

**The Sika Deer Management Plan
and Action Plan
in the Shiretoko Peninsula**

**Hokkaido Regional Environment Office
Kushiro Regional Office for Nature Conservation
Ministry of the Environment**

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Chapter 1 : Framework of the plan

1-1 Background

During the Meiji Period, some local populations of Sika deer on Hokkaido went extinct due to heavy snowfall and over-hunting. In the Shiretoko Peninsula, however, certain populations migrated from the Akan region in the 1970s, and Sika deer colonized the peninsula. The number of wintering individuals of Sika deer in the Shiretoko Cape, one of the major wintering grounds in the Peninsula, rapidly increased from 53 individuals in 1986 to 592 individuals in 1998. The population density, thereafter, has remained at a high level with some fluctuations. High deer density is observed for a prolonged period in other major wintering grounds as well.

Although the snowfall is usually shallow in eastern Hokkaido, the peninsula has heavy snowfalls due to the topography, and this limits suitable wintering grounds for the Sika deer. The peninsula's steep terrain allows for only a discontinuous distribution of wintering grounds in areas at low altitudes of below 300 m (Figure 1). Suitable for wintering in the peninsula are areas where there are grasslands with light snowfall due to strong winds, etc., and open forests to be used as foraging grounds, with an adjacent coniferous forest that provides shelter during unfavorable weather. The ratio of coniferous forest is higher on the Shari side than on the Rausu side. Consequently, there are more wintering deer on the Shari side. Sika deer gather in these wintering grounds during the snowy season. They eat dwarf bamboo, twigs, and tree bark when snowfall is light, and eat more tree bark when snowfall is heavy. When there is no snow, their habitat is extended out around the wintering grounds. Many of the animals move from the Shari side to the Rausu side, and some move to higher altitudes in the spring season.

Foraging pressure due to the high population density of Sika deer has resulted in a variety of negative impacts on the Shiretoko World Natural Heritage Site ("Heritage Site"). These impacts include a sharp decrease in, and insufficient regeneration of, specific tree species due to bark stripping particularly in wintering areas, a decrease in the volume and diversity of forest floor vegetation, and a decrease of coastal vegetation communities characteristic of the Heritage Site, as well as endangered plant species included in those vegetation communities. If the high population density of Sika deer continues for a prolonged period, there will be concerns about the extinction of

endangered plant species and populations, the impact on alpine vegetation, and the soil erosion of steep terrain, and so on.

The present high population density of Sika deer and the change in vegetation could be an ecological process that also occurred repeatedly in the past. However, there have been significant anthropogenic changes to the wide range of environment including the Heritage Site, and surveys such as the analysis of the yearly growth rings of the trees clearly show that their impact on the vegetation of the Shiretoko Peninsula is the most intense in the past 100 years at least. These indicate a qualitative change in the ecological process, and if the current conditions are left in natural process, irreversible negative impact of Sika deer may not be avoided. Based on the precautionary principle, there is a need to take practical management measures immediately.

Given to seasonal movements and the dispersal of subadults, the Sika deer population may have an impact on the environment not only for the Heritage Site but extends to the base of the Shiretoko Peninsula as well. Consequently, management of the Sika deer population in the Heritage Site requires a uniform management that will cover the adjacent areas.

In many parts of the peninsula, including the tip of the Shiretoko Cape, native people inhabited the area from the Epi-Jomon Period (2,000 to 1,500 years ago) until the Meiji to Showa Period, and wolves that prey on deer were present until the Meiji Period. These factors may have had a significant impact on the trends of Sika deer. The management plan does not intend to restore the former state of these factors, but will explore measures for the adequate management of the Sika deer population in the peninsula by supplementing the functions they used to fulfill with anthropogenic controls.

1-2 Objective of developing the plan

“The Sika Deer Management Plan in the Shiretoko Peninsula” will be developed in order to reduce the excessive impact on the Heritage Site’s ecosystem induced by the high population density of Sika deer as described above.

1-3 Positioning of the plan

The plan is positioned as a regional plan under the Specified Wildlife Conservation and Management Plan -“Conservation and Management Plan for Sika deer in Hokkaido” - formulated by the Hokkaido Prefectural Government.

1-4 Areas covered by the plan

For management of Sika deer in the Heritage Site, the plan needs to cover the entire distribution area taking into consideration the seasonal movement of the Sika deer population inhabiting the region. Therefore, parts of the distribution area outside of the Heritage Site are defined as the Adjacent Zone and also covered by this plan (Figure 2).

The range of the Adjacent Zone may be changed in accordance with future survey results, but for the implementation of this plan at present it is defined (during Phase 1, as described later) as the area around the Kinzan River on the Shari side and around the Uebetsu River on the Rausu side.

1-5 Duration of the plan

Phase 1 of this plan will span five years from April 2007 to March 2012. At the end of phase 1, the monitoring results (continuing surveillance), implemented management measures, and management targets will be examined and the continuation or change of the plan will be reviewed taking into consideration changes in the social situation.

