# Shirakami-Sanchi World Heritage Property
# Monitoring Plan

Revised July 2022

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Regional Liaison Committee for Shirakami-Sanchi World Heritage Property

Shirakami-Sanchi World Heritage Property Monitoring Plan

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# Shirakami-Sanchi World Heritage Property Monitoring Plan

## 1. Purpose of the Monitoring Plan

The ecosystem of the beech forest of the Shirakami-Sanchi World Heritage Property (hereinafter referred to as “the Property”) must be conserved and managed in an adaptive manner based on scientific knowledge. Accordingly, the Tohoku Regional Environment Office of the Ministry of the Environment, the Tohoku Regional Forest Office of the Forestry Agency, Aomori and Akita prefectures and the relevant municipalities (hereinafter referred to as “the Relevant Administrative Bodies”) shall work with universities, research institutes and other academic experts to promote monitoring of the natural heritage. The methods used to conserve and utilize the Property shall be reviewed based on the monitoring results and refined as required to ensure the conservation of the Property is optimally managed.

This monitoring plan is designed to promote adaptive conservation management* based on scientific findings and ensure that the ecosystem and value of the beech forest on the Property is passed on to future generations. It aims to define the monitoring objectives, monitoring items and evaluation criteria for the monitoring survey to be implemented by the Relevant Administrative Bodies over the next decade, as well as clarify the contents, implementation, evaluation of results and other monitoring-related matters.

* Adaptive conservation management: A method to manage feedback while constantly monitoring by incorporating the potential for circumstances that differ from the initial prediction into the management system in advance.

## 2. Objectives of Monitoring

To monitor whether the outstanding universal value (OUV: see Reference 1) of the Property is maintained, it is necessary to accurately identify changes in the natural environment such as climate change, changes in the social environment such as human activities and their impact on the Property. Accordingly, the monitoring objectives have been set as follows. Based on these, various surveys will be conducted and the items and contents will be arranged. In addition, if there are concerns about the risk of undermining the OUV, the risk factors will be promptly identified.

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| **Monitoring Objective I** | **The basic environmental conditions for meteorological, hydrological and terrestrial phenomena that sustain the beech forest are identified.** |
| **Monitoring Objective II** | **The forest ecosystem, mainly of the beech forest, is maintained. The effects and signs of climate change are identified.** |
| Objective II-A | Pristine beech forests are kept healthy over a wide area. |
| Objective II-B | Diverse flora and fauna in the beech forest is adequately preserved. |

| | |
|---|---|
| **Monitoring Objective III** | **The OUV is managed properly, taking into account changes in social conditions surrounding the Property, so that the value at the time of its inscription on the World Heritage List is not adversely affected by human use or activities and benefits regional development.** |

## 3. Monitoring Items and Evaluation Criteria

Based on the monitoring objectives in 2 above, the monitoring items, specific survey items and risk/precursory phenomena that could undermine the value of the natural heritage and evaluation criteria, etc., are shown in Attached Table 1, "**Monitoring Items and Evaluation Criteria**."

Given that the evaluation criteria are used to manage the risks affecting the World Heritage Property, they have been established based on efficiency and other factors, focusing on risks that stand out in terms of magnitude and frequency of occurrence and which could impair the value of the World Heritage.

## 4. Description of Survey for Each Monitoring Item

The locations, frequency, contents and implementing body for each monitoring item (monitoring objective and specific survey item) for the Property and its surrounding area are shown in Attached Table 2, "**List of Monitoring Survey Items**."

## 5. Implementation of Monitoring

The implementing body of each survey shall strive to conduct surveys related to the monitoring items systematically and in accordance with this monitoring plan.

In implementing the monitoring, the implementing body of each survey shall promote coordination/collaboration with the Regional Liaison Committee for Shirakami-Sanchi World Heritage Property (hereinafter referred to as "the Regional Liaison Committee"), universities, research institutes and other academic experts. Advice from the Scientific Committee for Shirakami-Sanchi World Heritage Property (hereinafter referred to as the "Scientific Committee") should also be obtained.

<Priority Surveys>

Because the monitoring plan includes wide-ranging surveys, including OUV-related and high-profile surveys, surveys of particular importance ("priority surveys") have been selected with adaptive conservation management in mind.

* Selection criteria

(1) Closely related to OUV

(2) Closely related to evaluation criteria

(3) Likely to fluctuate in the short term

(4) Cost-effective and sustainable

The priority surveys shall be carried out appropriately and effectively through mutual coordination

among the implementing bodies under detailed advice from the Scientific Committee on implementation methods (survey practice, sampling data, precautions, etc.).

## 6. Compilation and Reporting of Survey Results

The Shirakami-Sanchi World Heritage Center Nishimeya Kan, on behalf of the Regional Liaison Committee, shall solicit the cooperation of implementing bodies. It shall compile the results of their surveys after the implementing bodies have completed the surveys and clarify the survey findings and their relationship with the evaluation criteria (hereinafter referred to as “monitoring results”). The monitoring results shall be reported to the Scientific Committee once approved by the Regional Liaison Committee.

## 7. Assessment of Monitoring Results

The Scientific Committee shall evaluate and analyze the monitoring results, especially those related to the evaluation criteria and advise the Regional Liaison Committee on how to manage the conservation of the Property.

The monitoring results will basically be evaluated about once every five years.

The Regional Liaison Committee shall examine the implementation or review of conservation management projects in the Property and its surrounding area, taking the advice of the Scientific Committee into account.

<Evaluation and Review>

In fiscal 2016, the results of the monitoring surveys for the previous five years were compiled and the monitoring activities were evaluated and reviewed, taking the advice of the Scientific Committee into account. To evaluate the monitoring survey, see Reference 3, “Evaluation Results of Shirakami-Sanchi World Heritage Property Monitoring Survey.”

## 8. Utilization of Monitoring Results

The monitoring results and their evaluation shall be distributed to the Relevant Administrative Bodies as required and be made widely available to the public through the Shirakami-Sanchi World Heritage Center Nishimeya Kan. The results and evaluation shall also be used by member organizations of the Regional Liaison Committee to ensure proper management of the Property. In addition, information on rare species shall be carefully handled.

## 9. Modifications to the Monitoring Plan

This monitoring plan shall be reviewed basically every five years and may be modified by the Regional Liaison Committee based on the evaluation of the monitoring results and the advice of the Scientific Committee on how to manage the conservation of the Property.

## 10. Others

If the results of a survey conducted by external organizations other than the Regional Liaison Committee are deemed necessary for evaluation, the Regional Liaison Committee shall request cooperation from such external implementing organizations to allow the Committee to use their results.

The Regional Liaison Committee shall also proactively ask the external implementing bodies to cooperate in the usage of the data.

(Document formulation and revision history)

Formulation on March 31, 2012

1st revision on March 31, 2017

2nd revision on July 1, 2022

Attached Table 1: Monitoring Items and Evaluation Criteria (1/3)

| Monitoring objectives | Monitoring items | | | | Specific survey items | Risk/precursory phenomena that could undermine the value of the natural heritage [Evaluation criteria] |
|---|---|---|---|---|---|---|
| | Major classification | | Minor classification | | | |
| **I. The basic environmental conditions for meteorological, hydrological and terrestrial phenomena that sustain the beech forest are identified.** | 1 | Meteorological conditions | (1) | Meteorological information in the World Heritage Property and surrounding area | Atmospheric temperature, precipitation, amount of snow, wind direction/velocity, humidity, amount of solar radiation, recording of abnormal weather, etc. | Meteorological conditions change to a degree that may threaten the ecosystem, etc. of Shirakami-Sanchi, due to a rise in atmospheric temperature, frequent heavy rain and strong winds, less snow, etc. **[There have been no reports of figures significantly exceeding average-year values due to abnormal weather, etc.]** |
| | | | (2) | Forest micrometeorology | Atmospheric temperature, ground temperature, forest humidity, maximum snow depth | |
| | 2 | Hydrological conditions | (1) | Water quality and flow rate of major rivers | Water quality (pH, turbidity, nutrient salts, chemical substances, etc.), flow rate | Hydrological conditions change to a degree that may threaten the river ecosystem of Shirakami-Sanchi, due to changes in the water quality and flow rate. |
| | 3 | Geological conditions, etc. | (1) | Topographical features | Broad-area topographical map, and the status of changes in collapsed land | Geographical conditions, etc. change to a degree that may threaten the ecosystem of Shirakami-sanchi, due to occurrence of land collapse/landslide, decreases in avalanche vegetation areas, changes in alpine vegetation area/wetland area, etc. **[Among large-scale land collapse and landslide cases, no significant natural disturbance that may affect the ecosystem has been reported.]** |
| | | | (2) | Identification of ground surface coverage and unusual topographical features of entire area | Present condition of forest, shrubland, grassland, collapsed land, development areas (roads, dams), etc. | |
| | 4 | Others | (1) | Radiation level | Status of radioactive substances | |
| | | | (2) | Agricultural chemicals | Status of use of agricultural chemicals | |
| **II A. Pristine beech forests are kept healthy over a wide area.** | 1 | Forest structure of beech forests, etc. | (1) | Identification of changes in forests at fixed sites | Changes in individual beech growth, hierarchical structure, understory vegetation, production amount (net production, seed production, etc.) | Significant change is observed in the status of growth of the beech forest, renewal conditions of the beech forest, beech distribution areas, hierarchical structure, number of beech trees growing (difference between the number of withered and promoted trees, respectively), and production volume (net production, seed production, etc.). **[No continuous or significant change has been reported with regard to the growth of beech trees in the marginal part of the beech distribution area.]** |
| | | | (2) | Area-wide changes in forests | Changes in forest physiognomy and vegetation | |
| | | | (3) | Genetic diversity and spatial genetic structure of beech populations | Genetic diversity and spatial genetic structure of beech populations | |
| | 2 | Impact on beech forest, etc. | (1) | Forest noxious insects and damage status | Damage *from Syntypistis punctatella* and *Venusia phasma*, occurrence of Japanese oak wilt, pine wilt, etc. | A substantial decrease in major trees constituting beech forests is observed due to occurrence/expansion of damage from noxious insects and meteorological damage. **[There has been no significant expansion/increase in noxious insects thanks to countermeasures taken inside and outside the Heritage Property.]** |

