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H. E. Mr Takio Yamada
Ambassador Extraordinary and Plenipotentiary
Permanent Delegate
Permanent Delegation of Japan to UNESCO
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75015 Paris

08 November 2019

IUCN Evaluation of the Amami-Oshima Island, Tokunoshima Island, Northern part of Okinawa Island, and Iriomote Island – Nominated for inclusion on the World Heritage List

Dear Ambassador,

Further to the above nomination to the World Heritage List, I am writing with information on progress with the IUCN evaluation. As noted in previous correspondence, IUCN seeks to develop and maintain a dialogue with States Parties during the evaluation process of all nominations.

The IUCN World Heritage technical evaluation mission to the Amami-Oshima Island, Tokunoshima Island, Northern part of Okinawa Island, and Iriomote Island was undertaken by Dr Wendy Strahm and Dr Ulrika Åberg from 5-12 October 2019. The evaluators greatly appreciated the excellent support, organisation and co-operation provided by your colleagues in the preparation and implementation of the mission, and the kind welcome of the State Party throughout the mission. Please convey our sincere thanks to all of the officials, scientists and contributors that assisted the mission.

The IUCN World Heritage Panel will convene to discuss this and the other nominations for 2020 during the week of 2 December 2019. The panel will examine in detail each nomination dossier, reports and desktop reviews of field evaluators and external reviewers, as well as other references regarding the nominated properties.

As discussed during the evaluation mission, there still remain some issues, in particular the management of riverine systems and invasive species, for which the panel would appreciate additional information. We would be grateful if the State Party could provide further information including:

A. Amami-Oshima

1. The State Party's willingness and the feasibility of potentially including, into the buffer zone, the entire length of the Yakugachi River (including the special protection mangrove forest area and estuary, as well as the upstream ordinary zone). If possible this should be supported by maps.

2. The State Party's willingness and the feasibility of potentially including, also into the buffer zone, the entire length of the Katoku River, including the beach and estuary, to ensure the conservation of this last free-flowing river. If possible this should be supported by maps.

B. The entire property

3. A list and map locations, of the total number of existing dams, concrete groins and retaining walls constructed within or along the rivers situated in the nominated property and its buffer zone.

4. A list of infrastructure projects planned within the current and potentially extended buffer zones of Amami-Oshima (see above). In particular, detailing the work proposed within the Yakugachi, Sumiyo and Katoku Rivers.

5. A list of biosecurity measures in place or planned to ensure that no new invasive species are accidentally introduced to the property (in particular cane toads to Iriomote and the Guam brown tree snake to Okinawa).

C. For Amami-Oshima and Okinawa Island

6. Measures and resources to ensure the sustainability of mongoose eradication interventions in the nominated property once phase II of the eradication programme finishes in 2022.

We would appreciate your response to the above points as soon as possible, in order to facilitate the evaluation process, but **no later than the 28 November 2019**.

Supplementary information should also be submitted officially in three copies to the UNESCO World Heritage Centre in order for it to be registered as part of the nomination. An electronic copy of any supplementary information to both the UNESCO World Heritage Centre, Mr Alessandro Balsamo (a.balsamo@unesco.org) and IUCN Headquarters, Dr Ulrika Åberg (ulrika.aberg@iucn.org) would also be helpful.

Please note that there may also be further requests after the IUCN World Heritage Panel has met in December.

In the interest of ensuring full transparency and dialogue regarding the IUCN evaluation process, we are happy to respond to any questions you may wish to raise regarding IUCN's work on the World Heritage Convention, including the above points. Please do not hesitate to contact Dr Ulrika Åberg or myself if you require any further clarifications on the above.

Please allow me to reiterate our thanks for your support of the World Heritage Convention and for the conduct of IUCN's recent mission. We thank you for your cooperation in providing this very important information, which will facilitate the panel in making its recommendations.

Yours sincerely,

Peter Shadie
Director - World Heritage Programme

cc. Japanese National Commission for UNESCO, Ms Mami Oyama, Secretary-General
UNESCO World Heritage Centre, Mr Feng Jing and Mr Alessandro Balsamo
IUCN Asia Regional Office, Ms Aban Marker Kabraji, Regional Director

Supplementary Information for IUCN Evaluation of the "Amami-Oshima Island, Tokunoshima Island, Northern part of Okinawa Island and Iriomote Island" (Japan)

Government of Japan

November, 2019

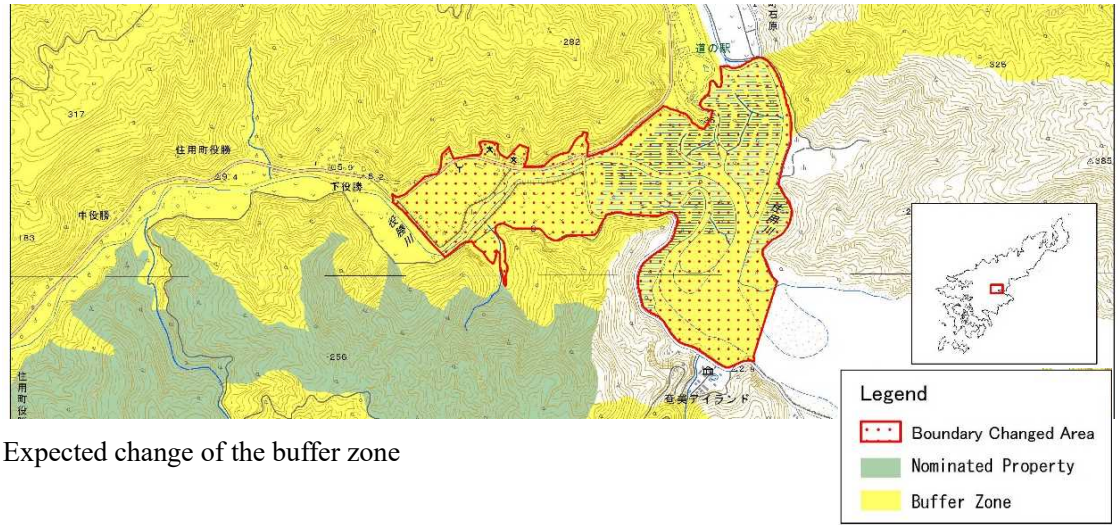
Table of Contents

Signature on behalf of the State Party

1. Potential boundary change of the buffer zone along the Yakugachi River

The government of Japan is planning to include the entire length of the Yakugachi River (including the special protection mangrove forest area and estuary, as well as the upstream ordinary zone) into the buffer zone of the nomination, in line with the suggestion made by IUCN in the letter dated 08 November 2019 (hereinafter 'IUCN Letter'). It is planned to make necessary consultations with local community and the related municipality by 28 February 2020 (see the figure below).

- Since this area includes the residences and living space of local people (seven people), the government of Japan aims to promote efforts to obtain consents from these residents and the municipality.
- After that, with the approvals of the Scientific Committee and the Regional Liaison Committee (for these committees, please see the nomination dossier P255-257), the government of Japan aims to submit maps of the amended boundary of the buffer zone by 28 February 2020.

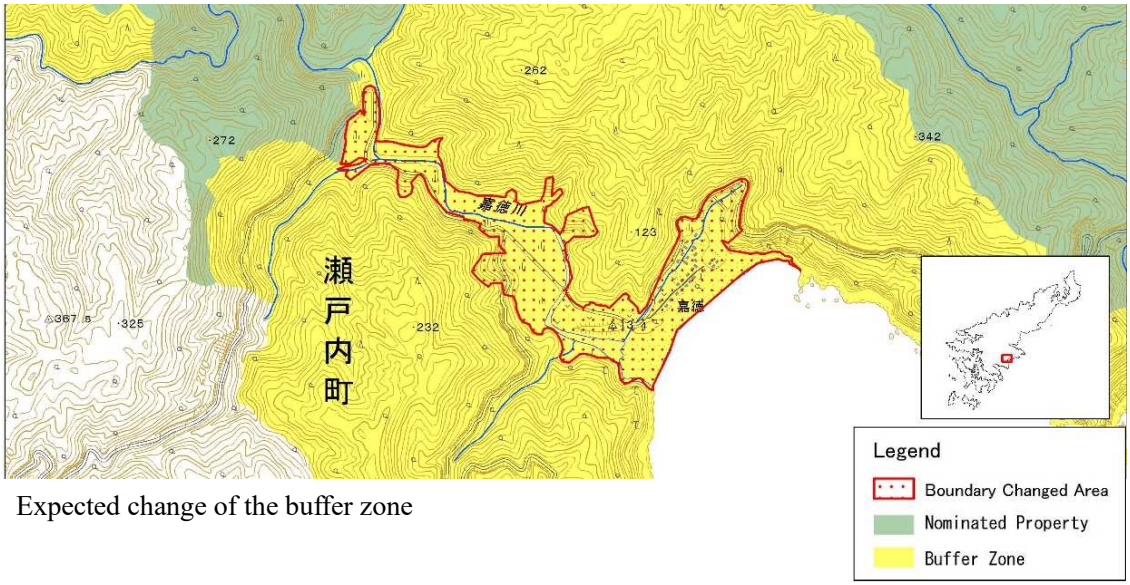


Expected change of the buffer zone

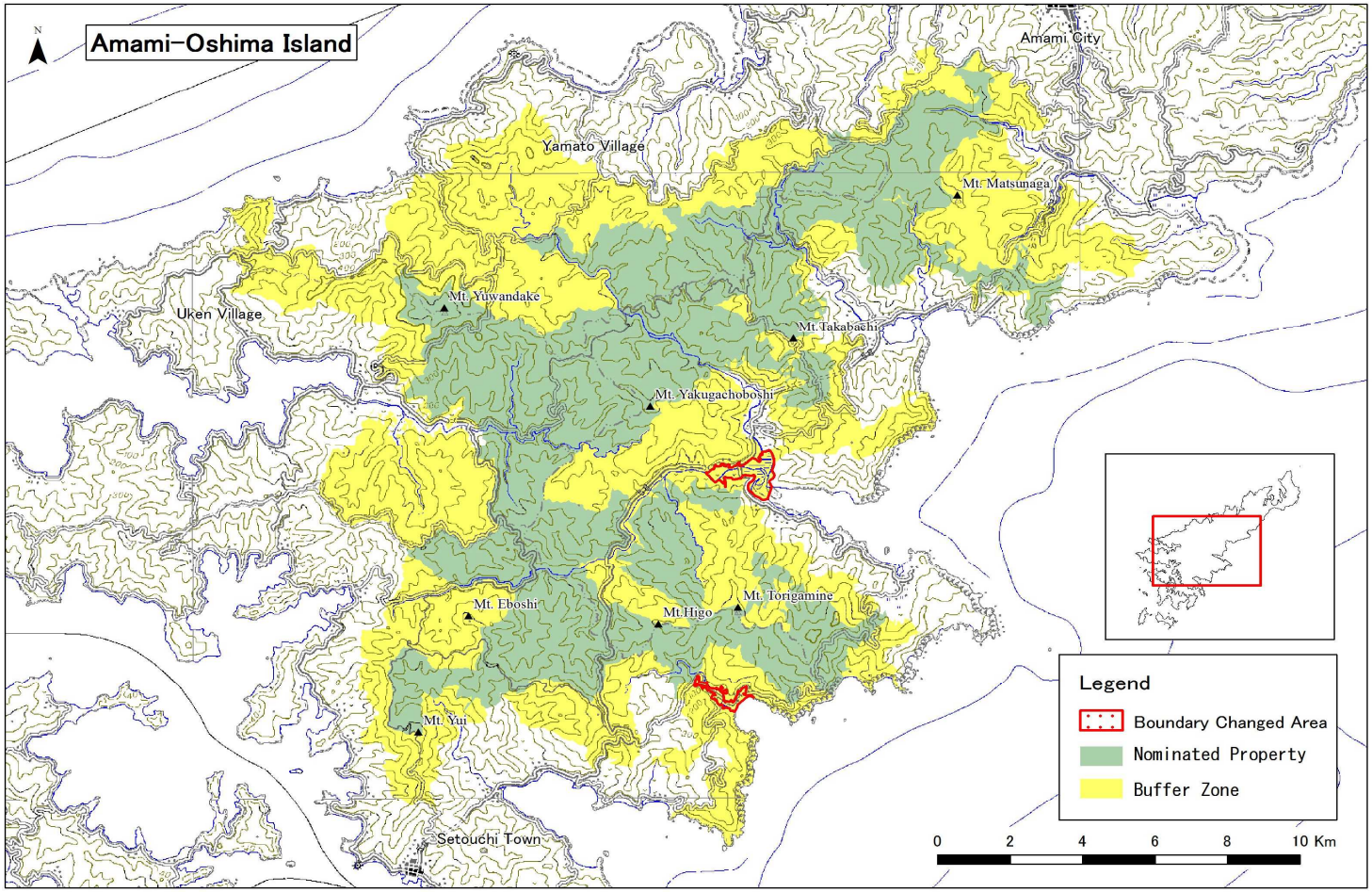
2. Potential boundary change of the buffer zone along the Katoku River

The government of Japan is planning to include the entire length of the Katoku River, including the beach and estuary, into the buffer zone of the nomination, in line with the suggestion made in the IUCN Letter. It is planned to make necessary consultations with local community and the related municipality by 28 February 2020 (see the figure below).

- Since some parts along the river and beach include the living space of local people (approximately 20 people) such as cultivated lands and cemeteries, the government of Japan aims to promote efforts to obtain consents from these residents and municipality.
- After that, with the approvals of the Scientific Committee and the Regional Liaison Committee (see nomination dossier P255-257), Japan aims to submit maps of the amended boundary of the buffer zone by 28 February 2020.



Expected change of the buffer zone



Nominated property and buffer zones

3. A list and map locations of existing dams, etc. constructed within or along the rivers situated in the nominated property and its buffer zones

Based on the suggestion made during the IUCN World Heritage technical evaluation mission, the government of Japan submits a list of existing river structures standing against the flow of major rivers in the nominated property and its buffer zones (Annex 3-1), and maps showing their locations (Annex 3-2).

These river structures are indispensable for the local people to live. In the four regions containing the nominated property, the habitats of the endemic and threatened species that convey the OUV are located adjacent to the places of people's daily life and industrial activities. For a long period of time, based on traditional way of living and faith, life of people has been supported by utilizing such natural environment. In particular, water resources are essential for the lives of people in the regions, and therefore settlements spread in the estuary region of each major river. In addition, the nominated property is located in zones most vulnerable to tropical cyclones (typhoons) that are among the most powerful even on a global scale, and as a consequence, landslides occur in forest areas and rivers flood in downstream areas. Future climate change may cause greater disruption. This is why there are some river structures existing in the nominated property and buffer zones. These structures are essential to secure water sources for the lives of local residents (e.g. water utilization dams and intake weirs) and for protecting their lives and assets from disasters (e.g. check dams and sabo check dams).

Types and purposes of river structures standing against the flow

Type	Purpose
Check dam	There are frequent typhoons in this area and landslides occur along rivers every year. The check dams are necessary from the viewpoints of disaster risk reduction, preventing forest devastation and sediment disasters in the downstream area where settlement spread, as well as conserving the habitats of fauna and flora.
Sabo check dam	The sabo check dams deter mudslides and control the movement of sediments in typhoons, etc. These dams are necessary from the viewpoint of disaster prevention.
Groundsill	The groundsills prevent rivers from overflowing in typhoons, etc. by preventing river bed scouring and stabilizing river gradient. These structures are necessary from the viewpoint of disaster prevention.

Water utilization dam	Three major water utilization dams are installed in the buffer zones in Northern part of Okinawa Island. These dams play an important role in the water supply to the central and southern part of Okinawa Island and support the life and industry of about 1.4 million people on Okinawa Island.
Intake weir	There are water intake weirs for domestic use and agricultural use. Especially on Iriomote Island, as the brackish water area extends to the middle of the rivers, some intake weirs are installed in a part of the nominated property and buffer zones for securing fresh water that is necessary for daily life.

Annex 3-1

No.	Region	Property or Buffer zones	Name of a river	Type	Management body	Year of the completion
1	Amami-Oshima Island	Nominated property, Buffer zone	Okawa River	Intake weir	Amami City	1983
2	Amami-Oshima Island	Buffer zone	Naon River	Intake weir	Kyushu Electric Power Co., Inc	1956
3	Amami-Oshima Island	Buffer zone	Naon River	Intake weir	Naon Irrigation Association	Before the Meiji period (1868-1912)
4	Amami-Oshima Island	Nominated property	Sumiyo River	Intake weir	Kyushu Electric Power Co., Inc	1959
5	Amami-Oshima Island	Buffer zone	Yakugachi River	Ground sill	Kagoshima Prefecture	Unknown
6	Amami-Oshima Island	Buffer zone	Asato River and its tributary	Sabo check dam	Kagoshima Prefecture	1961 1966
7	Amami-Oshima Island	Buffer zone	Shirinashi River	Sabo check dam	Kagoshima Prefecture	1983
8	Amami-Oshima Island	Buffer zone	Sutarumata River	Sabo check dam	Kagoshima Prefecture	1997
9	Amami-Oshima Island	Buffer zone	Kamiya River	Sabo check dam	Kagoshima Prefecture	2012
10	Amami-Oshima Island	Buffer zone	Uekawa River	Sabo check dam	Kagoshima Prefecture	1999
11	Amami-Oshima Island	Nominated property	Honda River	Sabo check dam	Kagoshima Prefecture	2011
12	Amami-Oshima Island	Buffer zone	Yanma River	Sabo check dam	Kagoshima Prefecture	1990
13	Amami-Oshima Island	Buffer zone	Agina River	Sabo check dam	Kagoshima Prefecture	1993
14	Amami-Oshima Island	Nominated property	Ishira River	Sabo check dam	Kagoshima Prefecture	1993
15	Amami-Oshima Island	Nominated property	Ishira River	Sabo check dam	Kagoshima Prefecture	1985
16	Amami-Oshima Island	Nominated property	Yakugachi River	Sabo check dam	Kagoshima Prefecture	1999
17	Amami-Oshima Island	Nominated property	Yakugachi River	Ground sill	Setouchi Town	Unknown
18	Amami-Oshima Island	Nominated property	Kawauchi River *1	Sabo check dam	Kagoshima Prefecture	1962 1963
19	Amami-Oshima Island	Buffer zone	Kogachi River	Ground sill	Kagoshima Prefecture	Unknown
20	Amami-Oshima Island	Nominated property	Kawauchi River *2	Ground sill	Uken Village	1995
21	Amami-Oshima Island	Nominated property	Kawauchi River *2	Ground sill	Uken Village	Unknown

*1: The Kawauchi River in Amami City.
*2: The Kawauchi River in Uken Village.