If there arises an especially important case for management of Sika deer in the Shiretoko Peninsula, revision of the plan and/or implementation of emergency measures will be considered as needed, even if it occurs during the duration of this plan.

1-6 Basic policies of Sika deer management

The basic policies of Sika deer management includes the following items:

- 1) The aim of the plan is not to recover the static species composition found at a

certain time in the past, but to restore a dynamic ecosystem that changes in the course of ecological processes. The plan adopts as a model the ecosystem before the start of modern exploitation (before the Meiji Period).

- 2) Existing knowledge does not allow to determine whether the current increase of Sika deer is an ecological process or anthropogenic matter. However, in light of the fact that leaving Sika deer in a natural process for a long period of time gives rise to a grave impact on the ecosystems in various regions in Japan, management measures, including control of the population size, will be considered as soon as possible based on the precautionary principle in the area covered by this plan where there is a concern about the negative impact on the ecosystem.
- 3) In the first phase of the plan, the zones [Heritage Site (Heritage Site Zone A and Zone B), Adjacent Zone] will be defined based on human land use and the state of conservation. Management policies will basically be set for each zone.
However, separate management policies will be developed for areas such as the Shiretoko Cape, for which data is already available on the movement of the Sika deer population and on changes in vegetation, and where prompt management is required (Specified Management Zones) in Heritage Site A.
In the future, a more detailed plan will be developed based on fluctuations in the Sika deer population size, use of habitats, seasonal movements, and impacts on vegetation and the ecosystem.
- 4) In each zone, implementation areas will be sorted with a consideration for priority from the perspective of the Sika deer population size and their impact on the vegetation on one hand, and its feasibility from a technical viewpoint on the other. Concrete measures for management will first be taken in these areas.
- 5) Adaptive management methods will be employed to conduct adequate management in line with the management policies of the respective zone while adequately monitoring, assessing, and examining the results to incorporate them into the management policies.
- 6) Impact on endangered bird species will be considered when implementing management policies.

1-7 Setting evaluation items

The evaluation items necessary for adaptive management methods will be set for each zone from the three points of view such as vegetation, population size/population index of Sika deer, and soil erosion. For each evaluation item, criteria will be considered and defined.

They will be reviewed as needed based on implementation of monitoring during the duration of this plan.

1-8 Management methods

After zones are defined in line with the basic policies, a combination of the following three methods will basically be adopted for each zone in order to avoid the negative impact on vegetation caused by the Sika deer.

1) Defensive method:

Installing protective fences, enclosing plant communities, blocking movements by making use of the landform, bark protection nets for specific species that are distributed in a wide area with low density and such.

2) Changing wintering environment:

Reducing the environmental capacity of the wintering grounds, especially by changing the environments of human origin, such as grass establishment on the embankments along roads, and planting grounds of afforestation plants in empty lots after being used for agriculture or forestry. Use of plants that Sika deer do not graze (limited to indigenous species) can be considered.

3) Control of the population size:

Direct intervention on the population size of Sika deer by capturing. This will be conducted as an “experimental density manipulation” for an experiment on Sika deer density manipulation through population control and a verification of vegetation restoration to

reflect the results in the management. In phase 1, the feasibility of the experimental density manipulation will be considered for the four areas including Shiretoko Cape, Rusa-Aidomari, Iwaobetsu, and Makoi where particularly focused management is required. An experimental manipulation will be started in the areas where natural and social conditions are satisfactory.

Chapter 2 : Management policies for individual zones

Management policy common to the Heritage Site Zones is as follows:

In principle, things will be left to natural process. However, if there is the threat of loss to endangered or indigenous plant species and communities characteristic of the Heritage Site, management measures to avoid the loss will be taken in order to ensure the conservation of biodiversity.

2-1 Heritage Site Zone A

1) Definition of the Zone

This zone will be the core area of the Heritage Site excluding the core area of the Heritage Site in the Horobetsu/Iwaobetsu Highlands and the Specified Management Zone (Shiretoko Cape area) (Figure 2).

2) Impact of the Sika deer

a. Wintering ground:

The Rusha area is a major wintering ground, and significant impact has been found on grassland and forest vegetation in this area. Upstream of the Rusha River is a mountain pass that is at the lowest altitude (about 350 m) in the Shiretoko Peninsula. It is confirmed that Sika deer are moving between this area and the Rusa area on the Rausu side even during the winter. The relation of this group and the population wintering at the Shiretoko Cape is unknown.

b. Non-wintering ground:

b-1. Alpine area:

Impact on alpine vegetation at present is minor in this area. Traces of Sika deer crossing the ridge line between Mt. Onnebetsu and Mt. Chinishibetsu at the southern end of the Heritage Site have been observed.

b-2. Mountain area to subalpine area:

In the summer, signs of Sika deer are found from low-altitude areas to high-altitude areas. Details of the impact of foraging pressure made by Sika deer on forest floor vegetation is not yet known, but is believed to be relatively light at present. Bark stripping is rare in areas where the

altitude is over 400 m.

b-3. Coastal area:

The coastal plant communities characteristic of the peninsula are scattered on the coastline of the Heritage Site Zone A. Some of the communities are not foraged by Sika deer. However, only a few of these include endangered plant species and there are not many communities of tall grass plants that need well-developed soil. Current data on the vegetation here is rudimentary, and the population trends of individual species are unknown.

