<u>Template for GIAHS proposal</u> Globally Important Agricultural Heritage Systems (GIAHS) Initiative

SUMMARY INFORMATION

Name/Title of the Agricultural Heritage System

Sado's satoyama in harmony with Japanese crested ibis

Requesting Agency/Organization: Sado City

Cooperating Organizations:

- (1) Ministry of Agriculture, Forestry, and Fisheries (MAFF),
- (2) United Nations University Institute for Sustainability and Peace (UNU-ISP), United Nations University-Institute of Advanced Studies, Operating Unit Ishikawa/Kanaz awa (UNU-IAS OUIK),
- (3) Niigata Prefecture,
- (4) Niigata University (Framework Agreement with Sado City),
- (5) Tokyo University of Agriculture(Framework Agreement with Sado City),
- (6) Sado Agricultural Cooperative,
- (7) Hamochi Agricultural Cooperative

Country/location/site (please annex maps and descriptions of loca tion):

Sado City, Niigata, Japan

Sado Island, one island, one city,

located 40km northwest off the coast of Niigata,

located on the Sea of Japan side, Japan

Sado Niigata

Accessibility of the site

2 hours from Tokyo to Niigata by bullet train65 minutes from Niigata to Sado by high-speed boat, 2.5 hours by car ferry

Approximate Surface Area: 855km²

Agro-Ecological Zone/s: Paddy field zone in temperate area

Topographic features: Island

Climate Type: Temperate

Approximate Population: 64,000 (28,000 farmers)

Main Source of Livelihoods: Agriculture, tourism

Ethnicity/Indigenous population: N/A

Traversed by two mountain ranges with a broad plain in the middle, the Sado Island located off the shore of Niigata Prefecture is characterized by a variety of landforms and altitudes, which have been ingeniously harnessed to create the *satoyama* landscape, a dynamic mosaic of various socio-ecological systems comprising secondary woodlands, plantations, grasslands, paddy fields, wetlands, irrigation ponds and canals. These exist in close proximity and interdependence with the marine-coastal ecosystems of *satoumi* landscapes, comprised of seashore, rocky shore, tidal flats and seaweed/eelgrass beds¹.

With their ecosystem complexity, the satoyama and the satoumi landscapes in Sado Island harbor a variety of agricultural biodiversity, such as rice, beans, vegetables, potatoes, soba, fruit, grown in paddy fields and other fields, livestock, wild plants and mushrooms in forests, and many seafood in the coastal areas. Rice, beef and persimmon from the Sado are among the best in Japan. The satoyama in Sado was also the last habitat of the wild Japanese crested ibis, a culturally valued bird in Japan that feeds on paddy fields and roost on the tall trees. The history of rice cultivation and other agricultural practices in Sado can be traced back to the Yavoi period, 1700 years ago. Over the centuries, a diversified landscape has been produced and maintained by the communities inhabiting the island, that have developed locally adapted practices for resource use and management. For example, ingenious water management practices with over 1000 irrigation ponds to cope with a scarcity of water resources coupled with rapid drainage of rainwater into the sea, while creating a rich local culture of rice farming, such as Kuruma Rice Planting listed as national important intangible cultural heritage. Pressures on food production during the gold rush of the Edo period (1603-1868) led to the development of rice terraces on hill slopes, which contribute to the landscape's aesthetic appeal as well as to the feeding ground of Japanese crested ibis.

After a period of systematic promotion of conventional agriculture in Sado similar to the rest of Japan, the island is witnessing a revival of traditional practices, catalyzed by its efforts to reintroduce the crested ibis to the wild. Traditional ecological knowledge associated with *satoyama* is being combined with applications of modern technology and governmental policy to restore the mosaic of ecosystems on which the ibis depends for its survival while promoting environmentally-sound agricultural practices. Communities on the island are collaborating with researchers and governments in exploring further measures towards a more sustainable agriculture.

DESCRIPTION OF THE AGRICULTURE HERITAGE SYSTEM I. Characteristics of the proposed GIAHS

Global (or national) importance

Traversed by two mountain ranges with a broad plain in the middle, the Sado Island located 40km off the shore of Niigata Prefecture is characterized by a variety of landforms and altitudes, which have been ingeniously harnessed to create the *satoyama* landscape, a dynamic mosaic of various socio-ecological systems comprising secondary woodlands, plantations, grasslands, paddy and upland fields, wetlands, irrigation ponds and canals. These exist in close proximity and interdependence with the marine-coastal ecosystems of *satoumi* landscapes, comprised of seashore, rocky shore, tidal flats and seaweed/eelgrass beds². In general, the wood-lands, grasslands as well as upland fields are distributed on the sloping areas while the paddy fields, wetlands, streams and ponds are located in the valley bottoms or flat areas. The village settlements are concentrated at the foot of the hills and mountains or in the transition areas between paddy fields and mixed forests.

Satoyama provide a variety of ecosystem services to meet the rural livelihoods and needs. In the past, woodlands provided villagers with the forest litters as fertilizer to the paddy fields, the wild plants and mushroom as food, the timber for buildings and the firewood for cooking and heating. Grasslands feed horses and

¹ As defined by the Japan Satoyama Satoumi Assessment (JSSA, October 2010)

² ibid.

cattle, which provided main draft power for farming while grass was also harvested for roof thatching. Streams and ponds were managed to irrigate the paddy fields and to produce fish. The paddy fields and upland fields produce rice and vegetables to ensure food security. Rice cultivation over centuries has also created rich culture, including Kuruma Rice Planting listed as national important intangible cultural heritage, and Shinto ritual for rice planting and harvesting. On the other hand, the *Satoyama* landscapes offer mosaics of varied biotope for high biodiversity, both domestic (crops and livestock) and wild species. Among its diversity of agricultural crops and livestock, rice, beef and persimmon of Sado are well known for their quality in Japan.

Distinguishably, Sado''s *satoyama* offered the ideal habitat combination for the endangered Japanese crested ibis, which depends on varied landscape for its survival. The ibis culturally valued in Japan feeds on small fish like loaches, insects like grasshoppers, worms, small river crabs and frogs that are easily available in paddy fields and nearby creeks (Photo 1). Furthermore, it always feeds in places where trees are present so that it can have an extensive view of the area and take a rest. It prefers tall trees like pines and *quercus serrata* that can command a good view for resting, roosting, and nesting. Only *satoyama* with paddy fields and woodlands meet these conditions of the ibis habitat in Japan. Unfortunately, the ibis was brought to the verge of extinction by excessive hunting and degradation of its habitat-the



Photo 1. Ibis feeds on paddy fields harvested

traditional *satoyama*, including loss of food due to wetland conversion as a result of land improvement measures, and due to agricultural chemicals, loss of resting and roosting places due to under-use and under-management of the forests and rice terraces in the *satoyama* landscapes.

Being the last habitat of the wild Japanese crested ibis, various efforts of the public and private sectors have been made to bring the ibis back in the wild in Sado Island³. Traditional and new agricultural practices that conserve and enhance biodiversity, including minimal inputs of agricultural chemicals and fertilizer and holistic management of ecosystems at the landscape level are being adopted to rebuild the *satoyama* landscape that the ibis can depend on for its survival. The ibis friendly agriculture helps add value to agricultural products through certification and payment for environmental services, enhancement of tourism attractions, and revitalization of local economy.

As the ibis is on the near top of the ecosystem food web (Figure 1), the ibis stands as a symbol for biodiversity conservation in Sado, but also for the predicament of Japanese and global biodiversity as a whole in the face of conventional agriculture. Sado upholds the aims of the *Satoyama* Initiative, which was established under the overarching goal of "harmonious coexistence between humans and nature" under Japan's 21st Century Environmental Nation Strategy (2007). In 1994, when the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF) initiated its national committee for promoting environmentally sound agricultural practices, Sado Island gained recognition as a pioneer of changing agricultural practices towards agriculture that is more sustainable. Thus, it can be considered representative of *satoyama* sites in Japan that draw on traditional knowledge while adopting innovation in response to changing physical and socio-economic contexts.

At the global level, Sado is important for more than just its endemic and endangered species and its unique socio-cultural traditions. In the context of a shift from a conservation paradigm that fences off protected areas to approaches that integrate development goals with community participation, and a closer focus on biodiversity conservation and sustainable use in human-influenced landscapes, Sado offers a model for human activity that has the potential to sustain and even enhance biodiversity by integrating agriculture with biodiversity management. It also demonstrates that locally adapted practices can play an important role in maintaining and enhancing habitats that are the product of centuries-long selective human intervention and modification. Finally, in the face of rapid decline in habitat loss and species diversity, the experience of Sado offers both a promise

³ In fact, the last 7 birds of the crested ibis living in the wild in the world were found in remote forest valleys of Yang County, China where traditional farming continued without use of machinery and agrochemicals, and the ibis was believed to be auspicious and protected by local people.

that with commitment and participation from a variety of stakeholders these negative trends can be reversed, and a lesson that powerful, cultural, emotional symbols can be used to catalyze change in the way we conceive our relationships with nature. The implementation of the Sado GIAHS initiative will offer an excellent model through which many of the post-2010 period targets of CBD can be achieved.



Figure 1. Food web of Sado, ibis on the top level

1. Food and livelihood security

Sado is an island in the Sea of Japan, north off to Niigata Prefecture. It has over 1,000m-mountains, a hilly mountainous area, and an agricultural plain, where a variety of food can be produced. Rice, beans, vegetables, potatoes, soba, fruit, harvested from paddy fields and other fields, dairy products, wild plants and mushrooms from forests, and a variety of seafood, support the food supply and economy on Sado (Table 1). The agricultural output of rice is about 8 billion yen, that of fruit is 1.5 billion yen, and that of the livestock products is 0.6 billion yen. Sado exports a variety of farm products such as rice, persimmon, and seafood. Over one third of its citizens is engaged in agriculture to practice "locally produce locally consume". This makes the self-sufficiency rate quite high at 187% (Table 2).

Table 1. Planted acreage (ha)								
ranking	1995	2005						
1	Paddy rice, 7917	Paddy rice, 6700						
2	Persimmon, 589	Persimmon, 548						
3	Feed, 325	Soy bean, 254						
4	Soy bean, 248	Soba, 249						
5	Japanese radish, 112	Feed, 246						
6	Adzuki bean, 105	Japanese radish, 99						
7	Soba, 89	Potato, 77						
8	Potato, 84	Adzuki bean, 62						
9	Eggplant, 38	Eggplant, 35						
10	Sweet potato, 37	Sweet potato, 28						
		Watermelon, 28						

Tabel 2. Sell sufficiency rate per capita (%, weight-o	ased)
Rice	754
Fruits	335
Fish	337
Mushrooms	92
Vegetables	109
Milk	115

Tabel 2. Self sufficiency rate per capita (%, weight-based)

Note: Self-sufficiency rate on Sado, 187% (calorie-based)

2. Biodiversity and ecosystem function

Biodiversity

Sado has a unique terrain of 1,000 m-mountains and 400 to 600 m-hilly areas, with the plain in between, and a marine climate due to the location in a cool-temperate zone in the Sea of Japan (Figure 2). The characteristic of a warm-temperate zone with a warm ocean current has generated the diversity of agriculture systems and food production. Due to the geographical and climatic conditions, southern strains and northern strains of plants are distributed in a complex way. What makes Sado distinguished from mainland Japan is its perpendicular distribution of plants. At a place of lower altitude, alpine flora or subalpine flora of the mainland can be observed. The cause is not yet known. 37 critically endangered species of plants have been registered. In particular, as endemic species seen only on Sado, *R. cirrhosa* is protected.