Attached Table 1: Monitoring Items and Evaluation Criteria (2/3)

| Monitoring objectives | Monitoring items | | | | Specific survey items | Risk/precursory phenomena that could undermine the value of the natural heritage [Evaluation criteria] |
|---|---|---|---|---|---|---|
| | Major classification | | Minor classification | | | |
| **II B. Diverse flora and fauna in the beech forest is adequately preserved.** | 1 | Flora | (1) | Flora | Present condition of vegetation, rare plants, species that grow close to their distribution limits, *Satoyama* plants, invasive plants, etc. | Significant changes are confirmed in the plant distribution area, such as disappearance of rare plants, entry and settlement of invasive species associated with utilization, as well as regular appearance of such phenomena.<br>**[New invasion and settlement of invasive plants have been controlled, and those invasive species already settled have not caused significant damage on existing vegetation.]** |
| | | | (2) | Existing vegetation | Present condition of vegetation | |
| | | | (3) | Phenology of beech forest | Phenology of budding, fruition, coloring of leaves, fallen leaves, etc. | The phenology has significantly changed due to climate change with ongoing appearance of several phenomena. |
| | 2 | Fauna | (1) | Fauna | Changes in living conditions of unique species of mammals, birds, reptiles, amphibians, insects and fish | Irrecoverable changes are observed in keystone and umbrella species (decrease in the populations of *Ursus thibetanus* and *Capricornis crispus,* animals representing the beech forest of the relevant area, decrease in population and reproductive rate of rare birds (in particular, *Aquila chrysaetos, Dryocopus martius, Histrionicus historionicus*, among others)).<br>**[No significant change has been observed in the population of large mammals. The reproductive rate of birds of prey has not declined continuously.]** |
| | | | (2) | Living conditions of endangered species | Changes in living conditions of *Dryocopus martius*, *Aquila chrysaetos* and *Nisaetus nipalensis* | |
| | | | (3) | Invasive animals | Habitat status of *Cervus nippon* (habitat area, photo-taking frequency, and sex ratio)<br>Impact on plants and vegetation<br>Captivity status | Deterioration and simplification of vegetation are observed associated with invasion of *Cervus nippon* into the Heritage Property.<br>**[There have been no significant increase in the number of *Cervus nippon* observed in surrounding municipalities and no decrease of plant species nor decline of vegetation observed in the Heritage Property.]** |
| | | | (4) | Impact on animals | Occurrence status of infectious diseases | |
| | 3 | Fungi | (1) | Survey on distribution of fungi | Condition of soil fungus, yeast, lactobacillus, actinomycete, etc. | Irreversible changes are observed in the environment, such as changes in the composition of soil fungus due to acid precipitation and changes in the composition of specific fungi due to climate change. |

Attached Table 1: Monitoring Items and Evaluation Criteria (3/3)

| Monitoring objectives | Monitoring items | | | | Specific survey items | Risk/precursory phenomena that could undermine the value of the natural heritage [Evaluation criteria] |
|---|---|---|---|---|---|---|
| | Major classification | | Minor classification | | | |
| **III. The OUV is managed properly, taking into account changes in social conditions surrounding the Property, so that the value at the time of its inscription on the World Heritage List is not adversely affected by human use or activities, and benefits regional development.** | 1 | Usage environment | (1) | Number of visitors | Number of visitors | Significant alterations of the ecosystems by humans and decline in heritage preservation awareness are observed, such as expansion of mountain trails, contamination of river water, and frequent occurrence of various illegal acts (damaging trees, collecting plants, fishing in mountain streams, making fires).<br>**[No malicious illegal acts or violation of manners, and no rapid increase in the number of users have been reported.]** |
| | | | (2) | Present status of use of major trails | Present status of use of major trails | |
| | | | (3) | User manners | Condition of guideposts, tape, paint, remaining graffiti, etc. | |
| | 2 | Contribution to regional development | (1) | Number of users of facilities at conservation and utilization sites, etc. | Number of users of facilities at conservation and utilization sites, etc. | Facilities at conservation and utilization sites are not utilized, nor have any initiatives to raise the heritage value, such as awareness-raising activities, been implemented.<br>**[No decreasing trends have been seen in terms of the number of users of facilities at conservation and utilization sites, the number of awareness-raising activities related to heritage value, and the number of environmental education activities]** |
| | | | (2) | Environmental education and awareness-raising | Status of environmental education and awareness raising using World Natural Heritage | |
| | 3 | Social environment surrounding the Heritage Property | (1) | Status of local areas | Total population, depopulation, population by industry, etc. | The region has found difficulty succeeding socio-economically.<br>Local residents become irrelevant to nature by hunting, fishing, and using mountain vegetables and mushroom in their livelihood, thereby fold knowledge (skills, knowledge, etc.) to be obtained from their actual use is not generated or succeeded. |
| | | | (2) | Folk knowledge | Hunting, status of using mountain vegetables and mushroom and the status of fishing, etc. in local areas | |

## Attached Table 2 List of Monitoring Survey Items (1/13)

Monitoring objective I　The basic environmental conditions for meteorological, hydrological and terrestrial phenomena that sustain the beech forest are identified.

| Monitoring objectives | Monitoring items | | Specific survey items | Implementing organization* | Survey name | Survey year | Survey frequency | Subsequent years | Survey locations | Survey items | Priority survey |
|---|---|---|---|---|---|---|---|---|---|---|---|
| I | 1 Meteorological conditions | (1) Meteorological information in the World Heritage Property and surrounding area | Atmospheric temperature, precipitation, amount of snow, wind direction/velocity, humidity, solar radiation, recording of abnormal weather, etc. | MOE | Meteorological observation survey in the Shirakami-Sanchi World Heritage Property and its surrounding area | From 1998 | Every year | To be continued | Ridge area of Mt. Kushiishi, Futatsumori, Nishimeya-mura | Atmospheric temperature, ground temperature, precipitation, snow depth, wind direction/velocity, solar radiation, humidity, atmospheric pressure | ✓ |
| | | | | Hirosaki Univ. | Meteorological observation in the Shirakami-Sanchi World Heritage Property and its surrounding area | From 2009 | Every year | To be continued | Okuakaishi Forest Road, Shirakami Natural Science Park | Precipitation, atmospheric temperature, humidity, atmospheric pressure, wind direction/velocity, snow depth, $CO_2$ concentration | |
| | | | | MOE, Forestry, Aomori, Akita | Patrolling by patrol officers, staff members, etc. | From 1992 | Every year | To be continued | Entire World Heritage Property | Recording of abnormal weather, etc. during patrolling | |
| | | | | Others | AMeDAS data | From 1976 | Every year | To be continued | Fukaura, Ajigasawa, Dake, Hachimori, Fujisato | | |
| | | (2) Forest micrometeorology | Atmospheric temperature, ground temperature, forest humidity, maximum snow depth | Survey Committee, MOE | World Heritage Shirakami-Sanchi Beech Forest Monitoring Survey | From 1999 | Every year | To be continued | Three locations around Mt. Kushiishi (Ridge site, *Dryocopus martius* site, Yanadaki Site) | Atmospheric temperature, ground temperature, humidity (micrometeorology) | |
| | | | | Forestry | Survey of long-term changes in virgin beech forest in the Shirakami-Sanchi World Heritage Property | From 1998 | Every year | To be continued | Yanadaki-no-Sawa testing site, Kasuge River source area testing site | Forest atmospheric temperature, maximum snow depth (micrometeorology) | |
| | 2 Hydrological conditions | (1) Water quality and flow rate of major rivers | Water quality (pH, turbidity, nutritive salts, chemical substances, etc.), flow rate | Aomori | Measurement result of water quality in public water bodies and groundwater | From 2010 | Every month | To be continued | Sazanai Bridge (Sazanai River) | Water quality (living environment item) and flow rate (field observation item) | |

* Implementing organizations → MOE: Ministry of the Environment, Forestry: Forestry Agency (Tohoku Regional Forest Office), Aomori: Aomori Prefecture, Akita: Akita Prefecture, Survey Committee: Beech Forest Monitoring Survey Committee, Hirosaki Univ.: Hirosaki University

Attached Table 2 List of Monitoring Survey Items (2/13)

| Monitoring objectives | Monitoring items | | Specific survey items | Implementing organization* | Survey name | Survey year | Survey frequency | Subsequent years | Survey locations | Survey items | Priority survey |
|---|---|---|---|---|---|---|---|---|---|---|---|
| I | 3 Geological conditions, etc. | (1) Topographical features | Broad-area topographical map, and the status of changes in collapsed land | To be determined | Survey of topographical changes in the Shirakami-Sanchi World Heritage Property | 2003 (Forestry), 2011 (Forestry) | Randomly | To be determined | Airplane measuring range (2×3 km) | Preparation of a broad-area topographical map using DTM (digital terrain model) data | |
| | | (2) Identification of ground surface coverage and unusual topographical features of entire area | Present condition of forests, shrubland, grassland, collapsed land, development areas (roads, dams), etc. | Forestry | Survey of topographical changes in the Shirakami-Sanchi World Heritage Property (reposted) | 2003, 2011 | Once every 10 years or upon detecting a large-scale land collapse or other change | To be continued | 3,000 ha of the Heritage Property | Identification of beech forest and other community distribution, dynamics of shrubberies, alpine vegetation, wetland areas, etc., identification of gaps, etc. | |
| | | | | Forestry, Aomori, Akita | Mountain disaster survey | | In the event of disaster | To be continued | Affected areas | Outline survey from above using helicopter | |
| | | | | MOE, Forestry, Aomori, Akita | Patrolling by patrol officers, staff members, etc. | From 1992 | Every year | To be continued | Entire World Heritage Property | Patrolling by staff members, patrolling by outsourcing, patrolling activities by volunteer patrol officers, etc. | |

