

Conservation Management Plan for the Iriomote-jima Island Forest Ecosystem Reserve (Excerpts)

Introduction

Many wild ecosystems and precious wildlife habitats still remain in national forests. As part of national forestry business, these precious forests are designated as protected forests and managed in accordance with the changes in the natural environment and also in accordance with the intention for the designation. When necessary, vegetation restoration measures are implemented or protective fences are installed in order to appropriately conserve and manage the precious natural environment.

Iriomote-jima Island is covered by national forests in some 90 percent of its surface, and they are composed mainly of mangroves, as well as sudajii chinquapin (*Castanopsis sieboldii*), Okinawa-urajirogashi oak (*Quercus miyagii*), and tabunoki camphor tree (*Machilus thunbergii*), vegetation of continental relict: temperate zone plants, and tropical plants growing side by side. Dotted with forests quite similar to primeval woods in terms of the combination of species found in the entire plant community there and quite valuable from the scientific standpoint, the Urauchi-gawa River basin (excluding Long-Term Profit-Sharing Afforestation districts and farmland, etc.) and the Nakama-gawa River basin, as well as the northern precipice zone stretching from around Mt. Komi-dake to Urauchi, and an area surrounding Haimi Beach were designated in March 1991 as a Forest Ecosystem Reserve after deliberation by the Reserve Designation Committee. Some 20 years after the designation, secondary forests, with no or little work done for them by humans, have also grown out of the Reserve. People living on the island traditionally hunt wild boars and collect wild vegetables in national forests there as part of their livelihood. In recent years, areas lying along the Urauchi-gawa and Nakama-gawa Rivers, both flowing through the Ecosystem Reservation, and other smaller rivers running out of the Reserve, are visited for eco-tours. With these changes seen in conditions of the Island, the Iriomote-jima Island Forest Ecosystem Reserve Designation Committee was set up in January 2009, and met several times to deliberate what should be done not only to conserve primeval natural forests but also to pay good attention to securing integrated management of protected forests on small islands. As a result, the existing Forest Ecosystem Reserve was extended in area in 2012 and 2015. The two extensions were intended to maintain and conserve primeval natural forests, and woods rich in natural features, as well as habitats for rare species, which cover almost all the national forests in the island, except Long-Term Profit-Sharing Afforestation districts and farmland, etc., as Forest Ecosystem Reserve in good balance achieved with wild boar hunting and wild vegetable collection by local people, forest environment education, and use for forest recreation, which should be conserved and managed.

Iriomote-jima Island belongs to the Ryukyu Islands, which were recognized in 2003 by the Review Committee on Candidate Natural Sites for Nomination to the World Heritage List of Japan as one of the regions that are highly likely to satisfy criteria for registration and conditions of integrity set by the World Heritage Convention, as they have unique geological history in their relation with the continent, and hold a

great diversity of especially indigenous semitropical forest and coral reef ecosystems, as well as offer wonderful scenery both on the land and in the sea, and are inhabited by endangered species. In December 2013, the Science Committee for the Amami-Okinawa World Natural Heritage Candidate decided to recommend four islands (areas), which include Iriomote-jima, as candidate sites. Parties concerned are expected to address challenges that must be solved for their registration. For this area, it is feared that human activities and other factors may give impact on ecosystems there, and coordination between conservation and usage must be facilitated with consensus built among stakeholders based on scientific grounds.

Against backdrops as stated above, the Conservation Management Plan for the Iriomote-jima Island Forest Ecosystem Reserve has been prepared based on the deliberation of the Review Committee for Conservation Management of the Iriomote-jima Island Forest Ecosystem Reserve as comprehensive guidance for implementing a series of initiatives in a systematic manner, making clear how national forests in Iriomote-jima Island should be conserved and managed, with their distinctive features taken into consideration.

2. Basic Matters Related to Conservation and Management

The Iriomote-jima Island Forest Ecosystem Reserves have been designated, as a part of national forest conservation and management activities, for the purpose of bequeathing their unique forest ecosystems. These designated reserves are divided into "Preservation Zones" and "Conservation and Utilization Zones." In Preservation Zones, forests must be left with no work done for them by humans, except for operations essential for conservation and rehabilitation. Conservation and Utilization Zones must be the buffer for Preservation Zones. The Forest Ecosystem Reserves stretch over 22,367 hectares, of which Preservation Zones and Conservation and Utilization Zones cover 9,999 hectares and 12,368 hectares, respectively.

(1) Approach to Forest Conservation and Management, and Important Matters

The forest ecosystems on Iriomote-jima Island cannot be handed down to posterity without understanding of, and cooperation with, people living there, tourists and other users of the forests, and agencies concerned, among others. Based on approaches to management and usage stated below in sections 2, 3, and 4, work must be done to limit impact of human activities on them to the lowest possible level by performing regular monitoring of impact of alien species and utilization, so that any findings will be evaluated and reviewed to implement necessary measures ("adaptive administration"). Environmental education must also be promoted to help people better understand how precious forest ecosystems are.