Sado is home to mammals like the Sado Mole (*Mogera tokudae*) and the Sado Hare, which are sub-endemic species to Sado. The Sado Hare is on the verge of extinction because of the influence of nonnative martens. Among birds living on Sado, the Japanese crested ibis is the most famous. Sado is used as a passageway for migratory birds, and cranes, white-fronted geese, and mallards, as well as storks have been identified in recent years.

Agrodiversity

On Sado, a variety of agricultural products suited to a complicated climate have been produced. Agriculture is a key source of livelihoods, centered on rice cultivation in stretching from terraced to plain paddy fields. Vegetables, fruit, and flowers are also produced in small quantities, harnessing the environments suitable for a variety of products.

Local brand products include "Sado Rice" among the most expensive rice varieties in Japan, "Okesa Persimmon", "Sado Beef," mainly grown on the island. A variety of horticulture products are also produced such as apples, pears, figs, and strawberries, and flowers and bulbs mainly in the dune land. The farm stand "Fureai" which sells products direct and food such as "Ampo Persimmon" processed by women are also well known. Due to impacts of climate change on agricultural production, apples and mandarin oranges characterized as cold climate crops and warm climate crops respectively, can now be produced on Sado while the production of mandarin oranges had not been possible until 10 years ago.



Figure 2. Sado geographical sketch

3. Knowledge systems and adapted technologies

As paddy fields are the main feeding grounds for the Japanese crested ibis, environmentally friendly agriculture has been practiced throughout the island in order to bring back the bird into the wild. Sado City has been studied the technologies, based on traditional knowledge, that nurture small living creatures, such as loaches and worms, to be fed by the ibis live and propagate in and around rice paddies. These technologies help enrich small animals and fish for the Japanese crested ibis to feed on. The rice cultivation technology practiced in the past in some area has been reintroduced into the entire island. Three technologies are highlighted as follows:

"E" technology

In the hilly and mountainous areas, a ditch called "E" was created around the paddy fields when irrigation channels were made in the past. In "E," water always remained as a safe haven for aquatic organisms and biotope, as well as a perfect feeding ground for the crested ibis. At present, paddy fields are drained for about a week in summer, a production technique called "nakaboshi", to improve the quality of rice. During this period, "E" becomes a shelter for aquatic creatures as food source for ibis. Also, the Japanese crested ibis does not like paddy fields covered by tall rice plants in summer. As a result, "E" was important as a feeding ground for the bird. Restoring "E" which is dug 20-30cm around paddy fields is being promoted. Especially, "E" on the side of water outlet would be effective to provide a habitat for loaches and tadpoles and ultimately enhance biodiversity conservation. "E" in winter can serve as a spawning ground for montane brown frogs.



Photo 2. E



Figure 3. Cross-section of E

Winter flooding

Due to the agricultural water shortage in the past, soil puddling was conducted from autumn to winter, and paddy fields were filled with water during winter to save water for rice planting in spring. This is called as winter flooding (Photo 3). Flooded paddy fields can function as a habitat for aquatic creatures to survive through winter and as a feeding ground for the Japanese crested ibis during the snowy season. Winter flooding can dramatically increase midge larvae (*tubifex*) which helps make soil ooze, so that seeds of weeds will sink into the soil and kill weed seeds, resulting in herbicidal effect. Midge larvae can be also be food of aquatic organisms supporting biodiversity.



Photo 3. Winter flooding

Reduction of agricultural chemicals

Because of the development of gold and silver mining⁴, there was a time when the demand of agricultural products was not met, so importance has been attached to the development of terraced fields and preservation of farmlands. The reduction of agricultural chemicals, as well as the custom of not spraying herbicide on the ridges between rice fields in order to preserve farmlands has been passed down from generation to generation. It is very unusual that in 99% of the farmlands, herbicide is not used on the ridges and agricultural roads.

At a certain point during the post-war period, the use of agricultural chemicals increased on Sado. However, the awareness of sustainable agriculture was raised through the preservation activities for the Japanese crested ibis. The rise in awareness of food safety among consumers has led to rice cultivation with low use of agricultural chemicals throughout the area.

4. Cultures, value systems and social organizations (Agri-Culture)

Agricultural production organizations

Many of Sado farmers are small-scale. Agriculture has been practiced collectively in villages and cooperatives were established in each village to manage agricultural water and agricultural roads. This cooperative agricultural management has been passed down. On the other hand, farmers of paddy fields which underwent a large scale improvement project are formulating a large-scale cooperative system, including "The Measures to Conserve and Improve Land, Water, and Environment" for the management of agricultural facilities. The cooperation system, in accordance with the community, size, and modality, is the driving force of maintaining agriculture on the island.

Traditional culture developed from agriculture

The history of Sado is closely related to the history of gold mining. During the height of gold mining in the Edo period, one hundred thousand people lived in Aikawa Village. With the increased population, rice was distributed at a price three times higher than that on the mainland. This resulted in the development of terraced rice paddies in the hilly and mountainous areas of the island. The terraced fields developed in those days have provided a feeding ground for the Japanese crested ibis and ensured a rich village life, creating various cultural customs through shrine rituals concerning agriculture. At present, the succession of traditional culture is at stake due to the decreasing and aging population, and the preservation of culture is required as part of biodiversity preservation activities.

Traditional farming method and customs

Kuruma Rice Planting

Kuruma Rice Planting is a traditional way of rice planting in which rice is planted in a circle around a seedling in the center. It is the custom practiced at the end of rice planting in the largest paddy field of an old-established family. It is a very important example of an old agricultural customs and designated as National important intangible cultural heritage (Photo 4).

Ritual Shinto performance at the Hakusan Shrine

Photo 4. Kuruma Rice Planting

This is a ritual Shinto performance to wish for (pre-celebrate) a good harvest practiced at the Hakusan Shrine. The agricultural work from making a bed for rice seedlings to planting is enacted at the outer shrine.

Ritual Shinto performance of rice planting at the Gosho Shrine

This is a ritual Shinto performance to pray for a successful rice harvest in the coming year practiced at the Gosho Shrine by enacting rice planting at the shrine. This ritual is passed down exclusively to the eldest son of the selected shrine parishioner by succession and kept secret from other families. It is held annually at 3 p.m. on the sixth of February, and practiced in seven separate ceremonies. Women are prohibited from entering the precinct in the afternoon on this occasion.

⁴ On Sado, silver was also produced in large quantities. Therefore, it is sometimes referred to as "gold and silver mines." In this document, it is referred to as "gold mine." Sado City is promoting agriculture that pays full attention to "food production" and "preservation of biodiversity," by combining the above mentioned knowledge and technologies.

5. Remarkable landscapes, land and water resources management features

Remarkable landscapes

Sado preserves its natural environment and many *satoyama* where people and nature live in harmony. It preserves secondary natural areas managed through human activities such as terraced fields developed to increase food production (Photo 5), It also preserves beautiful pristine landscapes (Photo 7) such as beautiful primeval forests preserved in a harsh natural environment (Photo 6). In recent years, because of the ongoing depopulation and aging population, maintenance and management of agricultural land and forests are getting difficult. Efforts, however, are being made toward the creation of a beautiful island in cooperation with biodiversity preservation activities that nurture the Japanese crested ibis.

Photo5.

Terraced fields that have sustained Gold Mines and ibis



Photo 6. Primeval forest preserved by people and culture



Photo 7. Gregarious sweetroots

Land and water control

Sado is an island with a small basin and no big rivers. In ancient times it suffered water shortages. Therefore, over 1,000 irrigation ponds of various sizes were made throughout the island, (Photo 8). Even in the Showa period, water shortage continued. At the same time, the Kuninaka Plain was frequently flooded whenever there was intense rainfall. Because of these, large scale dams such as the Ogura Dam (Photo 9) were constructed as part of the National Land Development Project to secure water, while drainage pumping stations were built in areas downstream to prevent flooding. The farmland was developed as well, resulting in great improvement in agricultural production infrastructure and efficient agriculture.

It is imperative to continue efficient and sustainable agriculture to preserve irrigation ponds, creeks, and rice fields which serve as feeding grounds for the Japanese crested ibis. "The Measures to Conserve and Improve Land, Water, and Environment," to manage and maintain agricultural facilities such as irrigation canals, and to create and develop biotope, are being taken in 75 districts of 5,000 ha, by farmers as well as whole communities.



Photo 8. Scattered irrigation ponds



8

Photo 9. Ogura Dam

II. Other social and cultural characteristics pertinent to the management of the agricultural system (optional)

Many traditional cultural customs were developed from agricultural rituals, supported by the local economy which was prospering from gold and silver mining and these rituals have been passed down to the present. These traditional customs were declining, due to depopulation, a dwindling birthrate and the aging population, but in recent years their value has been seen in the limelight again, and they a re being restored through exchanges between people in cities. The efforts in releasing the Japanese cre sted ibis back into the wild have brought about the high-valued added agricultural products and the re vitalization of settlement communities, and they are also very effective in conserving traditions.

Noh play

Noh plays started not as entertainment for ordinary people, but as prayers for safety in the gold mines. Because of this, it has been conserved by farmers as an agricultural custom, such as prayers for a good harvest. At present one-third of the Noh theaters in Japan remain on Sado. The conservation activities have become very active and the Noh culture, including a torchlight performance (Photo 10), has been restored. Zeami, the famous Sarugaku artist who in the early Muromachi period perfected Sarugaku (present Noh play) with his father, Kanami, was banished to Sado. However, Noh became very popular in the Edo period, with the development of gold mining, and it came to be performed in various parts of the island.

Oni-daiko (Oni Drum)

This started in the Edo period, and over 100 conservation groups are still active on Sado (Photo 11). It is performed at festivals held in various parts of Sado, and is used for praying for a good harvest, a good catch, the safety of one's family, and for driving evil spirits away. A spring festival is held before rice planting to pray for a good harvest. An autumn festival is held to thank the gods for the harvest.

Hanagasa Dance

The dance is offered at the annual celebration of Kuji Hachimangu to console holy spirits and to pray for a good harvest. Dancers are exclusively made up of 14 or 15 girls or boys.