No.	Region	Property or Buffer zones	Name of a river	Type	Management body	Year of the completion
1	Tokunoshima Island	Buffer zone	Akirigami River	Check dam	Forestry Agency	1991
2	Tokunoshima Island	Nominated property	Akirigami River	Check dam	Forestry Agency	1983
3	Tokunoshima Island	Nominated property	Akirigami River	Check dam	Forestry Agency	1973
4	Tokunoshima Island	Nominated property	Akirigami River	Check dam	Forestry Agency	1987
5	Tokunoshima Island	Nominated property	Kametoku River	Check dam	Forestry Agency	2003
6	Tokunoshima Island	Nominated property	Kametoku River	Check dam	Forestry Agency	1990
7	Tokunoshima Island	Nominated property	Akirigami River tributary	Check dam	Forestry Agency	1988
8	Tokunoshima Island	Nominated property	Akirigami River tributary	Check dam	Forestry Agency	1990
9	Tokunoshima Island	Nominated property	Akirigami River tributary	Check dam	Forestry Agency	1995
10	Tokunoshima Island	Nominated property	Akirigami River tributary	Check dam	Forestry Agency	1997
11	Tokunoshima Island	Nominated property	Akirigami River tributary	Check dam	Forestry Agency	2009
12	Tokunoshima Island	Nominated property	Akirigami River tributary	Check dam	Forestry Agency	1992
13	Tokunoshima Island	Nominated property	Akirigami River tributary	Check dam	Forestry Agency	2006
14	Tokunoshima Island	Buffer zone	Akirigami River	Water utilization dam	Amagi Town	1968
15	Tokunoshima Island	Buffer zone	Soya River and Tari River	Sabo check dam	Kagoshima Prefecture	1982

No.	Region	Property or Buffer zones	Name of a river	Type	Management body	Year of the completion
1	Northern part of Okinawa Island	Buffer zone	Oku River	Sabo check dam	Okinawa Prefecture	1983
2	Northern part of Okinawa Island	Buffer zone	Yona River	Sabo check dam	Okinawa Prefecture	1983
3	Northern part of Okinawa Island	Buffer zone	Okuma River	Sabo check dam	Okinawa Prefecture	1982
4	Northern part of Okinawa Island	Buffer zone	Hiji River	Sabo check dam	Okinawa Prefecture	1985
5	Northern part of Okinawa Island	Buffer zone	Benoki River	Intake weir	Okinawa Prefecture	Unknown
6	Northern part of Okinawa Island	Nominated property	Takazato River tributary	Check dam	Okinawa Prefecture	1991
7	Northern part of Okinawa Island	Buffer zone	Benoki River	Water utilization dam	Okinawa General Bureau, Cabinet Office	1988
8	Northern part of Okinawa Island	Buffer zone	Fungawa River	Water utilization dam	Okinawa General Bureau, Cabinet Office	1983
9	Northern part of Okinawa Island	Buffer zone	Aha River	Water utilization dam	Okinawa General Bureau, Cabinet Office	1983

No.	Region	Property or Buffer zones	Name of a river	Type	Management body	Year of the completion
1	Iriomote Island	Nominated property	Nakama River tributary	Check dam	Forestry Agency	1994
2	Iriomote Island	Nominated property	Nakama River tributary	Check dam	Forestry Agency	1996
3	Iriomote Island	Nominated property	Nakama River tributary	Check dam	Forestry Agency	2009
4	Iriomote Island	Nominated property	Nakama River tributary	Intake weir	Taketomi Town	1975
5	Iriomote Island	Nominated property	Aira River	intake weir	Taketomi Town	1977
6	Iriomote Island	Nominated property	Male River	Intake weir	Taketomi Town	1978
7	Iriomote Island	Nominated property	Fukai River	Intake weir	Taketomi Town	1981

Amami-Oshima Island

N

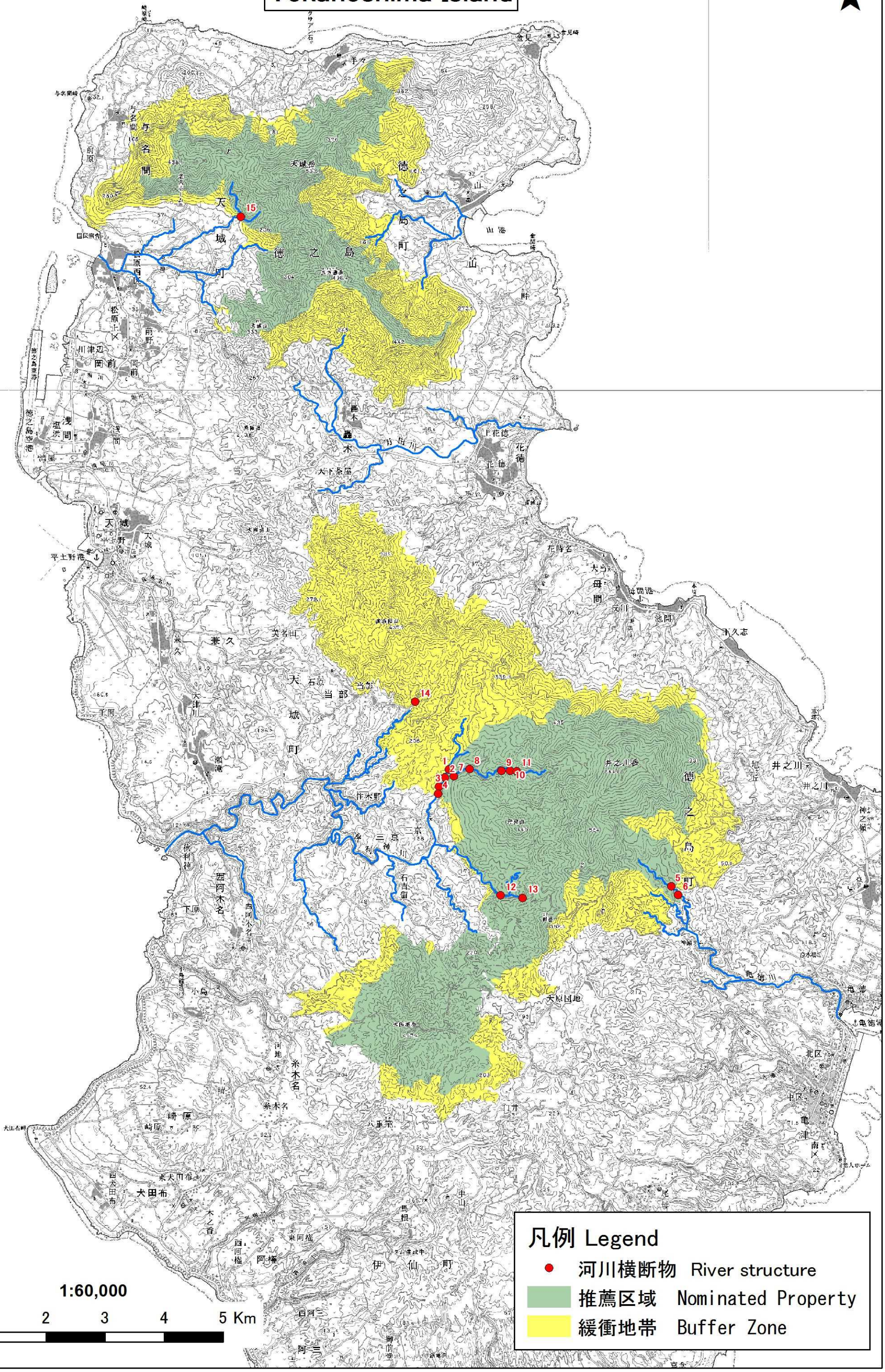
凡例 Legend

- 河川横断物 River structure
- 推薦区域 Nominated Property
- 緩衝地帯 Buffer Zone

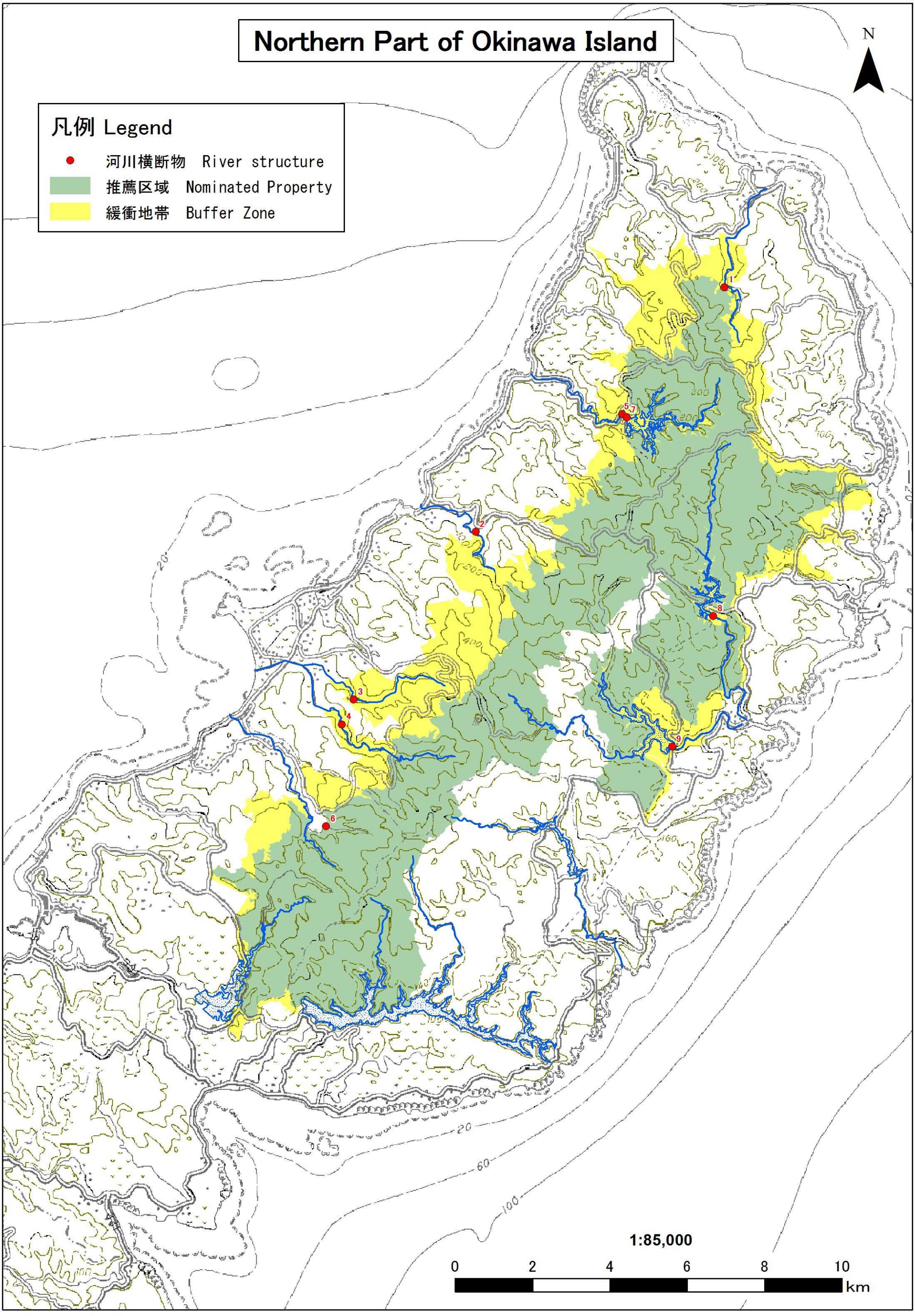
1:95,000

0 2 4 6 8 10 Km

Tokunoshima Island



Northern Part of Okinawa Island



凡例 Legend

河川横断物 River structure

推薦区域 Nominated Property

緩衝地帯 Buffer Zone

Iriomote Island

N

1:85,000

0 2 4 6 8 10 km

4. A list of infrastructure projects planned within the buffer zones*

*including potentially extended buffer zones of Amami-Oshima shown in 1 and 2

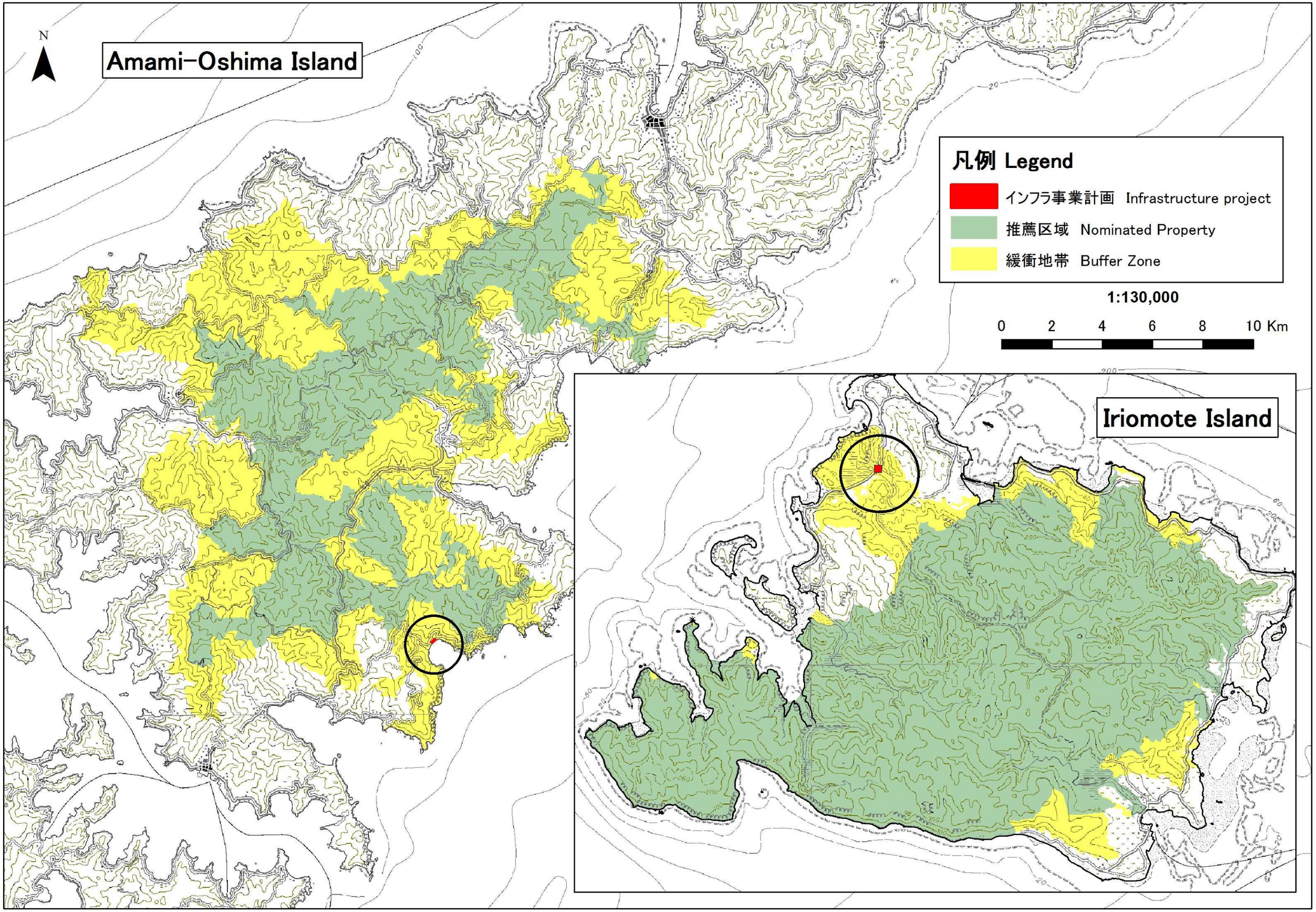
Table 1 below shows the river structures standing against the flow and other infrastructure development projects currently planned within the buffer zones. A map of the project sites is shown in Annex 4-1. Both projects are indispensable to protect the lives and assets of local residents and are managed by prefectures. These projects have already been budgeted and started.

In order to reduce the impact on the ecosystem, both projects took various measures including a preliminary survey on the natural environment, interviews with experts in various fields related to the natural environment and rivers, establishing a review committee, and adopting, as necessary, construction methods and designs that take natural environment into consideration.

Table 1: A list of infrastructure projects planned within the buffer zones

Map No.	Island	Location	Project type	Project purpose and period
1	Amami-Oshima	Katoku Beach	Erosion control	Based on a strong request from local residents and the necessity to protect the lives and assets of local residents from disasters such as typhoons, revetment construction work for erosion control is being implemented on Katoku beach. For the project implementation, review committee meetings were held with experts of the natural environment, and the initially planned revetment of 530 m long was changed to 180 m. In addition, environmentally friendly construction methods, such as covering the front of the revetment with sand and native plants, are adopted. The project period (including design period) is planned from JFY 2016 to JFY 2023. No construction work is planned on the Katoku River itself.. [Annex 4-2 shows the details of the project]
2	Iriomote	Urauchi River	Bridge replacement	The Urauchi Bridge, built as a main road used by residents on a daily basis, has been deteriorated because about 50 years have passed since the construction. Therefore, in order to maintain the daily life of residents and secure their safety, the bridge will be replaced at the same location and at the same scale. The project period (including design period) is planned from JFY 2015 to JFY 2031.

				[Annex 4-3 shows the details of the project]


N
Amami-Oshima Island
凡例 Legend
インフラ事業計画 Infrastructure project
推薦区域 Nominated Property
緩衝地帯 Buffer Zone
1:130,000
0 2 4 6 8 10 Km
Iriomote Island

Annex 4-2

Katoku Beach Erosion Control Project

1. Purpose

To protect the lives and assets of the coastal community from disasters such as typhoons by implementing an erosion control project at the Katoku beach in Setouchi Town.

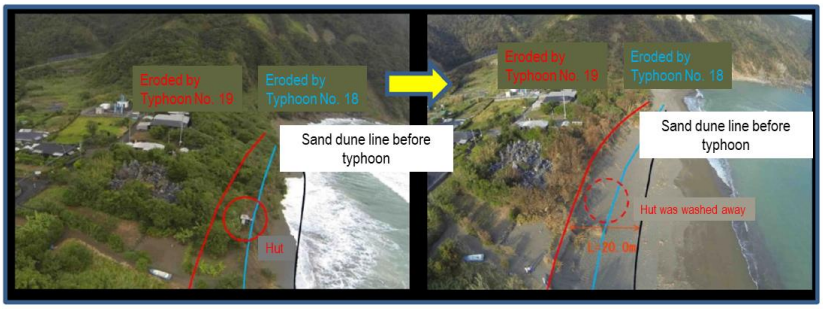
[Damage situation]

October 2014: Due to damage caused by Typhoon No. 18 and Typhoon No. 19, sand dunes were eroded for about 20 meters, crop fields and huts were washed away, and the beach scarp approached close to the houses and a cemetery.

The same month: A request was submitted from the residents of Katoku community to take an urgent bank protection measure.

After passing Typhoon No. 18 [October 9, 2014]

After passing Typhoon No. 19 [October 15, 2014]



Erosion caused by typhoons

2. Construction overview

Site: Katoku, Setouchi Town, Oshima-gun

Type: Concrete gravity revetment (with a planting treatment on the seaside of the revetment, in consideration of natural environment)

Scale of revetment:180 m long, 6 m high

3. Project period (including design phase)

JFY 2016 to JFY 2023 (planned)

4. Implementing body

Kagoshima Prefecture

5. Environmental consideration

(1) Project policy

To develop the project plan, “Review Committee for the Katoku Beach Erosion Control Project” was established and the project policy was discussed.The length of the revetment was 530 m in the initial plan, but based on the results of review by the committee, it was changed to the minimum required area (180 m in length) where the hinterland was used for houses and graves, and erosion width of sand dunes was large.

In addition, after the revetment is completed, the front of the revetment will be covered with sand and vegetation such as native Tahitian screwpine *(Pandanus odoratissimus*) to conserve the ecology of fauna and flora as well as landscapes.

[Summary of project policy]

i) A concrete gravity revetment is installed as a permanent measure at the minimum required range (180 m) of the initially planned 530 m.

ii) For areas other than i), future actions will be determined through continuous monitoring.

iii) Fully implement the wildlife conservation measures.

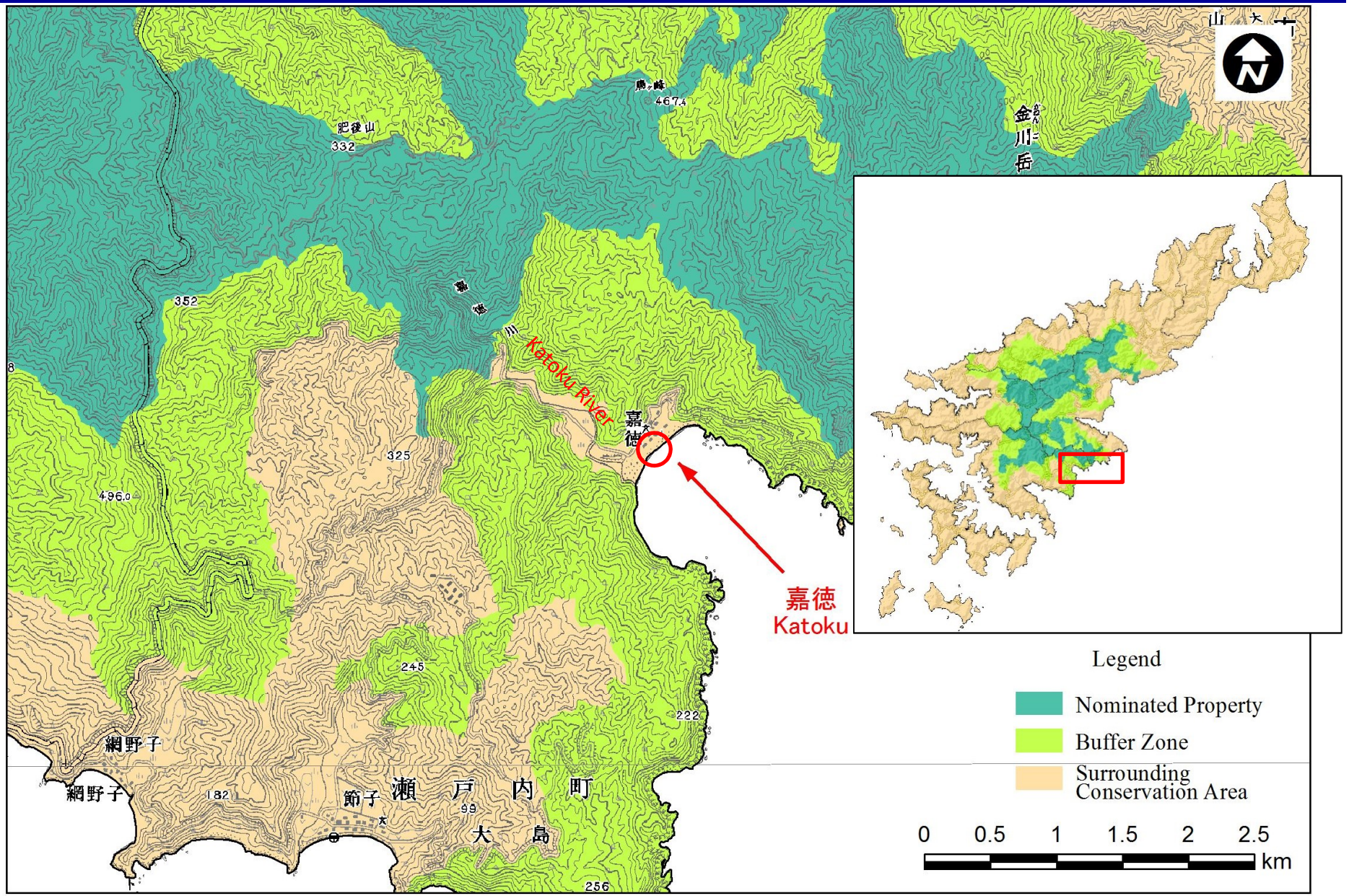
(2) Impact on the Katoku River by the project

The project is being carried out on the Katoku beach adjacent to the Katoku River. However, the project site is far from the mouth of the Katoku River. Furthermore, the revetment will be installed on land area, and will be covered by sand and plants, therefore, there will be no impact on the Katoku River.

*There is no future construction plan for the Katoku River.

The material provided during the IUCN evaluation mission is attached for reference.