The long-term target must be set as turning the Island into a place where forest ecosystems will be sustainable into the future with great biodiversity, which should include endemic species and other rare wildlife. For that purpose, measures that are necessary and relevant to each site must be implemented in cooperation with agencies concerned and other stakeholders.

(2) Preservation Zones

(i) Forest management

In Preservation Zones, forest ecosystems must be preserved in a rigorous manner, and in principle left with no work done for them by humans, going through natural transition.

Note, however, the following actions can be taken notwithstanding the description above, when needed to maintain forest ecosystems:

- (A) Monitoring and other research and survey
- (B) The following actions that are carried out as emergency measures for extraordinary disasters:
 - (a) Extinction of forest fires, etc.; and
 - (b) Implementation of restoration measures after disasters such as large-scale forest collapse and mudslides;
- (C) Installation of signs and other similar objects;
- (D) Actions recognized based on scientific knowledge as necessary to conserve and/or restore indigenous biodiversity and forest ecosystems
- (E) Other actions that conform to relevant laws and ordinances

(ii) Forest use

Preservation Zones may be used only for activities listed below:

- (A) Actions that are approved as being necessary for public welfare reasons, such as those performed in relation to usage of biological genetic resources for academic research;
- (B) Usage, maintenance, and repair of existing pathways, etc.; and
- (C) Installation of signs and other similar objects for actions mentioned in (A) and (B);

(3) Conservation and Utilization Zone

(i) Forest management

Conservation and Utilization Zones must have roles to play as buffer to prevent any change in external environments from giving direct impact on forests in a Preservation Zone.

In any forest in the Conservation and Utilization Zones, no forest operation should be performed for the purpose of timber production, Artificial forests must be treated, so that they will be transformed into natural forests in the future.

Note, however, the following actions can be taken notwithstanding the description above:

- (A) The same forest management procedures as applied to Preservation Zones;
- (B) Logging and removal of dead or damaged trees;

(ii) Forest use

Conservation and Utilization Zones may be used only for acts listed below:

- (A) The same acts for use as those allowed in Preservation Zones;
- (B) The following acts, when performed to the degree that they avoid going against the purpose of designation as Conservation and Utilization Zone;
 - (a) Forest environment education, and forest recreation;
 - (b) Construction of roads, buildings, and other facilities needed for acts mentioned in (a); and
 - (c) Wild boar hunting and wild vegetable collection performed by local people;

(4) Other national forests

Other national forests lying adjacent to the Iriomote-jima Island Forest Ecosystem Reserve must be administered and managed with full attention paid to conservation and management of the Reserve, with the greatest possible effort exerted to conserve indigenous wildlife species and other natural conditions. For Long-Term Profit-Sharing Afforestation districts managed under contracts (Forest Compartment No. 132 - No. 134, and No. 139 - No. 142), coordination must be secured with contracting parties through careful communication with them, so that they will be managed and operated with full attention paid to conservation and management of the Forest Ecosystem Reserve.

3. Specific Matters Related to Conservation and Management

(1) Issues Related to Management

(i) Issues Related to Rare and Endemic Spices

Iriomote-jima Island is inhabited by many precious wildlife species, such as Iriomote-yamaneko wildcat (*Prionailurus bengalensis iriomotensis*), designated by the national government as a Nationally Endangered Species of Wild Fauna or Flora and Special Natural Monument.

For some of the wildlife, it is feared that habitat conditions are deteriorating with illegal digging of rare plants, and traffic accidents of animals, among others.

For such rare and endemic spices, measures stated below must be taken.

(A) For plants

For rare and endemic species, patrol and monitoring surveys must be conducted to recognize conditions of their habitats, and take measures for protection and conservation when necessary.

To prevent illegal digging of rare and endemic species, surveillance activities and other measures must be performed in cooperation with agencies concerned.

(B) For animals

For Iriomote-yamaneko wildcat and other rare and endemic species, patrol and monitoring surveys must be conducted to recognize conditions of their habitats, and take forest maintenance and other measures for improving and/or recovering the habitats, when necessary, in cooperation with agencies concerned.

(C) Treatment of the former Heimi Forest for Preserving Genetic Resources of Forest Trees

The former Heimi Forest for Preserving Genetic Resources of Forest Trees was designated as protected forest in fiscal 1992 to preserve genetic resources of Ryukyu-matsu pine (*Pinus luchuensis*) there, before being delisted in fiscal 2012 and consolidated into the Iriomote-jima Island Forest Ecosystem Reserve.

