

Long-Term Monitoring Plan for the Shiretoko World Natural Heritage Site
(JFY2012-2021)
Comprehensive Evaluation Report

March 2022

Shiretoko Natural World Heritage Site Scientific Council

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Introduction

Shiretoko was inscribed as a World Natural Heritage site in 2005 in recognition of its possession of an ecosystem and biodiversity having globally outstanding universal value. The Management Plan for the Shiretoko Natural World Heritage Site was formulated in 2009 with the aim of passing on this value to future generations. Noting that Shiretoko is one of the few areas of Japan where a pristine natural environment remains intact, it sets forth the following as necessary perspectives for managing it: (a) Collaboration and cooperation with the local communities, (b) Adaptive management, (c) Comprehensive management of the terrestrial and marine areas, (d) Management by area classification, (e) Coexistence with primary industries, (f) Recreational use and conservation of the natural environment, (g) Management from a broad perspective. With an eye to promoting adaptive management based on scientific knowledge, the “Long-Term Monitoring Plan for the Shiretoko World Natural Heritage Site” (February 2012; hereinafter the “Long-Term Monitoring Plan”) was formulated through studies by the Shiretoko Natural World Heritage Site Scientific Council (hereinafter the “Scientific Council”). Since then, the monitoring and evaluation of monitoring necessary for appropriate conservation and management of the area have been conducted continually with the cooperation and collaboration of concerned parties.

The Long-Term Monitoring Plan will come to an end in JFY2021. In view of this, this report summarizes the current status of Shiretoko’s value as a World Natural Heritage site after the passage of approximately 15 years after its inscription. It is based on a comprehensive assessment using data obtained over the 10 years from JFY2012 to JFY2021 (with some data covering longer periods), discussions by the Scientific Council, and views and opinions obtained from local stakeholders.

1. About the Long-Term Monitoring Plan

The long-term monitoring plan establishes eight evaluation items that are based on three perspectives for the effective and efficient adaptive management of the Shiretoko World Natural Heritage Site.

List of evaluation items

(1) Are the ecosystems and biodiversity of Shiretoko, which are criteria for its inscription as a World Natural Heritage site, being maintained?	
I	The productivity of a unique ecosystem is being maintained.
II	The interaction between marine and terrestrial ecosystems is being maintained.
III	Biodiversity is being maintained at the same level as when the site was inscribed on the World Heritage List.
(2) Are the recommendations based on the field survey (February 2008) by the UNESCO World Heritage Center and International Union for Conservation of Nature (IUCN) being addressed?	
IV	Conservation of marine ecosystems within the heritage site is being balanced with stable fishing through sustainable use of fisheries resources.
V	Impact of river constructions has been lessened so as to maintain river ecosystems that can support salmonid species reproduction.
VI	Excessive influence of high sika deer (<i>Cervus nippon yezoensis</i>) population density on the ecosystem of the heritage site is not occurring.
(3) Is the management outlined in the Management Plan for the Shiretoko World Natural Heritage Site (formulated in December 2009) being provided?	
VII	Recreational utilization of the site and other human activities are being balanced with conservation of the natural environment.
VIII	Impacts, or potential impacts of climate change are being tracked early.

Monitoring is required to evaluate each of these evaluation items. Within the Shiretoko World Natural Heritage Site, the ecosystem and other important aspects are continuously monitored by concerned administrative agencies, local governments, related organizations, experts, and others. Their efforts were included in the establishment of a total of 37 monitoring items suitable for evaluation. Evaluation of each item then proceeded.

2. Evaluation Method


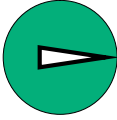
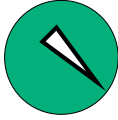

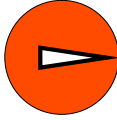
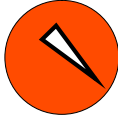
The overall evaluations were conducted based on numerical values. This was done to make the expressions as clear and simple as possible, as the aim was to disseminate information not only to Heritage managers but also to the general public, including local residents of Shiretoko.

The numerical evaluation (score) for each of the eight evaluation items was discussed by the Working Group (WP) or Advisory Panel (AP) in charge as follows. (The WGs and Aps are subordinate bodies of the Scientific Council.)

[Evaluation procedure]

- (1) Each WG/AP evaluates each monitoring item that has clear evaluation criteria on a 5-point scale. In doing so, the WG/AP takes into account the "status" (i.e., whether the item meets the desired criteria) and "trend" (i.e., improvement or deterioration during the evaluation period) of the item being monitored.