嘉徳 Location of Katoku Settlement



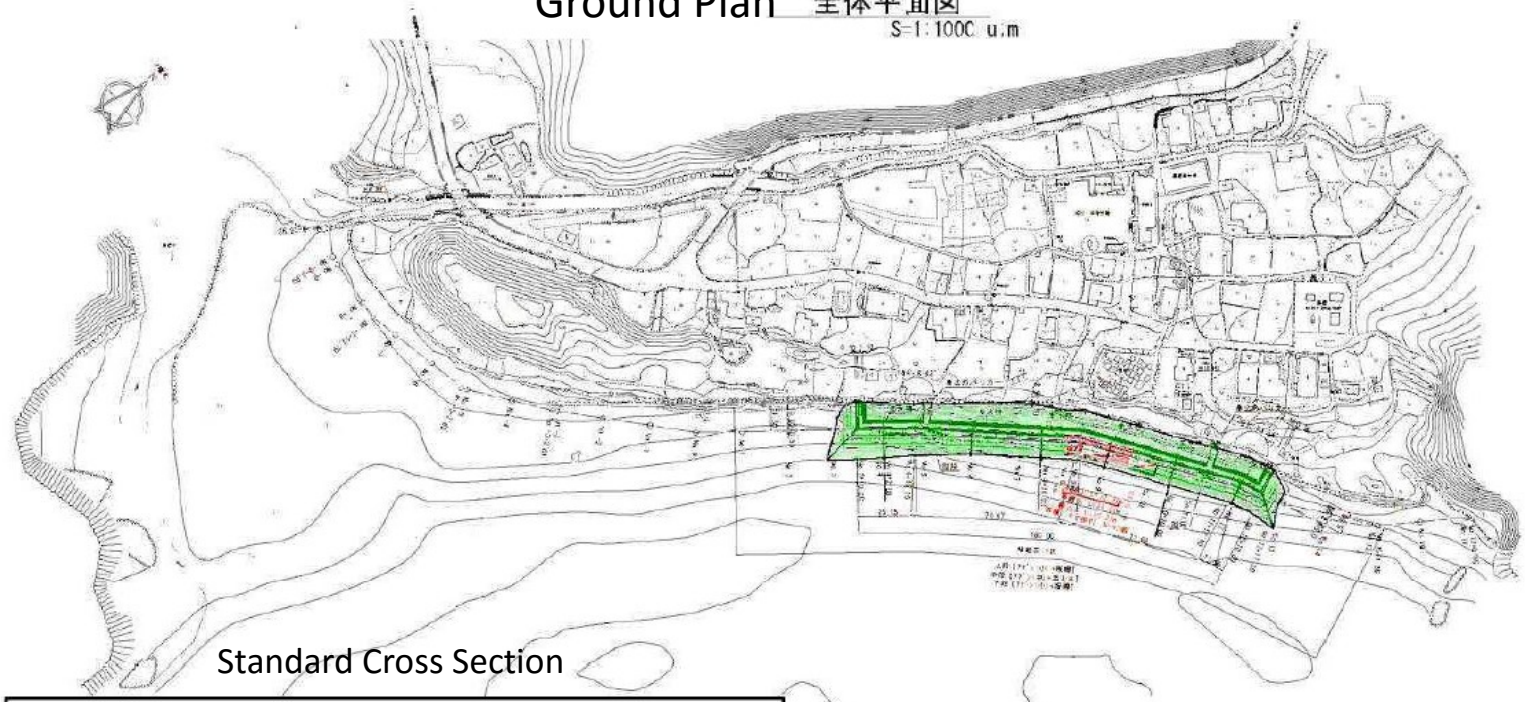
嘉徳Location of Graveyard etc. in Katoku

2012.3.26 14:00

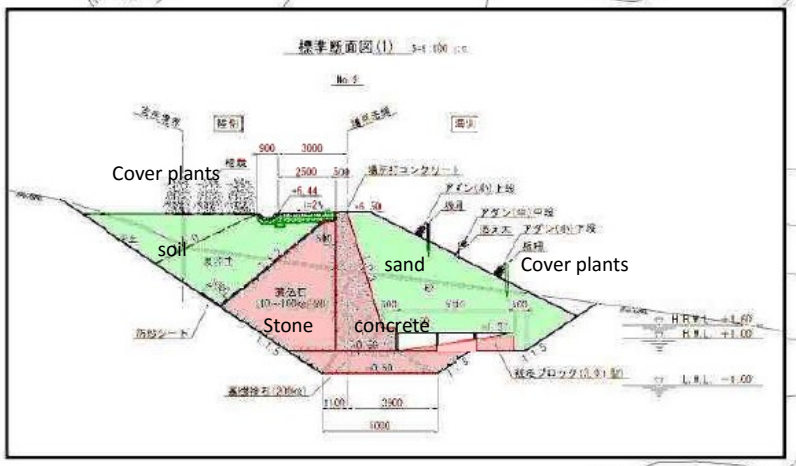
嘉徳 Design of Buried Embankment

Ground Plan 全体平面図

S=1:1000 u.m



Standard Cross Section



Design
FY2018
Katoku

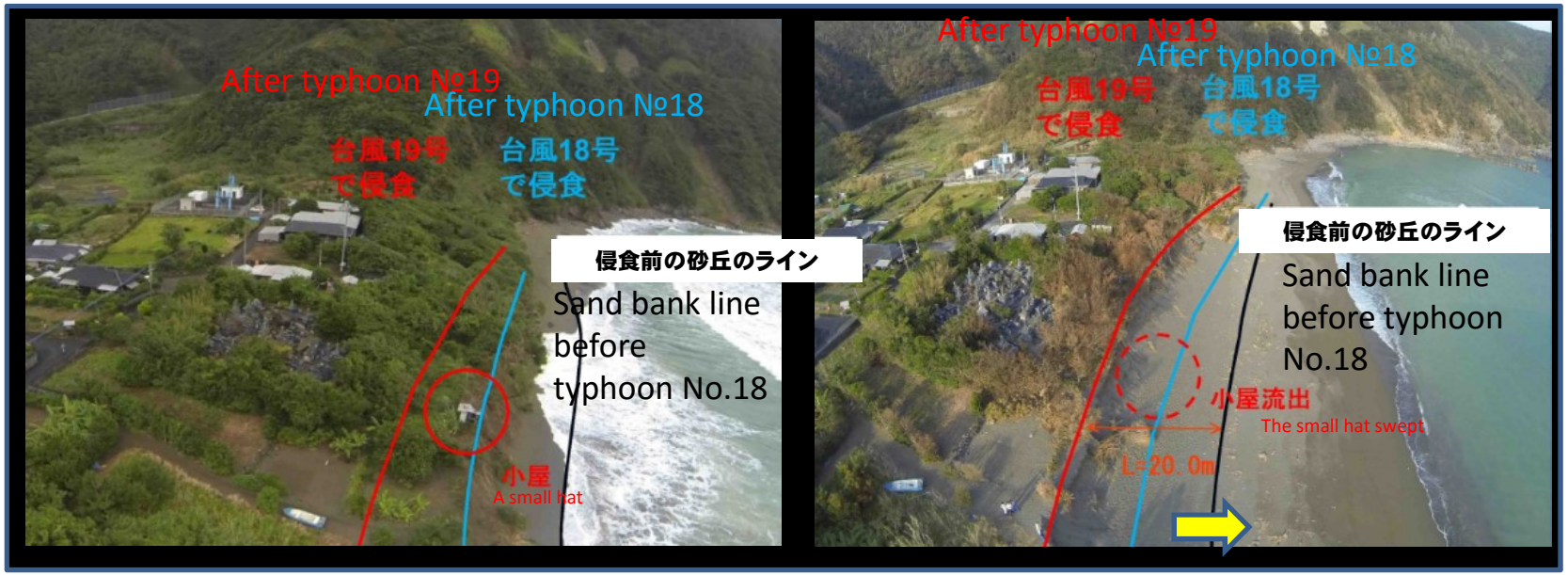
実施設計図

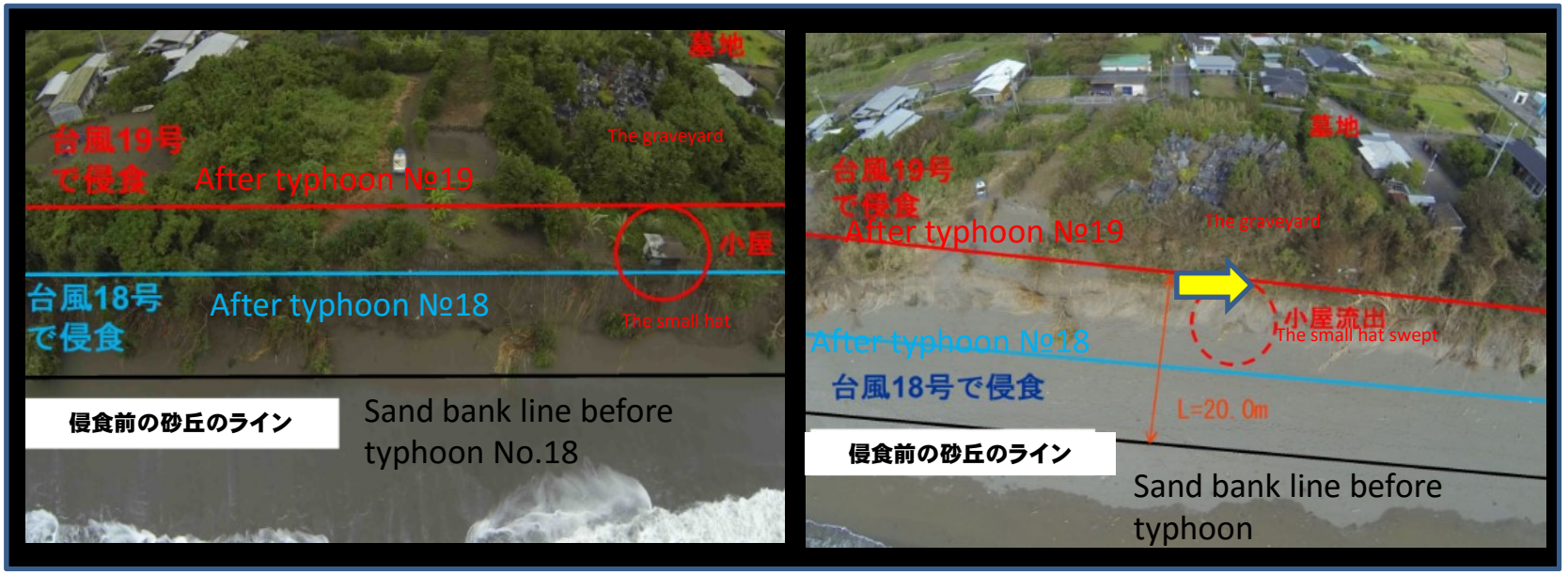
平成 30年度
嘉徳海岸
侵食対策工事(1緯工区)
全体平面図
全17葉の内 1 号
縮尺 1000 分の1
鹿 児 島 県

嘉徳Encroachment of Katoku Beach

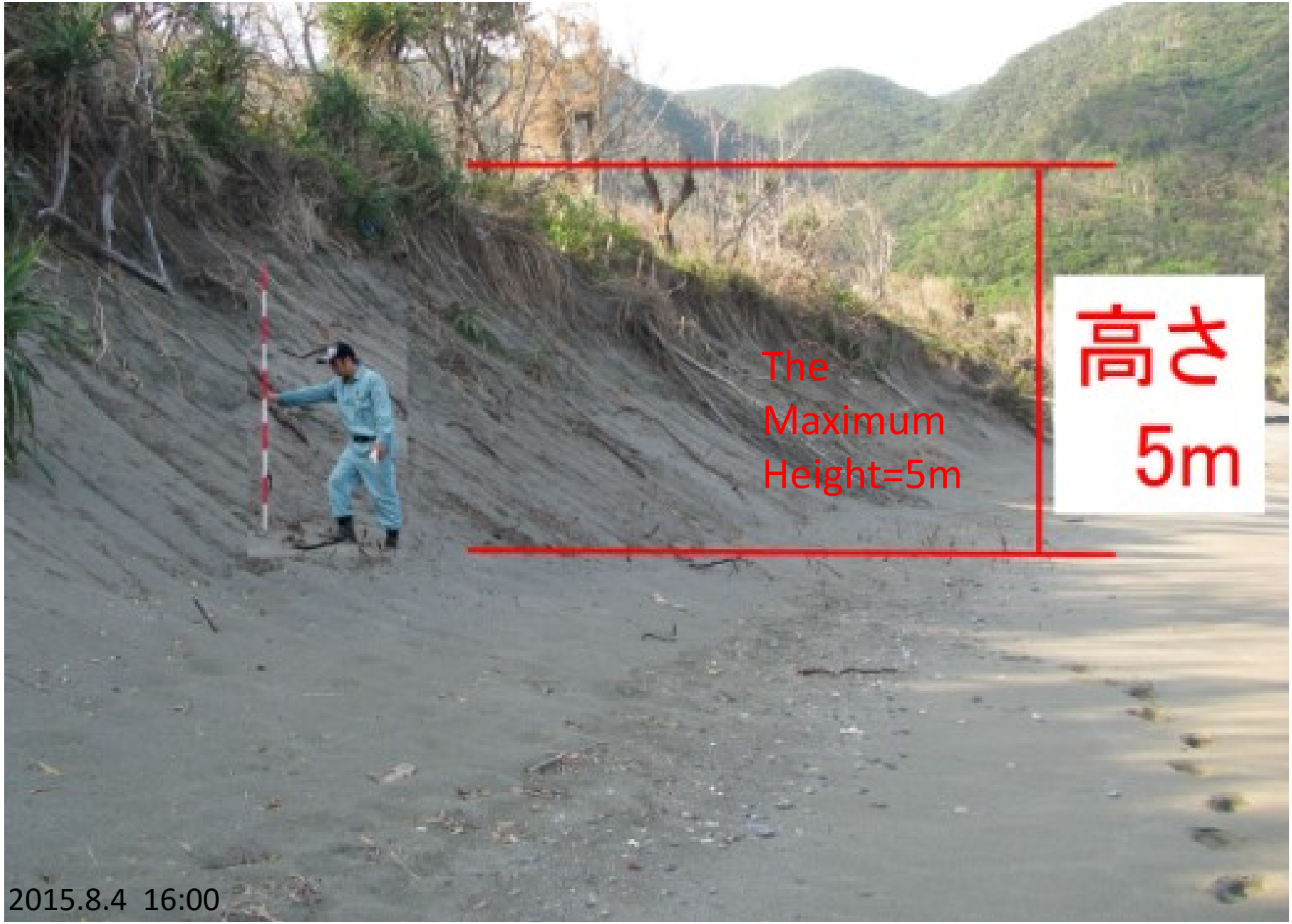
台風18合経過後
After typhoon №18【2014.10.9】

台風19号経過後
After typhoon №19【2014.10.15】



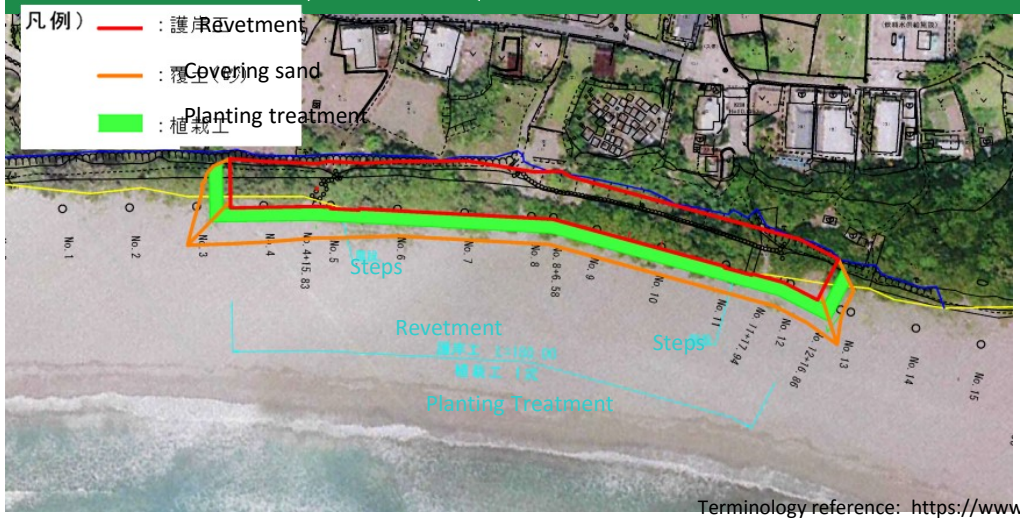


嘉徳The Sand Bank of Katoku Beach



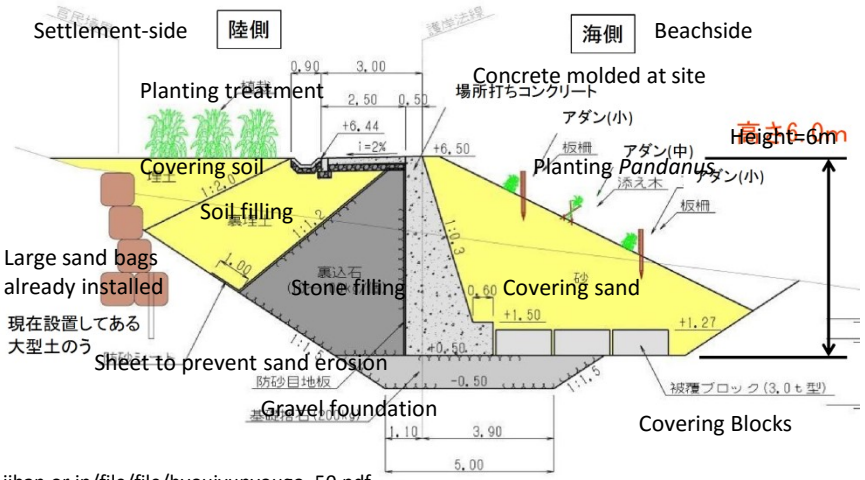
嘉徳 Outline of Buried Embankment

Outline of the Design of Gravity Concrete Revetment (L=180m)



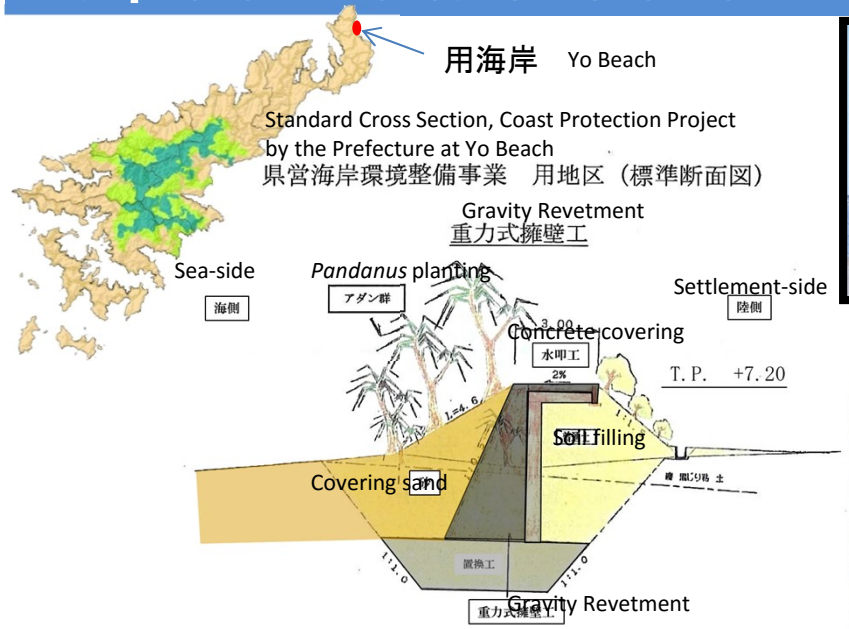
Cross Section of Structure

【護岸整備区間の構造図】



Terminology reference: https://www.jiban.or.jp/file/file/hyoujyunyougo_50.pdf

Example of the same Revetment Installed in Amami-Oshima (At Yo Beach)



Urauchi Bridge Replacement Project

1. Purpose

The Urauchi Bridge (272 m long) was built in 1970 and has been used as a major residential road. Because about 50 years have passed since the construction, deterioration such as corrosion of main girders and peeling of floor slabs has progressed. Therefore, bridge replacement work is planned to maintain the daily life of residents and secure their safety. The new bridge will be built at the same location and at the same scale.

The details of the project including necessary environmental considerations and construction of temporary bridge are currently being discussed by the implementing body and related organizations.

2. Project period (including design period)

JFY 2015 to JFY 2031 (planned)

3. Implementing body

Okinawa Prefecture

5. A list of prevention measures against unintentional invasion by invasive alien species

(1) A list of biosecurity measures

Annex 5-1 shows the list of biosecurity measures in place to ensure that no new invasive species are accidentally introduced to the property.

The alien species that have or may have adverse impacts on the ecosystem, human lives and bodies, and agriculture, forestry, and fishery industries are designated as Designated Invasive Alien Species under the Invasive Alien Species Act. The importing, raising and so on of these species are prohibited. They are subject to stringent inspections at the customs, plant protection station and other relevant offices. A person who has violated these regulations will be punished with work for a period of time not exceeding three years in prison or a fine not exceeding three million yen (approximately USD 28 thousand). In case of a juridical person, it will be punished by a fine not exceeding 100 million yen (approximately USD 0.1 million).

Other than Designated Invasive Alien Species, alien species (including domestic alien species) that have or may have adverse impacts on the native species and ecosystems are appropriately controlled in each prefecture through, for instance, their designation as Prefectural Designated Invasive Alien Species and regulations on activities such as their raising under prefectural ordinances.

These efforts securely prevent the introduction of new invasive alien species to Amami-Oshima Island, Tokunoshima Island, the Northern part of Okinawa Island and Iriomote Island (hereinafter, the “Four Islands”), in principle.

Furthermore, various activities are carried out continuously in preparation for any unintentional invasion of new invasive alien species into the Four Islands. Transect surveys are conducted in the areas around the airports, ports, and main roads on the Four Islands and Ishigaki Island, and sighting information is collected from experts and local residents, in order to promptly detect the invasion. Awareness raising is also promoted. There is enough organizational capability and cooperative relationships among relevant agencies and bodies to promptly detect new invasion before such species invade the property.

If any invasive alien species on the Four Islands is detected, elimination measures will be implemented promptly before their invasion into the property pursuant to the Invasive Alien Species Act and relevant ordinances, in collaboration with relevant organizations.