* Implementing organizations → MOE: Ministry of the Environment, Forestry: Forestry Agency (Tohoku Regional Forest Office), Aomori: Aomori Prefecture, Akita: Akita Prefecture, Survey Committee: Beech Forest Monitoring Survey Committee, Hirosaki Univ.: Hirosaki University

Attached Table 2 List of Monitoring Survey Items (3/13)

| Monitoring objectives | Monitoring items | | Specific survey items | Implementing organization* | Survey name | Survey year | Survey frequency | Subsequent years | Survey locations | Survey items | Priority survey |
|---|---|---|---|---|---|---|---|---|---|---|---|
| I | 4 Others | (1) Radiation level | Status of radioactive substances | Nuclear Radiation Authority | Radiation monitoring | From 2011 | Every 10 minutes | | Nationwide (three sites in Shirakami-Sanchi area: Fukaura-machi Town Hall, Hirosaki City Hall, and Noshiro City Yamamoto Regional Development Bureau) | Measurement by monitoring post and real-time dosimeter | |
| | | | | Nuclear Radiation Authority | Radiation monitoring | From 2011 | Every year | | From Aomori prefecture to Aichi prefecture | Air dose rate by using airplane | |
| | | | | Aomori | Radioactive substance survey for agricultural products produced in Aomori prefecture | From 2011 | Every year | | Municipalities of Aomori prefecture (by production area) | Radioactive cesium (Cesium 134 and Cesium 137) | |
| | | | | Akita | Radioactive substance survey for agricultural products produced in Akita Prefecture | From 2011 | Every year | | Municipalities of Akita prefecture (by production area) | Radioactive cesium (Cesium 134 and Cesium 137) | |
| | | (2) Agricultural chemicals | Status of use of agricultural chemicals | Aomori, Akita | | None | | | | Standards for use are determined in the Agricultural Pest Control Guidelines. | |

* Implementing organizations → MOE: Ministry of the Environment, Forestry: Forestry Agency (Tohoku Regional Forest Office), Aomori: Aomori Prefecture, Akita: Akita Prefecture, Survey Committee: Beech Forest Monitoring Survey Committee, Hirosaki Univ.: Hirosaki University

## Attached Table 2 List of Monitoring Survey Items (4/13)

Monitoring objective II　The forest ecosystem, mainly of the beech forest, is maintained. The effects and signs of climate change are identified.

Objective IIA　Pristine beech forests are kept healthy over a wide area.

Objective IIB　Diverse flora and fauna in the beech forest is adequately preserved.

| Monitoring objectives | Monitoring items | | Specific survey items | Implementing organization* | Survey name | Survey year | Survey frequency | Subsequent years | Survey locations | Survey items | Priority survey |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IIA | 1 Forest structure of beech forests, etc. | (1) Identification of changes in forests at fixed sites | Changes in individual beech growth, understory vegetation, production amount (net production, seed production, etc.) | Survey Committee, MOE | World Heritage Shirakami-Sanchi Beech Forest Monitoring Survey (reposted) | From 1999 | Every year | To be continued | Three locations around Mt. Kushiishi (Ridge site, Dryocopus martius site, Yanadaki Site) | Monitoring survey of trees, shrubs, bamboo grass and seedlings, survey of the supply of litter and seeds | ✓ |
| | | | | Forestry | Survey of long-term changes in virgin beech forest in the Shirakami-Sanchi World Heritage Property (reposted) | From 1998 | Every year | To be continued | Yanadaki-no-Sawa testing site, Kasuge River source area testing site | Every tree survey (adding new trees), canopy projection drawing, survey of trees with collapsed canopy, forest floor vegetation survey | ✓ |
| | | | | Hirosaki Univ. | Shirakami-Sanchi Takakura Woods survey area | From 2009 | Every year | To be continued | Takakura Woods survey area (1.4 ha) | Every tree survey, survey of community structures of young trees/seedlings, survey of the supply of litter and seeds (for litter, sampling only) | |
| | | | | Iwasaki Junior High School | Juniko Beech Forest Monitoring | From 2005 | Every year | To be continued | Beech forest near Juniko Aoike (50 x 50 m) | Monitoring survey of trees, shrubs, and seedlings, survey of the supply of litter and seeds | |
| | | | | Forestry (Agency) | Basic Survey of Diversity of Forest Ecosystems | 2000, 2002, 2005, 2007, 20010, 2012, 2015, 2017, 2020, 2022 | Once every 5-10 years | To be continued | 0.1 ha grid points of 4 km mesh in Aomori and Akita prefectures (circular, rectangular) | Every tree survey, root cutting survey, fallen tree survey, understory vegetation, soil erosion survey | |
| | | | | Forestry | Protected forest monitoring survey operations and assessment operations | 2010, 2011, 2015, 2016, 2020, 2021 | Once every 5 years | To be continued | Shirakami-Sanchi forest ecosystem protected areas (Aomori and Akita Prefectures) | Every tree survey, vegetation survey, fixed-point photo taking, flora survey | |
| | | | | Forestry | Monitoring survey of vertically distributed vegetation in the Shirakami-Sanchi World Heritage Property, etc. | 2012 to 2013, 2018 | Once every 5-10 years | 2018 | Shirakamidake, Takakuramori, Futatsumori, Kodake | Survey by elevation (monitoring survey of vertically distributed vegetation), maintenance of piles indicating plot positions | |

* Implementing organizations → MOE: Ministry of the Environment, Forestry: Forestry Agency (Tohoku Regional Forest Office), Aomori: Aomori Prefecture, Akita: Akita Prefecture, Survey Committee: Beech Forest Monitoring Survey Committee, Hirosaki Univ.: Hirosaki University

Attached Table 2 List of Monitoring Survey Items (5/13)

| Monitoring objectives | Monitoring items | | Specific survey items | Implementing organization* | Survey name | Survey year | Survey frequency | Subsequent years | Survey locations | Survey items | Priority survey |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IIA | 1 Forest structure of beech forests, etc. | (2) Area-wide changes in forests | Changes in forest physiognomy | Forestry | Gathering of aerial photographs, etc. | 2000 to 2010 | Once every 5 years | To be continued | Entire Shirakami-Sanchi area | Gathering of satellite images or aerial photographs | |
| | | | | Forestry | Survey of topographical changes in the Shirakami-Sanchi World Heritage Property (reposted) | 2003, 2011 | Once every 10 years or upon detecting a large-scale land collapse or other change | To be continued | 3,000 ha of the Heritage Property | Changes in wide-area avalanche vegetation and tree height | |
| | | (3) Genetic diversity and spatial genetic structure of beech populations | Genetic diversity and spatial genetic structure of beech populations | To be determined | Genetic structures of vegetation and beech forests seen in diverse topographical features of Takakuramori | 2004 to 2005 | Completed | Completed | Takakuramori | Analysis of genetic diversity and spatial genetic structure of beech populations | |
| | 2 Impact on beech forests, etc. | (1) Forest noxious insects and damage status | Damage *from Syntypistis punctatella* and *Venusia phasma*, occurrence of Japanese oak wilt, pine wilt, etc. | Forestry | Forestry patrol by staff members (Survey of damaged trees) | From 2012 | Every year | To be continued | Heritage Property and neighboring areas of Heritage Property | Identification of forest noxious insects and weather-related damage on beech forests and trees composing beech forests, etc., such as *Quercus crispula* and *Pinus parviflora var. pentaphylla*, and integrated recording of locations of damaged trees, description of countermeasures, and information on occurrence of noxious insects | |
| | | | | Aomori | Airborne survey of forest damage by noxious insects | From 2011 | Every year | To be continued | Forests along the coast of Sea of Japan in areas from Ajigasawa-machi through Fukaura-machi | Conducting aerial survey of withered and dead trees, etc. by prefectural disaster helicopters twice a year in June and September | |
| | | | | Akita | Airborne survey of forest damage by noxious insects | From 2012 | Every year | To be continued | Forests along the coast of Sea of Japan in areas from Happo-cho through Noshiro City | Identification of damage by forest noxious insects such as Japanese oak wilt and pine wilt by prefectural disaster helicopters | |

* Implementing organizations → MOE: Ministry of the Environment, Forestry: Forestry Agency (Tohoku Regional Forest Office), Aomori: Aomori Prefecture, Akita: Akita Prefecture, Survey Committee: Beech Forest Monitoring Survey Committee, Hirosaki Univ.: Hirosaki University