3) Management policies

- a. Common management policy is applied most rigorously to this zone and the avoidance of human intervention is made a principle (excluding defensive measures).
- b. Careful monitoring will be continued on the changes in biodiversity and ecological processes. If a significant impact on the vegetation due to foraging pressure by Sika deer is found, defensive measures will be taken.

4) Management goal

To conserve the dynamic ecosystem that changes in the course of ecological processes and to conserve biodiversity, including an avoidance of the loss of endangered or indigenous plant species and communities characteristic of the heritage site.

5) Management methods

- a. Monitoring Sika deer population at wintering in this zone and indicator plants in both wintering grounds and the non-wintering grounds.
- b. Special attention will be paid to endangered indigenous plant species and communities. Those will be conserved with defensive methods as needed.

2-2 Specified Management Zone (Shiretoko Cape Zone)

1) Definition of the Zone

This zone is north of the northern part of the Horomoi Bay on the Shari side and north of the Kabuto Rock on the Rausu side. Within the zone, the area north of

the Shishi Rock on the Shari side and north of the Waterline 1 Glen on the Rausu side, where highly diverse communities of tall grass plants used to be found, will be managed intensively because the Sika deer population of the zone is concentrated in this area, resulting in a very high foraging pressure on endangered plant communities and forests. (Figure 2,3)

2) Impact of the Sika deer

- a. The Shiretoko Cape area is the most densely inhabited wintering ground in the entire area under the plan and is suffering from a high foraging pressure on its forest vegetation and vegetation communities on the coastal abrasion platform. There is also a concern about soil erosion at the edges of the platform. One third of the western side is used by the Sika deer that are resident here year round and suffers from foraging pressure even in summer. It is not known whether there are migrating deer that use this area only as a wintering ground.
- b. There are already three small (about 0.04 ha) and one large (1 ha) experimental plots for excluding Sika deer to protect and monitor vegetation.
- c. Survey on the number of wintering individuals and deaths at the beginning of spring is important to understand their wintering state. Data has been collected since 1986 on the number of wintering individuals and since 1999 on the number of deaths.
- d. Because the dominance of bull thistle is an obstacle to the restoration of vegetation, eradication of the species is currently underway.

3) Management policy

Human intervention (defensive measures and population control) will be implemented as needed while respecting common management policy. However, the wintering environment will not be changed in this zone, as it is the natural wintering ground of the Sika deer.

4) Management goal

Through the reduction of foraging pressure by Sika deer, biodiversity including plant communities of strong wind areas, as well as alpine and subalpine tall grass plant communities will be conserved while mitigating excessive soil erosion. .

5) Management methods

Changes in the population number of wintering Sika deer in this zone will be understood and, while effectively utilizing existing survey areas on the coastal abrasion platform and forest areas, long-term survey areas and indicator plants will be set for monitoring including vegetation, flora, and foraging pressure. At the same time, the following measures will be taken as needed:

- a. Protection of vegetation with defensive measures
- b. Implementation of experimental Sika deer density manipulation after confirming its feasibility.

2-3 Heritage Site Zone B

1) Definition of the Zone

This zone will be the buffer area between the Heritage Site and the core area of the Heritage Site on the Horobetsu/Iwaobetsu plateau(Figure 2).

2) Impact of the Sika deer

- a. In the abandoned farm lands on the Horobetsu/Iwaobetsu plateau on the Shari town side, a forest restoration project is being conducted under the "Shiretoko 100 Square-Meter Forest Movement", for which the foraging pressure by Sika deer constitutes the greatest constraint. Furthermore, severe impact on vegetation is in progress, especially in the wintering grounds. Human-induced vegetation, such as pasture grass growing in the abandoned farm lands and on the embankments along roads, provide food to Sika deer during the winter season. It makes the death rate here lower than that at the Shiretoko Cape. There are also groups of deer that use the area only during the winter, but most of the population has settled here. As a part of a forest restoration project, the zone is dotted with forested sites and nursery fields surrounded with fences to protect against Sika deer, and the trees preferred by Sika deer are wrapped with bark protection nets.
- b. The low-altitude area from the Rusa River to Aidomari on the Rausu town side is also a wintering ground, but is smaller in size when compared with other wintering grounds due to a lack of level ground. The state of foraging pressure by Sika deer in this area is unknown.
- c. It is thought that the density of Sika deer is highest in the Iwaobetsu and the

Rusa-Aidomari areas in the Shiretoko Peninsula.

3) Management policies

- a. Human intervention (defensive measures, population control and change of the wintering environment) will be implemented as needed while respecting common management policy.
- b. With regards to implementation, Cooperation with the forest restoration project promoted by Shari town will be encouraged.