(2) Measures against the introduction of the cane toad (*Phinella marina*) to Iriomote Island

The cane toad is a Designated Invasive Alien Species under the Invasive Alien Species Act. Importing is prohibited and it is subject to stringent inspections at the customs, plant protection stations (plant quarantine), and other relevant offices. In the event that it is brought into the Four Islands, its transportation is regulated. A person who has violated these regulations will be punished with work for a period of time not exceeding three years in prison or a fine not exceeding three million yen (approximately USD 28 thousand). In case of a juridical person, it will be punished by a fine not exceeding 100 million yen (approximately USD 0.1 million).

The access to Iriomote Island is limited to ferries and most of the materials are shipped from Ishigaki Island. The continued monitoring and capturing system of alien frogs in the port district on Ishigaki Island prevent the unintentional invasion of new alien frogs into Iriomote Island along with such materials. On Iriomote Island, monitoring to promptly detect the invasion of new invasive alien species including alien frogs is continued at various places including port districts.

The invasion of the cane toad was detected for the first time in 2000 on Iriomote Island. Thanks to subsequent elimination activities, no cane toad has been observed since 2017.

The monitoring carried out on Iriomote Island detected the invasion of white-lipped treefrogs (*Polypedates leucomystax*) in 2015 at the early stage of their invasion. With prompt elimination activities, their eradication was achieved in 2019.

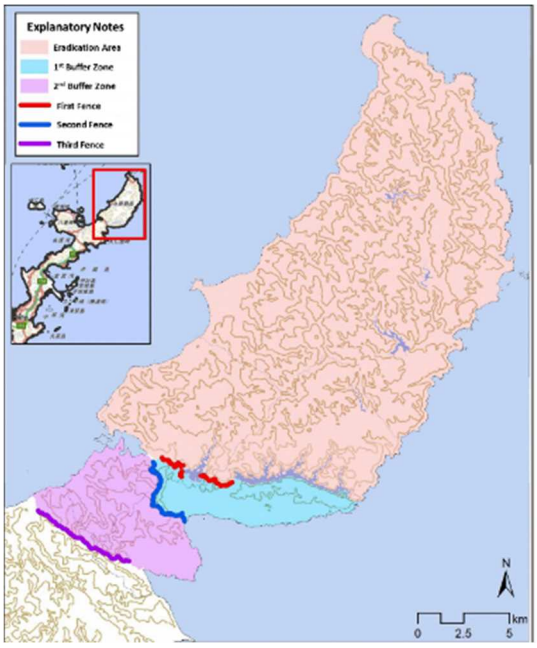
Annex 5-2 shows the details of existing biosecurity measures to securely prevent the unintentional introduction of the cane toad into the nominated property on Iriomote Island.

(3) Measures against the Guam brown tree snake on Okinawa Island

The brown tree snake is a Designated Invasive Alien Species under the Invasive Alien Species Act. The importing, raising and so on of these species is prohibited and it is subject to stringent inspections at the customs, plant protection stations, and other relevant offices. In the event that it is brought into the Okinawa Island, its transportation is regulated. A person who has violated these regulations will be punished with work for a period of time not exceeding three years in prison or a fine not exceeding three million yen (approximately USD 28 thousand). In case of a juridical person, it will be punished by a fine not exceeding 100 million yen (approximately USD 0.1 million).

Furthermore, the fences installed as part of mongoose control measures in Northern part of Okinawa Island has a structure to prevent the invasion of alien snakes as well. This will physically control any

invasion to the Northern part of Okinawa Island, even if alien snakes, such as the brown tree snake, have invaded from a port and expanded its distribution (the airport and ports accessible from outside the island are located south of the mongoose fences only).



Left: Location of mongoose invasion prevention fences in Northern part of Okinawa Island. The Second Fence (blue line) has a structure that can prevent the invasion of alien snakes.

Right: Photo of the Second Fence
The back of the fence is the north side, and the front is the south side. The fence has vertical slits with no catches, and it is difficult for snakes to climb. The lower part of the fence is made into a panel or the slit width is narrowed to prevent snakes from entering through the gap.

In addition, the United States Government ((hereinafter, the "USG") has been undertaking the efforts indicated in the following and annexed documents to prevent taking the brown tree snake out of Guam where ecological damages have been caused by this species. These efforts secure the border control to prevent invasion to Okinawa Island.

1. BTS interdiction and control drivers --- summary of documents that guide the USG's action on Brown Tree Snake, from the BTS Control Act to the installation instructions (Annex 5-3).
2. Biosecurity Management Strategy --- is an overall focus on preventing the movement of 1) BTS and 2) other invasive species (weeds, invertebrates, and small vertebrates) on military cargo, equipment, vehicles, or conveyances (Annex 5-4).

3. JTREGMARIANASINST 5090.10A --- actions to control and interdict the BTS associated with Department of Defense (DoD) activities on Guam (Annex 5-5).
4. AAFB 36 WG INSTRUCTION 32-7004 --- implements the BTS control plan on Andersen AFB in Guam (Annex 5-6).

*Since the IUCN members focused on the brown tree snake in their question, in turn the USG focused on that species in the response.

In addition, it is widely recognised that one of the reason why the damage caused by brown tree snake to the ecosystem on Guam was so serious is the fact that there was only one snake species, the Brahminy blind snake (*Indotyphlops braminus*), inhabited on Guam, an oceanic island. Okinawa Island is a continental island, and there are a total of eight species of native snakes such as the species that preys on vertebrates including birds. Although the situation is different, in the unlikely event that this species should invade Okinawa Island, immediate control measures based on the Invasive Alien Species Act and related ordinances will be taken before the species invades the nominated property.

(For reference) Invasive Alien Species Act

Act on the Prevention of Adverse Ecological Impacts Caused by Designated Invasive Aliens Species (Invasive Alien Species Act) prevents invasion and expansion of Designated Invasive Aline Species by designating invasive alien species that have or may have adverse impacts on the ecosystem, human lives and bodies, and agriculture, forestry, and fishery industries as Designated Invasive Aline Species and by regulating its rearing, growing, storing, carrying, importing and other activities. The control measures are taken by the State and the relevant municipality.

A list of biosecurity measures in place to ensure that no new invasive species are accidentally introduced to the property

		Area			
		A. Entrances of the islands (airports and ports), including central and southern parts of Okinawa Island and Ishigaki Island *1	B. Surrounding Conservation Areas	C. Buffer zones	D. Property
Measures	(1) Understanding invasion status mainly at the entrances of the islands	1. Check at customs clearance i) Check at customs, plant protection stations, etc.			
		2. Survey of invasion status i) Survey of invasion status of species that are listed on the List of invasive alien species threatening biodiversity, human health and/or economy development in Japan.			
		2. Survey of invasion status ii) Survey of alien frogs (Iriomote Island and Ishigaki Island) *1			
		2. Survey of invasion status iii) Survey of alien ants (Okinawa Island *2, Ishigaki Island *1)	3. Monitoring patrol i) Monitoring patrol by government staff, related organizations or groups		
		2. Survey of invasion status iv) Survey of attached seeds at the airport and port (Amami-Oshima Island)	4. Gathering sighting information ii) Gathering information from alien species control promoters (Amami-Oshima Island and Tokunoshima Island), experts and local residents		
		4. Gathering sighting information i) Gathering information from related business operators			
	(2) Measures to prevent invasion into the property or buffer zones	1. Early control i) Emergency control system on the sites when new invasive alien species are detected in (1)			
		2. Regulations based on Invasive Alien Species Act and ordinances i) Regulations on importing, carrying, storing, growing, raising or other handling of regulated species, and appropriate keeping of those species			
			3. Physical preventive measures i) Installation of northward migration prevention fences (Okinawa Island)	3. Physical preventive measures ii) Installation of alien plant seeds removal mats at the starting point of the mountain trail	
			4. Appropriate management of pets i) Appropriate enforcement of ordinances, etc.		
	(3) Elimination measures for invading species	1. Elimination by physical methods 2. Monitoring of elimination status 3.Technological development for early detection and early control * Since elimination measures should be different for each species, specific measures will be taken based on the invasion status of newly invaded alien species.			
	(4) Awareness-raising and education	1. Raising public awareness on invasive alien species among local residents, children, and tourists 2. Education on invasive alien species for staff of related organizations at the ports and airports 3. Information sharing at regular liaison meetings with relevant agencies 4. Raising public awareness on appropriate keeping of pets 5. Raising public awareness on alien species ordinances (regulation contents, regulated species, etc.)			

*1: Since access to Iriomote Island is limited to ferry boat routes from Ishigaki Port, it is relatively easy to undertake preventive measures against invasions. Therefore, intensive measures for preventing invasion and establishment on the island have been implemented, especially for species that may cause damages.

*2: Since there are direct flights from overseas, implementation of border control is particularly effective. Therefore, intensive measures for preventing invasion and establishment on the island have been implemented, especially for species that may cause damages.

Details of existing biosecurity measures that are designed to ensure prevention of the unintentional introduction of the cane toad (Rhinella marina) to the property on Iriomote Island

- Existing biosecurity measures

A. Entrances to the Iriomote Island (ports) and Ishigaki Island (port) which is the access route to Iriomote Island

- Raise awareness and educate the residents of the neighboring Ishigaki Island (especially the parties involved in material shipping) concerning the identification of the cane toad, its impact on environment, and other relevant information.
- Monitor alien frogs in the materials storage places and port district on Ishigaki Island from where materials and other goods are shipped to Iriomote Island.
- Establish a system to capture alien frogs in the port district of Ishigaki Island, from the viewpoint to prevent invasion to Iriomote Island.
- The contractee of public works to be carried out on Iriomote Island provides the parties involved in such works with guidance on the prevention of alien frogs' invasion in connection with such works.

B. Surrounding Conservation Area

- Raise awareness and educate the residents of Iriomote Island concerning the identification of the cane toad, its impact on environment, and other relevant information.
- Monitor alien frogs in the ports and potential habitats on the entire Iriomote Island (a total of about 170 sites) by nighttime play-back surveys, sound devices that attract alien frogs, and recording at fixed times using voice recorder.
- Conduct line transect surveys in 10 sites (with the length of approximately 2.5 to 3 km per one line), mainly in and around the port districts of Iriomote Island, to detect the invasion of species listed on the list of invasive alien species threatening biodiversity, human health and/or economy development in Japan, including cane toad.
- If any invasion is confirmed, capture the species on the spot by staff and other concerned parties.

- Background and specific actions taken

- In 1978, several cane toads were brought into Ishigaki Island for the purpose of pest control. The distribution of cane toads thereafter expanded.
- In 2000, several cane toads were captured on Iriomote Island. This prompted the development of tools including an identification manual and call samples, and awareness raising and education was promoted, mainly targeting the local residents of Ishigaki and Iriomote Islands. At the same time, research activities were conducted to identify the invasion route of cane toads and invasion prevention measures (e.g. fences) were developed. In addition, the monitoring and capturing of cane toads were carried out and continued on Iriomote Island by monitoring staff, including local volunteers, with a

focus on lentic areas, which are necessary for cane toads' breeding. The monitoring of alien frogs has continued thereafter in the port districts and their surrounding areas on Iriomote Island as well as in the port district on Ishigaki Island, while improving monitoring methods.

- No cane toad has been captured on Iriomote Island since it was last captured in 2017.

(For reference)

Countermeasures against white-lipped treefrog (*Polypedates leucomystax*) on Iriomote Island

- In 2015, the inhabitation of the white-lipped treefrog was confirmed in the monitoring of alien frogs, resulting in the immediate launch of a capturing project receiving advices from the experts.
- The capturing project was conducted intensively using improved methods taking into consideration the ecology of the species. Enhanced monitoring was also continued.
- No white-lipped treefrog has been confirmed since 2018 on Iriomote Island.
- Although monitoring is continuing, it was determined in 2019 that the white-lipped treefrog was eradicated and an announcement was made to that effect, as no white-lipped treefrog had been confirmed for one and a half years.
- The monitoring of alien frogs is continuing.

BTS Interdiction & Control Drivers

Federal Regulations/ Law

- ESA (1973)
- Sikes Act (1960)
- DoD Transportation Regulation Part V Chapter 505 (2009)
- **BTS Control Act (2004)**

Executive Orders

- EO 13112 (1999)
- EO 13751 (2016)

Biological Opinions

- ISR Strike
- JGPO
- MITT
- THAAD
- HMU Baiting BO
- GMKI MOA

Installation Instructions

- 36 WGI 32-7004: BTS Management (2006)
- JTREGMARIANAST 5090.10A : BTS Control and Interdiction Plan (2016)

Brown Treesnake (BTS) and Biosecurity (Non-BTS) Risk Management Strategy for Training Activities in the JRM AOR (Guam & Commonwealth of the Northern Mariana Islands (CNMI) [Rota, Tinian, Saipan, FDM])

REFERENCES:

(a) 36 WG INSTRUCTION 32-7004 Brown Tree Snake Management
(b) JTREGMARIANASINST 5090.10A Brown Treesnake Control and Interdiction Plan
(c) COMNAVMARIANAINST 3500.4A Mariana Islands Range Complex Training Manual
(d) 2015 Mariana Islands Training & Testing Biological Opinion
(e) Armed Forces Pest Management Board (AFPMB) Technical Guide No. 31 (Guide for Agricultural Preparation of Military Gear and Equipment for Redeployment)
(f) DoD Directive 4500.9.3.10.1 Processing and Shipping DoD-Sponsored Retrograde Materiel
(g) Executive Order 13112 (13751) Safeguarding the Nation from the Impacts of Invasive Species

Risk Management Strategy:

This risk management strategy will focus on preventing the movement of 1) brown treesnakes (BTS) and 2) other invasive species (weeds, invertebrates, and small vertebrates) on military cargo, equipment, vehicles, or conveyances.

1. Brown Treesnake (BTS)

The risk of BTS movement from Guam to off-island destinations, including the CNMI, involves the movement of aircraft, small vessels (≤100ft), cargo/equipment, and vehicles. To prevent the movement of BTS from Guam to other destinations, the procedures outlined in references (a-d), require 100% inspection by BTS detector canine teams on Guam and the CNMI:

A. Guam Departure Inspections:

1) All aircraft and small vessels (≤100ft) movements to off-island destinations, including the CNMI (Rota, Tinian, Saipan, and FDM) and vessels, must be inspected by USDA-WS BTS detector canine teams (visual & canine inspections) prior to departure from Guam.

2) All cargo/equipment, containers, pallets, and vehicles destined for off-island locations must receive inspections by USDA-WS BTS detector canine teams prior to loading onto aircraft or vessels.

3) All containers and contents must be canine inspected by USDA-WS BTS detector canine teams prior to packing the containers.

4) All airdrop pallets and bundles will be staged in one location and items will receive multiple canine inspections during each USDA-WS shift change and just prior to upload to the aircraft.

B. CNMI Arrival Inspections:

1) All cargo and equipment originating from Guam with arrival on Rota, Tinian, and Saipan must be inspected by BTS detector canine teams upon arrival.

2) All aircraft originating from Guam and shutting down on Rota, Tinian, and Saipan must undergo inspection by BTS detector canine teams.

3) All aircraft originating from Guam and not shutting down "running hot" (including APU running) on Rota, Tinian, and Saipan will undergo BTS visual surveillance/observance until departure by qualified BTS personnel.

4) In order to determine the availability of BTS detector canine teams and BTS visual observers on Rota, Tinian, and Saipan, units must coordinate with the JRM BTS Program Manager.

C. Farallon de Medinilla (FDM) Movements:

1) All aircraft departing Guam to Saipan and then landing on FDM are required to have a canine inspection on Guam prior to departure and on Saipan upon arrival.

2) Tactical flights that start on Guam and go directly to FDM, will require canine inspections on Guam and a visual inspections on arrival at FDM by flight crews and other military personnel on the ground. If the tactical flight returning from FDM needs to stop on Saipan for fuel the aircraft must undergo a BTS canine inspection.

D. Additional BTS Interdiction Measures:

1) BTS control devices are maintained and operated at strategic locations at port and airport locations on Guam (USDA-Wildlife s/CEMML) and in the CNMI (CNMI BTS Program).

2) When necessary, additional BTS control devices will be deployed and maintained by the Navy and/or USDA-Wildlife Service personnel during exercises in which cargo/equipment/vehicles from Guam are offloaded in the CNMI where control devices are not routinely maintained. Therefore Baker runway (Tinian North Field), Charlie Gate (Tinian West Field), and Rota Airport exercise cargo staging area. These BTS control devices are deployed along forest edges in close proximity to aircraft cargo offload operations and cargo staging areas.

3) USDA-WS BTS detector dog teams will be deployed (as necessary) to Rota, Tinian, and Saipan for the duration of an exercise to inspect aircraft, vehicles and cargo/equipment arriving from Guam.

4) All aircraft parked and not in operation at Andersen AFB will have all doors and hatches secured to prevent BTS ingress during nighttime hours.

5) All exercise participants conducting activities on Guam, Rota, Tinian, Saipan, and FDM will be briefed on BTS awareness.

6) All exercise participants will inspect their own personal gear and other hand-carried equipment and supplies for BTS prior to departure from Guam for all off-island destinations.

7) All aircraft crews and all other exercise personnel will maintain alertness for potential BTS around aircraft during taxiing, off-load, on-load, and parking on Guam and all CNMI LZs.

8) USGS-FORT BTS Rapid Response Team Coordinator will be briefed on the locations of the exercise, types of aircraft, numbers of exercise participants, and types and volume of cargo moving between islands.

9) USFWS BTS Coordinator (located on Saipan) will be briefed on the locations of the exercise, types of aircraft, numbers of exercise participants, and types and volume of cargo moving between islands.

E. Brown Treesnake POCs:

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2. Biosecurity (non-BTS)

To prevent the movement of invasive species to, from, and within the JRM AOR, all DoD entities and foreign training partners shall comply with references (d-g) on invasive species introduction prevention and washdown standards. Below describes the general procedures that must take place during training events.

BLUF

- It is the responsibility of the unit to plan for and have adequate washdown equipment or coordinate for the use of wash facilities.
- It is the responsibility of the unit to coor[illegible]ith NAVFAC Biosecurity Program to schedule inspections prior to any movement to/from/between islands within the JRM AOR.
- It is the responsibility of the unit to ensure that all cargo/equipment and vehicles to be moved to/from/between islands within the JRM AOR are clean IAW reference (d). Failure to do so may result in quarantine.

A. Guam Washdown & QA/QC Biosecurity Inspections for Arrival and Departure/Retrograde:

1) **Prior to Arrival to Guam:**
   a. All cargo/equipment and vehicles originating from outside of Guam will be required to meet the AFPMB TG-31 washdown standard.

   b. All items will be systematically inspected by Navy and/or Colorado State University Center for Environmental Management of Military Lands (CSU CEMML) personnel

upon arrival to Guam to ensure no dirt/soil, weed seeds, vegetation, spider webs, invertebrates (e.g., snails, slugs, insects, spiders, etc.), and small vertebrates (e.g., rodents, shrews, skinks, geckos, etc.) are present on any items.

c. Cargo/equipment and vehicles not meeting the standard will be quarantined through the duration of the training until necessary mitigation (e.g., washing, fumigation, etc.) is arranged and conducted at the expense of the respective unit.

2) **Prior to Departure/Retrograde from Guam:**
   a. All cargo/equipment and vehicles departing Guam are required to meet AFPMB TG-31 washdown standards.

   b. All items will be systematically inspected after washdown by Navy personnel and/or CSU CEMML personnel prior to departure to ensure no dirt/soil, weed seeds, vegetation, spider webs, invertebrates (e.g., insects [including Coconut rhinoceros beetles], spiders, snails, slugs, spiders, etc.), and small vertebrates (e.g., rodents, shrews, skinks, geckos, etc.) are present on any items.

   c. All container interiors/exteriors (including bottoms) must be clean and inspected prior to packing and field equipment (including tents) must be clean and inspected to packing to ensure AFPMB TG-31 standards are met.

   d. **Note:** Foreign military partners departing Guam to return directly to their home country will not be required to meet AFPMB TG-31 washdown standards. It is assumed that foreign military partners must meet their country of origin's customs and quarantine standards for reentry into their country, which may be more or less restrictive than the AFPMB TG-31 standards.

3) **Secondary Inspections:** All items staged for several days (>3 days) prior to scheduled departure, will receive additional secondarv inspection(s) for non-BTS invasive species just prior to departure/retrograde.

4) **Personal Gear Self-Inspections:** All exercise participants shall conduct self-inspections of all personal gear and clothing for soil/dirt accumulation, seeds, vegetation, invertebrates, and small vertebrates prior to Guam arriv leparture/retrograde.

5) **Wood Items:**
   a. All wood items (e.g., pallets, plywood, chocks, dunnage, etc.) will be inspected for pest species upon arrival into Guam and before wood items depart Guam.

   b. If wood items are identified as having pest issues, the wood items will be quarantined and removed from the transportation network.

6) Unit POCs: Unit POCs shall coordinate biosecurity inspections of all cargo/equipment and vehicles to be moved to and from Guam with appropriate Biosecurity POC (see below) prior to movement.

B. CNMI Washdown & QA/QC Biosecurity Inspections for Arrival and Departure/Retrograde:

1) **Prior to Arrival to the CNMI:**
   a. All cargo/equipment and vehicles originating from outside the CNMI must meet the AFPMB TG-31 standard.

   b. All items will be systematically inspected by Navy and/or CSU CEMML personnel upon arrival to the CNMI (unless inspected on Guam just prior to movement to the CNMI) to ensure no dirt/soil, weed seeds, vegetation, spider webs, invertebrates (e.g., snails, slugs, insects, spiders, etc.), and small vertebrates (e.g., rodents, shrews, skinks, geckos, etc.) are present on any items.

   c. Cargo/equipment and vehicles not meeting the standard will be quarantined through the duration of the training event until necessary mitigation (e.g., washing, fumigation, etc.) is arranged and conducted at the expense of the respective unit.