Attached Table 2 List of Monitoring Survey Items (6/13)

| Monitoring objectives | Monitoring items | | Specific survey items | Implementing organization* | Survey name | Survey year | Survey frequency | Subsequent years | Survey locations | Survey items | Priority survey |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IIB | 1 Flora | (1) Flora | Present condition of rare plants, species that grow close to their distribution limits, *Satoyama* plants, invasive plants, etc. | MOE Hirosaki Univ. | Shizukagoten Vegetation Survey | 2002 to 2011, 2016 to 2017, 2021 | Every 5 years | To be continued | Shizukagoten (Northern ridge line of Mt. Mukaishirakamidake) | From 2002 to 2007, checking during patrol in the operations of Shirakami-Sanchi Natural Environment Preservation Area natural environment survey operations, etc. From 2008 to 2010, vegetation survey by staff. In 2011, Shirakami-Sanchi Natural Environment Preservation Area flora survey operations. In 2016, 2017 and 2021, joint survey operations with Hirosaki University. | |
| | | | | MOE | Natural Environment Preservation Basic Survey (Specific plant community survey) | 1978, 1988, 1997, 2011 | Once every 10 years | To be continued | Specific plant communities (23 locations) | In 2011, conducted follow-up survey in the Shirakami-Sanchi Natural Environment Preservation Area flora survey operations | |
| | | | | Aomori | Academic survey of the Shirakami-Sanchi Heritage Property Peripheral Ecosystem, etc. | 2004, 2005 | Completed | To be determined | Akaishi River area, Takakuramori and Anmon-no-Taki area, Okawa River area, Oirase River and Sazanai River area, Juniko and Shirakamidake area, Mini-Shirakami area, major flow areas of Shirakami-Sanchi, mountain peak, ridge lines | On-site survey of flora and rare plants | |
| | | | | Aomori | Survey of soil hardness and erosion condition on mountain trails of Shirakami-Sanchi | 2009 to 2011 | Completed | To be determined | Nature observation road, Anmon-no-Taki trail and beech forest walking trail, Tohoku nature trail, Juniko trail | Survey of growing condition of invasive plants (*Plantaginaceae*, etc.), survey of escaped plants (cover degree, species name), interview survey of plants having disappeared or in decline | |
| | | | | Forestry | Survey to identify actual conditions in the Shirakami-Sanchi World Heritage Property | 2001, 2009, 2010 | Once every 5-10 years | To be determined | Scheduled routes for actual conditions identification survey (established trails, designated routes, related routes) | Recording of rare plants and invasive plants (*Satoyama* vegetation) using GPS, interview survey | |

* Implementing organizations → MOE: Ministry of the Environment, Forestry: Forestry Agency (Tohoku Regional Forest Office), Aomori: Aomori Prefecture, Akita: Akita Prefecture, Survey Committee: Beech Forest Monitoring Survey Committee, Hirosaki Univ.: Hirosaki University

Attached Table 2 List of Monitoring Survey Items (7/13)

| Monitoring objectives | Monitoring items | | Specific survey items | Implementing organization* | Survey name | Survey year | Survey frequency | Subsequent years | Survey locations | Survey items | Priority survey |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IIB | 1 Flora | (2) Existing vegetation | Present condition of vegetation | MOE | Natural Environment Preservation Basic Survey (Vegetation survey) | 1981, 1985, 2012 | Once every 10 years | To be continued | Entire Heritage Property | Vegetation survey, drawing existing vegetation map | |
| | | | | MOE | Shirakami-Sanchi Natural Environment Preservation Area natural environment survey, patrolling, etc. operations | From 2001 | Every year | To be continued | Heritage Property (designated routes and surrounding areas) | Recording of plant species by patrolling officers | |
| | | | | MOE | *Cervus nippon* handling examination and other operations | From 2015 | Every year | To be continued | Heritage Property and surrounding areas | Selection of species and plant communities for monitoring, route-census survey, spot-census survey | |
| | | | | MOE, Hirosaki Univ. | Vegetation survey in Oni-no-tsubo | 2016, 2017, 2021 | To be determined | To be determined | Oni-no-tsubo (halfway up Mt. Aogatake) | Vegetation survey | |
| | | (3) Phenology of beech forest | Phenology of budding, fruition, coloring of leaves, fallen leaves, etc. | MOE | Survey of phenology of beech forests in the Shirakami-Sanchi World Heritage Property | From 2009 | Every year | To be continued | Ridge area of Mt. Kushiishi | Phenology survey of beech trees, etc. (with stationary camera) | |
| | | | | Forestry | Survey of long-term changes in virgin beech forest in the Shirakami-Sanchi World Heritage Property (reposted) | From 1998 | Every year | To be continued | Yanadaki-no-Sawa testing site, Kasuge River source area testing site | Phenology survey of beech trees, etc. (added to the survey objectives by year-round camera) | |
| | | | | Hirosaki Univ. | Meteorological observation survey in the Shirakami-Sanchi World Heritage Property and its surrounding area (reposted) | From 2006 | Every year | To be continued | Ridge area of Mt. Kushiishi, Futatsumori, Nishimeya-mura | Atmospheric temperature, survey by stationary camera (except winter seasons) | |

* Implementing organizations → MOE: Ministry of the Environment, Forestry: Forestry Agency (Tohoku Regional Forest Office), Aomori: Aomori Prefecture, Akita: Akita Prefecture, Survey Committee: Beech Forest Monitoring Survey Committee, Hirosaki Univ.: Hirosaki University

Attached Table 2 List of Monitoring Survey Items (8/13)

| Monitoring objectives | Monitoring items | | Specific survey items | Implementing organization* | Survey name | Survey year | Survey frequency | Subsequent years | Survey locations | Survey items | Priority survey |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IIB | 2 Fauna | (1) Fauna | Changes in living conditions of unique species and species approaching distribution limits of mammals, birds, reptiles, amphibians, insects and fish | Forestry | Survey to identify actual conditions in the Shirakami-Sanchi World Heritage Property (reposted) | 2001, 2009, 2010 | Once every 5-10 years | To be determined | Scheduled routes for actual conditions identification survey (established trails, designated routes, related routes) | Survey of medium- and large-sized mammals, survey of birds (recording of identified locations) | ✓ |
| | | | | Akita | Entrusted project of comprehensive measures for breeding/growing management of inland fishery resources | 2002 to 2005 | Completed | To be determined | Mase River, etc. | Fish (*Salvelinus leucomaenis*) Survey | |
| | | | | Forestry | Protected forest monitoring survey operations and assessment operations (reposted) | 2010, 2011, 2015, 2016, 2020, 2021 | Once every 5 years | To be continued | Shirakami-Sanchi forest ecosystem protected areas (Aomori and Akita Prefectures) | Fauna survey (mammals, insects) | |
| | | | | MOE | Monitoring Sites 1000 (terrestrial birds survey) | 2009 (Tengudake) 2006, 2011 (Juniko) 2007, 2012 (Dakedai) | Once every 5 years | To be continued | Tengudake, Juniko, Dakedai | Birds fixed-point survey | |
| | | | | MOE | Survey of medium- and large-sized mammals in Shirakami-Sanchi | From 2013 | Every year | To be continued | Heritage Property and its surrounding area (around 26 points) | Stationary camera survey to identify medium- and large-sized mammals | ✓ |
| | | | | Forestry | Survey of medium- and large-sized mammals in the Shirakami-Sanchi surrounding area | From 2014 | Every year | To be continued | Surrounding area (around 78 points) | Stationary camera survey to identify medium- and large-sized mammals | ✓ |

* Implementing organizations → MOE: Ministry of the Environment, Forestry: Forestry Agency (Tohoku Regional Forest Office), Aomori: Aomori Prefecture, Akita: Akita Prefecture, Survey Committee: Beech Forest Monitoring Survey Committee, Hirosaki Univ.: Hirosaki University

Attached Table 2 List of Monitoring Survey Items (9/13)

| Monitoring objectives | Monitoring items | | Specific survey items | Implementing organization* | Survey name | Survey year | Survey frequency | Subsequent years | Survey locations | Survey items | Priority survey |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IIB | 2 Fauna | (2) Living conditions of endangered species | Changes in living conditions of *Dryocopus martius*, *Aquila chrysaetos* and *Nisaetus nipalensis* | MOE | Shirakami-Sanchi Natural Environment Preservation Area *Dryocopus martius* living conditions information survey operations | 1998 to 2002, 2014 | To be determined | To be continued | Middle part of southern slope of Mt. Kushiishi, entire Heritage Property and its surrounding area (each flow area of Sazanai, Oirase, Akaishi, Nakamura, and Anmon rivers, etc.) | Confirmation of living conditions of *Dryocopus martius* (interview survey), on-site survey | ✓ |
| | | | | Forestry | Survey of living conditions of *Dryocopus martius* around Shirakami-Sanchi | 1996, 2008, 2019, 2020 | Once every 10 years | To be determined | Heritage Property and its surrounding area | Confirmation of living conditions of *Dryocopus martius* | |
| | | | | MOE | Patrol by National Wildlife Protection Area rangers | From 2006 | Every year | To be continued | Heritage Property and its surrounding area | Gathering of information by National Wildlife Protection Area rangers, etc. | |
| | | | | MOE | Shirakami-Sanchi *Aquila chrysaetos* living conditions survey operations | 2013, 2016, 2019 | Once every 3 years | To be continued | Five locations on Aomori side, four on Akita side | Survey of living conditions and reproductive rate of birds of prey, such as *Aquila chrysaetos* and *Nisaetus nipalensis* (survey continuously conducted every year since 1997 by the Aomori Golden Eagle Survey Team) | |
| | | (3) Invasive animals | Habitat status of *Cervus nippon* (habitat area, photo taking frequency, sex ratio), impact on plants and vegetation, and captivity status | Aomori | Gathering eyewitness information | From 2005 | Every year | To be continued | Surrounding area | Gathering information | |
| | | | | Akita | Gathering eyewitness information | From 2009 | Every year | To be continued | Surrounding area | Gathering information | |
| | | | | MOE | Survey of medium- and large-sized mammals in Shirakami-Sanchi (reposted) | From 2013 | Every year | To be continued | Heritage Property, surrounding area | Fixed-point survey with sensor cameras | |
| | | | | Forestry | Survey of medium- and large-sized mammals in the Shirakami-Sanchi surrounding areas (reposted) | From 2014 | Every year | To be continued | Surrounding area | Fixed-point survey with sensor cameras | |
| | | | | Aomori | *Cervus nippon* monitoring sensor camera installation program | From 2015 | Every year | To be continued | Surrounding area | Fixed-point survey with sensor cameras | |

