>○○○○</td><td>…</td><td></td><td>Need improvement</td></tr>
<tr><td rowspan="4">Implementation status of related monitoring items

●: Implemented as planned
▲: Partially implemented
×: Not implemented</td><td>No.</td><td>Monitoring items</td><td>Evaluation indicators</td><td>Implementation status</td><td>—</td></tr>
<tr><td>1</td><td>Fixed-point observation of water temperature using ocean observation buoys</td><td>- Water temperature</td><td>●</td><td>—</td></tr>
<tr><td>[1]</td><td>Observing sea ice distribution status by aircraft, artificial satellites, etc.</td><td>- Distribution state of sea ice</td><td>●</td><td>—</td></tr>
<tr><td>…</td><td>○○○○</td><td></td><td>●</td><td>—</td></tr>
<tr><td>Remarks (Matters requiring attention, concerns, and other opinions, etc.)</td><td colspan="5">- It has been confirmed that alien species presumed to have invaded after 2009 have taken root, and their dynamics and impact on other species should be closely monitored.</td></tr>
</table>

[Form 5] Evaluation items — Evaluation sheet (Example of entry)

* Examples of items to evaluate for changes or impacts

<table>
<tr><td>Evaluation items</td><td colspan="4">D　Are there any signs of climate change in the heritage site?</td></tr>
<tr><td>Evaluation bodies:
(WG/AP)</td><td colspan="4">Sika Deer WG (Coordinate with Marine Area WG and River Construction AP)</td></tr>
<tr><td>Month and year of the evaluation</td><td colspan="4">MM/20YY</td></tr>
<tr><td>Evaluation period</td><td colspan="4">MM/20YY to MM/20YY</td></tr>
<tr><td>Evaluation criteria</td><td colspan="4">Evaluate whether there are signs of climate change in the changes or trends in climate data.</td></tr>
<tr><td>Evaluation results</td><td>Changes or signs of changes due to climate change</td><td>□ Seen</td><td>■ Seen in some of the evaluatement indicators</td><td>□ Not seen</td></tr>
<tr><td>Reasons for the evaluation</td><td colspan="4">- Although annual fluctuations in sea and river temperatures are measured by ocean observation buoys; it does not deviate significantly from the long-term variability range.
- However, statistical analysis of the number of days with a daily maximum temperature of 25°C or higher from the observation data of Japan Meteorological Agency taken in Utoro and Rausu (1978–2021) shows an upward trend in water temperatures. The record taken at Abashiri (1945–2021) shows that the first observation day and last observation days of drift ice tend to be delayed and advanced, respectively. (According to the results of sea ice distribution observation from aircraft, etc., the amount of floating ice has decreased over the long term. However, looking at the records since 2012, it has remained mostly flat, although it reached a minimum in 2015.)
～
- In view of the above, changes or signs of changes due to climate change are currently “Seen in some indicators.”</td></tr>
<tr><td>Evaluation results of monitoring items used in the evaluation</td><td>No.</td><td>Monitoring items</td><td>Evaluation indicators</td><td>Evaluation results (Changes or signs of changes due to climate change)</td></tr>
<tr><td></td><td>1</td><td>Fixed-point observation of water temperature using ocean observation buoys</td><td>- Sea water temperature</td><td>Not seen</td></tr>
<tr><td></td><td>18</td><td>Habitat status of freshwater fish, especially Dolly Varden, which characterizes the freshwater ichthyofauna in Shiretoko</td><td>- River water temperature</td><td>Not seen</td></tr>
<tr><td></td><td>27</td><td>Survey of observed weather conditions</td><td>- Temperature
- Precipitation
- Final snow melting day
- Sea surface temperature
- Sea ice duration (Abashiri)</td><td>Seen</td></tr>
<tr><td></td><td>28</td><td>Meteorological observation in typical vegetation area</td><td>- Ground temperature
- Land surface temperature</td><td>Not seen</td></tr>
<tr><td></td><td>[1]</td><td>Observing sea ice distribution status by aircraft, artificial satellites, etc.</td><td>- Distribution state of sea ice</td><td>Not seen</td></tr>
<tr><td>Remarks
(Matters requiring attention, concerns, and other opinions, etc.)</td><td colspan="4">- We just started meteorological observation in typical vegetation areas in 2022 and will continue to monitor long-term changes closely.</td></tr>
</table>

5.3 Method of the comprehensive evaluation

(1) Evaluation policy

- The comprehensive evaluation shall be conducted, overlooking the evaluation result linked to each evaluation item (A–L) based on the perspectives defined for the four subjects eligible for evaluation.
- The results of each evaluation shall be summarized and compiled to show the current status of the Shiretoko World Natural Heritage evaluation.
- Evaluation is carried out by the Shiretoko World Natural Heritage Site Scientific Council.