Photo 10. Noh play



Photo 11. Oni-daiko

III. Historic relevance

Paddy agriculture passed down as agricultural assets

On Sado, the remains of agriculture and rice cultivation are found in the Chigusa Remains. During the Ritsuryo era (the eighth century) Jyori paddy fields, or compartment paddy fields (about 1,350 ha), were developed.

In the Edo period (1603-1868), Sado was under direct control of the Tokugawa Shogunate. But during the next 100 years, the area of paddy fields increased about 1.6 times from about 5,000 ha to about 8,000 ha, due to the population explosion. With the development of gold mining, over one hundred thousand people came to the island, and the demand for rice increased, resulting in the expansion of new paddy fields. Ogura Senmaida (meaning thousands) terraced fields (Photo 12) were developed in this era, and as many as 1,165 irrigation ponds were made as a water source for the newly developed paddy fields. These agricultural assets centering on paddy fields have been passed down through history to the present day. These terraced fields and irrigation

ponds not only formed unique landscapes, but also played a role in preserving biodiversity. They became the habitat of Japan's last remaining Japanese crested ibis, and through their release back into the wild, it aims to formulate the Japanese method of restoring species, environment, and biodiversity.



Photo 12. Ogura Senmaida terraced fields

History of gold mining and technology of draining agricultural water

In the the Edo period, gold was mined underground below sea level, and ground water posed a big problem. "Suishorin" technologies (Figure 4) were adopted to pump up and drain groundwater. These technologies are the Archimedes pump called the "Ryubisha" in China, and which was later introduced to Japan via China. They were utilized in transporting water from rivers and irrigation ponds to paddy fields developed in hilly and mountainous areas.

In the Kuninaka Plain, the drainage measures for the Kono River started to be taken, and the "Waju (circle levee)" was formed to develop farmlands. Even in the modern era, the creation of irrigation ponds has continued, and land was reclaimed in Nakaoki Plateau, Yoshii, and Shukunegi. Because of the small drainage basin, the shortage of water sources was a great problem on the island. In the Showa period, various projects for water source development and drainage measures were introduced, and modern agriculture was realized.



Figure 4. Suishorin of Sado gold mining

IV. Contemporary relevance

Toward the end of 2010 International Year of Biodiversity, we have witnessed the momentum that a new era of living in harmony arose and new global alliance to protect life on earth was established.

Satoyama gained international recognition at the 10th meeting of the Conference of the Parties to the Convention on Biological Diversity (COP10 Nagoya) when the "the International Partnership for the Satoyama Initiative (IPSI)", jointly developed and proposed by the Ministry of the Environment of Japan and UNU-IAS, was adopted in a decision on the Sustainable Use of Biodiversity at COP10 Nagoya and globally recognized "as a potentially useful tool to better understand and support human-influenced natural environments for the benefit of biodiversity and human well-being". Under the Satoyama Initiative, Japan is reaching across borders to communities around the globe to work together to enhance understanding and raise awareness of the impor-

tance of socio-ecological production landscapes for livelihoods and to support the cultural heritage and diversity of socio-ecological production landscapes globally.

Aichi Target is another important outcome of the COP10 Nagoya. The Strategic Plan of the Convention on Biological Diversity or the "Aichi Target" is organized under five strategic goals that address the underlying causes of biodiversity loss, reduce the pressures on biodiversity, safeguard biodiversity at all levels, enhance the benefits provided by biodiversity, and provide for capacity-building, with consensus of a substantial increase in the level of financial resources. The "Aichi Target" will be the overarching framework on biodiversity not only for such biodiversity-related conventions, but for the entire United Nations system. Parties agreed to translate this overarching international framework into national biodiversity strategy and action plans within two years.

These aforementioned global efforts will get more linked with policy at national and local levels. These international efforts to promote Aichi Target and IPSI will support national policy such as Japan's 21st Century Environmental Nation Strategy (2007). Sado upholds the aims of the IPSI, which was established under the overarching goal of "harmonious coexistence between humans and nature" under the Strategy, including the design of physical and social infrastructure for the conservation and sustainable use of socio-ecological landscapes and their biodiversity.

Securing and preserving biodiversity is called for nationwide in agriculture. "The Protection and Propagation Project for the Japanese Crested Ibis (Ministry of Environment, Ministry of Agriculture, Forestry and Fisheries, and Ministry of Land, Infrastructure and Transport)" in 2002 also called for the improvement of habitat environment, including preservation of feeding grounds in paddy fields and agricultural ditches. It is noted that, Sado Island gained recognition as a pioneer of changing agricultural practices towards agriculture that is more sustainable in 1994 when the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF) initiated its national committee for promoting environmentally sound agricultural practices.

As a pioneer to practice sustainable agriculture, it is hoped to develop "Sado model", as an environmentally friendly island, in cooperation with the government and prefecture. It is highly expected that Sado model by integrating the agricultural biodiversity preservation system with the ibis-friendly farming system is driven, with GIAHS recognition, to be established and disseminated from the island to be applied to other regions and beyond the country.

The Japanese crested ibis is a symbolic creature of nature restoration. Most large avian species including the Japanese crested ibis are umbrella species and constitute a part of the food chain system (Figure 1). Rice paddies play an important role in biodiversity conservation as they and marsh areas serve as feeding grounds of various living organisms. Accordingly, it is needed to secure the continuity of agricultural production activities and entail farming entails feeding environment of the ibis as well as biodiversity. In addition, the understanding of the relation between biodiversity of paddy fields and rice cultivation should be commonly shared among consumers and farmers. To this end, Sado City has actively disseminated the concept, the significance of paddy fields and agriculture through the preservation and restoration activities for prized species, in cooperation with other areas beyond prefecture level: Toyooka City in Hyogo prefecture to preserve storks, and Osaki City in Miyagi prefecture, to preserve white-fronted geese.

This Sado's experience is expected to ultimately contribute to Japan's 21st Century Environmental Nation Strategy by overcoming sustainable development challenges such as water, land and biodiversity conservation as well as food security. Realization of a low-carbon society by Sado imitative is also expected to make a contribution to the national strategy. In fact, Sado City laid down the Environment Basic Ordinance in 2005 and plans to formulate the Sado Biodiversity Economic Strategy and the Sado Biodiversity Local Strategy in 2011. These efforts of the City can be widely disseminated as a successful model of "the Economics of Ecosystems & Biodiversity (TEEB)" and international platform.

V. Threats and challenges

Sado faces challenges at crossroads. The aging and decreasing the population in agriculture has resulted in the abandonment of terraced fields (because of difficult arable conditions), the loss of marshes connected to forests and irrigation ponds, as well as the deterioration in biodiversity and inhabiting environment for large avian species.

It is concerned that at operational level, the decrease of farming population will lead to a decline in collective agrarian functions to support sustainable agricultural system as well as a loss of diversity. The decrease of farming population has also generated part-time farmers those who cannot spare enough time and labor on farm work. This has also invited the situation that such farmers depend on agricultural chemicals and fertilizers in producing agricultural products within manageable labor. As a result, the management of paddy fields that serve as feeding grounds for the crested ibis is becoming more challenging. Not only that, another challenge is falling market price due to overproduction and sluggish tourism, which is not economically sustainable. Accordingly, the population of the island has decreased by about 1,000 people per year.

In order to overcome such challenges, Sado City has made efforts to revitalize local agriculture and tourism through promotion of the ibis-friendly farming based on traditional *satoyama*. This ibis-friendly farming has been successful in adding value to agriculture products through certificate such as the ibis rice as well as promoting tourism in linkage with ibis restoration. As ibis near top of food web, restoration of ibis is needed to promote biodiversity conservation on the whole island. A series of collaborative efforts of public and private sectors have been made to support this ibis friendly farming and restoration of the bird.

VI. Practical considerations

Ongoing efforts to promote GIAHS

With support of national government, MOE, and MAFF, the city has launched ibis friendly farming to rebuild *satoyama* for revitalization of local economy through the value addition and for restoration of ibis which is cherished for generations in Japan. Certification of the ibis friendly farming has been expanding, with significant reduction of chemical inputs in agriculture and restoration of traditional technology such as "E" technology today, several ibis has been released to wild since 2008. Marketing of the brand rice named "ibis rice" has been quite successful in increasing farmers" income.

Potentials and opportunities for sustainability and management of GIAHS

Governments at local and national levels have committed to restore ibis and restore *satoyama* and they recognize the potentials to work with GIAHS in the direction of the restoration. One example is that Sado City plans to formulate the Sado Biodiversity Economic Strategy and the Sado Biodiversity Local Strategy in 2011, building on the Environment Basic Ordinance in 2005. As a national strategy, Japan's 21st Century Environmental Nation Strategy was established in 2007 and the GIAHS objectives are very much in line with overarching goal of "harmonious coexistence between humans and nature" of this strategy.

Expected impact of GIAHS on society and ecology

This GIAHS initiative will further strengthen local identity and pride as well as improve local livelihoods through adding values to products of GIAHS and enhance biodiversity. With success of the ibis farming certificate, it is expected that GIAHS recognition will further boost the branding of ibis-satoyama rice and other agriculture products from Sado. In terms of livelihoods, GIAHS designation is expected to raise the branding of ibis rice and other products and tourism of Sado in the face of depopulation. This will help revitalize local economy. In terms of ecology, the GIAHS initiative will be built on on-going efforts of ibis restoration to further expand the coverage of land where ibis friendly farming is practiced. It will also enhance biodiversity and ecosystem services on the whole island. Outcomes of GIAHS initiative with all relevant stakeholders will develop a Sado model, as a good practice, to promote living in harmony with nature including the Japanese crested ibis.

Motivation of the local community, the local/national authorities and other relevant stakeholders

Local communities expect GIAHS to help raise branding and market price of agriculture products in Sado and it is expected to contribute to local economy. Local/national governments aim to contribute to achieve Aichi Target and CBD. In this regard, GIAHS is taken as an important means to reach the goal. Local governments also take it a way to revitalize the island economy. Japanese and local stakeholders are interested in exchanges of approaches and viewpoints to adaptive management of agriculture heritage systems with international partners.

Furthermore, cooperation with CSR activities of companies is expected and cooperation among universities and local communities is enhanced for field work of academic research. It will help development of payment for environmental services, revitalization of relationship between people, economy and environment as common keywords. Other stakeholders and local people love ibis and desire to support the ibis restoration, and they recognize through exchanges and collaboration between urban and rural societies.