2) **Prior to Departure/Retrograde from CNMI:**
   a. All cargo/equipment and vehicles departing CNMI are required to meet AFPMB TG-31 standards.

   b. All items will be systematically inspected after washdown by Navy and/or CSU CEMML personnel prior to departure to ensure no dirt/soil, weed seeds, vegetation, spider webs, invertebrates (e.g., snails, slugs, insects, spiders, etc.), and small vertebrates (e.g., rodents, shrews, skinks, geckos, etc.) are present on any items.

   c. All container interiors/exteriors (including bottoms) must be clean and inspected prior to packing and field equipment (including tents) must be clean and inspected to packing to ensure AFPMB TG-31 standards are met.

   d. **Note:** Foreign military partners departing the CNMI to return directly to their home country (therefore not transiting through Guam) will not be required to meet AFPMB TG-31 washdown standards. It is assumed that foreign military partners must meet their country of origin's customs and quarantine standards for reentry into their country, which may be more or less restrictive than the AFPMB TG-31 standards.

3) **Secondary Inspections:** All items staged for several days (>3 days) prior to scheduled departure, will receive additional secondary inspection(s) for non-BTS invasive species just prior to departure/retrograde.

4) **Personal Gear Self-Inspections:** All exercise participants shall conduct self-inspections of all personal gear and clothing for soil/dirt accumulation, seeds, vegetation, invertebrates, and small vertebrates prior to CNMI arrival and departure/retrograde.

5) **Wood Items:**
   a. All wood items (e.g., pallets, plywood, chocks, dunnage, etc.) will be inspected for pest species upon arrival into the CNMI and before wood items depart the CNMI.

   b. If wood items are identified as having pest issues, the wood items will be quarantined and removed from the transportation network.

6) **Unit POCs:** Unit POCs shall coordinate biosecurity inspections of all cargo/equipment and vehicles to be moved to and from the CNMI with appropriate Biosecurity POC (see below) prior to movement.

C. Additional non-BTS Interdiction Measures:

1) CRB traps are maintained and operated at strategic locations at ports and airports in the CNMI (CNMI Government).

2) When necessary, additional CRB traps will be deployed and maintained by the Navy during exercises in which cargo/equipment/vehicles from Guam are offloaded in the CNMI where CRB traps are not routinely maintained. Therefore Baker runway (Tinian North Field) and Charlie Gate (Tinian West Field). These CRB traps are deployed along fence lines and forest edges in close proximity to aircraft cargo offload operations and cargo staging areas.

2) All aircraft parked and not in operation at Andersen AFB will have all doors and hatches secured to prevent CRB ingress during nighttime hours.

D. Biosecurity (non-BTS) POCs:

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JTREGMARIANASINST 5090.10A
J4
15 Aug 16

JTREG MARIANAS INSTRUCTION 5090.10A

From: Commander, Joint Region Marianas

Subj: BROWN TREE SNAKE CONTROL AND INTERDICTION

Ref: (a) Executive Order 13112, Invasive Species
(b) OPNAVINST 5090.1D
(c) COMNAVMARIANASINST 3500.4A
(d) SECNAV Manual 5210.1

Encl: (1) Joint Region Marianas Implementation Plan for Brown Tree Snake Control and Interdiction June 2016
(2) Critical Brown Tree Snake Points of Contact

1. Purpose

a. To provide a plan to coordinate actions to control and interdict the Brown Tree Snake (BTS) associated with Department of Defense (DoD) activities on Guam and within the Joint Region Marianas (JRM) Area of Responsibility (AOR).

b. To establish specific responsibilities, policy, procedures, and guidelines to prevent the spread of the BTS via the DoD transportation network of Naval Support Activity Andersen (NSAA) Guam, also referred to as Andersen Air Force Base (AAFB), Naval Base Guam (NBG), or by any tenants of DoD leased and owned lands on Guam to areas where BTS is not already established.

c. To provide procedures and guidelines pertaining to pre-departure of training exercises off-island. The dispersal of BTS from Guam to other locales is a serious economic and environmental threat. Preventing dispersal of BTS via military sea and air movement is a priority for JRM.

d. This instruction is a complete revision and should be reviewed in its entirety.

2. Cancellation. COMNAVMARIANASINST 5090.10.

3. Applicability. This instruction applies to JRM, Base Commanders, Major Exercise Commanders, Training Unit Commanders,

all military flight and sea crews, and all commands, organizations, units, and activities authorized on DoD lands on Guam and facilities, training areas, and ranges controlled by JRM.

4. Background. In accordance with (IAW) reference (a), JRM is responsible for implementing measures to prevent the introduction or spread of invasive species to the United States or elsewhere. The BTS is an alien species to the United States, including Guam, whose introduction has caused significant economic and environmental harm; consequently, it is classified as an invasive species. IAW reference (b), the Navy is required to ensure military readiness and sustainability while complying with natural resources protection laws, and conserving and managing natural resources in the United States, its territories, and possessions. This dual dynamic of stewardship and readiness is essential for the long-term maintenance of military and natural resources sustainability. IAW reference (c), JRM is the controlling and scheduling authority for Navy-owned and controlled training areas and services in the Mariana Islands.

5. Policy. Preventing the dispersal of BTS in military sea and air cargo is a priority for JRM. This instruction provides guidance and direction to prevent the dispersal of BTS from Guam to other locales via military sea and air shipments of personnel, equipment, and cargo. This instruction establishes the JRM Implementation Plan for BTS Control and Interdiction, hereafter referred to as the "BTS Implementation Plan". Enclosure (1) is to be followed during the planning and execution of any movement of military sea and air shipments, including personnel. Enclosure (2) is a listing of Critical BTS Points of Contact.

6. Responsibilities

a. Commander, Joint Region Marianas (CJRM) through JRM Region Engineer (J4) is responsible for:

(1) Implementing measures to ensure that all cargo leaving Guam is snake free;

(2) Ensuring adequate funding of BTS control and interdiction operations related to JRM and mission-specific activities;

(3) Assigning authority and responsibility regarding BTS control and interdiction to applicable personnel;

(4) Communicating with, and assisting all applicable Federal and State agencies, in the timely completion of mandatory BTS control and interdiction processes;

(5) Facilitating the implementation of the BTS Implementation Plan to reduce BTS from areas under JRM jurisdiction with the ultimate goal of BTS eradication and prohibit BTS leaving Guam via the DoD transportation network;

(6) Ensuring military training and exercises are in compliance with Mariana Islands Training and Testing Program Biological Opinion (MITT BO) BTS control and interdiction requirements; and

(7) Requiring and supporting BTS educational awareness training for all DoD personnel, tenant commands, and accountable contractors.

b. Region Operations Program Director (J3) is responsible for:

(1) Overseeing BTS control and interdiction operations pursuant to the planning and deployment of all off-island training exercises;

(2) Assembling the Combined Exercise Command Group (CECG) and Combined Exercise Support Group (CESG) when required for major training exercises to undertake tasks IAW reference (b);

(3) Ensuring that JRM Conservation Program (EV2) is involved in the planning process related to BTS control and interdiction;

(4) Ensuring that all relevant BTS control and interdiction procedures and protocols are included in Environmental Monitor Checklist or equivalent;

(5) Ensuring all DoD personnel, tenant commands, and contractors participating in the preparation and execution of

off-island training are fully informed and compliant with BTS control and interdiction requirements; and

(6) Halting, postponing or modifying any aspect of the training exercise in the event BTS control and interdiction requirements are breached.

c. Base Commanders, within their respective AOR, are responsible for:

(1) Ensuring environmental oversight and compliance of all actions with respect to BTS control and interdiction, including military training;

(2) Reviewing, understanding, and complying with the BTS Implementation Plan;

(3) Ensuring effective communication with EV2 relating to the BTS Implementation Plan;

(4) Ensuring that personnel are knowledgeable in terms of execution and compliance of the BTS Implementation Plan;

(5) Stopping movement or issue BTS inspection exemptions as defined in the BTS Implementation Plan; and

(6) Exercising jurisdiction over non-DoD tenants to stop movement or issue BTS inspection exemptions as defined in the BTS Implementation Plan.

d. Commanding Officers in charge of tenant commands and deploying units operating within the JRM AOR are responsible for:

(1) Understanding and complying with the BTS Implementation Plan;

(2) Communicating with EV2 any issues, comments, modifications or clarifications pertaining to the BTS Implementation Plan;

(3) Ensuring that personnel are knowledgeable in terms of execution and compliance of the BTS Implementation Plan;

(4) Coordinating BTS inspection schedules with United States Department of Agriculture-Wildlife Services (USDA-WS) and EV2;

(5) Stopping movement or issue BTS inspection exemptions as defined in the BTS Implementation Plan;

(6) Notifying the recipient location of the departure of craft, vessel or cargo without a BTS inspection (including urgent and short order missions) prior to arrival at destination;

(7) Ensuring all records of required, completed and missed inspections are entered in the BTS log daily;

(8) Facilitating the transmission to EV2 of a weekly report of BTS inspection results including required, completed and missed inspections for preceding week;

(9) Ensuring all observed, contained or killed BTS are reported to EV2; and

(10) Ensuring completion of BTS educational awareness training for all DoD personnel, tenant commands, and accountable contractors.

e. The CECG and CESG are responsible for:

(1) Including DoD environmental staff with BTS expertise to assist with planning and execution of major training exercises;

(2) Reviewing, understanding, and complying with the BTS Implementation Plan;

(3) Reviewing, understanding, and complying with Appendix A of reference (c) or equivalent;

(4) Consulting with EV2 on any BTS interdiction request requiring logistic support from USDA-WS;

(5) Working with the Air Force Commanders to ensure aircraft parking plans comply with BTS interdiction requirements;

(6) Working with the Navy Commanders to ensure sea vessel mooring plans comply with BTS interdiction requirements;

(7) Ensuring BTS processes are in place by providing monitors when required;

(8) Informing EV2 of staffing assignments relating to cargo handling and BTS response;

(9) Supporting training unit Commanders in the establishment of temporary quarters, and staging areas for BTS inspection of personnel, vehicles, and cargo;

(10) Assisting EV2 with the scheduling of troop briefing sessions on BTS awareness and education; and

(11) Assisting and coordinating with EV2 on the distribution of BTS educational material and posting of BTS information in temporary quarters, barracks, and work sites.

f. Commanders and Officers in Charge (OICs) of units deploying into AOR are responsible for:

(1) Complying with all aspects of Environmental Monitor Checklist training and other training instructions;

(2) Communicating and cooperating with EV2 and the CECG/CESG during the establishment of temporary quarters, and BTS inspection staging areas;

(3) Coordinating with EV2 for troop briefing sessions on BTS awareness and education;

(4) Ensuring that EV2 or the CECG/CESG have conducted BTS information sessions and disseminated information and materials to all participating units and cargo handlers;

(5) Ensuring all training and logistic support staff sign BTS briefing attendance form on the completion of the briefing session;

(6) Consulting with EV2 on any BTS interdiction request requiring logistical support from USDA-WS;

(7) Working with on-site Commanders to determine wash down facilities and BTS inspection areas;

(8) Providing USDA-WS with access to cargo and equipment for BTS inspections;

(9) Ensuring all individual troops are responsible for inspection of all personal gear;

(10) Designating staff to assist USDA-WS with BTS inspections where necessary;

(11) Ensuring that all associated transportation craft have been inspected prior to departure; and

(12) Informing USDA-WS in the event of missed aircraft, sea vessel, cargo or equipment BTS inspection.

g. OICs of Aircraft Operations, in addition to requirements of reference (c), are responsible for:

(1) Ensuring that notifications for BTS inspection requirements are included in the appropriate flight publications;

(2) Ensuring a copy of the daily and updated flight schedule is provided at every shift change or upon request to USDA-WS and EV2;

(3) Informing USDA-WS immediately of modifications to posted flight schedules;

(4) Requiring flight plans to be filed to 36 OSS and Command Post no less than three (3) hours prior to intended departure;

(5) Notifying USDA-WS no less than two (2) hours prior to departure for scheduled BTS inspection; and

(6) Stopping movement or issue BTS inspection exemptions as defined in the BTS Implementation Plan.

h. OICs of Sea Vessel Operations, in addition to requirements of reference (c), are responsible for:

(1) Ensuring USDA-WS and EV2 are notified in writing of any sea vessel requiring a BTS inspection no less than 24 hours prior to intended departure;

(2) Informing USDA-WS immediately of modifications to posted sea vessel departure schedules;

(3) Requiring departure plans for sea vessels requiring BTS inspection to be delivered to Port Operations no less than 12 hours prior to the intended departure; and

(4) Notifying USDA-WS no less than five (5) hours prior to departure for scheduled BTS inspection.

i. OICs of Cargo Operations (including munitions, general cargo, privately-owned vehicles and household goods), in addition to requirements of reference (c), are responsible for:

(1) Providing schedules of inspections to USDA-WS and EV2 for the subsequent week;

(2) Informing USDA-WS and EV2 of all inspections requiring additional or revised scheduling;

(3) Providing USDA-WS with no less than four (4) hour notice for all required BTS inspections;

(4) Issuing immediate notification to USDA-WS and EV2 in the event cargo is loaded without a BTS inspection; and

(5) Ensuring all personnel associated with the transportation of cargo are in full compliance of the BTS Implementation Plan.

j. Aircraft Pilots and Sea Vessel Captains are responsible for:

(1) Ensuring that all points of entry including doors, windows, gangways, access panels, and intakes are closed and/or sealed when not in use;

(2) Delaying departure until a scheduled BTS inspection has occurred unless a departure without BTS inspection has been authorized by the OIC within AOR;

(3) Remaining alert for, and report, BTS to EV2 via OIC within AOR; and

(4) Containing or killing BTS where possible.

k. Flight and Sea Vessel Crews participating in training exercise are responsible for:

(1) Cooperating and complying with EV2, CECG/CESG, and USDA-WS directions pursuant to BTS inspection;

(2) Remaining alert for, and report, BTS to the chain of command, and EV2 within the AOR; and

(3) Containing or killing BTS where possible.

l. 36 Munitions (36 MUNS), Naval Munitions Command (NMC), Naval Munitions East Asia Guam and all DoD ordnance transportation entities on Guam are responsible for:

(1) Informing USDA-WS and EV2 no less than 30 days prior to large scheduled shipments of munitions;

(2) Staging munitions shipments in an area and manner conducive to BTS inspections as outlined in the BTS Implementation Plan;

(3) Ensuring all open containers are closed and sealed before dusk;

(4) Ensuring BTS inspection occurs before the final closure of the container and seal immediately after inspection;

(5) Ensuring uncovered (i.e., break-bulk) munitions or munitions held overnight in opened or unsealed containers are subject to BTS inspection prior to transportation;

(6) Issuing notification to USDA-WS and EV2 within two (2) hours in the event that munitions are loaded without a BTS inspection;

(7) Remaining alert for, and report, BTS to OIC within AOR; and

(8) Containing or killing BTS where possible.

m. All entities and personnel responsible for cargo including POVs are responsible for:

(1) Avoiding cargo stacks higher than five (5) feet during canine BTS inspection;

(2) Providing a movable, level platform for BTS canine inspections in the event that cargo stacked higher than five (5) feet is unavoidable;

(3) Inspecting boxes and crates for holes, punctures, cracks, and other damages, and flag for a more detailed BTS inspection;

(4) Ensuring outbound cargo is inspected by USDA-WS prior to loading and transportation;

(5) Scheduling additional BTS inspection if cargo is not secured in a BTS-proof container or transported prior to dusk;

(6) Remaining alert for, and report, BTS to OIC within AOR; and

(7) Containing or killing BTS where possible.

n. All entities responsible for the transportation of DoD personal household goods off Guam are responsible for:

(1) Providing a pack-out list that includes physical address, resident's contact information, estimated overall weight, carrier, destination, and any other relevant information to USDA-WS and EV2;

(2) Providing USDA-WS and EV2 with information on cancellation, postponement, revision, or any other changes to the scheduled BTS inspection the day prior to the intended inspection; and

(3) Ensuring goods are prepared and staged in a manner conducive to BTS inspection as outlined in the BTS Implementation Plan.

o. EV2 is responsible for:

(1) Reviewing, understanding, and complying with the BTS Implementation Plan;

(2) Performing duties associated with the execution of the BTS Implementation Plan including Planning, Programming, Budgeting, and Execution (PPBE) and the establishment of all required reporting elements and protocols;

(3) Providing oversight of the day-to-day operational components of the BTS Implementation Plan;

(4) Liaising with USDA-WS on scheduling, BTS operations, and all other information pertaining to BTS;

(5) Ensuring USDA-WS is fully aware of all activities requiring its support;

(6) Ensuring follow up communication and debrief with appropriate personnel at recipient location in the event aircrafts or sea vessels depart Guam without a BTS inspection;

(7) Requiring the submission of weekly, monthly and annual BTS related data and/or reports from USDA-WS;

(8) Requiring the submission of weekly data and/or reports from OICs responsible for aircraft, sea vessel and cargo inspections;

(9) Reviewing and approving all BTS submitted reports;

(10) Maintaining records pertaining to BTS control and interdiction operations;

(11) Reporting non-compliance to either the J4 Region Engineer or Base Commander, where appropriate;

(12) Submitting BTS related report(s) to CJRM via J4 Region Engineer annually or upon request;

(13) Developing and initiate appropriate BTS education modules for use via the Environmental Compliance Assessment, Training, and Tracking System (ECATTS) or the Environment, Safety, and Occupational Health Training Network (ESOHTN), and completed as part of standard DoD training protocols. Facilitate other on-site staff educational training requirements via the development of awareness briefings, written information, and visual aids;

(14) Overseeing development and dissemination of BTS education and awareness information for DoD personnel, tenant and other commands, and relevant contractors;

(15) Informing USDA-WS immediately of BTS observed, captured, or killed in areas of interdiction by DoD personnel or contractors;

(16) Facilitating and ensuring J3's ability to comply with BTS control and interdiction requirements pursuant to training exercises;

(17) Facilitating and assisting BTS briefing sessions for troops prior to exercise deployment; and

(18) Recommending to J3, the cessation of any aspect of the training exercise, in the event BTS control and interdiction requirements are breached.

7. Action. Applicable entities will adhere to the policies and procedures provided in enclosure (1).

8. Records Management. Records created as a result of this instruction, regardless of media and format, shall be managed IAW reference (d).

B. BOLIVAR

Distribution:
JTREGMARIANASINST 5215.2
Electronic only, via the CNIC G2 Portal at
https://g2.cnic.navy.mil/JRM/SitePages/Home.aspx
Lists I through IV

JOINT REGION MARIANAS IMPLEMENTATION PLAN FOR BROWN TREE SNAKE CONTROL AND INTERDICTION MANUAL

JTREGMARIANASINST 5090.10A

Prepared for
Commander, Joint Region Marianas

June 2016

RECORD OF CHANGES

CHANGE NO.	DATE OF CHANGE	DESCRIPTION OF CHANGE	DATE CHG MADE	INITIALS

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JOINT REGION MARIANAS IMPLEMENTATION PLAN FOR BROWN TREE SNAKE CONTROL AND INTERDICTION

Reference:

(a) Executive Order 13112, Invasive Species
(b) Biological Opinion for the Mariana Islands Training and Testing Program (2015)
(c) Nonindigenous Aquatic Nuisance Prevention and Control Act (1990)
(d) Duncan Hunter National Defense Authorization Act, Public Law 110-417 sec. 316 (2009)
(e) COMNAVMARIANASINST 3500.4B
(f) OPNAVINST 5090.1D
(g) Brown Tree Snake Control and Eradication Act (2004)
(h) Report to Congress, Control of the Brown Tree Snake (2008)

1.0 INTRODUCTION

1.1 Purpose

The Joint Region Marianas (JRM) Implementation Plan for Brown Tree Snake (BTS) Control and Interdiction[1] (BTS Implementation Plan) is a management tool intended to facilitate the day-to-day execution of the operational procedures designed to prevent the transportation of the snake from Guam and protect Department of Defense (DoD) personnel, dependants, and contractors living and working on base. It also includes BTS translocation prevention measures for the preparation and execution of off-island training exercises. Prevention of BTS translocation is achieved through interdiction[1]. The Instruction assigns responsibilities and standardizes operations with respect to BTS interdiction logistical support. JRM chain of command assumes most responsibility as do units directly involved with BTS interdiction procedures. JRM's overall goals and objectives for the prevention of BTS translocation, and the strategies by which they will be achieved, are established in the BTS Implementation Plan. The BTS Implementation Plan addresses the three programmatic areas of BTS control and interdiction: Logistic Containment, Quality of Life, and Conservation. The BTS Implementation Plan is applicable to all DoD activities on Guam in the JRM AOR, and all personnel directly or indirectly responsible for military sea and air transportation of goods, equipment, and personnel. This includes Commander, JRM through JRM Region Engineer [J4], Base Commanders, Officers in Charge (OICs) of Tenant and Other Commands, Area Training and Operations [J3], Major Exercise Commanders, Training Unit Commanders, military flight and sea crews, and all commands, tenants, organizations, and units. JRM Conservation Program [EV2] will oversee the day-to-day operations and act as a liaison between DoD and the Service Provider (United States Department of Agriculture-Wildlife Services [USDA-WS]).

The BTS Implementation Plan is specific to BTS interdiction activities on Guam. Interdiction requirements for activities occurring at other locales are addressed in the COMNAVMARIANASINST 3500.4B (Marianas Training Manual)

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[1] For the purpose of the Interdiction Plan, the definition of interdiction is to hinder, prohibit, or prevent the BTS from departing Guam using all current inspection and suppression processes. Interdiction implicitly includes BTS control. The definition of suppression is the reduction or elimination of BTS in a given area.

and MITT BO (USFWS 2015) and the MITT Record of Decision (ROD). Other recipient localities and additional information relevant to off-island BTS management is also covered in the Region Biosecurity Plan for Micronesian and Hawaii.