* Implementing organizations → MOE: Ministry of the Environment, Forestry: Forestry Agency (Tohoku Regional Forest Office), Aomori: Aomori Prefecture, Akita: Akita Prefecture, Survey Committee: Beech Forest Monitoring Survey Committee, Hirosaki Univ.: Hirosaki University

Attached Table 2 List of Monitoring Survey Items (10/13)

| Monitoring objectives | Monitoring items | | Specific survey items | Implementing organization* | Survey name | Survey year | Survey frequency | Subsequent years | Survey locations | Survey items | Priority survey |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IIB | 2 Fauna | (3) Invasive animals | Habitat status of *Cervus nippon* (habitat area, photo taking frequency, sex ratio), impact on plants and vegetation, and captivity status | Others | Installation of sensor cameras | 2017 to 2020 | Once | Since 2017 | Surrounding area | Fixed-point survey with sensor cameras Project commissioned by the Agriculture, Forestry and Fisheries Research Council Conducted by the Forestry and Forest Products Research Institute | |
| | | | | Others | Eyewitness information gathering using ICT | From 2017 | To be determined | Since 2017 | Surrounding area | Gathering of eyewitness information using various mobile phone terminals Project commissioned by the Agriculture, Forestry and Fisheries Research Council Conducted by the Forestry and Forest Products Research Institute | |
| | | | | Others | Feces collection survey and analysis | 2017 to 2020 | To be determined | Since 2017 | Surrounding area | Collecting feces to identify species and sex from DNA Project commissioned by the Agriculture, Forestry and Fisheries Research Council Conducted by the Forestry and Forest Products Research Institute | |
| | | | | MOE | *Cervus nippon* handling operations | From 2015 | Every year | To be continued | Surrounding area | Light census, voice-trap survey, vegetation monitoring (route-census, spot-census) | |
| | | | | MOE | *Cervus nippon* feces identification survey | From 2016 | Every year | To be continued | Surrounding area | Collecting feces to identify species from DNA | |
| | | | | Forestry | Survey of long-term changes in virgin beech forest in the Shirakami-Sanchi World Heritage Property | From 2010 | Every year | To be continued | Heritage Properties (12 to 16 locations) | Analysis from photographed images taken for visitor (user) counter survey | |
| | | | | Akita | *Cervus nippon* habitat survey | From 2017 | Every year | To be continued | Surrounding area | Fixed-point survey with sensor cameras | |
| | | | | Aomori | Captivity based on the Category 2 Specified Wildlife Control Plan, etc. | From 2017 | Every year | To be continued | Surrounding area | The captive number of *Cervus nippon* | |
| | | (4) Impact on animals | Occurrence status of infectious diseases | Aomori, Akita | | As necessary | Every year | To be continued | Surrounding area | Collecting information on infection and spread of infectious diseases to wildlife in surrounding area | |
| | 3 Fungi | (1) Survey of distribution of fungi | Condition of soil fungus, yeast, lactobacillus, actinomycete, etc. | Akita | None | | | To be determined | Kasuge River source area, Shirakami-Sanchi foothills area | Collection and storage of yeast, lactobacillus, actinomycete, and other fungi | |
| | | | | Hirosaki Univ. | Shirakami-Sanchi mushroom information search site | Until 2020 | | To be continued | Shirakami-Sanchi | Mycoflora identification | |

* Implementing organizations → MOE: Ministry of the Environment, Forestry: Forestry Agency (Tohoku Regional Forest Office), Aomori: Aomori Prefecture, Akita: Akita Prefecture, Survey Committee: Beech Forest Monitoring Survey Committee, Hirosaki Univ.: Hirosaki University

## Attached Table 2 List of Monitoring Survey Items (11/13)

Monitoring objective III　The OUV is managed properly, taking into account changes in social conditions surrounding the Property, so that the value at the time of its inscription on the World Heritage List is not adversely affected by human use or activities and benefits regional development.

| Monitoring objectives | Monitoring items | | Specific survey items | Implementing organization* | Survey name | Survey year | Survey frequency | Subsequent years | Survey locations | Survey items | Priority survey |
|---|---|---|---|---|---|---|---|---|---|---|---|
| III | 1 Usage environment | (1) Number of visitors | Number of visitors | MOE | Survey of the number of visitors to the Shirakami-Sanchi World Heritage Property and surrounding area | From 2004 | Every year | To be continued | Nine locations on Aomori side, four on Akita side | Setting visitor counters at the entrance of walking trails | ✓ |
| | | | | Forestry | Survey of long-term changes in virgin beech forest in the Shirakami-Sanchi World Heritage Property (reposted) | From 2010 | Every year | To be continued | 13 locations on Aomori side, 3 locations on Akita side | Installing sensor cameras and identifying from images | |
| | | (2) Present status of use of major trails | Present status of use of major trails | Aomori | Survey of soil hardness and erosion condition on mountain trails of Shirakami-Sanchi | 2009 to 2011 | Once every 5 years | To be determined | Nature observation road, Anmon-no-Taki trail and beech forest walking trail, Tohoku nature trail, Juniko trail | Survey of status of use of trails | |
| | | | | Forestry | Protected forest monitoring survey operations and assessment operations (reposted) | 2010, 2011 | Once every 5-10 years | To be continued | Shirakami-Sanchi forest ecosystem protected areas (Shirakamidake) | Use dynamics survey (survey of the number of users, user actual conditions survey, taking fixed-point photographs) | |
| | | (3) User manners | Condition of guideposts, tape, paint, remaining graffiti, etc. | All | Joint patrol | | Every year | To be continued | Entire World Heritage Property | | |
| | | | | MOE, Forestry, Aomori, Akita | Patrolling by patrol officers, staff members, etc. | From 1992 | Every year | To be continued | Entire World Heritage Property | Patrolling by staff members, GSS, patrol officers of MOE, patrol officers commissioned by the Prefecture, and Shirakami-Sanchi World Heritage local patrol officers | |
| | | | | Forestry | Survey to identify actual conditions in the Shirakami-Sanchi World Heritage Property (reposted) | 2001, 2009, 2010 | Once every 5-10 years | To be determined | Scheduled routes for actual conditions identification survey (established trails, designated routes, related routes) | Installing road signs, identifying the status of remaining items left, etc. | |

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Attached Table 2 List of Monitoring Survey Items (12/13)

| Monitoring objectives | Monitoring items | | Specific survey items | Implementing organization* | Survey name | Survey year | Survey frequency | Subsequent years | Survey locations | Survey items | Priority survey |
|---|---|---|---|---|---|---|---|---|---|---|---|
| III | 2 Contribution to regional development | (1) Number of users of facilities at conservation and utilization sites, etc. | Number of users of facilities at conservation and utilization sites, etc. | Aomori, Akita, municipalities | Survey of present condition of conservation and utilization sites | From 2003 | Every year | To be continued | Akaishi River area, Takakuramori and Anmon-no-Taki area, Okawa River area, Oirase River and Sazanai River area, Juniko and Shirakamidake area, Mini-Shirakami area | Statistics of tourist visitors | |
| | | (2) Environmental education and awareness-raising | Status of environmental education and awareness-raising using World Natural Heritage | MOE | Nishimeya Elementary School integrated study | From 2008 | Every year | To be continued | Nishimeya-mura | Environmental education regarding Shirakami-Sanchi at local elementary schools | |
| | | | | MOE | Shirakami-Sanchi usage conditions survey | From 2016 | Once every 5-10 years | To be continued | World Heritage Property and its surrounding municipalities | Targeting relevant organizations in surrounding municipalities, etc., identifying the status of guides, experience and other programs working in Shirakami-Sanchi and status of learning at schools | |
| | | | | Akita | Aggregation of the number of tourists (visitors) in Shirakami-Sanchi | From 2003 | Every year | To be continued | Fujisato-machi, Happo-cho | Based on the statistics of the number of tourist visitors | |
| | 3 Social environment surrounding heritage | (1) Status of local areas | Total population, the number of employees by industry, etc. | Statistics Bureau | National census | From 1920 | Once every 5 years | 2020 | Municipalities | Analysis of regional population and depopulation, identification of actual conditions of workers by industry, mainly primary industry | ✓ |

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Attached Table 2 List of Monitoring Survey Items (13/13)

| Monitoring objectives | Monitoring items | | Specific survey items | Implementing organization* | Survey name | Survey year | Survey frequency | Subsequent years | Survey locations | Survey items | Priority survey |
|---|---|---|---|---|---|---|---|---|---|---|---|
| III | 3 Social environment surrounding heritage | (2) Folk knowledge | Hunting, status of using mountain vegetables and mushroom and the status of fishing, etc. in local areas | Others | Identification and examination of actual conditions regarding daily utilization by regional residents | To be determined | To be determined | To be determined | World Heritage Property and its surrounding municipalities | Examining the method of identifying present conditions regarding daily utilization, such as use of mountain vegetables and hunting, as well as the implementing bodies (museums, schools, etc.) | |
| | | | | Forestry | Survey of long-term changes in virgin beech forest in the Shirakami-Sanchi World Heritage Property (reposted) | From 2010 | Every year | To be continued | 13 locations on Aomori side, 3 locations on Akita side | Installing sensor cameras and identifying from images | |
| | | | | Others | The number of memberships of local hunting clubs | To be determined | To be determined | To be determined | Surrounding municipalities | Examining the method of identifying present conditions, such as interview survey, as well as implementing bodies (museums, schools, etc.) | |
| | | | | Others | Utilization status of local mountain vegetables and mushroom | To be determined | To be determined | To be determined | World Heritage Property and surrounding municipalities | Examining the method of identifying present conditions, such as interview survey, as well as implementing bodies (museums, schools, etc.) | |
| | | | | Others | The number of memberships of local fishery cooperatives | To be determined | To be determined | To be determined | Municipalities | Examining the method of identifying present conditions, such as interview survey, as well as implementing bodies (museums, schools, etc.) | |

* Implementing organizations → MOE: Ministry of the Environment, Forestry: Forestry Agency (Tohoku Regional Forest Office), Aomori: Aomori Prefecture, Akita: Akita Prefecture, Survey Committee: Beech Forest Monitoring Survey Committee, Hirosaki Univ.: Hirosaki University

Reference 1

# Outstanding Universal Value (OUV) of the Shirakami-Sanchi World Heritage Property

January 31, 2011

To be submitted to the World Heritage Committee

a. Overview

Situated in the mountains at an altitude of 200 to 1,250 m above sea level and along the Sea of Japan in northern Honshu, Shirakami-Sanchi is a wilderness area with the largest remaining virgin beech forest in East Asia. The World Heritage Property contains the remnant of the cool-temperate beech forests that covered the hills and mountain slopes of northern Japan some eight to twelve thousand years ago.