VII. DYNAMIC CONSERVATION PLAN FOR GIAHS SELECTED SITE

Sado City has started "the ibis-friendly farming method" and a certification system for creation of the homeland of the Japanese crested ibis to rebuild the *satoyama* for local economy and biodiversity. These measures are well familiarized in the area. The efforts are being made to promulgate the understanding of the branding of Sado rice, expansion of the feeding grounds of the Japanese crested ibis, and an integration of biodiversity preservation and agricultural production. For ibis friendly agriculture, Sado City aims to reduce agricultural chemicals and chemical fertilizers throughout the island. A 30% reduction was realized in 2010, and it is expected that a 50% reduction will be realized in 2012. Sado aims to settle 60 Japanese crested ibises in the eastern part of the Kosado area by 2015.

Certification for the homeland to live with the Japanese crested ibis

It is one of important certification programs ibis-friendly farming. All of the following conditions should be met in order to be certified as an ibis-friendly farming method in the following points:

- (1) The ibis-friendly farming method should be practiced to secure marsh areas in paddy fields and to also secure a habitat for other living creatures
 - (a) Creation of "E" and conventional technologies like winter flooding (see page 6, Photo 2, Figure 3)
 - (b) Creation of fish passes⁵ (Photo 13)
 - (c) Creation of biotope⁶ and connections with paddy fields (Photo 14)
- (2) Certification of an eco-farmer
- (3) Reduction of agricultural chemicals and chemical fertilizers by over 50% from the local standards
- (4) Implementation of "bio-assessment" twice a year



Photo 13. Fish passes



Photo 14. Biotope

It is important to inform public about safety and security of agricultural products through the preservation of the Japanese crested ibis, and the value of revitalization of ecosystem such as frogs and loaches that paddy fields nurture. Sado rice has come to well recognized nationwide, since 2008, to estab-

lish a local brand. The model of agriculture that preserves sustainable agriculture and biodiversity throughout the entire area, as well as the promotion and branding of agricultural produce are being disseminated nationwide in order to establish payment system for the environment accompanying consumers" purchase of agricultural products.

The rice grown with the "ibis-friendly" farming is sold as certified rice and a high value is added as brand rice (Photo 15). The rice was sold at a price 140-200 yen per kg higher than regular price, supporting a good sale. Linkage between consumers" support of rice cultivation and biodiversity conservation is clarified and shared through the donation scheme, namely one yen per 1kg sale is donated to the Crested Ibis Preservation Fund in Sado City. This system supports the sales of high



Photo 15. Ibis-friendly" farming certified rice

⁵ Fish passes in paddy fields (Photo 13): In areas where a large-scale paddy development was conducted, a fish pass is made to preserve the condition in which loaches and other creatures can move from a creek to paddy fields.

⁶ Biotope (Photo 14): By connecting a biotope and paddy fields with a creek or fish pass, a habitat for creatures is secured when paddy fields are drained.

price rice and also helps people understand widely the relationship between "eating" and "food production and environment preservation" as a key message from Sado. The sale of rice at a higher price has motivated farmers to practice the "ibis-friendly farming method, and has increased affection for the Japanese crested. As a result, the ibis-friendly farming has spread rapidly throughout the area as 20 % of the rice planted area on Sado has been practiced by the farming. The acreage of farmland under the certification system rose from 460 ha (2008) to 1,200 ha (2010), supporting good sales of rice, and at the same time, feeding grounds for the Japanese crested ibis are steadily increasing through the expansion of the ibis-friendly farming method, as a cycle process of sustainable environment restoration and agricultural production. It brings Sado to ranks first in Japan in terms of the acreage of winter flooding, the acreage of "E", and the extent of bio-assessment.

This has helped to change farmers" awareness. The preservation of the environment does not mean sacrifice or volunteer work, but the environment can be preserved through the new system of agriculture with payment for environmental service. This compatibility of environmental and economic activities is one feature of the symbiosis between people and the Japanese crested ibis, which was created on Sado.

Environmental education

The city is also committed to environmental education in the communities, farmland and water preservation activities, as well as human resource development. Regular bio-assessment day is organized to raise public awareness of biodiversity. "The Sado Kids Bio-Assessment Team" is formed by elementary school students and "The Environment Citizen's College" is held for citizens to learn about agriculture, and the environment that nurtures the Japanese crested ibis (Photo 16).





Photo 16. Exchange program with city people (left), bio assessment & rice planting (right)

Technology development and human resource development

In cooperation with the government (Ministry of Agriculture, Forestry and Fisheries, and Ministry of Education), the prefecture and the university, the ibis-friendly farming method is being monitored with the GIS system in order to evaluate its effects and examine future environment restoration methods. In collaboration with the Sado Nature Restoration Research Center at Niigata University, human resources that support and spread the practice of the ibis-friendly farming method are being developed.

Multi-stakeholder participation

The creation of an island where people can cohabitate along with the Japanese crested ibis has led to the revitalization of the area. Through the acceptance of the corporate social responsibility (CSR) activities from companies that support these activities, and further expansion of exchange with urban dwellers, Sado City will disseminate the value of multifaceted functions of agriculture, and the need for a reservation system.

In order to protect feeding grounds, the activities for protecting abandoned fields and terraced fields were started, and many biotopes were created with the participation of city people and students. The terraced field ownership system was started in cooperation between local residents and urban dwellers, resulting in the development of activities for re-developing abandoned fields and protecting local land-scapes. Notably, the Ogura Senmaida, terraced rice paddies which are falling into a state of disrepair, are restored through the ownership-system and an ongoing exchange of activities with city dwellers (Photo 17). The participation of young people like urban dwellers and students in the activities has contributed to maintaining the formation of the settlement.



Photo 17. Ownership system by non-farmers

In some cases, endangered species have been found in the course of spreading and maintaining biotopes in the hilly and mountainous area through the activities for protecting the Japanese crested ibis. A Red Data Book for Sado (field guide to animals) is planned to be published in the future in order to research biodiversity and to secure preservation.

Promotion of agriculture on Sado

In the future the method of restoring ecosystems that attaches importance to the relations among paddy fields, forests and rivers should be clarified on Sado. The agricultural production system that operates with *satoyama* and biodiversity preservation is planned. The environmental economy will be urged to be revitalized by branding agricultural and marine products through the cooperative system between forest restoration (tree thinning and the production of chips from thinned wood) and mushroom production, as well as a cooperative system between grassland conservation and the stock-raising industry (branding dairy products like milk, cheese, and butter). These efforts intend to revitalize the agricultural system that attaches importance to the preservation of biodiversity on Sado.

Reference:

The declaration of bio-assessment day

Sado City specifies the second Sunday in June and the first Sunday in August as a "Bio-Assessment Day," a day set aside to practice it.

The declaration of bio-assessment day

We have promoted the development of the island where people and the Japanese crested ibis can live together, in cooperation with the government, industry and academia under the national project of releasing the Japanese crested ibis back into the wild. The attempts to restore the environment where the once extinct Japanese crested ibis can live again, is an endeavor to face squarely with the crisis of biodiversity, and to restore the Japanese crested ibis, the large avian species, by nurturing small creatures, leading to the restoration of biodiversity, which is drawing global attention.

This also means to restore the natural environment through human efforts, which was lost due to the human desire to seek affluence at any cost. The mission of Sado, which the wild Japanese crested ibis chose as last habitat, is to develop a rich island where people live in harmony with nature.

We hereby declare that we set the second Sunday in June and the first Sunday in August as "Bio-Assessment Day," and that we accomplish the settlement of the Japanese crested ibis in the wild, and bring to fruition the realization of a society where people can live in harmony with nature.

June 13, 2010 Koichiro Takano, Mayor of Sado City

SUGGESTED ANNEXES:

• location map of the system/site



• location map of land and water resource managements and environmental conservation activities



Location map of land and water resource managements and environmental consevation activities

• lists of agricultural biodiversity and associated List of agricultural biodiversity

分類 class	品 目 items	品種名 variety name	学名 scientific name	備 考 remarks
*	うるち米	コシヒカリ	Oryza sativa	
Rice	Nice	こしいぶき	Oryza sativa	
		ゆきの精	Oryza sativa	
		ひとめぼれ	Oryza sativa	
		越路早生	Oryza sativa	
		あきたこまち	Oryza sativa	
		トドロキワセ	Oryza sativa	
	醸造用米	五百万石	Oryza sativa	
	Rice for Brew	越淡麗	Oryza sativa	
		たかね錦	Oryza sativa	
	もち米	こがねもち	Oryza sativa	
	glutinous Rice	わたぼうし	Oryza sativa	
穀物類	小麦 ^{W/L+}		Triticum	
grain	wheat 六条大麦		Hordeum vulgare	
	そば	信濃1号	Fagopyrum esculentum	
	とうもろこし	ゴールド	Zea mays	
豆類	大豆		Glycine max	
leguminous	soybean, soya bean 小豆		- Vigna angularis	
	azuki bean, adzuki bean 落花生		Arachis hypogaea	
	えだまめ	サヤムスメ	Givcine max	
	green soy beans	茶マメ	Giveine max	
	青さやいんげん			
	snow pea pea さやえんどう		Picum satiyum	
	Pea そらまめ		Vicia faha	
 お茶	broad bean			
Tea plant 田中的照音	茶 	ヤフキタ茶	Camellia sinensis (L.) Kuntze	
朱美的野采	strawberry	越後姫	Fragaria	
Fruits and Vegetables	Watermelon	祭ばやし	Citrullus lanatu	
	·	スリーセブン	Citrullus lanatu	
	メロン Muskmelon	アールスマイト、	Cucumis melo	
		アンデス5号、	Cucumis melo	
		グランドール4号	Cucumis melo	
果菜類	さゆつり Cucumber	シャープ	Cucumis sativus	
Fruits and Vegetables		フリーダム	Cucumis sativus	
	トマト tomato	桃太郎	Solanum lycopersicum	
		あいこ	Solanum lycopersicum	
		ミニキャロル	Solanum lycopersicum	
		レッドオーレ	Solanum lycopersicum	
	なす Eggplant	千両2号	Solanum melongena	
		中長ナス	Solanum melongena	
	. 0	水ナス	Solanum melongena	
	ビーマン bell pepper	京みどり	Capsicum annuum	
		京波	Capsicum annuum	
	かぼちゃ Pumpkin	えびす	Cucurbita moschata	
		ぼっちゃん	Cucurbita moschata	
		小菊	Cucurbita moschata	