[Conceptual diagram of the evaluation of an individual monitoring item]

Evaluation result for the individual monitoring item						
	Satisfies Improvement	Satisfies Maintained	Satisfies Deterioration	Does not satisfy Improvement	Does not satisfy Maintained	Does not satisfy Deterioration
Status of evaluation indicators	No problems exist (Requires attention)		No indication of a major problem (Requires attention)		Problematic situation (Requires study of measures to improve the situation)	
Guide to numerical evaluation	5		4	3	2	1
	*Determined with consideration for degree of status/trend, etc.					

- (2) The evaluation items are also evaluated on a 5-point scale by calculating the average value of the results of the evaluation of each monitoring item that corresponds to the 8 evaluation items. Evaluation content and issues that cannot be expressed as evaluation values are also compiled into an evaluation sheet.

- (3) The Scientific Council summarizes the above-mentioned results and makes a comprehensive evaluation of the current status of Shiretoko's value as a World Natural Heritage site.

3. Comprehensive Evaluation Results

With the evaluation results for the eight evaluation items serving as the basis, a summarized overall evaluation was prepared by taking into account the three perspectives for the effective and efficient adaptive management of the Shiretoko World Natural Heritage Site.

(1) Are the ecosystems and biodiversity of Shiretoko, which are criteria for its inscription as a World Natural Heritage site, being maintained?

Evaluation Item I: Maintenance of ecosystem productivity

1) Score: 4.0 out of 5.0

2) Evaluation summary

- The status of marine biota—which includes the seal population, the stock of walleye pollock, and the shellfish population in shallow waters—is maintained as it was at the time of inscription.
- Decreases in seasonal sea ice, increases in air and sea temperatures, and other effects of climate change are generating greater concern, and therefore further enhancement of marine environmental monitoring is required.

Evaluation Item II: Maintenance of sea-land interaction

1) Score: 4.3 out of 5.0

2) Evaluation summary

- The interrelationship between the marine and terrestrial ecosystems is being maintained, as the biota of sea areas is largely maintained, the improvement of river constructions is progressing, and the upstream and downstream migration of salmonids is being facilitated.
- The populations of some seabirds (cormorants and gulls) that supply nutrients from the sea to the land have decreased by half since inscription. The factors behind this must be identified.

Evaluation Item III: Maintenance of biodiversity

1) Score: 3.3 out of 5.0

2) Evaluation summary

- The marine and terrestrial biota is largely being maintained at the level it was at the time of inscription for the Heritage site as a whole, and no major problems are observed.
- The decline of some seabirds and freshwater fishes and the distribution of alien species must continue to be closely monitored in the future.

Comprehensive evaluation

Although some issues related to monitoring and items demanding attention exist, the ecosystem and biodiversity of Shiretoko are being well maintained at the present time.

(2) Are the recommendations based on the field survey (February 2008) by the UNESCO World Heritage Center and International Union for Conservation of Nature (IUCN) being addressed?

Evaluation Item IV: Balanced conservation of marine ecosystems and fishing

1) Score: 3.3 out of 5.0

2) Evaluation summary

- The conservation of the marine ecosystem and stable fishing through the sustainable use of fishery resources are continuing.
- Catches of salmonids and Japanese common squid are declining, and changes in the walleye pollock stock and other major fishery resources must be closely monitored. The sharing of information between Japan and Russia will also be important in understanding the status of fish catches.

Evaluation Item V: Maintenance of river ecosystems

1) Score: 2.5 out of 5.0

2) Evaluation summary

- Improvements to river constructions are progressing and reducing obstacles to upstream migration, and thus facilitating the upstream and downstream migration of salmonids.
- The population density of Dolly Varden, which are representative of the freshwater ichthyofauna of Shiretoko, is showing an increasing trend in some rivers, but the overall trend is decreasing. However, the factors behind this trend are not clear.

*The score for this item was calculated as an average value using only the results of these two evaluations. Thus, it must be noted that the score is lower than those of other assessment items.

Evaluation Item VI: Prevention of excessive influence of sika deer

1) Score: 3.2 out of 5.0

2) Evaluation summary

- In the Cape Shiretoko area, where the sika deer population adjustment is ongoing, some herbaceous plants are recovering and the number of flowering species is also increasing.
- There are no major changes in the vegetation composition when the Shiretoko Peninsula is viewed as a whole. However, forest vegetation and some coastal vegetation continue to be affected by feeding pressure from sika deer. Continuing to maintain low densities of sika deer over the long term through population adjustments will be a challenge going forward.