Beech forests currently distributed across Europe, East Asia and North America are thought to have originated from circumpolar vegetation prior to the last glacial period. As the beech forests shifted their distribution from the circumpolar region to the south in the last glacial period, the southward shift was blocked by mountainous areas stretching east to west, resulting in simplified vegetation represented by many of the current beech forests. On the other hand, the beech forests in the Shirakami-Sanchi contain many elements of Tertiary Peri-Arctic flora, since vegetation originating in the circumpolar region, including beech, which retreated to southern Japan during the glacial period without being blocked in its southern migration, has re-expanded its distribution since the late glacial period.

Reflecting the distinct heavy-snow environment of the inland areas along the Sea of Japan, a rare climatic condition in the world, Shirakami-Sanchi has forests of monodominant *Fagus crenata*, a species endemic to Japan. A unique plant community with diverse flora, including undergrowth dominated by evergreen *Sasa kurilensis* has been formed.

Shirakami-Sanchi is also a habitat for rare bird species such as the black woodpecker (*Dryocopus martius*), and large mammals such as the Japanese serow (*Capricornis crispus*) and Japanese black bear (*Ursus thibetanus japonicus*), which requires a diverse forest environment including old-growth forest. These and other species are all interacting as functional elements of the ecosystem of the climax beech forest.

b. Attestation of satisfying the selection criteria

Criterion (ix) (Ecosystem)

Shirakami-Sanchi is a virtually undisturbed, pristine climax forest dominated by Fagus that escaped simplification of vegetation during the earths' glacial stages by shifting its distribution towards the south. Its extent is the largest in East Asia, one of

the distributional ranges where Fagus is dominant in the cool-temperate forests of the northern hemisphere. Its forest ecosystem reflects the history of global climate changes and the heavy-snow environment, and is an outstanding example of ongoing processes in the development and succession of communities of plants together with the animals that depend on them.

Shirakami-Sanchi is thus very important for studies on terrestrial cool-temperate ecology, particularly on Eurasian beech forest ecosystem processes, and for long-term monitoring of climate and vegetation changes.

c. Integrity

The Property contains a large pristine, non-fragmented beech forest. Many of Japan's beech forests were replaced in the past by planted forests, such as of cedar plantations. However, the topography of the Property is generally steep and this has preserved a pristine environment that has been virtually unaffected by human activities. The Property includes all the elements necessary to maintain the ecosystem function of the beech forest. The Property has an area of 16,971 ha, which is of an adequate size to ensure the long-term existence of the beech forest ecosystem.

e. Protection and management requirements

The entire expanse of the Property consists of national forests owned and managed by the national government. The Property is designated by law as Shirakami-Sanchi Nature Conservation Area, Tsugaru Quasi-National Park and other National Parks, Shirakami-Sanchi National Wildlife Protection Area and Shirakami-Sanchi Forest Ecosystem Reserve. The laws and systems to grant these statuses are designed to preserve Japan’s outstanding natural environment and impose strict legal regulations on development and other activities. In addition, to provide legal protection, the Japanese serow is designated as a Special Natural Monument, while the golden eagle, mountain hawk-eagle and black woodpecker are designated as National Endangered Species of Wild Fauna and Flora and/or Natural Monuments. The Ministry of the Environment, the Forestry Agency and the Agency for Cultural Affairs, which enforce the respective systems, jointly formulated the Shirakami-Sanchi World Heritage Property Management Plan. In line with the plan, the Property is managed in an integrated manner so as to facilitate smooth management of these areas and species, which have been designated for protection by different levels of governments. Local offices of the competent ministries and relevant local governments have established the Regional Liaison Committee for Shirakami-Sanchi World Heritage Property to promote conservation management of the Property through coordination and

collaboration with the local community. They have also established the Scientific Committee for Shirakami-Sanchi World Heritage Property, comprised of academic experts, to promote the adaptive conservation management of the Property.

Based on the conservation status survey by IUCN (1997), new member organizations joined the Regional Liaison Committee. Currently, municipalities are also involved in discussions and are playing a role in the management of the Property, including information dissemination, awareness raising, user guidance, and facility maintenance.

Reference 2

# Charter of the Scientific Committee for Shirakami-Sanchi World Heritage Property

(Purpose)

Article 1 A Scientific Committee for Shirakami-Sanchi World Heritage Property, comprising academic experts, shall be established with the aim of understanding the natural environment of the Shirakami Mountains (Shirakami-Sanchi), which are inscribed on the World Natural Heritage List, and advise the Regional Liaison Committee for Shirakami-Sanchi World Heritage Property on adaptive management as required, based on scientific data.

(Issues to be considered)

Article 2 The Scientific Committee shall consider the following issues as required:

(1) Issues relating to conservation management of the Shirakami-Sanchi World Heritage Property

(2) Issues relating to survey, research and monitoring for (1) above

(3) Other issues necessary to achieve the purpose

(Membership)

Article 3 The Scientific Committee shall comprise the following members, secretariat and observers:

(1) Members

Academic experts

(2) Secretariat

Administrative bodies stipulated in Article 6

(3) Observers

Any other person involved in conservation management

(Members)

Article 4

1 The members of the Scientific Committee shall be appointed by the head of the Directorate of the Secretariat from among academic experts.

2 The term of office of the committee members shall be three years. However, reappointment shall not be precluded.

3 In the event committee members are replaced or their number increases, the term of office shall be the same as the remaining term of office of other committee members.

(Operation)

Article 5

1 The Chair of the Committee shall convene and conduct the proceedings.

2 The Vice-Chair shall assist the Chair in the proceedings.

3 The Chair and Vice-Chair shall be elected by the committee members from among themselves.

4 The Chair may request academic experts other than committee members to attend committee meetings as required.

5 The Committee may establish subcommittees or working groups under the Committee to further its consideration of important issues.

6 Meetings of the Committee shall be open to the public as a general rule, but may be closed to the public at the discretion of the Chair.

(Secretariat)

Article 6 The secretariat of the Committee shall comprise the Tohoku Regional Environmental Office of the Ministry of the Environment, the Tohoku Regional Forest Office of the Forestry Agency, the Aomori Office of the Forestry Agency Tohoku Regional Forest Office, Aomori Prefecture, Akita Prefecture, the Aomori Prefectural Board of Education, and the Akita Prefectural Board of Education. Directors of the secretariat shall rotate between the Tohoku Regional Environmental Office of the Ministry of the Environment and the Tohoku Regional Forest Office of the Forestry Agency.

(Others)

Article 7

1. The Committee shall advise the Regional Liaison Committee for Shirakami-Sanchi World Heritage Property to facilitate the proper management of the World Heritage Property.
2. Issues not specified above and necessary for the Committee's operation shall be set forth separately.

(Supplementary provisions)

1 This charter shall take effect on June 1, 2010.

2 Revised on December 13, 2010.

Reference 3

# The 2nd Evaluation Results of the Shirakami-Sanchi World Heritage Property Monitoring Survey ( I　1/2 )

| Monitoring objectives | Monitoring items | | | | Specific survey items | Risks/precursory phenomena that could undermine the value of the natural heritage [Evaluation criteria] | 1st Evaluation (FY 2016) | 2nd Evaluation (FY 2022) |
|---|---|---|---|---|---|---|---|---|
| | Major classification | | Minor classification | | | | | |
| **I. The basic environmental conditions for meteorological, hydrological and terrestrial phenomena that sustain the beech forest are identified.** | 1 | Meteorological conditions | (1) | Meteorological information in the World Heritage Property and surrounding area | Atmospheric temperature, precipitation, amount of snow, wind direction/velocity, humidity, solar radiation, etc. | Meteorological conditions change to a degree that may threaten the ecosystem, etc. of Shirakami-Sanchi, due to a rise in atmospheric temperature, frequent heavy rain and strong wind, less snow, etc. [There have been no reports of figures significantly exceeding average-year values due to abnormal weather, etc.] | ・ At present, there has not been abnormal weather that may threaten the ecosystem of Shirakami-Sanchi and thus no figures that significantly exceed the average-year values have been reported. Therefore, there is no issue. | ・ At present, there has not been abnormal weather that may threaten the ecosystem of Shirakami-Sanchi and thus no figures that significantly exceed the average-year values have been reported. Therefore, there is no issue. |
| | | | (2) | Forest micrometeorology | Atmospheric temperature, ground temperature, forest humidity, maximum snow depth | | | |
| | 2 | Hydrological conditions | (1) | Water quality and flow rate of major rivers | Water quality (pH, turbidity, nutritive salts, chemical substances, etc.), flow rate | Hydrological conditions change to a degree that may threaten the river ecosystem of Shirakami-Sanchi, due to changes in water quality and flow rate. | ・ At present, there have been no reports on any changes in hydrological conditions that may threaten the river ecosystem of Shirakami-Sanchi due to changes in water quality and flow rate. So, there is no problem. | ・ At present, there have been no reports on any changes in hydrological conditions that may threaten the river ecosystem of Shirakami-Sanchi due to changes in water quality and flow rate. So, there is no problem. |