4) Management goal

Through the reduction of foraging pressure by the Sika deer, biodiversity will be conserved while promoting forest restoration in the former clearings.

5) Management methods

Changes in the number of Sika deer wintering in the zone will be understood and, while effectively utilizing existing survey areas, long-term survey areas and indicator plants for monitoring will be set both on the Shari town side (100 Square-Meter Forest Movement site, riparian forests in the downstream of the Iwaobetsu River, etc.) and on the Rausu town side. The following measures will be taken as needed:

- a. Protection of vegetation with defensive measures
- b. Implementation of experimental Sika deer density manipulation in the Iwaobetsu and the Rusa-Aidomari areas after confirming its feasibility.
- c. Changes to the wintering environment will be made in the areas where the environment has become suitable for the wintering of Sika deer due to anthropogenic factors.

2-4 Adjacent Zone

1) Definition of the Zone

This zone will be a part of Shari town around the Kinzan River and Rausu town apical region from around the Uebetsu River, excluding the Heritage Site. These areas are within the habitat range of the Sika deer that use the Heritage Site. (Figure 2)

2) Impact of the Sika deer

- a. A tracking survey was conducted in the early 1990s, by attaching a transmitter to individual deer that wintered in the Makoi area, and found that there was a seasonal movement of deer for about 20-30 km over Mt. Onnebetsu within the Heritage Site to the Rausu side. A similar movement pattern was confirmed in a survey that began in 2004.
- b. From the late 1980s, damage by Sika deer increased in the farmlands of Utoro, Shari town and the meadowlands of Rausu town in the central part of the peninsula, as well as in the farmlands of Shari town and Shibetsu town at the base of the peninsula. Presently, large-scale deer fences have been put into place, and population size control is conducted with some exceptions, but the burden on the local governments is significant.
- c. From the late 1990s, there has been an increase in Sika deer that inhabit the urban area of Utoro, Shari town and Rausu town year round, leading to a conflict with citizens' lives, such as foraging damage on garden plants. Deer fences have been put in place in Utoro, Shari town.
- d. Severe impact on vegetation is in progress in Utoro, Shari town, Makoi area, the southern part of Rausu town, and from the low-altitude zone of northern part of Shibetsu town to the coastal terrace, especially in the wintering grounds.
- e. Capturing Sika deer is prohibited in the area from the Kinzan River to the wildlife protection area on the Shari side because it may give impact on the nesting of white-tailed eagles and Blackston's fish-owls, and on the wintering of white-tailed eagles and Steller's sea eagles. Furthermore, bare lands that were cleared by logging provide man-made foraging resources for Sika deer in the zone.
- f. On the Shari town side, capturing Sika deer for utilization is under consideration.

3) Management policies

- a. This zone will be positioned as an important area for conservation of biodiversity in the Heritage Site, and human intervention (defensive measures, population control and change of the wintering environment) will be implemented as needed.
- b. Partnership/cooperation with projects undertaken by Hokkaido, Shari town, Rausu town, the private sectors and others will be promoted.

- c. Community-based population control will be encouraged through the cooperation with the private sectors in the utilization of Sika deer and in returning benefits to the local communities. These effects will be analyzed.

4) Management goal

Through the reduction of foraging pressure by Sika deer, vegetation where endangered bird species in National Wildlife Protection Area inhabit will be protected, while reducing conflict between the local residents and Sika deer.

5) Management methods

Changes in the number of Sika deer wintering in the zone, and their movement to and from the Heritage Site, will be understood and, while effectively utilizing existing survey areas, long-term survey areas and indicator plants for monitoring will be set. The following measures will be taken as needed:

- a. Protection of vegetation with defensive measures
- b. Changes in the wintering environment in the areas where the environment has become suitable for the wintering of Sika deer due to anthropogenic factors.
- c. Implementation of experimental Sika deer density manipulation in Makoi area after confirming its feasibility

Chapter 3: Monitoring

In order to promote the appropriate management of Sika deer in the Heritage Site based on an adaptive management method, monitoring (detailed survey of the individual areas and a wide-area survey) will be conducted systematically and continuously on each of the assessment item such as vegetation, Yezo Sika deer population size/population index, and soil erosion. In the process of implementing this plan, criteria will be set for the respective evaluation items and their evaluation results will be clarified for integration in future management plans (Table 1).

The survey results will be verified from a scientific point of view for their adequate incorporation in implementation of the plan. Advice from a scientific perspective will be provided by the Shiretoko World Heritage Site Scientific Committee that consists of academic experts and the Sika Deer Working Group that was established by the committee (Figure 4).

Chapter 4: Implementation of the plan

4-1 Implementation bodies of the plan

The Ministry of the Environment will implement the plan within the area covered by the plan, in cooperation with the Forestry Agency, Hokkaido, Shari town, and Rausu town, and others.

National administrative agencies other than the Ministry of the Environment and local governments are also expected to carry out their projects in line with the plan.