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		ごぼう edible burdock	滝野川	Arctium lappa	
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fuil tree. Usage 10 (split B) 27 (SC 40 horvy Wild Onerry or Sweet Dirary 佐藤協 Paras avium ・ ・	果樹	びわ	田中びわ	Eriobotrva japonica	
市地のLing of Sheet Chainy 市砂 Punus avium 1北レオン Punus avium 1北レオン Punus avium 1山中島 Amygdalus persica 川中島 Amygdalus persica 東金桃 Amygdalus persica 東金桃 Amygdalus persica 大田県 東田 東金桃 Amygdalus persica 大田県 Punus salicina アUm YUNダム Punus asilcina Punus salicina フが 山田市 Punus salicina YUme Bassiti Punus mume Yume Bassiti Punus mume Yume Quartica vernata Punus prifolia T=tus Purus prifolia Punus prifolia Factu Multica punila Multica punila Aport Sitti persimon Multica punila Jubit Jubits punila Auto punila Jubit Multica punila Multica punila Aport Sitti persimon Multica punila Jubit Multica punila Multica punila	fruit tree.	(Japanese) Loqual おうとう(さくらんぼ) Wild Charmy or Swoot Charmy	佐藤錦	Prunus avium	
サージレンクション ウレルのよっいののののののののののののののののののののののののののののののののののの		wild Cherry or Sweet Cherry	高砂	Prunus avium	
も見 Peech日風 川中島 Anygdalus persica Anygdalus persica Anygdalus persica var. nectarina日風 川中島 Anygdalus persica Anygdalus persica var. nectarina水子ウジン Anygdalus persica var. nectarina寒明 冬崎 NectarineNectarineアは アuin大石甲生 アunus salicinaPunus salicinaブジ リロー防ろか 勝瓦Punus mumeブジ リロー小レグム 中田 中田 中田 第Punus mume1日東なし 中田 日東なし 中田 Nash Pear, Sand Pear月沢 東水 東水 中国 中国 中国 東水Para persica PartificiaPerfecture Perfecture Appleデボ トレングチエ シレングチエPyrus pyrifolia新聞 新聞 シロー シロー シローPyrus pyrifoliaFig Tere 人peir<			ナポレオン	Prunus avium	
Feadure 川中島 Anygadus persica 東全桃 和gath Anygadus persica 東ウリン 発明 Noctarine オmygdalus persica var. nectarina 芳峰 Noctarine アunus salicina 万峰 Noctarine Pulm ソルダム Prunus salicina フmu 藤五郎 Prunus mume フmu 市田町 Prunus mume マリ 月京 Castanea crenata 日本なし 二十世紀 Prus prifolia 日本なし 「レレクチエ Prus prifolia 日本なし 「レレクチエ Prus communic うたじ Malus pumila Sus pumila 「日本 Wash presimenon 「いうさない Malus pumila 「いちじて、 「な米種 Dossyros kali 「いちじて、 「な米種 Dossyros kali			白鳳	Amygdalus persica	
大クラリン Anygdalus persica var. nectarina黄金桃 怒明Anygdalus persicaすもも Puin多峰Nectarineすもも Puin大石早生Prunus salicinaうめ Ume原五郎Prunus salicinaうめ Ume原五郎Punus muneとのうめPunus mune(り) Japanese Chestnut Nashi Pear, Sand Pear月沢Castanea crenata日本ない Nashi Pear, Sand Pearタrus pyrifolia第五Prus pyrifolia日本ない Nashi Pear, Sand Pear新五アear (Europan Pear) Appleグバシ ンレクチエりたこ クロジ シレジ シレジ アuniaPrus communisうがく のがし あたい あたい シレジ シレジ ド リングPrus communisシレンクチエ アuniaアina Malus pumilaたい 和ext Rate Persimon Ligit veおけた術(平核無)りのspyros kaki ビオレ・ソリエスFicus carica		Feach	川中島	Amygdalus persica	
ネクタリン Amygdalus persia var. nectarina 教明 Nectarine 芳峰 Nectarine ブもも Pulm 大石早生 Prunus salicina ブリバダム Prunus mume 山me 通のうめ リロne 月沢 ローナなじ 月沢 Nabil Pear: Sand Pear 月沢 レンクチェ Prus pyrifola 日本なじ ウrus pyrifola 日本なじ サrus pyrifola 日本なじ シャル pyrifola 日本は シャル pyris communis シレンクチェ Pyrus pyrifola 日本は Nレレクチェ 内une 「ひがる 「酸夫 Malus pumila インレ 「秋夫 インレ 「根山 小した シャット シレ 「日本種 シレ 「日本種 シレ 「日本 小した 「日本 「日本 Netarine 「日本 Dispyros kaki 「日本 Ficus carica <			黄金桃	Amygdalus persica	
Principalities person 4 at inclusional でもも Pulm 秀峰 Nectarine でもも Pulm 大石早生 Prunus salicina Jub グム Prunus salicina Jub グム Prunus mume Lume Lume mume Lume Purus mume Lume Purus pyrifolia Part Prus pyrifolia Bart Prus pyrifolia Bart Prus pyrifolia Pear (European Pear) JApile Pyrus pyrifolia Bart Pyrus pyrifolia Pear (European Pear) JAJE Pyrus pyrifolia Sub C Malus pumila Sub C Malus pumila Sub C Malus pumila Sub C tak(平枝無) L'E/L··//JIZA		ネクタリン	黎明	Nectarine	
fition Pulm Pulm X石早生 Prunus salicina Jume jume jume Punus mume Japanese Chestnut Rakzu Rakzu Rakzu Rakzu Prus prifola Purus prifola Par Par Parus prifola Purus prifola Par Parus Purus prifola Purus Purus Purus Purus Par Purus Purus Purus Par Parus Purus Purus Par Purus Purus Purus Parus Purus Purus Purus		Amygualus persica var. nectarina	秀峰	Nectarine	
Puim ソルダム Prunus salicina うめ Ume 第五郎 Prunus mume 違のうめ Prunus mume Japanese Chestnut 日本なし 日本なし Nashi Pear, Sand Pear 丹沢 Castanea crenata 世紀 Pyrus pyrifolia 豊水 Pyrus pyrifolia 豊水 Pyrus pyrifolia 野県 アus pyrifolia 新高 Pyrus pyrifolia 新島 Pyrus pyrifolia 「リレレクチエ Pyrus communis うがる Malus pumila ふじ Malus pumila 「暖光 私lo pumila 大敗 Apple おけさ柿(甲核無) Diospyros kaki いちじく ig tree ビオレ・ソリエス		すもも	大石早生	Prunus salicina	
うめ Ume藤五郎Prunus mume違のうめPrunus mumeという地のうめPrunus mumeはのうめPrunus mume日本なし Nashi Pear, Sand Pear丹沢Castanea crenataレンレクアリus pyrifolia豊水Pyrus pyrifolia豊水Pyrus pyrifolia野興Pyrus pyrifoliaサービクチエPyrus communisシンレクチエPyrus communisシンレクチエAppleボミMalus pumilaドレンクチエMalus pumilaレンレクチエMalus pumilaシンレクチエMalus pumilaレンレクチエMalus pumilaレンレクチエMalus pumilaレンレクチエMalus pumilaレンレクチェMalus pumilaレンレクチェMalus pumilaレンレクチェMalus pumilaレンレクチェMalus pumilaレンレクチェDiospyros kakiビオレ・ソリエスビオレ・ソリエス		Pulm	ソルダム	Prunus salicina	
しme しのうめ Prunus mume Japanese Chestnut 日本なし 日本の		うめ	藤五郎	Prunus mume	
くり Japanese Chestnut 日本なし Nashi Pear, Sand Pear 丹沢 Castanea crenata 日本なし Nashi Pear, Sand Pear 二十世紀 Pyrus pyrifolia 章水 Pyrus pyrifolia 豊水 Pyrus pyrifolia 第興 Pyrus pyrifolia 新興 Pyrus pyrifolia 新興 Pyrus pyrifolia 1 Nu レンウチエ りんご つがる Apple ろがる 酸 Malus pumila 秋晩 Malus pumila 北レンちがに Diospyros kaki レンちしく 在来種 ビゴレ・ソリエス Ficus carica		Ume	越のうめ	Prunus mume	
Japanese Unestruit Fitted Bakab Fitted Parus pyrifolia 華水 Pyrus pyrifolia 豊水 Pyrus pyrifolia 豊水 Pyrus pyrifolia 第篇 Pyrus pyrifolia 新興 Pyrus pyrifolia 新興 Pyrus pyrifolia 小レクチエ Pyrus pyrifolia リんご つがる Apple ろいこ Malus pumila 「陽光 Malus pumila 大快、 Diospyros kaki ドcus carica ビオレ・ソリエス		< U	丹沢	Castanea crenata	
Nashi Pear, Sand Pear 単にして proception 学水 Pyrus pyrifolia 豊水 Pyrus pyrifolia 第二 Pyrus pyrifolia 新高 Pyrus pyrifolia 新興 Pyrus pyrifolia 新興 Pyrus pyrifolia りんご Porus pyrifolia リんご フがる Apple Malus pumila 「陽光 Malus pumila 「酸光 Malus pumila 「酸光 Malus pumila 「ちじく」 在来種 「cus carica ビオレ・ソリエス		Japanese Chestnut 日本なし	二十世紀	Pyrus pyrifolia	
Find pyrindic Sing pyrindic Byring pyrindic Byring pyrindic Byring pyrindic Byring pyrindic Byring pyrindic Sing pyrindi Sing pyrind		Nashi Pear, Sand Pear	二 T 匹化	Pyrus pyritolia	
Sing pynola Sin				Pyrus pyrifolia	
Final Apple Apple Apple ボルゴ 「アリスS pyriolia Site Apple アリスS pyriolia Site Apple アリスS pyriolia アリ			至六	Pyrus pyritolia	
西洋なし Pear (European Pear) りんご Apple かしクラエ フがる かる Malus pumila ふじ Malus pumila 酸光 Malus pumila 秋映 Malus pumila 秋映 Malus pumila 秋映 Malus pumila 秋映 Malus pumila			新興	Pyrus pyritolia	
Pear (European Pear) りんご Apple ふじ Malus pumila ふじ Malus pumila 酸光 Malus pumila 和us pumila		西洋なし	ル・レクチェ	Pyrus communis	
Apple July Malas punila ふじ Malus punila 陽光 Malus punila 秋映 Malus punila totsじく fig tree 在来種 Ficus carica		Pear (European Pear) りんご	つがろ	Malus pumila	
Reversion and a second mains punna 陽光 Malus punnila 秋映 Malus punnila 秋映 Malus punnila 秋映 Malus punnila tracki Persimmon いちじく fig tree ビオレ・ソリエス		Apple	\$.I*	Malus pumila	
柿 水映 Malus punila Kaki Persimmon おけさ柿(平核無) Diospyros kaki いちじく 在来種 Ficus carica ビオレ・ソリエス ビオレ・ソリエス			陽 米	Malus pumila	
林 Kaki Persimmon いちじく fig tree ビオレ・ソリエス			利吨	Malus pumila	
Kaki Persimmon はのでいてもないのです。 いちじく 在来種 fig tree ビオレ・ソリエス		柿	おけさ柿(亚核無)	Niaspyras kaki	
fig tree エネ種 Ficus carica ビオレ・ソリエス		Kaki Persimmon いちじく	な本番		
		fig tree	ビオレンルエス	ricus carica	
ぶどう 田州 Vitie can		ぶどう	ロ州	Vitie con	
Grape 中加 Vitis spp		Grape			
			ビル		
			ナナフスカット		
		キウィフルーツ	****	Vius spp	
kiwifruit パリード Actinua denciosa 柑橘類 みかん いまわせ Citrue unchin Marco	柑橘類	kiwifruit みかん			
mikan のようなとうなどののないのでのです。	citrus fruits	mikan	めら見生		
ゆず 本来種 Citrus image		ゆず	た来種		
yuzu ロネTE Of U as junios 菌茸類 soたけ ムャ語 Tricholome meteutoko	菌茸類	yuzu まつたけ		Tricholoma matsutake	
Tricholoma matsutake エヘ1重 Inclusional matsutake mushroom エリンギ Ling trumpat mushroom	mushroom	Tricholoma matsutake エリンギ	江不怪	king trumpet mushroom	
Pleurotus eryngii (De Cand.)Gillet 1874 シイタケ Lantinula adadac		Pleurotus eryngii (De Cand.)Gillet 1874 シイタケ		Lentinula adodes	
Shiitake mushroom ナメコ Bholiste nomeleo		Shiitake mushroom ナメコ		Pholiota nameko	
predaceous diving beetle Privile a maniferio 山菜類 フキ 本来語 Partsettes innonicute	 山菜類	predaceous diving beetle フキ		Petasites ianonicus	
Giant Butterbur 日本語 Productor pointers edible wild plants ウド 在安廷 Aralia cordata	edible wild plants	Giant Butterbur ウド	在变種	Aralia cordata	