Reference 3

The 2nd Evaluation Results of the Shirakami-Sanchi World Heritage Property Monitoring Survey ( I　2/2 )

| Monitoring objectives | Monitoring items: Major classification | | Monitoring items: Minor classification | | Specific survey items | Risks/precursory phenomena that could undermine the value of the natural heritage [Evaluation criteria] | 1st Evaluation (FY 2016) | 2nd Evaluation (FY 2022) |
|---|---|---|---|---|---|---|---|---|
| **I. The basic environmental conditions for meteorological, hydrological and terrestrial phenomena that sustain the beech forest are identified.** | 3 | Geological conditions, etc. | (1) | (1) Topographical features | Broad-area topographical map and the status of changes in collapsed land | Geographical conditions, etc. change to a degree that may threaten the ecosystem of Shirakami-Sanchi, due to occurrence of land collapse/landslide, decrease in avalanche vegetation areas, changes in alpine vegetation area/wetland area, etc.<br>[Among large-scale land collapse and landslide cases, no significant natural disturbance that may affect the ecosystem has been reported.] | ・ Among large-scale land collapse and landslide cases, no significant natural disturbance that may affect the ecosystem has been reported over the past five years. So, there is no problem.<br>・ Identification of avalanche vegetation attributed to topographical features of Shirakami-Sanchi is insufficient because no laser observation and aerial photography have been conducted since 2011.<br>・ Although changes in alpine vegetation have been pointed out, they are considered unrelated to terrestrial conditions, etc. | ・ Among large-scale land collapse and landslide cases, no significant natural disturbance that may affect the ecosystem has been reported over the past five years. So, there is no problem. |
| | | | (2) | Identification of ground surface coverage and unusual topographical features of the entire area | Present condition of forest, shrubland grassland, collapsed land, development areas (roads, dams), etc. | | | |
| | 4 | Others | (1) | Radiation level | Status of radioactive substances | | ・ Monitoring posts at observation sites near Shirakami-Sanchi show no particularly high values. Therefore, there is no issue regarding radiation levels. | ・ Monitoring posts at observation sites near Shirakami-Sanchi show no particularly high values. Therefore, there is no issue regarding radiation levels. |
| | | | (2) | Agricultural chemicals | Status of use of agricultural chemicals | | ・ No agricultural chemicals are used in Shirakami-Sanchi. Therefore, there is no issue. | ・ NSC agent (carbam) is used to fumigate trees to exteminate oak wilt in the Heritage Property by an application method avoiding any spreading of chemical agents. |

Reference 3

# The 2nd Evaluation Results of the Shirakami-Sanchi World Heritage Property Monitoring Survey ( IIA )

| Monitoring objectives | Monitoring items | | | | Specific survey items | Risks/precursory phenomena that could undermine the value of the natural heritage [Evaluation criteria] | 1st Evaluation (FY 2016) | 2nd Evaluation (FY 2022) |
|---|---|---|---|---|---|---|---|---|
| | Major classification | | Minor classification | | | | | |
| **II A. Pristine beech forests are maintained in a healthy condition over a wide area.** | 1 | Forest structure of beech forests, etc. | (1) | Identification of changes in forests at fixed sites | Changes in individual beech growth, hierarchical structure, understory vegetation, production amount (net production, seed production, etc.) | Significant change is observed in the status of growth of beech forest, renewal conditions of beech forest, beech distribution areas, hierarchical structure, number of beech trees growing (difference between the number of withered and promoted trees respectively) and production volume (net production, seed production, etc.).<br>[No continuous and significant change has been reported with regard to growth of beech trees in the marginal part of the beech distribution area.] | ・ At present, no significant changes with respect to forest structure have been observed. It is therefore considered that pristine beech forests are maintained. However, there are some points of concern, such as fewer good harvest years recently. A further monitoring survey should be conducted. | ・ Since 2016, the beech seed production in 2018 was second only to that in 2000. Given the change over an extended period since 1999, the interval of good harvest years has become longer which is a matter of concern and an ongoing survey is needed taking fruition interval and volume per elevation into consideration. |
| | | | (2) | Areawide changes in forests | Changes in forest physiognomy and vegetation | | | |
| | | | (3) | Genetic diversity and spatial genetic structure of beech populations | Genetic diversity and spatial genetic structure of beech populations | | | |
| | 2 | Impact on beech forests, etc. | (1) | Forest noxious insects and damage status | Damage from *Syntypistis punctatella* and *Venusia phasma*, occurrence of Japanese oak wilt, pine wilt, etc. | A substantial decrease in major trees constituting beech forests is observed due to occurrence/expansion of damage from noxious insects and meteorological damage.<br>[There has been no significant damage from noxious insects in the surrounding area nor has any damage been discovered in areas where host tree species are densely growing.] | ・ At present, no rapid negative impact of damage from noxious insects has been identified. However, damage from geometrid and other pests occurred in beech forests while oak wilt and pine wilt occurred on peripheral forest land. Continuous attention needs to be paid. | ・ Damage caused by the oak wilt has expanded in the areas surrounding the Heritage Property. In the Heritage Property, seven damaged trees were confirmed in buffer areas. A continuous monitoring survey, removal and other countermeasures are needed. |

Reference 3

The 2nd Evaluation Results of the Shirakami-Sanchi World Heritage Property Monitoring Survey ( IIB 1/4 )

| Monitoring objectives | Monitoring items: Major classification | | Monitoring items: Minor classification | | Specific survey items | Risks/precursory phenomena that could undermine the value of the natural heritage [Evaluation criteria] | 1st Evaluation (FY 2016) | 2nd Evaluation (FY 2022) |
|---|---|---|---|---|---|---|---|---|
| **II B. Diverse flora and fauna in the beech forest are adequately preserved.** | 1 | Flora | (1) | Flora | Present condition of vegetation, rare plants, species that grow close to their distribution limits, *Satoyama* plants, invasive plants, etc. | Significant changes are confirmed in the plant distribution area, such as disappearance of rare plants, entry and settlement of invasive species associated with utilization, as well as the regular appearance of such phenomena.<br>[Invasive plants have not settled in the growing area of existing vegetation.] | ・ No decrease in rare plants has been reported.<br>・ At present, entry of invasive species has been observed along the mountain entry route. However, no significant impact on existing vegetation has been observed. | ・ Regarding the growing conditions of rare plants, change, etc. are recognized in *Pinus pumila* communities. Since decrease in snow periods, phenological change and other various factors are considered to be involved, careful and ongoing observations are needed.<br>・ Eight invasive plant species were confirmed along the mountain entry route. *Plantaginaceae* (domestic invasive species) was confirmed more than ten years ago and have been widely distributed. At present, no significant impact on existing vegetation by invasive species has been observed, but a continuous monitoring survey of the status should be conducted. |
| | | | (2) | Existing vegetation | Present condition of vegetation | | | |
| | | | (3) | Phenology of beech forest | Phenology of budding, fruition, coloring of leaves, fallen leaves, etc. | The phenology has changed significantly due to climate change with the continuous appearance of several phenomena. | ・ At present, no significant changes have been observed in phenology. | ・ Survey results show trends of early beech budding and magnolia flowering as well as delayed fallen beech leaves between 2010 and 2020. Given the lack of any clear trend for snow days, snowmelt day and the number of snow days in a longer span, a continuous monitoring survey of the status should be conducted. |

Reference 3

# The 2nd Evaluation Results of the Shirakami-Sanchi World Heritage Property Monitoring Survey ( IIB 2/4 )

| Monitoring objectives | Monitoring items: Major classification | | Monitoring items: Minor classification | | Specific survey items | Risks/precursory phenomena that could undermine the value of the natural heritage [Evaluation criteria] | 1st Evaluation (FY 2016) | 2nd Evaluation (FY 2022) |
|---|---|---|---|---|---|---|---|---|
| **II B. Diverse flora and fauna in the beech forest are adequately preserved.** | 2 | Fauna | (1) | Fauna | Changes in the living conditions of unique species of mammals, birds, reptiles, amphibians, insects and fish | Irrecoverable changes are observed in keystone species and umbrella species (decrease in the populations of *Ursus thibetanus* and *Capricornis crispus,* animals representing the beech forest of the relevant area, decrease in population and reproductive rate of rare birds (in particular, *Aquila chrysaetos, Dryocopus martius, Histrionicus historionicus*, among others)).<br>[No significant change has been observed in the population of large mammals. The reproductive rate of birds of prey has not declined continuously.] | ・ Although no significant change is seen in the number of large mammals, intrusion of *Cervus nippon* is a concern.<br>・ As for birds, the reproduction rate of *Aquila chrysaetos* has declined. However, the reproduction rate of *Aquila chrysaetos* has been declining not only in Shirakami-Sanchi. It seems to be a tendency across the entire Tohoku Region or across Japan. Since the present condition of *Dryocopus martius* has not been fully understood, a further monitoring survey of the reproductive status should be conducted.<br>・ Distribution of *Sus scrofa* has been expanding in the Tohoku Region. A further study of their living conditions should be conducted. | ・ There is no tendency of significant change in habitat status of large mammals (*Cervus nippon* is mentioned later).<br>・ As for birds, the reproduction rate of *Aquila chrysaetos* has been recovering compared with the previous monitoring evaluation. Since 2014, habitats of *Dryocopus martius* has not been confirmed and their decline is concerned. Continuous monitoring survey of the status should be conducted.<br>・ Sensor camera took photos of *Sus scrofa* three times in 2017 and 4 times in 2020. Continuous monitoring of their living conditions should be conducted. |
| | | | (2) | Living conditions of endangered species | Changes in the living conditions of *Dryocopus martius*, *Aquila chrysaetos* and *Nisaetus nipalensis* | | | |