Comprehensive evaluation

Management measures in response to the recommendations have made progress and are gradually showing effects. However, measures must continue to reach the target levels.

(3) Is the management outlined in the Management Plan for the Shiretoko World Natural Heritage Site (formulated in December 2009) being provided?

Evaluation Item VII: Balanced recreational use, etc., and environmental conservation

1) Score: 3.3 out of 5.0

2) Evaluation summary

- Management and measures are being carried out to realize appropriate use and ecotourism. They include a system based on the Shiretoko Ecotourism Strategy* by which proposals for appropriate use are received from the community. In addition, the majority of local organizations involved in tourism and use of the site honor the strategy's policies, and tourism that takes conservation of the natural environment into account is being practiced.

*The strategy sets the basic policy for tourism in Shiretoko. It was established through cooperation, collaboration, and agreement among all parties concerned with the Shiretoko World Natural Heritage Site, (formulated in March 2013).

- Problems attributable to brown bears, such as dangerous incidents affecting tourists and damage to agriculture, are occurring, and improvements are required. It is important to continue to achieve a balance between conservation of natural ecosystems and the stability of local industries (e.g., tourism and the promotion of agriculture, forestry, and fishery).

Evaluation Item VIII: Tracking of climate change

1) Score: 2.6 out of 5.0

2) Evaluation summary

- The current monitoring system has not yet reached the stage where it can adequately assess the impacts of climate change.
- It is important to understand the impacts of climate change on natural ecosystems and local communities, and to take action to address them.
- Above all, there is insufficient monitoring of oceanographic and meteorological data and of data for grasping biological responses brought by climate change. This makes it necessary to review and improve the monitoring implementation system while also considering the formulation of future adaptation plans.

Comprehensive evaluation

Although no major problems are observed at the present time, more attention and measures are needed, especially with regard to climate change.

4. Views and Opinions from the Community

It is very important that the findings of this report, which summarizes the current status of Shiretoko's value as a World Natural Heritage site, be shared not only with administrative agencies, related organizations, and experts, but also with local residents living in and around the Heritage site, and thereby build renewed awareness of area's value and current status as a World Natural Heritage site.

For this reason, a draft of the report was presented to the "Shiretoko World Natural Heritage Site Regional Liaison Committee," which is composed of concerned ministries and agencies, local governments, and local organizations. The following views and comments were received as a result.

Views and opinions expressed by the Shiretoko World Natural Heritage Site Regional Liaison Council

- The magnificence and rarity of the Shiretoko Peninsula's ecosystem, which is worthy of being designated a World Natural Heritage site, come through in the overall evaluation.
- With respect to the World Natural Heritage Site's sea area, the report should also address the issue of how to deal with coastal debris, which has long been a problem in the site.
- With respect to vegetation, which is a key component of the terrestrial ecosystem, the report should pay attention not only to the influence of sika deer but also to the impacts caused by alien species.

*Opinions expressed at the "First Shiretoko World Natural Heritage Site Regional Liaison Committee Meeting of 2021" held on November 10, 2021.

5. Overall Summary

Maintaining value is required with respect to the following criteria, which were evaluated by the World Heritage Committee when Shiretoko was inscribed as a World Natural Heritage site.

Criterion ix (ecosystem)

- Shiretoko provides an outstanding example of the interaction of marine and terrestrial ecosystems as well as extraordinary ecosystem productivity, largely influenced by the formation of seasonal sea ice at the lowest latitude in the northern hemisphere.

Criterion x (biodiversity)

- Shiretoko has particular importance for a number of marine and terrestrial species. These include a number of endangered and endemic species, such as the Blakiston's fish-owl and the plant species *Viola kitamiana*.
- The site is globally important for a number of salmonid species and for a number of marine mammals, including Steller sea lions (*Eumetopias jubatus*) and a number of cetacean species.
- The site has significance as a habitat for globally threatened sea birds and is a globally important area for migratory birds.

For this reason, long-term monitoring is being conducted to promote adaptive management of the World Natural Heritage Site based on the Management Plan for the Shiretoko Natural World Heritage Site. According to the comprehensive assessment that was compiled for this report, the interaction of marine and terrestrial ecosystems that is influenced by seasonal sea ice continues to be maintained today. Moreover, Shiretoko continues to be an important area for biodiversity conservation, where a wide range of species, including many rare and endemic species, live and develop. From these findings, it can be concluded that the site's outstanding universal value is being well maintained overall following after its inscription as a World Natural Heritage site.