分 類 class	品 目 items	品種名 variety name	学 名 scientific name	備 考 remarks
	ぜんまい hairspring.	在来種	Osmunda japonica	
	クワイ water chestnut	在来種	Sagittaria trifolia	
	わらび western bracken fern	在来種	Pteridium aquilinum	
	ふきのとう Giant Butterbur	在来種	Petasites japonicus	

List of biodiversity

生物多様性のリスト EX:絶滅 EW:野生絶滅 CR:絶滅危惧 I A類 EN:絶滅危惧 I B類 VU:絶滅危惧 II 類 NT:準絶滅危惧 DD:情報不足 LP:地域個体群 EX:EXTINCT EW:EXTINCT IN THE WILD CR:CRITICALLY ENDANGERED EN:ENDANGERED VU:VULNERABLE NT:NEAR THREATENED DD:DATA DEFICIENT LP:THREATENED LOCAL POPULATION

4	3 新	利夕主#	ーけい分類	カテゴリー 学名 category	備老		
	class	fa	amily	சு வ scientific name	新潟県 Niigata	国 Japan	remarks
鳥類	Aves	<u>ウ</u> 科	Phalacrocoracidae	Phalacrocorax capillatus	NT		
		サギ科	Ardeidae	Gorsachius goisagi	VU	NT	
		ト七利	Throckiornithidoo	Egretta intermedia intermedia Nioponio niopon			
		トイロ	Anatidae	Branta bernicla orientalis			
			, indiado	Anser albifrons frontalis	NT	NT	
				Anser fabalis serrirostris	NT	VU	
				Anser fabalis middendorffii	NT	NT	
				Anser caerulescens caerulescens	VU	DD	
				Anser cygnoldes Anas Formosa	NT		
				Anas falcata	NT	vo	
				Histrionicus histrionicus pacificus	NT		
				Bucephala clangula clangula	NT		
		ミサコ 科	Pandionidae	Pandion haliaetus haliaetus	NT	NT	
		ダリ科	Accipitridae	Pernis apivorus orientalis Haliaeetus albicilla albicilla	FN	FN	
				Haliaeetus elagicus pelaricus	EN	VU	
				Accipiter gentilis fujiyamae	VU	VU	
				Accipiter gularis gularis	NT		
				Accipiter nisus nisosimilis	NT	NT	
				Spizaetus nipalensis orientalis Circus spilopotus spilopotus			
				Falco peregrinus iaponensis	NT	VU	
		クイナ科	Rallidae	Porzana fusca erythrothorax	VU		
		シギ科	Scolopacidae	Eurynorhynchus pygmeus	NT	EN	
				Tringa totanus ussuriensis	NT	VU	
				Numenius madagascariensis			
		ヤイタカシギ科	Recurvirostridae	Himantopus himantopus himantopus	NT	FN	
		ツバメチドリ科	Glareolidae	Glareola maldivarum	NT	VU	
		カモメ科	Laridae	Sterna albifrons sinensis	NT	VU	
		フクロウ科	Strigidae	Otus scops japonicus	NT		
				Otus lempiji semitorques	NT		
		コタカ科	Caprimulgidae	Ninox scutulata japonica Caprimulgus indicus intaka	NT		
		ヤマセミ科	Cerylidae	Megaceryle lugubris lugubris	NT		
		ブッポウソウ科	Coraciidae	Eurystomus orientalis calonyx	VU	VU	
		サンショウクイ科	Campephagidae	Pericrocotus divaricatus divaricatus	NT	VU	
		モズ科	Laniidae	Lanius cristatus superciliosus	VU	NT	
		レダイ科 カササギトタキ科	Muscicapidae	Muscicapa dauurica dauurica Ternsinhone atrocaudata atrocaudata	NT		
		ホオジロ科	Emberizidae	Emberiza vessoensis vessoensis	NT	VU	
		カラス科	Corvidae	Garrulus glandarius tokugawae	LP		Subspecies-specific
昆虫類	Insect	サナエトンボ科	Gomphidae	Gomphus postocularis	VU		
		ヤンマ科	Aeshnidae	Gynacantha japonica	VU		
		エフトン小科 ツチカメムシ科	Epopritrialmiinae	Epitneca marginata Canthophorus niveimarginatus	NT	NT	
		ハナカメムシ科		Lyctocoris beneficus	VU	EN	
		コオイムシ科	Belostomatidae	Appasus japonicus	NT	NT	
		タイコウチ科	Nepidae	Laccotrephes japonensis	EN		
		セミ科	Cicadidae	l ibicen flammatus	NT		
		マママエル科 ヤガ科	Saturniidae	Samia cyntnia pryeri Amphinyra subrigua			
		シジミチョウ科	Lycaenidae	Artopoetes pryer	NT		
		タテハチョウ科	Nymphalidae	Sasakia charonda	NT	NT	
				Mycalesis francisca	NT		
		····	0	Lethe sicelis	VU		
		ハンミョウ科	Gicincelidae	Cicindela sumatrensis niponensis			
		ゲンゴロウ科	Dytiscidea	Dytiscus sharpi	VU	VU	
		ゴミムシダマシ科	Tenebrionidae	Misolampidius rugipennis	LP	-	
		ハムシ科	Chrysomelidae	Chrysolina virgata	NT	DD	
		クワガタムシ科	Lucanidae	Dorcus hopei binodulosus	NT	NT	
		コリイムン科	Scarabaeidae	Copris ocnus			Niigstaprefecture only Sada
		オサムシ科	Carabidae	Carabus arboreus exilis	EX	EX	Subspecies-specific
				Carabus vanvolxemi ssp. noesskei			Subspecies-specific
				Damaster blaptoides capito			Subspecies-specific
				Oroblemus katorum			endemic species
		ハネカクシンジ	Stanbylinidae	Colpodes sylphis sadoenshis			Subspecies-specific
		コメツキモドキ科	Staphyllillude	Languriomorpha vamamotoi			Subspecies specific
		カミキリムシ科	Cerambycidae	Glaphyra nitida	NT		,

生物多様性のリスト EX: 絶滅 EW:野生絶滅 CR: 絶滅危惧 I A類 EN: 絶滅危惧 I B類 VU: 絶滅危惧 II類 NT: 準絶滅危惧 DD:情報不足 LP: 地域個体群 EX:EXTINCT EW:EXTINCT IN THE WILD CR:CRITICALLY ENDANGERED EN:ENDANGERED VU:VULNERABLE NT:NEAR THREATENED DD:DATA DEFICIENT LP:THREATENED LOCAL POPULATION

			カテゴリー category				
分	類	料名また	-は小分類	字 名	cale	igory	備考
CI	855	la	miny	scientific name	新潟県 Niigata	_⊟ Japan	remarks
				Obrium kusamai	Niigata	Uapan	endemic species
				Mesechthistatus binodosus insularis			Subspecies-specific
				Pidonia (Cryptopidonia) amentata sadoen	sis		endemic species
				Pidonia (Mumon) telephia			endemic species
				Pidonia (Pidonia) modesta			endemic species
			-	Obrium obscuripenne takakuwai			Subspecies-specific
		ハハナ科	l enthredinidae	Loderus sadoensis Tuishama hahai			
		レノハナ科 ヤマトビケラ利	Glassasamatidas	Glassocama andoonsia			
		ナガレトビケラ科	Rhyaconhilidae	Rhvaconhila ishihanaensis			endemic species
		トゲナガトドケラ科	Stenopsychidae	Setodos shirasensis			endemic species
		_,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		Oecetis hamochiensis			endemic species
両生類	Amphibia	サンショウウオ科	Hynobiidae	Hynobius nigrescens	NT		
		イモリ科	Salamandridae	Cynops pyrrhogaster	NT		
		ヒキカエル科	Bufonidae	Bufo japonicus formosus			
		アマカエル科	Rhacophoridae	Hyla japonica Rema sum stilumentuis			
		アカカエル科	Ranidae	Rana ornativentris			
				Rana sn			endemic species
				Rana catesbeiana			
		アオガエル科	Rhacophoridae	Rhacophorus arboreus	NT		
魚類	Fin	ヤツメウナギ科	Petromyzontidae	Lethenteron japonicum	NT		
		サケ科	Salmonidae	Salvelinus leucomaenis			
				Oncorhynchus mykiss			
				Oncorhynchus masou masou			
		11	5	Oncorhynchus keta			
		アユ科	Plecoglossidae	Plecoglossus altivelis altivelis			
		コ1 14	Cyprinidae	Zacco platypus Tribolodon bekononcio			
				Gnathonogon elongatus			
				Cyprinus carpio			
				Carassius buergeri subsp.1			
				Carassius cuvieri			
				Carassius auratus subsp.1			
				Rhodeus ocellatus ocellatus			
		ドジョウ科	Cobitidae	Misgurnus anguillicaudatus			
		アマム科	Siluridae	Silurus asotus	NIT	N/L	
		アトリアニクテス件	Adrianichthyldae	Oryzias latipes		vu	
		リアキ科ト	Gasterosteidae	Gasterosteus aculeatus	VU		
		カジカ科	Cottidae	Cottus kazika	NT		
				Cottus pollux			
				Cottus hangiongensis	LP		
				Cottus reini	NT	VU	
		サンフィッシュ科	Centrarchidae	Micropterus salmoides			
			M 111	Lepomis macrochirus			
		小ブ科 ハガ科	Gobiidae	Chelon haematochellus Tridentiger obscurus	ıр		Niigataprefecture only Sado
		· · • • 14	Gobildae	Tridentiger brevispinis	<u> </u>		The approved only date
				Rhinogobius sp. DA	LP		
				Rhinogobius sp. OR			
				Rhinogobius sp. CB			
				Rhinogobius sp. CO			
				Acanthogobius flavimanus			
				Acanthogobius lactipes			
				Gymnogobius urotaenia Gymnogobius potochilionaia			
				Gymnogobius opperiens			
				Chaenogobius castaneus	LP		
				Chaenogobius laevis			
				Leucopsarion petersii	NT	NT	
				Luciogobius guttatus			
		コチ科	Platycephalidae	Platycephalus sp.			
		ラノ14 フグ利	Delonidae	Autennes nians Takifugu ninbobles			
哺乳.類	Mammalia	<u>- ノーマ</u> トガリネズミ科	Soricidae	Sorex sadonis	NT	NT	Subspecies-specific
				Crocidura dsinezumi			, ,
				Mogera tokudae	NT	NT	endemic species
		キクガシラコウモリ	₹Rhinolophidae	Rhinolophus ferrumequinum			
				Rhinolophus cornutus			
		ヒナコワモリ科	vespertilionidae	Myotis macrodactylus Pipietrellus ebremus			
				Minionterus fuliginosus			
		イヌ科	Canidae	Nyctereutes procyonoides			
		イタチ科	Mustelidae	Martes melampus			
				Mustela itatsi			