4-2 Implementation process of the plan

1) Consensus building

This plan will be implemented ensuring consensus building with concerned bodies, and local residents and others. (Figure 4).

Information such as the contents of the plan and the various survey results will be promptly made public through websites, and such. At the same time, the current state of the natural environment in the area covered by the plan, and the need for various measures to be undertaken under this plan will also be actively communicated.

Furthermore, in order to ensure effective partnership/cooperation with the government organizations and local bodies concerned, opinions and suggestions will be asked from a broad range of local residents and concerned bodies, and "the Shiretoko World Natural Heritage Site Regional Liaison Committee" will be convened as needed for liaison and coordination.

2) Scientific review

In order to further this plan based on scientific knowledge, "the Shiretoko World Heritage Site Scientific Committee", which consists of academic experts and "the Sika Deer Working Group" under the Committee, will be held regularly to provide scientific evaluation of the plan and advice for review from a scientific point of view.

3) Reviewing the plan

The plan will be reviewed as needed based on the principle of adaptive

management and reflecting the results of the monitoring surveys, and the scientific advice described above.

4) Implementation plan

An implementation plan concerning the details of implementing this plan will be developed separately.

Development and implementation of the plan will be advanced ensuring consensus building with the Scientific Committee, the Sika Deer Working Group, concerned bodies, local residents and others.

Furthermore, the survey and research necessary for the development and review of the implementation plan will be conducted as needed (Table 1).

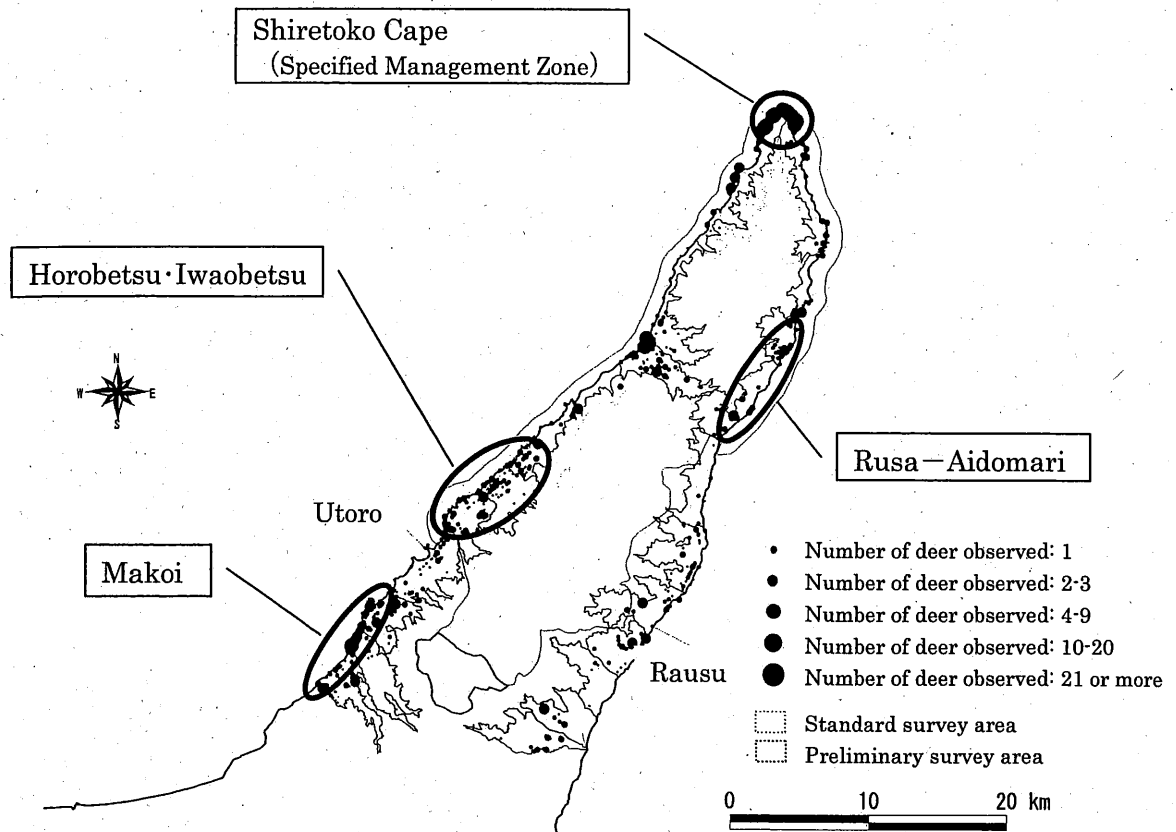


Figure 1. Location and categorized number of sika deer observed in the standard and preliminary survey areas during a helicopter census in March 2003. Shown in ellipsoids are candidate sites for experimental density manipulation.