In the district, according to the purpose set when it was designated as protected forest, adan screw pines (*Pandanus odoratissimus*) and broad-leaved trees, among others, have been cut down to preserve Ryukyu-matsu pines and their habitats, with Ryukyu-matsu stands kept in relatively good conditions.

Forest operations must be continued in the region as far as they are necessary to preserve genetic resources of Ryukyu-matsu.

(ii) **Issues Related to Alien Species**

(A) Principles for Measures to Control Alien Species in the Iriomote-jima Island Forest Ecosystem Reserve

To protect forest ecosystems on Iriomote-jima Island, measures must be taken to mitigate impact on them from invasion of new alien species that threaten habitat environments of native ones, replacement of the latter with exotic species that have invaded so far, and crossing between them, among others. For that purpose, introduction of new species or individuals must be prevented in cooperation with agencies concerned, with continued surveillance of invasion into natural environments from outside the Island. Any alien species detected at an earlier stage of invasion must be eradicated, or controlled with other measures. For those which have already taken hold, their impact on natural environments and/or ecosystem services must be evaluated to fix an order of priority between possible measures that should be taken.

Eradication or any other solution must be carried out with a well-defined, realistic target set for it, while reviews must also be performed along the process to verify their effectiveness. Care must also be paid to the possibility that eradication of a specific alien species might cause increases of others.

To prevent people from bringing any alien species into the Forest Ecosystem Reserve or other places in the course of their activities, on purpose or by accident, public relations and awareness raising activities must also be performed in cooperation with agencies concerned.

(B) Alien plants identified on Iriomote-jima Island

Among alien plants that have been identified so far on the island are sousiju acacia (*Acacia confusa* Merr), America hamaguruma daisy (*Sphagneticola trilobata*), sendangusa Spanish needles (*Bidens*), ginnemu leadtree (*Leucaena leucocephala*), shurogayatsuri papyrus (*Cyperus alternifolius* L.), tokusabamokumaou sheoak (*Casuarina equisetifolia*), and tsuruhiyodori bitter vine (*Mikania micrantha*).

Most of the alien plant species that have been found there grow only in and around places developed by humans, such as roads, sites prepared for development, and abandoned farmland, and only a few have

invaded into natural environments. Invasion of tokusabamokumaou sheoaks, ginnemu leadtrees, and America hamaguruma daisies into some parts of the Forest Ecosystem Reserve has been confirmed.

(C) Alien animals identified on Iriomote-jima Island

Forest areas are inhabited by inobuta boars (cross between wild and domestic boars) and feral cats. In rivers, kadayashi mosquitofish (*Gambusia affinis*), guppy (*Poecilia reticulata*), tilapia, and carp (*Cyprinus carpio*) are identified. Among species detected in and around paddy fields and settlements are sukumiringogai applesnail (*Pomacea canaliculata*) and Africa-maimai snail (*Achatina fulica*). For o-hikigaeru toad (*Rhinella marina*) and shiro-agogaeru toad (*Polypedates leucomystax*), which have both settled on Ishigaki-jima Island, there is a great risk that they may be brought to Iriomote-jima Island when they happen to lie in materials delivered to the island. Focusing on prevention of their introduction from outside, patrols have been conducted over a broad area of the island. However, in 2015, introduction of shiro-agogaeru toads was confirmed. To prevent their reproduction and settlement on the island, early-stage actions have got started quickly. Shiro-agogaeru toads spawn in the same places as Yaeyama-aogaeru toads (*Rhacophorus owstoni*), a source of worry about possible competition between them.

(2) Issues Related to Usage

The Iriomote-jima Island Forest Ecosystem Reserve is used for a range of activities, such as recreation, environment education, commerce, and research and survey, and it is feared that in some areas, such as those along the Hinai-gawa River, increased tourists and concentrated visits may end up with forest ecosystems being overused, and consequently deteriorated. Some measures must be introduced to mitigate impact of use of the forests on their ecosystems, and a good balance must be established between usage and protection in cooperation with agencies concerned to maintain and recover the forest ecosystems.

(i) Pathways and other facilities offered to ordinary people for their usage

(A) Preservation Zones

(a) Mountain trails, etc.

Ordinary people, including climbers and local residents, may only use roads and other facilities under the control of an identified administrator, with lease or other necessary procedures completed for that purpose. For safety reasons, ordinary climbers or other users should desirably be escorted by a person with a certain level of expertise on conservation of the Iriomote-jima Island Forest Ecosystem Reserve, such as a nature guide.

In principle, no tent may be set up in the Reserve. This may not apply, however, in case of emergency. For safety of users and necessity for search operations, public relations efforts must be made to offer information about sites that are relatively safe and easy to search, and therefore can serve as evacuation spots in case of emergency.

(b) Other areas

The other areas may not be used by ordinary people, in principle.