1.2 Brown Tree Snake Threat

The mildly venomous BTS probably arrived on Guam in the late 1940s as a stowaway in vehicles or other material originating in the Admiralty Islands (Rodda et al. 1992). The most plausible entry point to Guam is Apra Harbor. By the mid to late 1980s, the BTS had colonized the entire island (Savidge 1987). As the range of the BTS expanded, the distribution and abundance of native forest birds contracted (Savidge 1987). The BTS is believed responsible for the loss of most of Guam's native forest birds and negatively impacting several native lizard species (Savidge 1987, Rodda and Fritts 1992, Rodda et al. 1997, Wiles et al. 2003). Other detrimental effects include costly damage to electrical power infrastructure, loss of domesticated animals, bites and envenomations of humans, increased shipping costs, and possibly a decline in tourism (Rodda and Savidge 2007).

BTS sightings outside the known range have been reported in the Commonwealth of the Mariana Islands (CNMI), the Republic of the Marshall Islands, Chuuk, Hawaii, Okinawa, Wake Island, Diego Garcia, Spain, Texas, Alaska, and Oklahoma (Stanford and Rodda 2007, BTS Working Group 2009). The impacts resulting from BTS colonizing snake-free areas will likely be similar to those on Guam. The CNMI and Hawaii pose a particular risk because their climates are comparable to Guam, and their similar native faunas are vulnerable to novel predators such as the BTS. The CNMI and Hawaii are also susceptible to BTS establishment due to their relative proximity to Guam, high volume of commerce with Guam, and projected increases in military-related inter-island movements.

1.3 Authority

Provisions are applicable to all DoD activities on Guam in the JRM AOR, and all personnel on Guam directly and/or indirectly responsible for military sea and air transportation of goods, equipment, and personnel. This instruction is applicable to BTS control and interdiction activities administered by the programmatic areas of Logistic Containment, Quality of Life, and Conservation. This instruction is to be followed during the planning and preparation of any movement of military air and/or sea cargo, including personnel, originating from Guam. Guidelines for prevention of the spread of BTS at recipient locales are not covered by this instruction. Recipient locales are those in the Pacific Basin, including regions under the jurisdiction of the Mariana Islands Training and Testing Program Environmental Impact Statement (MITT EIS) and the Biological Opinion for the Mariana Islands Training and Testing Program 2015 (BO MITT, Guam CNMI). Responsibilities listed in Section B (BTS Control and Interdiction Operations for the Planning and Execution of Off-Island Training Exercises) are supplemental and do not replace those listed in Section A (BTS Control and Interdiction Operations). Compliance with this publication is mandatory.

1.4 Background

IAW reference (a), Federal agencies are responsible for preventing the introduction or spread of invasive species in the United States or elsewhere. The introduction of BTS to Guam has caused significant economic and environmental harm; consequently it is classified as an invasive species. IAW reference (b), the Navy will work cooperatively with U.S. Fish and Wildlife Services and U.S. Department of Agriculture to develop protocols for interdiction and control methods aimed at controlling BTS as they are relevant to the Mariana Islands Range Complex. IAW reference (c), a Task Force consisting of DoD and non-DoD members, will undertake a comprehensive, environmentally sound program in coordination with regional, territorial, State and local entities to control the BTS in Guam. IAW reference (d) The Secretary of Defense will develop a comprehensive program to eradicate the BTS population from military facilities on Guam and ensure that military activities, including civilian and military transport of personnel and equipment to and from Guam, do not promote the spread of the BTS. IAW reference (e), COMNAVMARIANAS is the controlling and scheduling authority for Navy-owned and controlled training areas and services in the Mariana Islands. The dispersal of BTS from Guam is a serious economic and environmental threat. Preventing dispersal of BTS in military sea and air cargo is a priority. IAW reference (f), the Navy is required to ensure military readiness and sustainability while complying with natural resources protection laws, and conserving and managing natural resources in the United States, its territories and possessions. This combination of stewardship and readiness is essential for the long-term maintenance of military and natural resources sustainability. IAW reference (g), a need exists for improved and better coordinated control, interdiction, research, and eradication of the BTS on the part of the United States. IAW reference (h), Navy and Air Force have committed to 100 percent snake-free cargo and annually appropriate funds for BTS control and inspection costs with the goal of preventing the BTS from exiting Guam. Section A is BTS Control and Interdiction Operations.

1.5 Management Responsibilities for Implementation

The DoD is responsible for preventing translocation of BTS via the military transportation pathway. To ensure prevention is achieved, DoD-funded BTS programs are in operation in conjunction with the implementation of the Instruction. These programs impact daily DoD operations and include transportation craft, cargo, and personnel. All DoD and civilian personnel working in the shipping and transportation sectors are responsible for providing support for BTS interdiction and complying with the mandated Instruction.

1.5.1 Roles of Federal Agencies Involved in BTS Control and Interdiction

Department of Defense

JRM is required to fund and support critical BTS operations designed to prevent the accidental translocation of BTS from Guam via any military transportation pathway. JRM is the responsible DoD entity and facilitates BTS control and interdiction across the three programmatic areas of Logistic Containment, Quality of Life, and Conservation. The JRM Conservation Program [EV2] oversees operations and program compliance. JRM is accountable for ensuring that all applicable personnel are aware of, and fully trained in, all relevant aspects of BTS programs.

United States Department of Agriculture-Wildlife Services
USDA-WS is the primary entity (Service Provider) responsible for implementing DoD-supported BTS programs. USDA-WS will adhere to JRM instructions and standards to maintain successful BTS control and interdiction programs. While executing JRM BTS-related programs, USDA-WS will be attentive to areas requiring improvement and increased efficacy. Suggestions to enhance operations will be proffered to JRM by USDA-WS. USDA-WS will assist JRM in promoting BTS awareness for military personnel and others as directed.

1.5.2 Overarching Goals of BTS Interdiction

JRM will facilitate activities and programs associated with achieving the following overarching goals of BTS control and interdiction:

- 100% inspection of all non-exempt transportation craft and cargo departing Guam;
- 100% implementation of assigned roles and responsibilities;
- 100% mandatory compliance with the Instruction; and
- 100% documentation of relevant BTS inspections and operations.

1.5.3 High Risk Destinations for BTS Translocation

The following destinations are most vulnerable to BTS translocation and colonization and therefore considered High Risk Destinations (HRD):

- CNMI, particularly Rota, Tinian, Saipan, and Farallon de Medinilla (FDM);
- Pacific Islands, particularly Hawaii (including Midway Island), Johnston Atoll, Wake Atoll, Marshall Islands (including Kwajalein and Majuro Atolls), Federated States of Micronesia (including Kosrae, Pohnpei, Chuuk, and Yap), Palau, Okinawa (Japan), and Iwo Jima (Japan);
- Diego Garcia; and
- Continental United States.

1.5.4 Relevant Regulations and Drivers for BTS Control and Interdiction

The following regulations and drivers establish the DoD's responsibility in the control of BTS populations on Guam and prevention of spread of BTS from Guam.

- Executive Order 13112, Invasive Species (1999)
- Defense Transportation Regulation, Agricultural Cleaning and Inspection Requirements (Part V, Chapter 505) (2009)
- Biological Opinion for the Mariana Islands Training and Testing Program 2015
- Sikes Act (2003)
- Nonindigenous Aquatic Nuisance Prevention and Control Act (1990)
- Duncan Hunter National Defense Authorization Act, Public Law 110-417 sec. 316 (2009)
- COMNAVMARIANASINST 3500.4A, Marianas Training Handbook (2013)
- OPNAVINST 5090.1D, Environmental Readiness Program Manual (2014)
- Brown Tree Snake Control and Eradication Act (2004)
- Report to the Congress, Control of the Brown Tree Snake (2008)
- National Defense Authorization Act (FY 2008)

- Animal Damage Control Act (1991)
- Memorandum of Agreement on Brown Tree Snake Control among the U.S. Department of the Interior, U.S. Department of Defense, U.S. Department of Agriculture, U.S. Department of Transportation, National Invasive Species Council, Government of Guam, State of Hawaii, and the Commonwealth of the Northern Mariana Islands (2011)
- Lacey Act (1998)
- National Environmental Policy Act (1969)
- Endangered Species Act (1973)
- DoD Instruction 4715.9 Environmental Planning and Analysis (1996)
- Federal Insecticide, Fungicide, and Rodenticide Act (1947)

SECTION A.

PROGRAMMATIC AREAS OF BTS CONTROL AND INTERDICTION

JRM supports BTS control and interdiction in three programmatic areas: Logistic Containment, Quality of Life, and Conservation. Logistic Containment is the principal program and involves all aircraft, sea vessels, cargo, and personnel departing Guam. The Quality of Life program aims to decrease human-snake interactions primarily in and adjacent to military housing installations. The Conservation program protects important natural resources such as the endangered Mariana swiftlet by decreasing BTS in essential habitats.

2.0 LOGISTIC CONTAINMENT

2.1 Strategic Goal

Prevent the dispersal of BTS through military transportation pathways to ensure the snake does not become established at any locale outside Guam.

Background - To prevent the dispersal of BTS through military movements, the federal government has funded a BTS program since 1990 (COMNAVMAR 2004). In 1993, DoD signed a Memorandum of Agreement with other stakeholder agencies to coordinate BTS research and support the Animal Damage Control Program operated by USDA-WS (BTS Task Force 1996, COMNAVMAR 2004). A primary component of this program is to prevent BTS translocation via aircraft and sea vessel pathways, shipments of cargo, and movements of DoD personnel (COMNAVMAR 2004).

2.1.1 Objective 1

Prevent BTS from departing Guam via military ***transportation craft.***

Implementation Task 1: Conduct BTS inspections of all non-exempt aircraft prior to departure.

Performance element: All non-exempt aircraft departing Guam will be subject to visual and canine inspection by USDA-WS prior to departure. USDA-WS requires a minimum of two [2] hour notices for inspection.

Aircraft on the ground for less than three [3] hours between dusk and dawn require only a visual inspection by USDA-WS. Aircraft that present a physical hazard to an inspecting canine (as ascertained by USDA-WS) will require a visual inspection only.

If a required inspection does not occur, movement of craft will be delayed until the inspection has taken place or exemption is granted by authorized personnel as IAW this Instruction Aircraft exempt from inspection include:

i. Aircraft protected by sovereign immunity;

ii. Urgent missions (e.g., Medevac, short-notice stage/contingency missions) or touch-and-go training (e.g., Field Carrier Landing Practice [FCLP] training);

iii. Unmanned Aircraft Systems (UAS) that fly above 10,000 ft for at least one [1] hour;

iv. Aircraft that land after dawn, are on the ground less than three [3] hours, and depart before dusk the same day;

v. Local missions that are not scheduled to land off-island; or

vi. Aircraft equipped with approved BTS exclusion device.

Leads: EV2, USDA-WS
Participants: JRM, OIC, AAFB, COMNAVMAR

Implementation Task 2: Conduct BTS inspections of all non-exempt sea vessels prior to departure.

Performance element: All non-exempt sea vessels departing Guam will be subject to visual and canine inspection by USDA-WS prior to departure. USDA-WS requires a minimum of five [5] hours notice for inspection.

If a required inspection does not occur, movement of craft will be delayed until the inspection has taken place or exemption is granted by authorized personnel as IAW this Instruction.

Sea vessels exempt from inspection include:

i. Sea vessels protected by sovereign immunity;

ii. Sovereign Vessel with USDA Animal and Plant Health Inspection Service (APHIS) personnel on board;

iii. Vessels berthed between dawn and dusk that depart the same day;

vi. Vessels equipped with approved BTS exclusion device;

v. Vessels longer than 100 ft; or

vi. Vessels anchored offshore.

Leads: EV2, USDA-WS
Participants: JRM, OIC, COMNAVMAR

Implementation Task 3: Prevent BTS from accessing transportation craft or vessel via cargo loading equipment.

Performance element 1: Cranes and other cargo loading equipment will be subject to visual and canine inspections by USDA-WS daily.

Leads: EV2, USDA-WS
Participants: JRM, AAFB, COMNAVMAR

Implementation Task 4: Reduce the number of BTS at and adjacent to points of exit.

Performance element 1: Operate BTS traps on, but not limited to, fence lines surrounding ports, warehouses, and aircraft holding facilities. Traps will be monitored, cleared, and serviced by USDA-WS at least once per seven [7] days. USDA-WS is responsible for trapping operations and ensuring trap functionality. The number of traps and their exact locations will be recommended by USDA-WS and approved by JRM prior to trap deployment. Modification to the number, type, and location of traps in the interim will require prior approval by JRM.

Performance element 2: Nighttime visual searches for BTS using spotlights will occur at transportation hub fence lines (e.g., flight line, ports). All searches will be conducted by trained USDA-WS personnel. At no time will spotlights be directed toward an active runway, taxiway, or parking apron during flight line searches. BTS detected during searches will be captured and killed. Search locations will be recommended by USDA-WS and approved by JRM. Visual searches in designated areas using spotlights will occur at least twice per seven [7] days, or as recommended by USDA-WS and approved by JRM.

Performance element 3: The number of BTS at and adjacent to points of exit will be reduced through the distribution of acetaminophen-laced bait, where deemed necessary. Bait stations will be monitored, cleared, and serviced by USDA-WS at least once per seven [7] days. The number and location of toxicant baits will be recommended by USDA-WS and approved by JRM prior to their deployment. Modification to the number and location of toxicant baits in the interim will require prior approval by JRM.

Lead: USDA-WS
Participants: JRM, EV2, AAFB, COMNAVMAR

Implementation Task 5: Reduce BTS prey at and adjacent to points of exit.

Performance element: USDA-WS or other Service Provider will conduct BTS prey reduction in areas surrounding aircraft and sea vessel facilities. The purpose of prey reduction is to reduce the likelihood of BTS being attracted to these areas, therefore decreasing the risk of a snake stowing away in outbound transportation craft.

The type, number, and location of toxicant baits for rodent control and methods for avian control will be recommended by USDA-WS or other Service Provider and approved by JRM prior to their implementation. Modification to the methods employed will require prior approval by JRM.

Lead: USDA-WS or other Service Provider
Participants: JRM, EV2, AAFB, COMNAVMAR

Implementation Task 6: Ensure that all air and sea crew members are familiar with BTS interdiction policies and procedures.

Performance element 1: BTS awareness briefings will be developed by EV2 and implemented for all incoming air and sea crew members.

Performance element 2: The following notification will be published in the appropriate Flight Information Publications (e.g., as a Notice to Airmen [NOTAM]).

"All aircraft departing Andersen AFB are required to have a brown tree snake inspection. Changes in scheduled departure times require three [3] hours prior notice to ensure timely accomplishment of this inspection."

Performance element 3: Prior to departing Guam, the question, "was the craft inspected for brown tree snakes?" will be accomplished by 36 Operations Support Squadron personnel. This question is mandatory for all departing flights. Answering this question is mandatory for all departing flights.

Lead: EV2
Participants: JRM, Base Commanders, OIC, 36 OSS, AAFB, COMNAVMAR, USDA-WS

Implementation Task 7: Follow established BTS Emergency Response Protocol for BTS sightings within interdiction areas on Guam and in the CNMI. Interdiction areas include any point of exit, such as a sea port or flight line, all cargo staging and holding facilities, and cargo loading locations for off-island shipments. (Appendix A).

Performance element: Any snake observed on or in the vicinity of an aircraft or sea vessel must be reported immediately to USDA-WS. If possible, the snake should be killed and held for identification. Visual contact with the snake should be maintained for as long as possible in the event the snake cannot be captured. Because the BTS is mildly venomous, caution must be exercised during the capture and killing of the snake.

Lead: EV2
Participants: JRM, OIC, AAFB, COMNAVMAR, USDA-WS.

2.1.2 Objective 2
Prevent the dispersal of BTS via military cargo shipments.

Implementation Task 1: Conduct BTS inspections of all outbound munitions prior to departure.

Performance element: All outbound munitions will be subject to visual and canine inspection by USDA-WS prior to departure. USDA-WS requires a minimum of three [3] hours notice for inspection.

Munitions will be staged in a manner conducive to inspection for BTS. Break-bulk munitions will be placed individually in the staging area so that the canine-handler team is able to fully circumnavigate the item. Munitions will not be stacked in a manner that would prohibit the canine from accessing all items potentially harboring a BTS.

BTS inspections will occur before the container is closed. Once the BTS inspection is complete and the inspected item is cleared by USDA-WS, the ISO or other container will be sealed.

Any munitions shipment left open or unsealed overnight will be subject to re-inspection. Re-inspection may involve unloading the container.

Leads: EV2, USDA-WS
Participants: JRM, OIC, AAFB, COMNAVMAR

Implementation Task 2: Conduct BTS inspections of all non-exempt outbound cargo prior to loading onto transportation craft.

Performance element: All non-exempt cargo departing Guam will be subject to visual and canine inspection by USDA-WS prior to loading onto the transportation craft. USDA-WS requires a minimum of three [3] hours notice for inspection.

Hazardous materials and other cargo that may be harmful to an inspecting canine (as ascertained by USDA-WS) will require a visual inspection only.

POVs must be inspected immediately prior to containerization.

Any cargo allowed to sit overnight in an unsealed shipping container must be re-inspected prior to loading.

Cargo exempt from inspection includes the following:

i. Cargo protected by sovereign immunity;

ii. Cargo stored below 23°F (-5°C) for more than one [1] hour; and

iii. Cargo stored below 31°F (0.6°C) for more than five [5] hours.

Leads: EV2, USDA-WS
Participants: JRM, OIC, AAFB, COMNAVMAR

Implementation Task 3: Conduct BTS inspections of all outbound household goods (HHG) prior to being placed in crates for shipment.

Performance element: All HHG departing Guam will be subject to visual and canine inspection by USDA-WS prior to being placed in crates by private moving companies. USDA-WS requires a minimum of three [3] hours notice for inspection.

Written information and visual aids will be developed by EV2 to inform residents of inspection requirements. Requirements will include procedures that will ensure access to goods at the scheduled time of inspection and require household pets be removed during the inspection process.

HHG are to be prepared and staged in a manner conducive to BTS inspection by canine. For the purpose of expediting crating by private moving companies, items should be placed in boxes prior to inspection. Boxes should be open during inspection and closed immediately thereafter. To the extent possible, boxes will be placed in a central location inside the residence. All boxes must be situated away from walls to allow circumnavigation by the USDA-WS canine-handler team.

The packaging of outbound items in crates **cannot occur** until the inspection is complete. HHG that are crated prior to BTS inspection will be regarded as missed.

In the event that circumstances prohibit the completion of all HHG inspections, inspections will be prioritized based on the potential risk of BTS at each housing location. Risk factors will be determined based on

residence location, number of at-risk items (e.g., outdoor equipment and furniture), and destination. In the absence of a risk analysis, parameters defining risk determination will be established by EV2 in consultation with USDA-WS and approved by JRM. Established risk determinations will be defined within USDA-WS Standard Operating Procedures.

Leads: EV2, USDA-WS
Participants: JRM, OIC, AAFB, COMNAVMAR

Implementation Task 4: Conduct BTS inspections of all cargo holding facilities.

Performance element: DoD cargo warehouses and staging yards will be subject to visual and canine inspections by USDA-WS at an established frequency necessary for interdiction purposes. Frequency of warehouse and staging yard inspections will be established by EV2 in consultation with USDA-WS and approved by JRM.

Areas affected by Implementation Task 4 include, but are not restricted to, 734th AMS warehouse and staging yard, Warehouse 9, Polaris Point T-shed (Building 3192) and Building 4436, MSC, Kilo Wharf, X-Ray Wharf, and COMNAVMAR POV lot.

Leads: EV2, USDA-WS
Participants: JRM, OIC, AAFB, COMNAVMAR

Implementation Task 5: Reduce the number of BTS in and adjacent to cargo holding facilities.

Performance element 1: Operate BTS traps on, but not limited to, fence lines surrounding the cargo staging areas at Polaris Point, Kilo Wharf, X-Ray Wharf, Sierra Wharf, Victor Wharf, Uniform Wharf. Traps will be monitored and serviced by USDA-WS at least once per seven [7] days. USDA-WS is responsible for trapping operations and ensuring trap functionality. The number of traps and their exact locations will be recommended by USDA-WS and approved by JRM via EV2 prior to deployment. Modification to the number, type, and location of traps in the interim will require prior approval by JRM.

Performance element 2: Nighttime visual searches for BTS using spotlights will occur in and adjacent to cargo storage facilities. All searches will be conducted by trained USDA-WS personnel. All BTS detected during searches will be hand captured and killed. Locations where nighttime visual search are conducted will be recommended by USDA-WS and approved by JRM. Visual searches using spotlights will occur at each location a minimum of once every seven [7] days, or as recommended by USDA-WS and approved by JRM.

Performance element 3: The number of BTS at and adjacent to cargo storage facilities will be reduced through the distribution of acetaminophen-laced bait, where deemed necessary. Bait stations will be monitored, cleared, and serviced by USDA-WS at least once per seven [7] days. The number and location of toxicant baits will be recommended by USDA-WS and approved by JRM prior to their deployment. Modification to number and location of toxicant baits in the interim will require prior approval by JRM.

Lead: USDA-WS
Participants: JRM, EV2, AAFB, COMNAVMAR

Implementation Task 6: Reduce BTS prey in and adjacent to cargo holding facilities.

Performance element: USDA-WS or other Service Provider will conduct BTS prey reduction operations in and adjacent to cargo holding facilities. The purpose of prey reduction is to reduce the likelihood of BTS being attracted to these areas, therefore decreasing the risk of a snake stowing away in outbound cargo.

The type, number, and location of toxicant baits for rodent control and methods for avian control will be recommended by USDA-WS or other Service Provider and approved by JRM prior to their implementation. Modification to the methods employed will require prior approval by JRM.

Lead: USDA-WS or other Service Provider
Participants: JRM, EV2, AAFB, COMNAVMAR

Implementation Task 7: Construct Snake Sterile Staging Areas (SSSAs) at areas of critical control, as necessary.