Table 9 Subjects eligible for the comprehensive evaluation and the perspectives of the evaluation

Subjects eligible for the evaluation	Viewpoints of the evaluation
1 State of conservation (States)	Are the ecosystems and biodiversity of Shiretoko maintained, which is the criteria for registration as a World Natural Heritage site?
2 Environmental pressure / Tourism pressure (State / Trends)	Are there any environmental or tourism pressures that impact the value of Shiretoko as a World Natural Heritage site?
3 Management results (Results)	Is the Site managed following the Management Plan for the Shiretoko World Natural Heritage Site?
4 Management effects (Effects)	Are there any effects of the management based on the Management Plan for the Shiretoko World Natural Heritage Site?

(2) Evaluation method

- The comprehensive evaluation shall be conducted, overlooking the evaluation result linked to each evaluation item (A–L) based on the perspectives defined for the four subjects eligible for evaluation.
- Then, based on the results of each evaluation, the current status of the Shiretoko World Natural Heritage site shall be compiled comprehensively.

(3) Compilation of the comprehensive evaluation

- The results of comprehensive evaluation shall be compiled using the "Comprehensive evaluation: Evaluation Sheet" (Form 6).

[Form 6] Comprehensive evaluation: Evaluation Sheet (Example of entry)

Subjects eligible for the evaluation		1 State of conservation (Condition)			
Viewpoints of the evaluation		Are the ecosystems and biodiversity of Shiretoko maintained, which is the criteria for registration as a World Natural Heritage site?			
Evaluation bodies		Science Committee			
Month and year of the evaluation		MM/20YY			
Evaluation period		MM/20YY to MM/20YY			
Comprehensive evaluation		- In the Shiretoko ecosystem, marine mammals and marine biota maintained their status at the time of heritage registration. In addition, due to the improvement of river construction, salmonid species migration upstream and downstream has been promoted, and the interrelationship between the marine and terrestrial ecosystems has been improved. - On the other hand, some seabirds have declined in numbers, and the impact on biodiversity due to a decrease in the number of plants present in some areas as a result of foraging by sika deer, but no significant effect has been observed compared to the time when the site was registered as a heritage site. - As for XX, YY has been maintained. ~ - Given the above, the ecosystem and biodiversity of Shiretoko are currently well maintained. However, some issues need to be monitored regarding the results of some monitoring surveys.			
Evaluation results (Evaluation item A)		Conformity to the evaluation criteria	■ Conformed	□ Not conformed	□ No judgment
		Trends	□ Restored/ improved	■ Maintaining the status quo	□ Got worse / □ Lack of information
		Judgement	■ Good	□ Caution	□ Need improvement
Evaluation results (Evaluation item B)		Conformity to the evaluation criteria	■ Conformed	□ Not conformed	□ No judgment
		Trends	□ Restored/ improved	■ Maintaining the status quo	□ Got worse / □ Lack of information
		Judgement	■ Good	□ Caution	□ Need improvement
Evaluation results (Evaluation item C)		Conformity to the evaluation criteria	■ Conformed	□ Not conformed	□ No judgment
		Trends	□ Restored/ improved	■ Maintaining the status quo	□ Got worse / □ Lack of information
		Judgement	■ Good	□ Caution	□ Need improvement
Remarks (Matters requiring attention, concerns, and other opinions, etc.)		- ○○○○○○			

Evaluation Sheet shall be prepared for subjects eligible for the evaluation 1 to 4.

Summary	- X years have passed since the heritage registration. According to the comprehensive evaluation results compiled based on the monitoring results, we can conclude that outstanding universal value has been generally well maintained since the interrelationship between sea and land ecosystems affected by seasonal sea ice has also been maintained, and the site has been an essential area for biodiversity conservation, with a wide range of species inhabiting and growing there, including many rare and endemic species. - On the other hand, ○○ and ○○ are observed as issues, thus we need to promote initiatives for ○○ and ○○. - Therefore, proper heritage management shall be conducted with due care of ○○ and ○○ in the future.