- Minimum number of confirmed individuals: 3,177 (Total number is 4,427)
(Estimation for the entire region → 4,333 to 6,235)
- The deer were concentrated in an area below 300 m. Only 0.6% of them were observed in areas at a higher altitude.
- Distribution of deer wintering grounds is discontinuous.
- Deer population is disproportionately denser on the Shari side during wintering (2.3 times as many as that on the Rausu side)

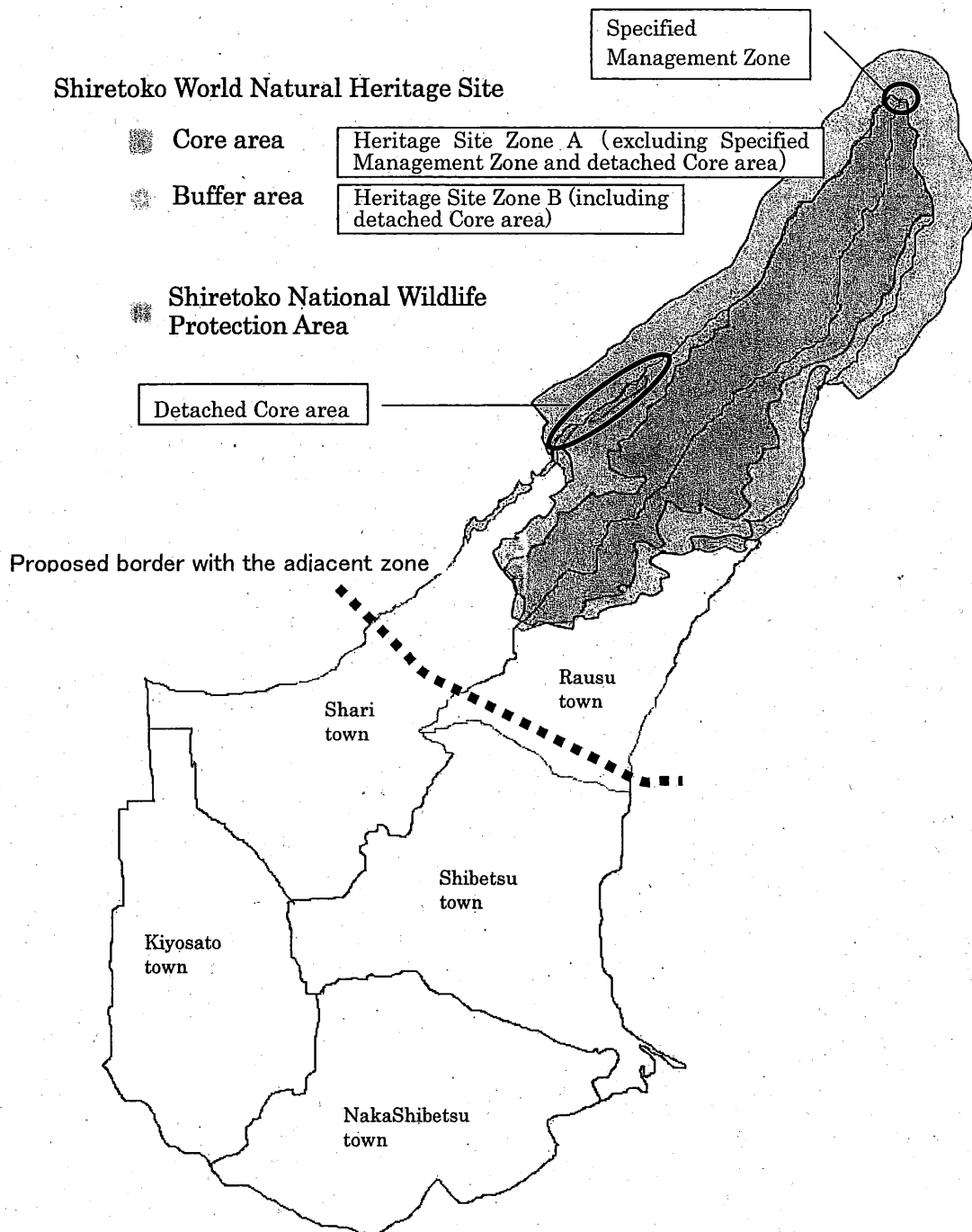


Figure 2. Map for the consideration of the areas to be covered by the Sika Deer Management Plan in the Shiretoko Peninsula

Note: Unit 12 of Conservation and Management Plan for Sika deer in Hokkaido covers Shari Town, Rausu Town, Shibetsu Town, Kiyosato Town and Naka-Shibetsu Town.