Reference 3

# The 2nd Evaluation Results of the Shirakami-Sanchi World Heritage Property Monitoring Survey ( IIB 3/4 )

| Monitoring objectives | Monitoring items: Major classification | | Monitoring items: Minor classification | | Specific survey items | Risks/precursory phenomena that could undermine the value of the natural heritage [Evaluation criteria] | 1st Evaluation (FY 2016) | 2nd Evaluation (FY 2022) |
|---|---|---|---|---|---|---|---|---|
| **II B. Diverse flora and fauna in the beech forest are adequately preserved.** | 2 | Fauna | (3) | Invasive animals | Habitats of *Cervus nippon* | Deterioration and simplification of vegetation are observed associated with the invasion of *Cervus nippon* into the Heritage Property.<br>**[There have been no reports on living and settlement of *Cervus nippon* in municipalities around the Heritage Property.]** | ・ Eyewitness reports of *Cervus nippon* have been increasing in the municipalities around the Heritage Property. Females have also been witnessed, indicating partial settlement. Eyewitness cases have been reported within the Heritage Property but no trace of any settlement was found. However, eyewitness reports have been steadily increasing over the past several years, so attention is required.<br>・ Thus, giving the rising probability of a settlement of *Cervus nippon* in the Heritage Property, specific actions should be urgently taken in preparation for their settlement and reproduction. | ・ In the Heritage Property surrounding areas, censor camera captured *Cervus nippon* across a wide area and the number of witnesses has shifted in a certain range over the last five years. In 2020, their habitats in the winter season and photos of females were also confirmed. There is the possibility of settlement.<br>・ In the Heritage Property, a photo of one male was taken in a buffer area in 2015. Since 2016, photos of three males were taken in buffer and core areas but no trace of any settlement was found. During the vegetation survey, etc., food marks were confirmed, although no vegetation decline at a community level was confirmed.<br>・ A continuous monitoring survey on the invasion and settlement status of *Cervus nippon* and their impact on vegetation, etc. should be conducted as well as specific preparation and a response should be made for these statuses. |
| | | | (4) | Impact on animals | Occurrence status of infectious diseases | | ・ At present, there have been no reports of any impact on animals. | ・ At present, there have been no reports of any impact on animals. |

Reference 3

# The 2nd Evaluation Results of the Shirakami-Sanchi World Heritage Property Monitoring Survey ( IIB 4/4 )

| Monitoring objectives | Monitoring items | | | | Specific survey items | Risks/precursory phenomena that could undermine the value of the natural heritage [Evaluation criteria] | 1st Evaluation (FY 2016) | 2nd Evaluation (FY 2022) |
|---|---|---|---|---|---|---|---|---|
| | Major classification | | Minor classification | | | | | |
| **II B. Diverse flora and fauna in the beech forest are adequately preserved.** | 3 | Fungi | (1) | Survey on distribution of fungi | Condition of soil fungus, yeast, lactobacillus, actinomycete, etc. | Irreversible changes are observed in the environment, such as changes in the composition of soil fungus due to acid precipitation and changes in the composition of specific fungi due to climate change. | ・ At present, there have been no reports on irreversible environmental changes, such as changes in the composition of soil fungus due to acid precipitation and changes in composition of specific fungi due to climate change. | ・ At present, there have been no reports on irreversible environmental changes, such as changes in the composition of soil fungus due to acid precipitation and changes in composition of specific fungi due to climate change. |

Reference 3

# The 2nd Evaluation Results of the Shirakami-Sanchi World Heritage Property Monitoring Survey ( III 1/3 )

| Monitoring objectives | Monitoring items | | | | Specific survey items | Risks/precursory phenomena that could undermine the value of the natural heritage [Evaluation criteria] | 1st Evaluation (FY 2016) | 2nd Evaluation (FY 2022) |
|---|---|---|---|---|---|---|---|---|
| | Major classification | | Minor classification | | | | | |
| **III. The OUV is managed properly, taking into account changes in social conditions surrounding the Property, so that the value at the time of its inscription on the World Heritage List is not adversely affected by human use or activities and benefits regional development.** | 1 | Usage environment | (1) | Number of visitors | Number of visitors | Significant alterations of the ecosystems by humans and decline in heritage preservation awareness are observed, such as expansion of mountain trails, contamination of river water and frequent and varying illegal acts (damaging trees, collecting plants, fishing in mountain streams, making fires).<br>**[No malicious illegal acts or violation of manners nor any rapid increase in the number of users have been reported.]** | ・No rapid increase has been observed in malicious illegal acts/violation of manners or the number of users. It can be assumed that no significant alterations by humans, such as expansion of mountain trails, contamination of river water and frequent and varying illegal acts, are occurring. Careful attention should be paid to fishing, which is likely to have a direct impact on fish in the streams, as well as making fires and leaving trash along the mountain trails. | ・According to a survey via a visitor counter, the total number of visitors has shifted from 20,000 to 40,000 over a few years, but been overall in decline since 2005 (80,000 visitors).<br>・In terms of illegal acts/violation of manners, making fires and fishing are declining, but the incidence of trash bumping have been confirmed. Awareness-raising should be continuously promoted.<br>・A decline in the number of users can also be observed in facilities at conservation and utilization sites、etc. As well as protecting and ensuring the succession of the OUV as a World Heritage feature, the scope to contribute to regional development, taking the social conditions of surrounding areas into consideration, should be examined. |
| | | | (2) | Present status of use of major trails | Present status of use of major trails | | | |
| | | | (3) | User manners | Condition of guideposts, tape, paint, remaining graffiti, etc., status of environmental education and awareness-raising | | | |

Reference 3

# The 2nd Evaluation Results of the Shirakami-Sanchi World Heritage Property Monitoring Survey ( III 2/3 )

| Monitoring objectives | Monitoring items: Major classification | | Monitoring items: Minor classification | | Specific survey items | Risks/precursory phenomena that could undermine the value of the natural heritage [Evaluation criteria] | 1st Evaluation (FY 2016) | 2nd Evaluation (FY 2022) |
|---|---|---|---|---|---|---|---|---|
| **III. The OUV is managed properly, taking into account changes in social conditions surrounding the Property, so that the value at the time of its inscription on the World Heritage List is not adversely affected by human use or activities and benefits regional development.** | 2 | Contribution to regional development | (1) | Number of users of facilities at conservation and utilization sites, etc. | Number of users of facilities at conservation and utilization sites, etc. | Facilities at conservation and utilization sites are not utilized, nor have any initiatives to raise the heritage value, such as the awareness-raising activities, been implemented. **[No decline has been seen in the number of users of facilities at conservation and utilization sites, the number of awareness-raising activities related to heritage value and the number of environmental education activities]** | ・ The involvement of local residents is indispensable to ensure the sustainability of the Heritage Property while keeping in mind the status of Shirakami-Sanchi for local residents. Its utilization as an educational resource in connection with local human resources development in the fields of nature, history and culture must also be kept in mind. | ・ There is a concern of shrinking the effect of awareness-raising due to a declining tendency of the number of users of facilities at conservation and utilization sites, etc. measures should be examined including the regional development perspective.<br>・ Local elementary and junior high schools are making considerable efforts in the area of environmental education, which is commendable. In future, as well as ongoing such efforts, a means of enhancing the contents should be examined.<br>・ The involvement of local residents is indispensable to ensure the sustainability of the Heritage Property while keeping in mind the status of Shirakami-Sanchi for local residents. Its utilization must be considered an educational resource in connection with local human resources development in the fields of nature, history and culture. |
| | | | (2) | Environmental education and awareness-raising | Status of environmental education and awareness-raising using World Natural Heritage | | | |

Reference 3

# The 2nd Evaluation Results of the Shirakami-Sanchi World Heritage Property Monitoring Survey ( III 3/3 )

| Monitoring objectives | Monitoring items | | | | Specific survey items | Risks/precursory phenomena that could undermine the value of the natural heritage [Evaluation criteria] | 1st Evaluation (FY 2016) | 2nd Evaluation (FY 2022) |
|---|---|---|---|---|---|---|---|---|
| | Major classification | | Minor classification | | | | | |
| **III. The OUV is managed properly, taking into account changes in social conditions surrounding the Property, so that the value at the time of its inscription on the World Heritage List is not adversely affected by human use or activities and benefits regional development.** | 3 | Social environment surrounding the Heritage Property | (1) | Status of local areas | Total population, depopulation, population by industry | There is a risk of the folk knowledge declining, such as the use of mountain vegetables and hunting. | ・ The currently set survey items are for general statistical data. It is difficult to judge from these figures whether there is a risk of folk knowledge, such as the use of mountain vegetables and hunting, disappearing.<br>・ Although not directly related to the value within the Heritage Property, it is desirable to provide a complementary explanation concerning the actual status of use by local residents in areas around the Heritage Property and its historical changes. | ・ The currently set survey items are for general statistical data including demographics. It is difficult to judge from these figures whether there is a risk of folk knowledge, such as the use of mountain vegetables and hunting, disappearing.<br>・ Although not directly related to the value within the Heritage Property, it is desirable to provide a complementary explanation concerning the actual status of use by local residents in areas around the Heritage Property and its historical changes. |