Performance element: A SSSA is a site secured by a snake barrier as defined by United States Geological Survey (USGS) construction materials and standards. SSSAs will be established for interdiction purposes as deemed strategically necessary by JRM. A SSSA can either serve as a containment unit that prohibits the escape of a snake or an exclusionary unit that prevents snake infiltration. Barriers may be constructed at points of entry and exit (e.g., cargo ports) or cargo containment areas.

Lead: JRM
Participants: AAFB, COMNAVMAR, EV2, USDA-WS

Implementation Task 8: Follow established BTS Emergency Response Protocol for BTS sightings within interdiction areas on Guam and in the CNMI. Interdiction areas include any point of exit, such as a sea port or flight line, all cargo staging and holding facilities, and cargo loading locations for off-island shipments. (Appendix A).

Performance element: Any snake observed in/on or in the vicinity of cargo or a cargo holding facility must be must be reported immediately to USDA-WS. If possible, the snake should be killed and held for identification. Visual contact with the snake should be maintained for as long as possible in the event the snake cannot be captured. Because the BTS is mildly venomous, caution must be exercised during the capture and killing of the snake.

Lead: EV2
Participants: JRM, OIC, AAFB, COMNAVMAR, USDA-WS

2.1.3 Objective 3
Prevent the dispersal of BTS via DoD personnel movements.

Implementation Task 1: Require all DoD personnel departing Guam to inspect personal belongings for BTS.

Performance element: Prior to departing Guam, DoD personnel will be required to inspect all outbound personal belongings.

A BTS inspection of personal belongings by DoD personnel will include a visual search of all gear, hand-carried items and any other possessions intended for off-island transport. Items are to be hand packed individually and carefully inspected immediately prior to placement in baggage.

Lead: OIC
Participants: JRM, EV2, AAFB, COMNAVMAR

Implementation Task 2: Educate all DoD personnel, tenant commands, and accountable contractors on the BTS threat and interdiction protocol.

Performance element 1: Directly upon arrival to Guam, personnel will be required to attend a BTS training and awareness seminar. The BTS information session will include the following:

i. BTS history on Guam, environmental impacts, and need for control and interdiction;

ii. Control operations on Guam;

iii. Canine inspection demonstration by USDA-WS;

iv. Live BTS demonstration;

v. Appropriate responses to a detected snake;

vi. A review of proper methods to capture, contain, restrain, and kill a snake; and

vii. Information distributed to the OIC and/or made available on the Internet.

Performance element 2: A course specific to the BTS will be incorporated into the Environmental Compliance Assessment, Training, and Tracking System (ECATTS) or the Environment, Safety, and Occupational Health Training Network (ESOHTN) and completed as part of standard DoD training protocols. A required ECATTS/ESOHTN yearly refresher course will be developed.

Performance element 3: Provide briefing with relevant written information/visual aids for BTS control and interdiction requirements and procedures for personnel departing Guam and requiring a pack out of HHG.

Performance element 4: BTS educational posters will be prominently displayed in work sites and dormitories.

Lead: EV2
Participants: JRM, OIC, AAFB, COMNAVMAR, USDA-WS

3.0 QUALITY OF LIFE

3.1 Strategic Goal

Decrease human-snake interactions to promote human health and safety for DoD personnel.

Background - The BTS is a mildly venomous snake. Although a bite from the BTS is not known to have resulted in a fatality, at least 10 children on Guam have been placed on life support after being bitten. A survey conducted in 1994 found that about 80 percent of bites occurred while the victim was asleep and 82 percent were on children one to three months of age (Fritts et al. 1994). JRM supports a BTS control program in and adjacent to military housing on installations in which USDA-WS operates BTS traps and conducts nighttime spotlighting for BTS. Trapping and spotlighting for human health and safety also occurs at the Guam Naval Hospital.

3.1.1 Objective

Decrease human-snake interactions in and adjacent to military housing installations and other areas of human health and safety concern.
Implementation Task: Reduce the number of BTS in and adjacent to military housing on both installations and other select locations.

Performance element 1: Operate BTS traps on, but not limited to, fence lines and perimeters surrounding military housing on both installation and Guam Naval Hospital. Traps will be monitored and serviced by USDA-WS a minimum of once every seven [7] days. USDA-WS is responsible for trapping operations and ensuring trap functionality. The number of traps and their exact locations will be recommended by USDA-WS and approved by JRM prior to deployment. Modification to the number, type, and location of traps in the interim will require prior approval by JRM.

Performance element 2: Nighttime visual searches for BTS using spotlights in and adjacent to military housing on both installations. All searches will be conducted by trained USDA-WS personnel. All BTS detected during searches will be captured and killed. Locations will be recommended by USDA-WS and approved by JRM. Visual searches using spotlights will occur at each location a minimum of once every seven [7] days, or as recommended by USDA-WS and approved by JRM.

Lead: USDA-WS
Participants: JRM, EV2, AAFB, COMNAVMAR

4.0 CONSERVATION

4.1 Strategic Goal

Support **conservation** and recovery of the endangered Mariana swiftlet on Guam.

Background - The BTS is implicated in the extirpation of 13 of Guam's 22 native breeding birds. The abundances of the remaining species were severely reduced (Fritts and Rodda 1998, Wiles et al. 2003). Of the native forest birds, only the Micronesian starling and Mariana swiftlet remain in the wild on Guam (Fritts and Rodda 1998, Wiles 2005). The Mariana swiftlet is

classified as endangered by the U.S. Fish and Wildlife Service and Government of Guam. Mariana swiftlets remaining on Guam inhabit three caves located on the Naval Magazine. The Conservation program aims to protect swiftlets from BTS predation to increase the number of birds in each cave.

4.1.1 Objective

Reduce BTS predation on the Mariana swiftlet.

Implementation Task: Reduce the number of BTS in areas surrounding caves inhabited by Mariana swiftlets.

Performance element: Operational BTS traps and bait stations in areas surrounding the three remaining occupied caves. Traps and bait stations will be monitored and serviced by USDA-WS a minimum of once every seven [7] days. USDA-WS is responsible for trapping and bait stations operations and ensuring trap functionality. The number of traps and bait stations and their locations will be recommended by USDA-WS and approved by JRM prior to deployment. Modification to number, type, and location of traps and bait stations in the interim will require prior approval by JRM.

Lead: USDA-WS
Participants: JRM, EV2, COMNAVMAR

SECTION B:

BTS CONTROL AND INTERDICTION OPERATIONS FOR THE PLANNING AND EXECUTION OF OFF-ISLAND TRAINING EXERCISES

5.0 OFF-ISLAND TRAINING EXERCISE PLANNING AND EXECUTION

DoD assets on Guam are to expand significantly in the coming years. Guam is projected to experience an influx of military personnel with the relocation of Marines from Okinawa, Japan. Associated with this relocation will be an increase in off-island training exercises. Training exercises involve increased movements of troops and equipment off Guam. For each training exercise that occurs, the potential for inadvertent BTS translocation exists. To prevent BTS translocation, additional control and interdiction measures are needed on Guam during the planning and execution phases of each exercise. The following requirements for BTS control and interdiction are specific to Guam and do not extend to activities at off-island training locations. Off-island training locations are those in the Pacific Basin, including regions under the jurisdiction of the Mariana Islands Range Complex and the Biological Opinion for the Mariana Islands Training and Testing Program 2015 (BO MITT, Guam CNMI). BTS control and interdiction operations at off-island training locations will need to have a separate execution plan for each off-island training exercise that is in compliance with the MITT BO in relation to BTS control and interdiction requirements. BTS control and interdiction requirements in this section augment and do not replace those provided in Section A.

5.1 Strategic Goal

Maintain integrity of BTS control and interdiction operations during the execution of training exercises and augment control and interdiction measures where needed.

Background - All requirements for BTS control and interdiction provided in Section A remain in effect for off-island training exercises. However, because an off-island training exercise can result in an elevation of transportation craft, cargo, and personnel movements, additional measures to prevent BTS translocation will be incorporated into the planning and execution stage.

5.1.1 Objective 1

Plan for and implement BTS control and interdiction operations during the preparation of off-island training exercises where needed.

Implementation Task 1: Coordinate logistics on Guam and with the location(s) hosting the scheduled exercise.

Performance element 1: Pre-exercise planning will include, but not be restricted to, the designation and/or provision of:

i. Responsible logistics personnel;

ii. Aircraft parking and sea vessel mooring plans;

iii. Cargo off-loading and staging areas;

iv. Vehicle staging areas;

v. SSSAs;

vi. Cargo drop zones; and

vii. Any additional equipment necessary for BTS control.

The necessity and planning of snake trapping strategies using topographical features and proximity to cargo staging, handling, or processing areas will be determined in consultation with USDA-WS and EV2.

Logistical requirements are to be determined and delegated in consultation with USDA-WS and EV2.

Performance element 2: Prior to the execution of an exercise in the CNMI, associated plans for BTS control and interdiction operations will be developed, and reviewed with CNMI Department of Lands and Natural Resources (DLNR) officials, including both the Division of Fish and Wildlife (DFW) and Division of Agriculture. For off-island exercises not occurring in the CNMI, associated plans for BTS control and interdiction operations will be reviewed with the appropriate government agencies. Information pertinent to BTS control and interdiction measures will be disseminated by EV2 or appointed personnel. Discussions with off-island location personnel will include coordination of cargo handling procedures for exercise-associated cargo departing Guam.

Leads: OIC, CECG, CESG, EV2
Participants: JRM, AAFB, COMNAVMAR, USDA-WS

Implementation Task 2: Increase and augment interdiction procedures on Guam during exercise preparation and execution.

Performance element 1: Assign USDA-WS canine-handler teams to be on duty 24 hours per day/seven days per week during deployment activities.

Performance element 2: All temporary quarters on Guam will be subject to visual and canine inspections by USDA-WS prior to departure.

Performance element 3: Personal equipment, including tent canvas, to be used in off-island training exercise will be laid out for USDA-WS canine inspection prior to off-island departure.

Performance element 4: All cargo departing Guam for the CNMI or other off-island destinations will be marked by USDA-WS to indicate that a complete canine inspection has occurred and that cargo has been approved for shipment.

Performance element 5: If scope of training exercise requires, SSSA(s) will be erected. A SSSA is a site secured by a snake barrier that creates a BTS-free holding area for inspected cargo cleared for shipment. Temporary snake barriers have been used in the past during large scale training exercises. Need, placement, and construction elements of SSSA(s) will be established by

EV2 and OIC in consultation with USDA-WS during the planning process and approved by JRM. SSSA(s) will be installed either by or under the supervision of USDA-WS in adherence to USGS construction materials and standards.

Performance element 6: Provide lighting at designated staging and inspection areas as needed.

Performance element 7: USDA-WS will implement increases in trapping operations around cargo staging and inspection areas as deemed necessary in the planning process.

Performance element 8: USDA-WS will conduct nighttime perimeter walks of cargo staging and inspection areas with spotlights to detect and capture BTS.

Performance element 9: Enhance rodent control measures and grounds maintenance practices to reduce the potential of BTS in areas selected for vehicle and cargo staging in coordination with USDA-WS, if deemed necessary.

Leads: EV2, USDA-WS
Participants: JRM, OIC, CECG, CESG, AAFB, COMNAVMAR

Implementation Task 3: Ensure personnel awareness of BTS translocation risk and interdiction procedures prior to execution of training exercise.

Performance element 1: Provide briefing with relevant written information/visual aids for BTS control and interdiction requirements to troops and other DoD personnel participating in exercise prior to departure.

A BTS briefing for a training exercise will include:

i. Potential impacts if BTS are transported from Guam via military vehicles, cargo, or equipment;

ii. BTS awareness instructional video and/or printed materials;

iii. Individual responsibilities for BTS sightings in interdiction areas on Guam and at off-island training locations in the CNMI (BTS Emergency Response Protocols, Appendix A);

iv. Participation and/or demonstrations by USDA-WS when possible (as determined by USDA-WS availability); and

v. The distribution of information cards as a reminder of the BTS threat and responsibilities for immediate action.

Performance element 2: For major exercises, incorporate BTS control and interdiction procedures into the exercise plan's Environmental Awareness Annex. Included in the annex will be information cards defining applicable environmental protective measures, including BTS control, interdiction, and inspection protocols that are to be distributed to training personnel.

Performance element 3: BTS educational posters will be prominently displayed in temporary quarters. Information displayed will include BTS Emergency Response Protocols (Appendix A).

Leads: OIC, CECG, CESG, EV2
Participants: JRM, J3, AAFB, COMNAVMAR, USDA-WS

Implementation Task 4: Follow established BTS Emergency Response Protocols for BTS sightings in interdiction areas on Guam and at off-island training locations in the CNMI (Appendix A).

Performance element: Any snake observed at an off-island training location (Tinian, elsewhere in the CNMI, and Hawaii) must be reported immediately. If possible, the snake should be killed and held for identification. Visual contact with the snake should be maintained for as long as possible in the event the snake cannot be captured. Because the BTS is mildly venomous, or the snake may not be a BTS, caution must be exercised during the capture and killing of the snake.

Lead: EV2
Participants: JRM, OIC, CECG, CESG, AAFB, COMNAVMAR, USDA-WS

5.1.2 Objective 2
Prevent the dispersal of BTS via DoD personnel movements.

Implementation Task 1: Require all DoD personnel departing Guam to inspect personal belongings for BTS.

Performance element: Prior to departing Guam, DoD personnel will be required to inspect all outbound personal belongings and document that all personal belongings have been thoroughly inspected for BTS.

A BTS inspection of personal belongings by DoD personnel will include a visual search of all gear, hand-carried equipment and supplies, tent canvas, and any other possessions intended for off-island transport. For the purpose of inspection, items are to be placed individually and in an orderly manner in an area cleared of all other extra items. The visual inspection of an item will involve, but not be limited to the opening of containers, unrolling of clothes or other bundled items, and investigation into any region of the item that may potentially serve as a hiding location for BTS. Items are to be hand packed individually and carefully inspected immediately prior to placement in baggage.

Lead: OIC
Participants: JRM, EV2, AAFB, COMNAVMAR

ACRONYMS, ABBREVIATIONS, AND KEY TERMS

36 MUNS	36th Munitions Squadron
36 OSS	36th Operations Support Squadron
734th AMS	734th Air Mobility Squadron
AAFB	Andersen Air Force Base (Also referred to as Naval Support Activity Andersen -- NSAA)
AOR	Area of Responsibility
APHIS	Animal and Plant Health Inspection Service
BTS	Brown Tree Snake
°C	Celsius
CECG	Combined Exercise Command Group
CES	Civil Engineer Squadron
CESG	Combined Exercise Support Group
CEVP	Civil Engineer Environmental Planning Division
CNMI	Commonwealth of the Northern Mariana Islands
COMNAVMAR	Commander Naval Forces Marianas
COMNAVMARIANASINST	Commander Naval Forces Marianas Instruction
Conservation Program	Program supported by Joint Region Marianas to minimize BTS predation on federally endangered species on Guam
Control	See Interdiction
DFW	Division of Fish and Wildlife
Dispersal	The act of spreading or disseminating
DoD	Department of Defense
DPW	Department of Public Works
EAD	East Asia Division
EIS	Environmental Impact Statement
EMS	Environmental Management System
EO	Executive Order
ESA	Endangered Species Act
EV2	JRM Conservation Program
Extralimital	Outside of a known range
°F	Fahrenheit
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FY	Fiscal Year

HHG	Household Goods
HRD	High Risk Destination
INRMP	Integrated Natural Resources Management Plan
Instruction	Joint Region Marianas Instruction Brown Tree Snake Control and Interdiction
Interdiction	Hinder, prohibit, or prevent the brown tree snake from departing Guam using all current inspection and suppression processes. Interdiction implicitly includes BTS control
ISO	International Organization for Standardization
JRM	Joint Region Marianas
JTREGMARIANASINST	Joint Region Marianas Instruction
Logistic Containment Program	Program supported by Joint Region Marianas to prevent the dispersal of the brown tree snake from Guam via a military transportation pathway
MSC	Military Sea Lift Command
MIRC	Mariana Islands Range Complex
MITT BO	Mariana Island Training and Testing Biological Opinion
MITT EIS	Mariana Island Training and Testing Environmental Impact Statement
MITT ROD	Mariana Island Training and Testing Record of Decision
NANPCA	Nonindigenous Aquatic Nuisance Prevention and Control Act
NAVFAC	Naval Facilities Engineering Command
NBG	Naval Base Guam
NEPA	National Environmental Policy Act
NCTS	Naval Computer and Telecommunications Station
NDAA	National Defense Authorization Act
NMC	Naval Munitions Command
NSAA	Naval Support Activity Andersen (Also referred to as Andersen Air Force Base -- AAFB)
OIC	Officer in Charge
OPNAVINST	Office of the Chief of Naval Operations Instruction
POV	Privately-owned Vehicle
Quality of Life Program	Program supported by Joint Region Marianas to trap BTS for human health and safety purposes around housing installations and other select areas
SSSA	Snake Sterile Staging Area

Suppression	Reduction or elimination of brown tree snakes in a given area
Translocation	Movement to a new location
U.S.	United States
USDA-WS	United States Department of Agriculture - Wildlife Services
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

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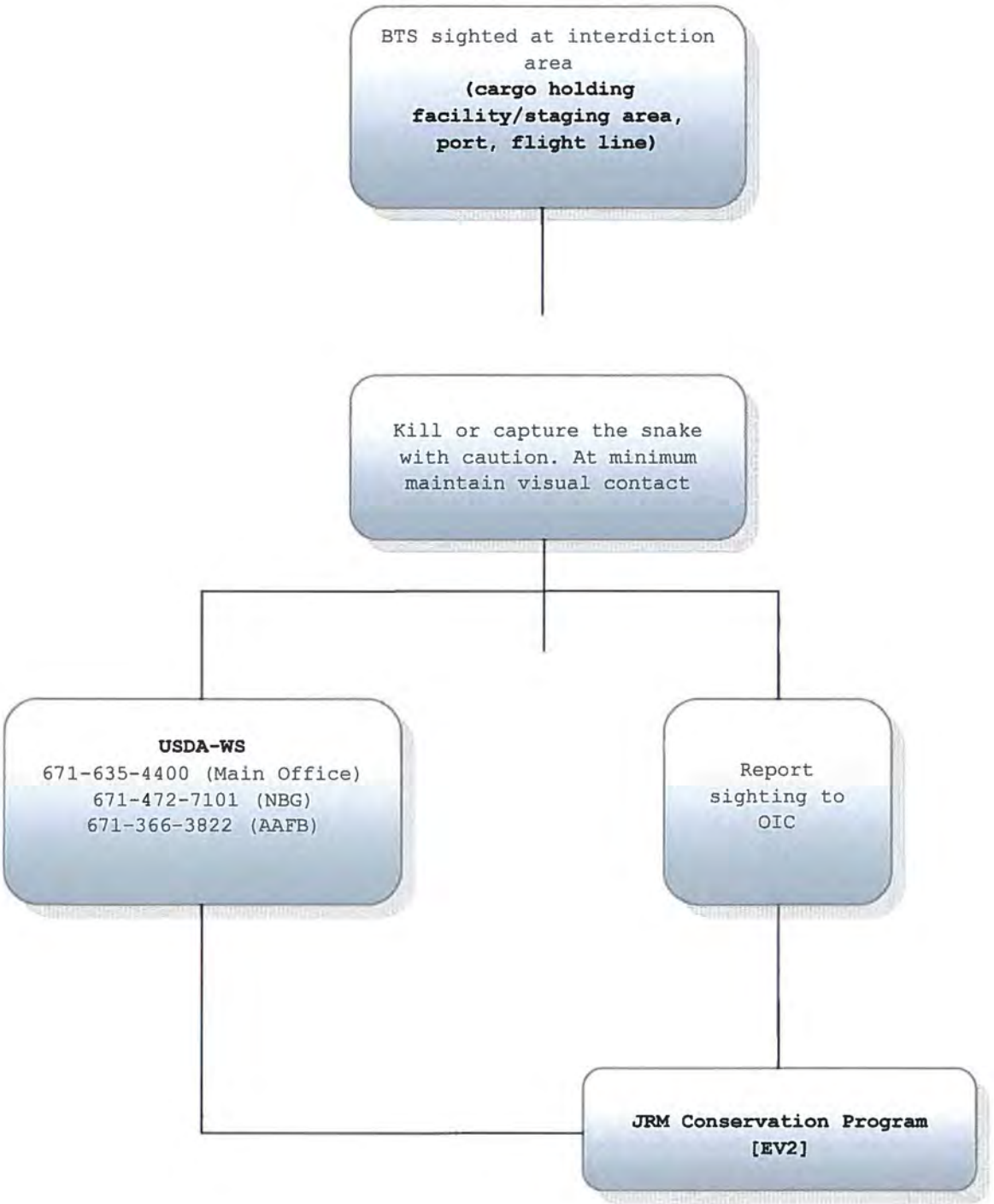
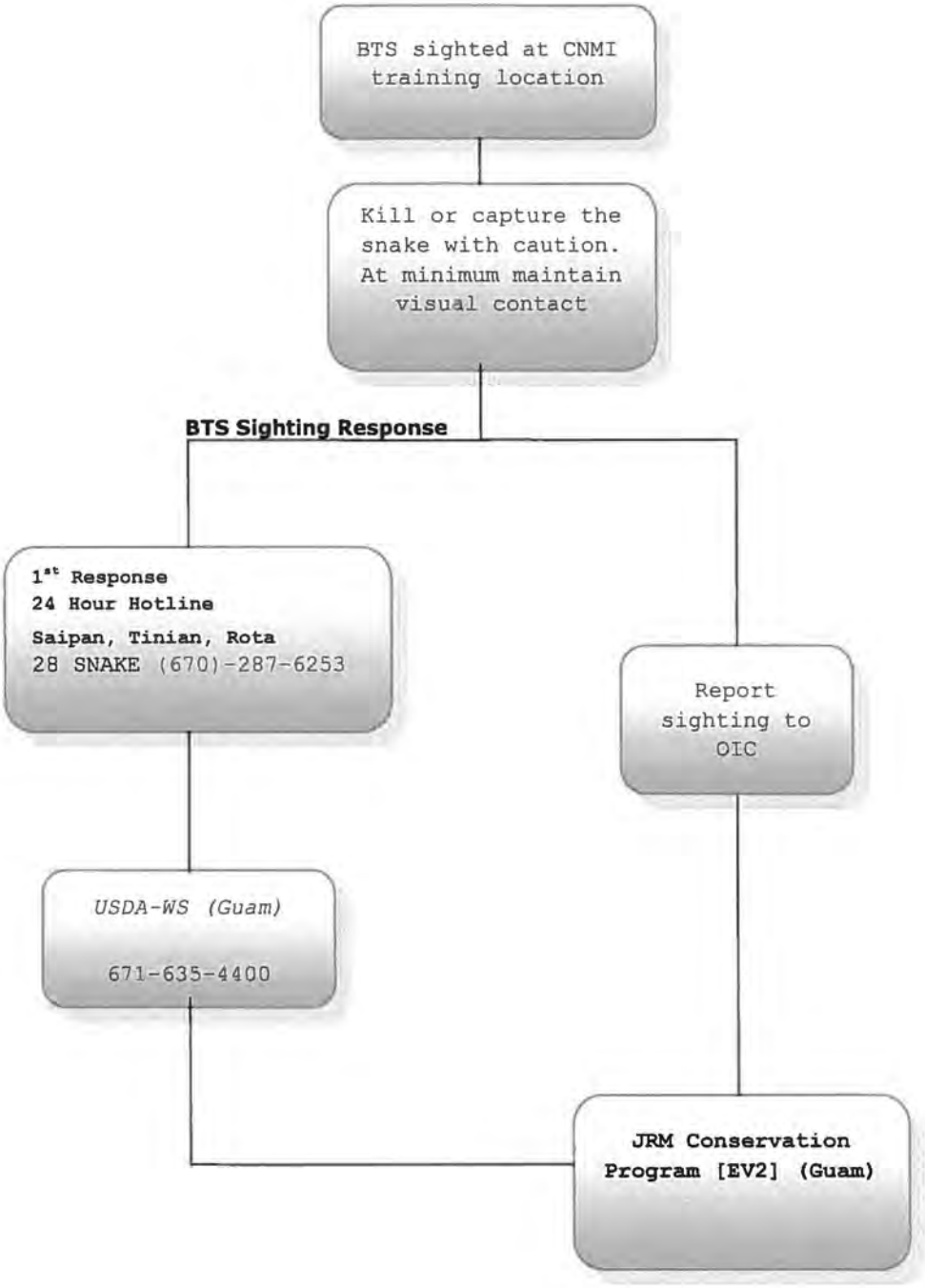
APPENDIX A
BTS EMERGENCY RESPONSE PROTOCOLS

Emergency response protocols for BTS sightings associated with Guam interdiction areas and off-island training locations in the CNMI are provided in this appendix. A Guam interdiction area includes any point of exit, such as a sea port or flight line, all cargo staging and holding facilities, and cargo loading locations for off-island shipments. CNMI off-island training locations are included in the emergency response protocols. Information for BTS sighting responses is provided in the form of decision matrices with corresponding contact numbers.