生物多様性のリスト EX:絶滅 EW:野生絶滅 CR:絶滅危惧 I A類 EN:絶滅危惧 I B類 VU:絶滅危惧 II類 NT:準絶滅危惧 DD:情報不足 LP:地域個体群 EX:EXTINCT EW:EXTINCT IN THE WILD CR:CRITICALLY ENDANGERED EN:ENDANGERED VU:VULNERABLE NT:NEAR THREATENED DD:DATA DEFICIENT LP:THREATENED LOCAL POPULATION

					カテゴリー		# *	
分	類	科名また	は小分類	学名	cate	gory	備考	
cl	lass	family		scientific name	新潟県	国 Japan	remarks	
		トーシード	M		Niigata	Japan		
		イムミ科	Muridae	Microtus montebelli brevicorpus			Subspecies-specific	
				Apodemus speciosus saudensis			Subspecies-specific	
				Rattus porvegious				
				Rattus rattus				
				Mus musculus				
		ウサギ科	Leporidae	Lepus brachvurus Ivoni	NT		Subspecies-specific	
爬虫類	Reptilia	イシガメ科	Geoemydidae	Mauremys japonica	NT			
				Chinemys reevesii				
		カナヘビ科	Lacertidae	Takydromus tachydromoides				
		トカゲ科	Scincidae	Plestiodon japonicus				
		ナミヘビ科	Colubridae	Elaphe climacophora				
				Elaphe quadrivirgata	LP			
				Dinodon orientalis				
				Amphiesma vibakari				
		두井미 & 너희	NC: 1	Rhabdophis tigrinus				
日粘	aballfiab	クサリヘビ科	Viperidae	Gloydius biomnomii Haminama bakadadianaa	NIT	NIT	Niizatanyafaatuwa anky Sada	
只預	snellfisn	ヤマキリコ科	Relicinidae				Nilgataprefecture only Sado	
		トマラーン作		Chamalycaeus ianonicus sadoensis			Subspecies-specific type locality	
		イツマデガイ科	Pomationsidae	Rianfordia ianonica ianonica	NT	NT	type locality Nijgstaprefecture only Sado	
			1 omadopsidae	Oncomelania minima	FN	VU	Nijgataprefecture only Sado	
		カワザンショウ科	Assimineidae	Paludinella tanegashimae	NT			
		ヤマボタルガイ科	Cochlicopidae	Cionella lubrica	LP	LP	Niigataprefecture only Sado	
		キバサナギガイ科	Vertiginidae	Vertigo eogea eogea	VU	VU	·····g·····p··························	
		キセルガイモドキ科	Buliminidae	Mirus japonicus	NT			
				Mirus reinianus	NT			
				Mirus andersonianus	NT	NT		
		キセルガイ科	Clausiliidae	paganizaptyx stimpsoni sadoensis	LP		Subspecies-specific • type locality	
				Mundiphaedusa	VU			
		ベッコウマイマイ科	Helicarionidae	Parakaliella sadoensis	NT	DD	endemic species•type locality	
		オナジマイマイ科	Bradybaenidae	Euhadra sadoensis	EN	VU	endemic species•type locality	
		アマオフネカイ科	Neritidae	Clithon retropictus	NT			
		タニシ科	Viviparidae	Cipangopaludina chinensis laeta		NT		
		モノアフカイ科	Lymnaeidae	Radix auricularia japonica				
		オカモノアフカイ科	Succineidae	Oxyloma hirasel				
		インカイ科	Curonidae	Cristaria piloata piloata		INT		
		マメンジョ利	Disidiidae	Disidium pippopense	NT			
植物	plant	ミズニラ科	Isoetaceae	Isoetes japonica	FN	VU		
	plane		1000140040	Isoetes asiatica	EN	VU		
				Isoetes sinensis	EN	EN		
		シノブ科	Davalliaceae	Davallia mariesii	EN			
		シシラン科	Vittariaceae	Antrophyum obovatum	EN	EN		
		アカウキクサ科	Azollaceae	Azolla japonica	EN	VU		
		ナデシコ科	Caryophyllaceae	Dianthus japonicus	EN			
				Honkenya peploides	VU			
		キンポウゲ科	Ranunculaceae	Pulsatilla cernua	EN	VU		
				Hepatica nobilis var. japonica	NT	NT		
				Adonis amurensis	VU	VU		
				Anemone debilis				
		ベンケイソウ封	Cracculaccoc	Arastachus iwaranga		EN		
		1 2 7 1 7 717	Olassulaceae	Orostachys imarenge				
				Sedum uniflorum subsn ianonicum var sena	LP			
	アカバナ科	Onagraceae	Epilobium hirsutum var villosum	FN	VU			
		ボタン科	Paeonaceae	Paeonia obovata	EN	EN		
				Paeonia japonica	VU	VU		
		ムラサキ科	Boraginaceae	Mertensia maritima ssp. asiatica	EN			
				Lithospermum zollingeri	VU			
				Cynoglossum asperrimum	NT			
				Messerschmidia sibirica	NT			
		コマノハグサ科	Scrophulariaceae	Deinostema adenocaulum	EN	EN		
				Dopatrium junceum	VU			
				veronica didyma var. lilacina	VU	VU		
				veronica melissaetolia				
				Euprirasia maximowiczii Popudoluoimoobien kiusienus sub-sus iii				
				r seuuoiysimachion kiusianum subsp. maritin Scrophularia gravana				
				Funhrasia insigna suben insignis var insigni	IP			
		オミナエシ科	Valerianaceae	Patrinia scabiosifolia	EN	VU		
		キキョウ科	Campanulaceae	Platycodon grandiflorus	EN			
		キク科	Asteraceae	Atractylodes japonica	EN	EN		
				Gnaphalium hypoleucum	EN			
				Achillea ptarmica subsp. macrocephala	VU			
				Erigeron thunbergii	VU			

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				カテゴリー		/# #	
分類	科名また	料名または小分類 学名		cate	igory	備考 remarks	
class	Tamily		scientific name	新潟県) Japan	remarks	
			Iveris polycenhala		oupun		
			Prenanthes tanakae	VU	VU		
			Saussurea pulchella	VU	VÜ		
			Wedelia prostrata	VU			
			Farfugium japonicum	NT			
			Inula salicina var. asiatica	NT			
			Nemosenecio nikoensis	NT			
			Carpesium cernuum	LP			
	ビルムシロ科	Potamogetonaceae	Potamogeton cristatus				
			Punnia maritima				
			Potamogeton berchtoldii	VU	VU		
	イバラモ科	Najadaceae	Najas japonica	EN	EN		
			Najas minor	EN			
	カヤツリグサ科	Cyperaceae	Cladium chinense	EN	EN		
			Carex brownii	VU			
			Carex meurocarpa	VU			
			Carex rugulosa	VU	VU		
			Rhynchospora alba	VU			
			Bolboschoenus koshevnikovii	VU			
			Scleria parvula	VU			
			Carex gibba	NT			
			Carex otaruensis	NT			
			Carex planata	NT			
			Carex dickinsii	LP			
			Carex filipes var. rouyana	LP			
		0.1.1	Carex scabrifolia				
	フン科	Urchidaceae	Calanthe hipponica				
			Cenhalanthera erecta var subanhvlla	EN	FN		
			Cremastra unguiculata	FN	VU		
			Cypripedium debile	EN	VU		
			Cypripedium japonicum	EN			
			Dendrobium moniliforme	EN			
			Eleorchis japonica	EN			
			Goodyera macrantha	EN			
			Liparis makinoana	EN	EN		
			Galearis cyclochila Orabia graminifalia		VU		
			Orchis grammona Pogonia ianonica				
			Tulotis iinumae	FN			
			Amitostigma kinoshitae	VU	VU		
			Calanthe discolor	VU	VU		
			Calanthe reflexa	VU	VU		
			Cephalanthera falcata	VU	VU		
			Dactylostalix ringens	VU			
			Ephippianthus schmidtii	VU			
			Epipactis papillosa Habaparia aggittifara		VII		
			Lecanorchis hokurikuensis	VU	^v ^o		
			Liparis auriculata	νŪ			
			Liparis japonica	VU			
			Listera japonica	VU			
			Listera makinoana	VU			
			Myrmechis japonica	VU			
			Platanthera hologlottis	VU			
			Platanthera japonica Degenie miner	VU			
			Fogorila minor Tipularia iaponica	VU			
			Vexillahium nakaianum	VU			
			Galeola septentrionalis	NT			
			Platanthera ophrydioides var. monophylla	NT			
			Coeloglossum viride var. bracteatum	LP			
			Listera cordata var. japonica	LP			
	イワヒバ科	Selaginellaceae	Selaginella helvetica	VU			
			Selaginella shakotanensis	VU			
	っケシノブ科	Hymenophyllogoog	Selaginella tamariscina Crepidomanes insigne				
	コ / ノ / / / / / / イノモトソウ科	Pteridaceae	Sphenomeris chinensis	VU			
			Pteris multifida	VU			
			Onychium japonicum	VŪ			
			Pteris excelsa	NT			
	オシダ科	Dryopteridaceae	Acystopteris japonica	VU			
			Arachniodes simplicior	VU			
	1		Urvonteris fuscines	IVU	1	1	