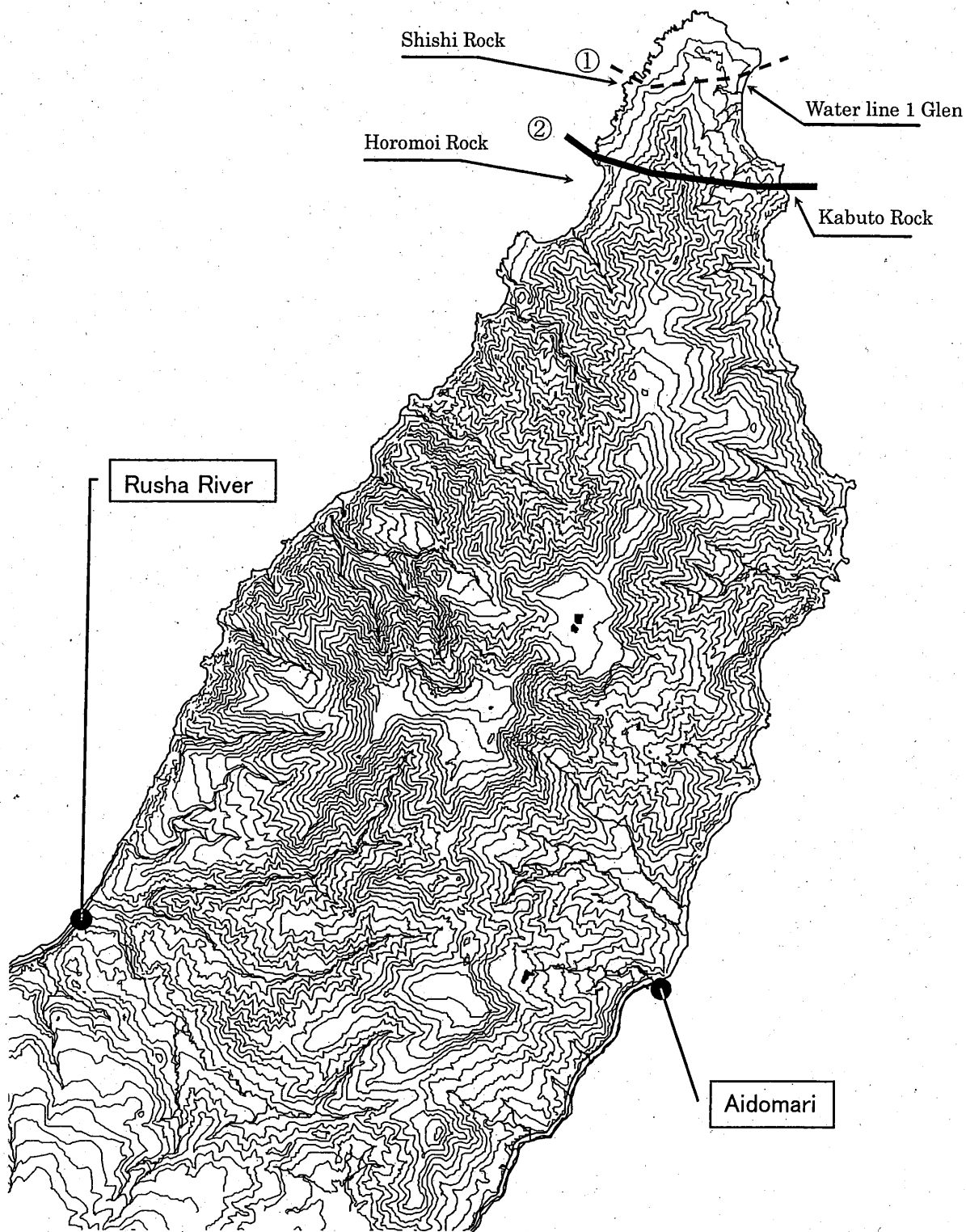


Figure 3. Map of the Shiretoko Cape and surrounds. Specified Management Zone [above the thick solid line②] and wintering ground [above the dotted line①] where intensive surveying and monitoring will be conducted.