In addition, amid efforts to advance management measures in response to recommendations received based on the field survey by UNESCO and IUCN (February 2008), it can be judged that marine ecosystem conservation and stable fishing through the sustainable use of fishery resources remain in balance. Furthermore, effects in terms of facilitated upstream and downstream migration of salmonids from the improvement of river constructions and the restoration of some herbaceous plants due to sika deer population adjustments are being observed.

On the other hand, some situations that demand attention have been identified from monitoring results. For example, the populations of some seabirds and the Dolly Varden, which is representative of Shiretoko's ichthyofauna, have been decreasing. Salmonid catches are falling while warm-water yellowtail and other species are increasing. There

are also more conflicts between brown bears and humans, and sharp increases in the number of sika deer have been confirmed in some areas. These circumstances will require continued close monitoring. Other challenges include improving the system for monitoring the effects of global-scale climate change, and developing an adaptation strategy from the standpoint of conserving and managing the totality of Shiretoko's value as a World Natural Heritage site.

Efforts focused on tourism and recreational utilization of the World Natural Heritage Site are underway based on the Shiretoko Ecotourism Strategy. Management efforts undertaken by various stakeholders to promote appropriate use and ecotourism are mitigating the impact of human activity. Nonetheless, tourism that makes use of wildlife must be watched closely.

It is therefore important to continue engaging in appropriate management and to maintain Shiretoko's value as a World Natural Heritage Site into the future.

It is worth noting that the following issues and opinions regarding future monitoring and management measures for the Shiretoko World Natural Heritage Site were raised by the Working Groups and Advisory Panels in the process of conducting the comprehensive evaluation. The promotion of scientific knowledge-based adaptive management of the World Natural Heritage Site must be continued by reflecting these points in the Long-term Monitoring Plan (Phase 2) (beginning in JFY2022).

(1) Issues relating to the long-term monitoring

- A comprehensive evaluation methodology must be established. Among other points, it should cover the handling of monitoring that is not conducted as planned, organization of the thinking behind evaluation items and methods for analyzing them, correspondence between monitoring items and evaluation items, and the method for setting scores (5-level evaluation).
- Some evaluations include items that can be improved through management (e.g., evaluation of management actions) and items that are extremely difficult to improve through management (e.g., evaluation of population decrease due to rising temperature). There are also evaluations for which causal links are not necessarily clear. These evaluations are currently mixed up and must be sorted out. Assessing each separately is desirable to grasp the essence of management as a World Natural Heritage site.
- Monitoring results should be used not only to evaluate current status but also to improve the current situation by applying the PDCA cycle for Heritage management.
- Some causal links between recreational use and conservation of the natural environment cannot be clarified. This makes monitoring and evaluation conducted

cooperatively by concerned WGs desirable.

- Achieving a balance between resource use and conservation within the World Natural Heritage Site requires sharing status information and data on "status of use," "impacts of use on the natural environment," and "management efforts." It also requires the reduction or mitigation of those impacts by promoting appropriate use in combination with monitoring.

(2) Views concerning World Natural Heritage site management

- The sharing of information between Japan and Russia is necessary for the conservation and sustainable use of fishery resources in the Nemuro Strait.
- The factors behind the falling numbers of Japanese cormorants and gulls are unknown and should be clarified.
- Indicators for ascertaining brown bear population trends must be established based on highly precise brown bear population estimates. Additionally, measures for avoiding human-caused injury and conflicts between humans and brown bears must be promoted based on scientific data.
- Efforts must be made to ascertain the encroachment of raccoons through cooperation and collaboration with related organizations.
- It is important to establish a management system based on monitoring of the population and damage situation of Steller sea lions migrating to the Nemuro Strait, and to formulate effective measures for preventing damage to fishing.
- In light of the growing interest in dam improvement among fishing personnel, management aimed at raising the area's outstanding universal value (OUV) as a World Natural Heritage site should be promoted through more active dam improvement and publicity of its effects.
- Low-cost methods for maintaining low sika deer densities must be established.
- Oceanographic and meteorological monitoring should be expanded at Shiretoko, and studies related to climate change adaptation measures should be accelerated.

Yasunori Sakurai, Chairperson, Shiretoko Natural World Heritage Site Scientific
Council