(B) Conservation and Utilization Zone

(a) Mountain trails, etc.

Ordinary people, including climbers and local residents, may use roads and other facilities under the control of an identified administrator, with lease or other necessary procedures completed for that purpose, as well as existing routes that have been used local residents or others only when the following conditions are satisfied:

- That the route falls under neither of the two below:
 - (i) A site where it is feared that rare species may be impacted by any usage; or
 - (ii) A site with danger of collapse or any similar risk.

For safety reasons, ordinary climbers or other users should desirably be escorted by a person with a certain level of expertise on conservation of the Iriomote-jima Island forest ecosystems, such as a nature guide.

In principle, tents must be set up only in designated sites. This may not apply, however, in case of emergency.

(b) Other areas

Ordinary climbers or other users entering the Iriomote-jima Island Forest Ecosystem Reserve, in principle, must be escorted by a person with a certain level of expertise on conservation of the Reserve, such as a nature guide.

Local residents may hunt wild boars, collect wild vegetables, and conduct other acts needed for succession of traditional culture and promotion of local industry. However, rare species designated as Nationally Endangered Species of Wild Fauna or Flora or Natural Monument must not be collected.

(ii) Usage for research and survey

Researchers or other people who would like to enter a forest for research and survey purposes must file an Application for Research of Protected Forests for permission, and may go there only when successfully permitted to. In principle, they must walk on pathways to reach a destination. Research must be conducted according to terms and conditions of the permission, with care paid to avoid any harmful impact on forest ecosystems there.

(iii) Public Relations for Usage Rules

Public relations must be conducted in an effective manner to help users recognize locations of Preservation Zones and Conservation and Utilization Zones in the Forest Ecosystem Reserve, and rules for using them in cooperation with agencies concerned. As part of the effort for public relations, location maps and other necessary facilities must be installed, for instance, along crossing roads.

(iv) Others

Bonfires are prohibited in the entire area of the Forest Ecosystem Reserve. However, only in places with no understory vegetation, including tent or evacuation sites, burners, including lanterns and heaters, that use no naked flame may be used, with care paid to danger of forest fire.

4. Promotion Systems

(1) Review Committee

Issues related to implementation or review of the Conservation Management Plan for the Iriomote-jima Island Forest Ecosystem Reserve must be deliberated by the Review Committee for Conservation Management of the Iriomote-jima Island Forest Ecosystem Reserve, set up according to the Guidelines for the Establishment of the Review Committee for Conservation Management of the Iriomote-jima Island Forest Ecosystem Reserve.

(2) Monitoring Survey, etc.

For conservation of forest ecosystems, monitoring surveys, and other necessary activities must be conducted in a systematic manner. Plans for monitoring surveys and other activities, and findings of them, must be reviewed by panels of experts or other relevant meetings, so that conservation and management will be performed in an appropriate manner. Effort must be exerted to make information on findings of monitoring surveys or other activities widely available. Monitoring surveys and other activities must be conducted in an effective manner in cooperation with agencies concerned and volunteers, among others.

Below are examples of issues that monitoring surveys and other operations should especially focus on:

- (i) Survey of forests and vegetation (stands and vegetation survey, etc.);
- (ii) Survey of habitation of wildlife (rare and/or endemic species, such as Iriomote-yamaneko wildcat, etc.);
- (iii) Survey of alien species (survey of state of habitation, evaluation of impact on rare species, prioritization between countermeasures, etc.);
- (iv) Survey of actual use (No. of users, ways of use, places used, impact on vegetation, etc.);

Among other tasks that must also be performed in cooperation with agencies concerned and other stakeholders are patrol for examining the state of habitation of Iriomote-yamaneko wildcat and other rare wildlife species, and patrol for preventing illegal digging or collecting of rare species.

(3) Public Relations and Awareness Raising

For collecting and managing a range of information on forest ecosystems in Iriomote-jima Island, and making it publicly available, when necessary, or disseminating it among people for raising their awareness, work must be performed to install signs and markings, issue PR magazines, and carry the information on websites, among others, in cooperation with agencies concerned and other stakeholders. For public

relations, arrangements must be made to render contact points easier to find and help users readily access to a variety of new information.

(4) Cooperation with Agencies Concerned, and Other Stakeholders

Closer cooperation must be developed with NPOs and other stakeholders, and volunteers must also be offered opportunities to play active roles in, for instance, patrols to guard wildlife species.

(5) Alignment with the World Heritage Conservation and Management Plan

Now that Iriomote-jima Island is listed as World Natural Heritage candidate site, measures for conservation and management of the islands are being considered. They must be implemented in coordination with this Plan and in cooperation with agencies concerned. This Plan must be reviewed and modified when necessary, based on administration policy for World Natural Heritage and conditions of the Reserve.