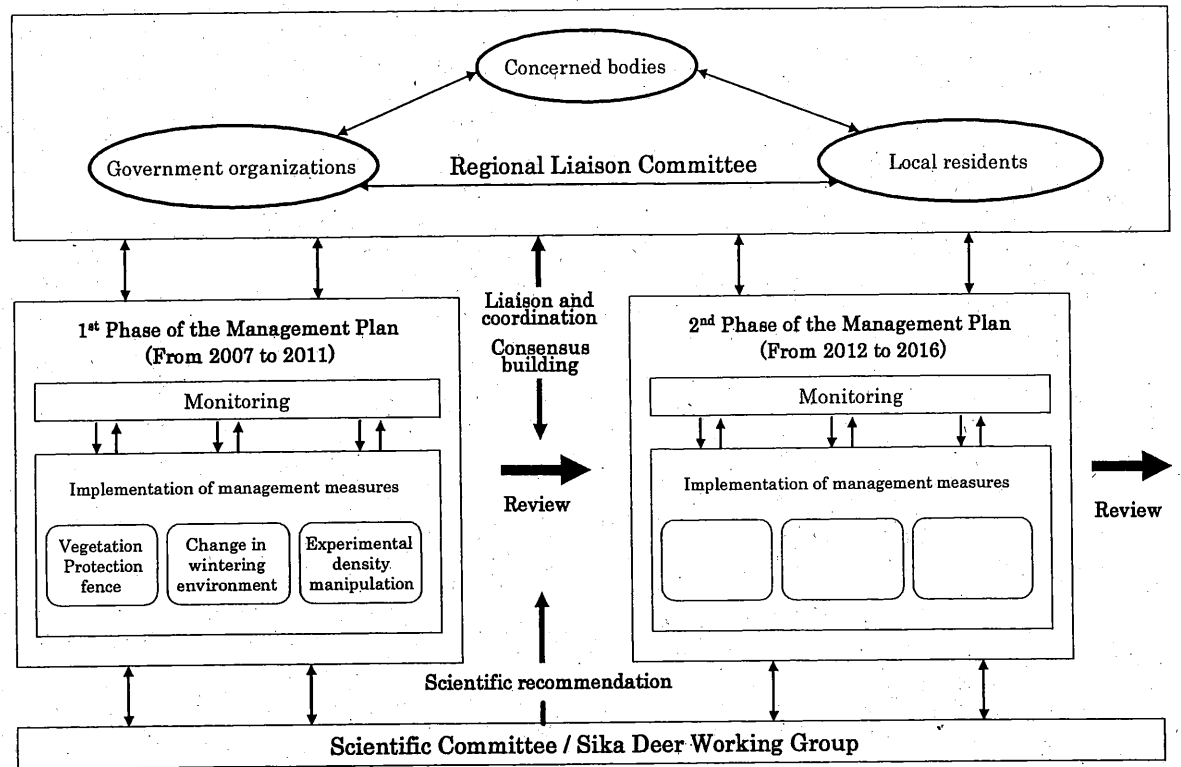


Figure 4. The Sika Deer Management Plan in the Shiretoko Peninsula and its implementation process

Table 1: Contents and objectives of monitoring surveys

Category			Survey item	Content/Objective	Heritage Site			Adjacent Zone	
					Heritage Site Zone A	Specified Management Zone	Heritage Site Zone B		
Monitoring	Vegetation	Detailed survey	Vegetation restoration survey	In order to review the intensity of capturing pressure of Sika deer and the allocation/scale of vegetation protection fences, a vegetation survey will be conducted inside and out of the various vegetation survey plots and deer fences in major wintering grounds, etc., to understand the relationship between specific plant species and the increase/decrease of Sika deer, as well as the state of vegetation recovery.	○	○	○	×	
			Experimental density manipulation area Deer foraging pressure survey	For the determination of the appropriate density of Sika deer (the appropriate number to be captured in individual wintering grounds), foraging pressure survey plots will be set in the wintering grounds where the experimental density manipulation is planned to understand the change in vegetation in response to the change in the density of the Sika deer.	×	○	○	○	
		Wide-area survey	Wide-area survey of deer foraging pressure	The state of Sika deer foraging pressure (arboreous and herbaceous plants) will be surveyed by region, altitude, and site location in order to understand Sika deer foraging pressure throughout the entire peninsula.	○				
			Indigenous species distribution survey	For the consideration of species (communities) to be protected, location/scale, etc., of Sika deer fences, and the number of Sika deer to be captured in wintering grounds, the distribution, scale, and existence of refugia will be widely surveyed regarding indigenous species, including species on the red list and other endangered species (both in terms of species and communities).	○				
	Population/population index of Deer	Detailed survey	Deer population trend survey	For the consideration of capturing methods (deciding the timing and the number to capture), a light census, counting from aircraft, etc., will be conducted to understand trends of population size and the composition of the groups.	○	○	○	○	
			Survey of the conditions of natural death	For the consideration of capturing methods (deciding the timing and the number to capture), age and gender of the individuals that died naturally in major wintering grounds will be surveyed.	○	○	○	×	
		Wide-area survey	Wintering group distribution survey	For the consideration of the allocation of vegetation protection fences and the setting of new sites to be monitored, distribution and size, etc., of the wintering groups will be surveyed with a helicopter census (as well as estimating the total number of deer in the entire peninsula).	○				
			Deer seasonal movement survey	In order to establish zones for population management, detailed data on the seasonal movement of individual wintering groups will be identified using transmitters, etc.	○				
	Soil erosion	Detailed survey	Soil erosion survey	Actual conditions of soil erosion and their causes will be identified.	○	○	○	×	
		Wide-area survey	Wide-area survey of the state of soil erosion	Place, scale, etc., of wide-area soil erosion will be identified.	○				
	Survey necessary for the development and review of the implementation plan			Survey for the development of a method for density manipulation	Elaboration of the concrete methods of capturing deer, including technical, safety, cost and other issues.	×	○	○	○
				Survey of the actual count of the deer in the wintering grounds	In order to decide the number of Sika deer to be captured, deer in all, or part, of the wintering grounds will be flushed out for actual counting.	×	○	○	○
Other			Growth ring/pollen analysis survey	In order to decide the degree of anthropogenic management, the long-term relationship between Sika deer and vegetation for the past several hundred to several thousand years will be clarified.	*To be completed before the development of the plan				