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	シュージャンション			カテゴリー category		供 老
分 類 class	料名また	たは小分類 amily	字 名 scientific name	年 印目	I I I	備考 remarks
01400	, , , , , , , , , , , , , , , , , , , ,			利荷乐 Niigata	Japan	
			Arachniodes simplicior var. major	VU		
			Athyriorumohra maximowiczii	VU		
			Christella acuminata	VU		
			Cyrtomium macrophyllum	VU		
			Deparla unifurcata Thelunteris glanduligera			
			Diplazionsis cavaleriana	VU		
			Ctenitis maximowicziana	VU		
			Polystichum pseudomakinoi	VU		
			Polystichum tagawanum	VU		
			Polystichum tsus-simense	VU		
			Polystichum tsussimense var. mayebarae	VU		
			Athyrium nikkoense	LP		
			Thelypteris hipponica Polystichum craspedosorum			
			Athyrium rupestre	IP		
			Athyrium brevifrons	LP		
			Diplazium hachijoense	LP		
			Diplazium wichurae	LP		
	チャセンシダ科	Aspleniaceae	Asplenium trichomanes	VU		
	ウラボジ科	Polypodiaceae	Lemmaphyllum microphyllum	VU		
			Loxogramme grammitoides	VU		
			Pyrrosia linearifolia	VU		
			l enisorus annuifrons	NT		
	サンショウモ科	Salviniaceae	Salvinia natans	VU	νu	
	ヒノキ科	Cupressaceae	Juniperus conferta	VU		
			Thujopsis dolabrata var. hondae	LP		
	ヤナギ科	Salicaceae	Salix chaenomeloides	VU		
	1-1-1-51		Salix eriocarpa	LP		
	イラクサ科	Urticaceae	Pilea japonica	VU		
	ツチトリチチ利	Balanophoraceae	Urtica laetevirens Balananbara ninnanica	VU	VII	
	タデ科	Polygonaceae	Persicaria taquetii	VU	VU	
		i olygonacoac	Persicaria viscofera	VU		
			Rumex longifolius	VU	VU	
	ツルナ科	Aizoaceae	Tetragonia tetragonoides	VU		
	マツブサ科	Schisandraceae	Kadsura japonica	VU		
			Aquilegia buergeriana	VU		
			Caltha palustris var. enkoso	VU		
			Clematis natens	VU	VU	
			Semiaguilegia adoxoides	VU	••	
	スイレン科	Nymphaeaeceae	Brasenia schreberi	VU		
			Nymphaea tetragona	VU		
	マツモ科	Ceratophyllaceae	Ceratophyllum demersum	VU		
	ドクダミ科	Saururaceae	Saururus chinensis	VU		
	オトキリシワ科	Guttiferae	Hypericum ascyron Ptoridophyllum rocomocum	VU		
	フキバンタ科	Saxifragaceae	Parnassia foliosa var japonica	VU		
	- () >)	ouxinagaooao	Penthorum chinense	VU	VU	
			Astilbe microphylla	NT		
			Cardiandra alternifolia	LP		
	バラ科	Rosaceae	Fragaria nipponica	VU		
			Geum aleppicum	VU		
			Potentilla chinensis	VU		
			Potentilla dickinsii Potentilla egedei var grandis	VU		
			Rosa rugosa	VU		
			Rubus pungens var. oldhamii	VU		
			Spiraea niopponica	VU		
			Waldsteinia ternata	VU		
			Filipendula multijuga	NT		
			Kerria japonica Potontillo tovomonojo			
			Rhanhiolenis indica var umhellata	IP		
			Rubus buergeri	LP		
			Rubus illecebrosus	LP		
			Rubus yabei	LP		
	マメ科	Leguminosae	Caesalpinia decapetala var. japonica	VU		
			Desmodium oldhamii	VU		
			Latnyrus palustris subsp. pilosus		VII	
			Thermonsis luninoides	VU	vu	
			Lespedeza cyrtobotrva	NT		
			Dunbaria villosa	IР	1	

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				カテニ	ゴリー	
分類	科名また	こは小分類	学名	cate	gory	備考
class	fa	mily	scientific name	新潟県	国 lanan	remarks
	나는 번 기가 부위	F 1 1:		Niigata	Japan	
	トワダイクサ科	Euphorbiaceae	Euphorbia togakusensis	VU		
	~=U14	VIOlaceae	Viola grayi Viola mandshurica var crassa	VU		
			Viola manusnunca var. crassa Viola phalacrocarpa	VU		
			Viola vezoensis	VU		
			Viola violacea	LP		
	ヒシ科	Trapaceae	Trapa incisa	VU	VU	
	アリノトウグサ科	Haloragaceae	Myriophyllum spicatum	VŪ		
	セリ科	Umbelliferae	Cnidium japonicum	VU		
			Bupleurum longiradiatum subsp. sachalinens	NT		
			Centella asiatica	LP		
			Ostericum sieboldii	LP		
			Pleurospermum camtschaticum	LP		
	イチヤクソウ科	Pyrolaceae	Pyrola incarnata	VU		
	ヤノコワシ科	Myrsinaceae	Ardisia crispa	VU		
	サクラソワ科	Primulaceae	Glaux maritima var. obtusifolia	VU		
			Lysimachia acroadenia	VU		
			Samalua parviflarua		VII	
	エクセイ利	Oleaceae	Suringa reticulata	VU	vu	
	しいドウ科	Gentianaceae	Swertia diluta var tosaensis	VU	VII	
	シップシワ科	Menvanthaceae	Menvanthes trifoliata	VU	vo	
	キョウチクトウ科	Anocynaceae	Amsonia elliptica	VU	VU	
	ガガイモ科	Asclepiadaceae	Vincetoxicum pycnostelma	VU	VU	
	クマツヅラ科	Verbenaceae	Callicarpa dichotoma	VU		
			Vitex rotundifolia	NT		
	シソ科	Labiatae	Leonurus macranthus	VU	VU	
			Mosla japonica	VU	VU	
			Scutellaria strigillosa	NT		
			Thymus quinquecostatus	NT		
			Ajuga shikotanensis	LP		
			Clinopodium multicaule	LP		
	ナス科	Solanaceae	Solanum japonense	VU		
			Tubocapsicum anomalum	NT		
	ハマウツボ科	Orobanchaceae	Orobanche coerulescens	VU		
	タヌキモ科	Lentibulariaceae	Utricularia australis	VU		
	コットシントモ	D:	Utricularia vulgaris var. japonica	VU	VU	
	マリムシリリ科	Dipsacaceae	Dipsacus japonicus Cashiana ing anian yang alaina			
	トチカガミジ	Hudroobaritaaaaa	Scapiosa japonica var. aipina Riuxa achinochorma		VII	
	1177777214	Tiyurocharitaceae	Blyza echinosperina Blyza iopopioo		vu	
			Halonhila ovalis	vo	NT	
			Ottelia iaponica	NT		
			Potamogeton frveri	NT		
	ミズアオイ科	Pontederiaceae	Monochoria korsakowii	VU	VU	
	アヤメ科	Iridaceae	Iris laevigata	VU	VU	
	イグサ科	Juncaceae	Juncus gracillimus	VU		
			Juncus yokoscensis	VU		
	ツユクサ科	Commelinaceae	Pollia japonica	VU		
	イネ科	Poaceae	Ischaemum aristatum var. glaucum	VU		
			Phacelurus latifolius	VU		
			Agrostis hideoi	NT	EN	
			Pseudoraphis ukishiba	NT		
	エレノナジ	•	Isachne nipponensis	LP		
	サト1 七件	Araceae	Symplocarpus toetidus var. latissimus	VU	VIII.	
	ミンリイキ	Sparganiaceae	Sparganium fallax	VU		
			Sparganium giomeratum			
			Sparganium erectum	NT	NT	
	トクサ科	Equisetaceae	Equisetum hvemale	NT		
		Equipolabola	Parasenecio hastatus subsp tanakae	NT		
	ウラジロ科	Gleicheniaceae	Gleichenia iaponica	NT		
	ホウライシダ科	Parkeriaceae	Ceratopteris thalictroides	NT		
	ウマノスズクサ科	Aristolochiaceae	Asarum megacalyx	NT	NT	
	ニシキギ科	Celastraceae	Euonymus alatus	NT		
	オオバコ科	Plantaginaceae	Plantago camtschatica	NT		
			Plantago major var. japonica	NT		
	オモダカ科	Alismataceae	Sagittaria aginashi	NT	NT	
	アマモ科	Zosteraceae	Zostera marina	NT		
	ユリ科	Liliaceae	Allium victorialis subsp. platyphyllum	NT		
			Amana edulis	NT		
			Gagea IUTea			
			Rohdea japonica	NT		
			Tofieldia coccinea var kondoi	NT		
			Paris verticillata	LP		

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	科名または小分類			カテゴリー category		
分類			学名			備者
class	fa	amily	scientific name	新短回	国	remarks
				Niigata	Japan	
	アヤメ科	Iridaceae	Iris gracilipes	NT	NT	
			Sparganium japonicum	NT	NT	
			Iris setosa	LP		
			Belamcanda chinensis	LP		
	ハナヤスリ科	Ophioglossaceae	Botrychium lanceolatum	LP	CR	
			Ophioglossum petiolatum	LP		
	シシガシラ科	Blechnaceae	Woodwardia orientalis	LP		
	ウラボシ科	Polypodiaceae	Neocheiropteris ensata	LP		
	マツ科	Pinaceae	Larix kaempferi	LP		
			Pinus koraiensis	LP		
	ブナ科	Fagaceae	Castanopsis sieboldii	LP		
		-	Quercus acuta	LP		
			Quercus salicina	LP		
	クワ科	Moraceae	Ficus nipponica	LP		
	シキミ科	Illiciaceae	Illicium anisatum	LP		
	アケビ科	Lardizabalaceae	Stauntonia hexaphylla	LP		
	アブラナ科	Brassicaceae	Cayratia japonica	LP		
			Draba nemorosa	LP		
	トベラ科	Pittosporaceae	Pittosporum tobira	LP		
	モチノキ科	quifoliaceae	Ilex integra	LP		
			Ilex pedunculosa	LP		
	ミツバウツギ科	Staphyleaceae	Euscaphis japonica	LP		
	シナノキ科	Tiliaceae	Corchoropsis tomentosa	LP		
	グミ科	Elaeagnaceae	Viola violacea	LP		
	ヤマトグサ科	Theligonaceae	Theligonum japonica	LP		
	マチン科	Loganiaceae	Mitrasacme pygmaea	LP		
	アカネ科	Rubiaceae	Galium gracilens	LP		
			Galium kikumugura	LP		
			Rubia jesoensis	LP		
			Lathraea japonica var. miqueliana	LP		



• Photos

















N.B. Do you agree on posting this information on the GIAHS website? Y/N