Guam Interdiction Area BTS Emergency Response Protocol



CNMI BTS Emergency Response Protocol



Additional Contact Numbers: CNMI-DFW BTS Division (Saipan) 670-664-6014; CNMI-DFW BTS Canine Division (Saipan) 670-285-7886; CNMI-DFW BTS Division (Tinian) 670-287-WILD (9453); CNMI-DFW BTS Division (Rota) 670-287-7682

CRITICAL BROWN TREE SNAKE POINTS OF CONTACT

	Contact Information
USDA-Wildlife Services (WS)	
AAFB Office	671-366-3822
AAFB Canine Team Leader	671-366-3885/671-685-7057
AAFB Canine Day Shift	671-685-2751
AAFB Canine Swing Shift	671-685-5765
AAFB Canine Grave Shift	671-686-0904
Naval Base Guam Office	671-472-7101
NBG Canine Day Shift	671-685-8992
NBG Canine Swing Shift	671-685-0319
Canine Program Manager	671-366-1572/671-747-1572
USDA-WS Guam State Director	671-635-4400
Naval Facilities Engineering Command Marianas - Environmental (EV2)	
Brown Treesnake Program Manager	671-339-2349
Planning & Conservation	671-339-2344

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

36WGI32-7004

BY ORDER OF THE COMMANDER, 36TH WING

36 WG INSTRUCTION 32-7004

DATE: 15 March 2006

Civil Engineering

BROWN TREE SNAKE MANAGEMENT

OPR: 36 CES/CES (Jonathan Wald)

Certified by: 36 CES/DCE (Merlin J. Miller)

Pages: 16/Distribution: F

This instruction implements the ***Brown Tree Snake Control Plan*** prepared under the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, the ***Brown Tree Snake (BTS) Control and Interdiction Plan (COMNAVMARIANAS INSTRUCTION 5090.10)*** dated June 2000, and the ***Brown Tree Snake Control and Eradication Act of 2004*** (Public Law 108-384, 108th Congress). The purpose of this instruction is to establish procedures and guidelines to prevent the spread of Brown Tree Snake (BTS) to areas where it is not already established via the AAFB transportation network. It outlines the procedures for cooperative interagency efforts to control and interdict BTS, including Department of Defense (DoD) coordination, support, and documentation of inspections of outgoing aircraft and cargo by United States Department of Agriculture Wildlife Services (USDA WS) personnel. This instruction applies to all personnel assigned, attached, or associated with the 36th Wing (36 WG), its tenant units, and contractors. This publication also applies to US Air Force Reserve and Air National Guard units and other organizations/tenants associated with or residing on Andersen AFB.

Chapter 1

PROGRAM REQUIREMENTS

1.1. Purpose of Program. Brown Tree Snake (BTS) control and interdiction efforts on Andersen are aimed at reducing the risk of dispersal of the BTS, an invasive species causing extensive damage to Guam's ecology, from Guam via the base's transportation network, as well as addressing ongoing and potential BTS threats to biological resources and human health and safety.

1.2. General Roles and Responsibilities. A Memorandum of Agreement, signed by the United States Departments of Defense, Interior, Agriculture, and Transportation, as well as the State of Hawaii, the Government of Guam, and the Commonwealth of the Northern Marianas Islands,

establishes the cooperative relationship between all signatories in administering BTS control and research activities.

1.2.1. Interdiction Program Requirements. All shipments by air or sea of material originating from Andersen AFB facilities for military exercise support, day-to-day military cargo and equipment and private contractors will be inspected by USDA WS personnel and/or their trained snake detection canines and properly document the inspection before transport off-island. All aircraft, military or civilian, taking off from Andersen AFB will be inspected by USDA WS to the maximum extent possible.

1.2.2. Oversight**.** 36 CES/CEV will designate a BTS Management Liaison responsible for administering the program outlined in this instruction and resolving any issues dealing with BTS management on Andersen AFB.

1.2.3. Role of U.S. Department of Agriculture Wildlife Service. Control and interdiction protocols will be practiced on a daily basis by private sector contractors and military organizations and/or personnel from Guam's USDA WS, which is the primary federal agency responsible for ensuring the BTS does not leave the island of Guam. USDA WS works cooperatively with the Department of Defense to implement proactive control measures aimed at preventing BTS dispersal.

1.2.3.1. All aircraft and cargo destined for off-island locations have a 100% requirement for BTS inspection. USDA WS personnel require a minimum of 2 hours' notice for inspections and will have detector canine teams available 24/7.

1.2.4. Role of Department of Defense. Andersen personnel involved with military training exercises, operational requirements, private contractors and BTS control/interdiction programs will:

1.2.4.1. Plan, direct, and coordinate all cargo handling procedures for cargo departing Guam with consideration for the on-going threat to the Pacific spread of BTS. Cargo handlers and/or managers will work closely with USDA WS personnel to establish and maintain effective cargo and equipment BTS inspection processes. The agency responsible for the BTS inspection or staging area will coordinate for and provide area lighting when needed.

1.2.4.2. Fully cooperate with USDA WS to conduct measures necessary to reduce the BTS snake population at port and cargo facilities through an integrated approach consisting of technical assistance and lethal and non-lethal control methods such as prey base reduction, exclusion, habitat modification, and capture.

1.2.4.3. Provide USDA WS with adequate forward notification of cargo movements that are not part of typical daily operations, as outlined in the corresponding chapters of this instruction, and assist them as necessary to facilitate the timely completion of the mandatory inspection process.

1.2.4.4. As part of major exercise planning, address BTS control and interdiction procedures in the exercise plan's AF Form 813, Request for Environmental Impact Analysis, in consultation with USDA WS.

1.2.5. Education and Awareness Requirements. The 36 CES/CEV BTS Management Liaison will coordinate closely with USDA WS to obtain and disseminate materials related to BTS education and awareness. Units involved with military training exercises, operational requirements, private contractors and BTS control/interdiction programs at Andersen will:

1.2.5.1. Publish and distribute the BTS Emergency Response Protocol. Prominently display contact information and telephone numbers to report BTS sightings (Attachment 1).

1.2.5.2. Conduct information briefings for both permanently assigned and transient personnel based on materials provided by 36 CES/CEV and USDA WS. Explain the potential for impacts if BTS were transported from Guam in military vehicles, cargo and equipment. Explain individual responsibilities if and when a BTS is sighted (kill/capture/immediately report to USDA WS). Use the BTS Awareness instructional videotapes and printed materials, requesting USDA WS participation and/or demonstrations at the briefings when their workloads permit.

1.2.5.3. Provide information cards to personnel as a reminder of the threat and responsibilities for immediate action.

1.2.5.4. Clearly display BTS identification and information posters in tent cities, dormitories, and work sites.

Chapter 2

OUTBOUND AIRCRAFT INSPECTION PROCEDURES

2.1. Requirements. Aircraft departing for off-island destinations are required to undergo 100% BTS inspections by USDA WS personnel with detector canines. USDA WS requires a minimum of 2 hours' notice in order to conduct an aircraft inspection.

2.2. Exemptions. Aircraft flying local missions that are not scheduled to land off-island are exempt from USDA WS inspection.

2.2.1. Since the BTS is nocturnal, quick-turn aircraft that remain on the ground less than 3 hours during daylight do not require BTS inspection.

2.2.2. Commercial aircraft that remain on the ground less than 3 hours during night time (any time on the ground between official sunset and sunrise) will undergo a visual BTS inspection. Commercial aircraft remaining longer than 3 hours will be prepared for a canine inspection. If a canine inspection occurs, the APUs on commercial aircraft will be off.

2.2.3. Urgent missions, such as MEDEVAC, will not be delayed in order to accomplish a BTS inspection. However, every effort will be made to conduct inspections on these aircraft prior to their scheduled departures.

2.3. Incoming Aircrew Notifications. 36 OSS will publish the following notification of BTS inspection requirements in the appropriate Flight Information Publications: "All aircraft departing Andersen AFB are required to have a brown tree snake inspection conducted by USDA WS. Changes in scheduled departure times require three hours' prior notice to ensure timely accomplishment of this inspection."

2.3.1. 36 OSS will require military aircrews with off-island destinations to file their flight plans no later than 3 hours prior to the desired departure time in order to provide enough response time to the USDA WS.

2.3.2. 36 OSS will relay BTS inspection requirements to deployed units during the "Local Area Knowledge" briefing.

2.4. USDA Notifications. Airfield Management (36 OSS/OSAM) will make a printed copy of the consolidated daily flying schedule available to USDA WS no later than 0600 each day. Failure to provide more than 2 hours' notification may result in a stop movement until an inspection can be conducted.

2.4.1. The 734th AMS is responsible for notifying USDA WS of changes to the daily flying schedule for any of the AMC controlled assets. This notification will be made as soon as possible after learning of the proposed change.

2.4.2. The 36 WG Command Post is responsible for notifying USDA WS of changes to the daily flying schedule for any non-AMC controlled assets. This notification will be made as soon as possible after learning of the proposed change.

2.4.3. HSC-25 will coordinate directly with USDA WS to ensure their aircraft with off-island destinations inspected prior to departure.

2.4.4. The 36 OSS will ensure that aircraft inspections are documented in the Access Database upon receipt of an outbound flight-plan. If no inspection is indicated, 36 OSS will coordinate with USDA WS to get the inspection completed. Every effort will be made to avoid departure delays.

2.5. Documentation Requirements. USDA WS will notify 36 WG Command Post upon completion of each aircraft inspection. 36 WG Command Post will annotate completed inspections in the Access database, annotating the entry with the initials or name of the USDA WS personnel making the notification.

2.5.1. Database Access. The Access database will be visible to authorized users within the 36 WG Command Post, 36 OSS, Expeditionary Bomb Squadron, Tanker Task Force, and 734th AMS. USDA WS will be provided information from the database upon request to any authorized user.

2.6. Authority to Stop Movement. The installation Commander has delegated authority to 36 OSS, upon a request by USDA WS made either directly or via the 36 WG Command Post, to stop any aircraft from departing Guam that has not been inspected and/or is suspected to harbor BTS.

2.6.1. The 36 OSS personnel who direct the stop movement will inform the 36 OSS/CC or his designated representative. The 36 OSS/CC or his designated representative will ensure 36 EOG/CC is briefed on the incident.

2.7. Aircraft departing without inspection. If an aircraft departs without having a BTS inspection accomplished, USDA WS will contact the appropriate agencies at its destination and inform them.

2.7.1. The 36 WG Command Post will inform the 36 OSS/CC or his designated representative if any aircraft has departed without the appropriate BTS inspection. The 36 OSS/CC or his designated representative will ensure wing leadership is briefed on the incident.

Chapter 3

AERIAL PORT CARGO INSPECTION PROCEDURES

3.1. General Responsibilities and Requirements. Outbound aerial shipments from Andersen include general freight, household goods, and unaccompanied baggage.

3.1.1. The 734th Air Mobility Squadron (AMS) on AAFB handles all outgoing air freight. Containers are delivered to the 734 AMS warehouse area, where they are then palletized, processed, and eventually loaded onto aircraft.

3.2. Routine cargo inspections. Inspections of outgoing air cargo are conducted at the 734 AMS warehouse area.

3.2.1. 734 AMS personnel will inspect all originating boxes for holes, punctures, damage and/or cracks that may permit BTS access and inspect all shipments throughout the selection, palletizing, building and loading process. 734 AMS personnel will handle and stack each sealed box individually while building up pallets.

3.2.1.1. 734 AMS will ensure all personnel receive initial in-depth training on procedures to follow upon spotting a BTS and coordinate with WS for periodic follow-up BTS awareness training sessions. Personnel will remain alert for BTS signs or opportunities at all times.

3.2.2. USDA WS will perform routine sweeps of the 734 AMS warehouse and cargo yard grid three times daily, M-F, and twice daily, Sat-Sun, and maintain a log book in the dispatch area that details their inspection dates and times.

3.3 USDA Notifications. 734 AMS load planners will notify USDA WS when load plans are complete, approximately 4-6 hours before departure. Notification will be either in person if USDA WS personnel are present or by phone when necessary.

3.4. Documentation Requirements. The 734 load planner will annotate the load plan with the time and name of the person notified. Upon completion of the inspection, USDA WS will notify 36 WG Command Post. 36 WG Command Post will update the central inspection database accordingly.

3.5 Authority to Stop Movement. The installation Commander has delegated authority to 36 OSS Commander or his designated representative, upon a request by USDA WS made either directly or via the ATOC, to stop any aircraft from departing Guam with any cargo or equipment that has not been inspected and/or is suspected to harbor BTS. 734 AMS ATOC personnel should notify USDA WS and 36 OSS Airfield Management if cargo about to be loaded onto an aircraft or vehicle has not undergone the appropriate BTS inspection.

Chapter 4

MUNITIONS SHIPMENT INSPECTIONS

4.1. Requirements. Munitions movements typically consist of either break-bulk/uncontainerized or International Organization for Standardization (ISO) container movements that are transported to Kilo Wharf on COMNAVMARIANAS, or those which are loaded directly onto aircraft at Andersen AFB. MUNS will schedule BTS inspections through USDA WS in order to better coordinate any munitions activities going on the same day.

4.2. Break-bulk/uncontainerized munitions:

4.2.1. Munitions pallets will be staged in an area conducive to USDA WS BTS inspections prior to on loading onto trailers for transport to Kilo Wharf.

4.2.2. USDA WS canine inspections will be conducted on the munitions while at the staging area before they are loaded.

4.2.3. Munitions will not be loaded on trailers which are not ready for immediate transport (within the same day). Munitions that have been exposed to the environment (not sealed in containers) overnight must be re-inspected by USDA WS prior to transport.

4.3. ISO containers:

4.3.1. Munitions will be staged in an area conducive to USDA WS BTS inspections prior to loading into the containers.

4.3.2. USDA WS canine inspections will be conducted on the munitions while at the staging area before they are loaded into the containers.

4.3.3. Containers not fully loaded, which are to be left unattended overnight, will be sealed after the last USDA WS BTS inspected munitions are loaded into the ISO container. All munitions that were not sealed in containers overnight must be inspected before loading continues on the following day.

4.3.4. Munitions destined for movement via aircraft will be coordinated through the 734 AMS and USDA WS for the BTS inspection prior to loading.

4.4. USDA Notifications. 36 MUNS will attempt to provide an estimated shipping date to USDA a minimum of 30 days out, for most large munitions shipments (i.e. Turbo CADS). Given that this projected date will be tentative, USDA WS will request further updates from MUNS, who will provide a firm target date for all munitions shipments at least 7 days in advance (unless MUNS receives less notice, in which case they will notify USDA WS immediately after learning of the short-notice shipment) and a minimum of 3 hours' notice for any inspections desired on that date.

4.5. Documentation Requirements. 36 MUNS personnel will make an entry in the BTS log located in the crew chief book that identifies the USDA WS inspector for that day's shipment and the approximate time the inspection was conducted, which will then be initialed by the handler conducting the inspection. Before the close of each day in which USDA WS has inspected munitions, USDA WS will coordinate with 36 MUNS to schedule an end-of-day verification of loaded munitions status. At the end of each day, 36 MUNS will make an entry in the BTS log located in the crew chief book verifying that all containers containing munitions packed for shipment have been closed prior to darkness, and the approximate time those containers were closed; USDA WS will authenticate this entry by initialing it.

Chapter 5

TMO SHIPMENTS

5.1. Requirements. Containerized household goods and unaccompanied baggage shipments for Air Force personnel and DOD civilians departing from Andersen AFB, as well as other items scheduled to leave Guam via surface vessel, are managed by Andersen's Transportation Management Office (TMO). When items are shipped by surface vessel, only those containerized prior to transportation to the waterport are addressed by this instruction.

5.1.2. The packing and loading of all household goods at Andersen, including unaccompanied baggage, is accomplished by carriers/local agents before the goods are surface-transported to the port for shipping. USDA WS will promote BTS education and training to local agent/carrier employees.

5.1.3. Items that are of greatest concern are those that have been stored outdoors or in carports and sheds, such as washers, dryers, swing set tubing, lawnmowers, barbeque grills, lumber, pipes, garden hoses, and vehicles. Personnel will be briefed by the TMO that USDA WS will be at the residence to inspect for the presence of BTS.

5.2. Prioritization. Although USDA WS will make every reasonable effort to perform HHG inspections, since HHG are packed at several geographically separated locations simultaneously, USDA WS will prioritize inspections based upon a risk analysis, conducting daily inspections on shipments deemed to pose the largest risk first. Risk factors they consider include packout location, shipment size (shipments of less than 4,000 pounds present a negligible risk), destination (Hawaii and Diego Garcia have the highest priority), and contents (large quantities of goods and equipment stored outdoors carries a higher risk).

5.3. USDA Notifications. TMO will provide USDA WS with a schedule of the upcoming week's HHG packouts and any other container movements every Friday; in addition, they will provide a detailed schedule every day by COB that identifies the type of shipment, carrier, and estimated weight for each of the next day's packouts and container movements.

5.4. Documentation Requirements. USDA WS will make a copy of the weekly schedule and annotate each shipment that was inspected with the inspector's name or initials. USD WS will provide this documentation to TMO ten (10) days later (the following Monday). TMO will maintain these documents on file for at least one year after completion.

5.5. Outbound Privately Owned Vehicles. A significant component of the PCS movement process, personally-owned vehicles (POVs) are handled through a single facility at COMNAVMARIANAS. Vehicles departing Guam are not inspected at Andersen.

5.5.1. USDA WS will conduct canine inspections daily (Monday-Friday) on outbound vehicles at the COMNAVMARIANAS POV lot before being packed directly into 20' or 40' containers and trucked to the Commercial Port for loading onboard a civilian cargo ship. If a vehicle is

inspected but not loaded prior to the close of business on a given day, USDA WS will conduct a follow-up inspection the next business day.

Chapter 6

HSC-25 AIRCRAFT INSPECTION PROCEDURES

6.1. Requirements. Since the BTS is nocturnal; maintenance personnel are present on the flight line in large numbers during the daytime; and pre-flight visual inspections are conducted; a morning inspection of HSC-25 aircraft by USDA WS is considered valid for all flights that take off during daylight hours that same day.

6.1.1. USDA WS inspections of HSC-25 aircraft will be conducted daily prior to the beginning of each day's scheduled flights. To the maximum extent possible, inspections will be conducted at a regular, recurring time as agreed upon by HSC-25 and USDA WS. To ensure timeliness and efficiency, only those aircraft identified by HSC-25 Maintenance Control as viable for flight operations will be inspected. The inspection time will be pre-coordinated between HSC-25 and USDA WS personnel and an HSC-25 Plane Captain will accompany the USDA WS inspector during the inspection to ensure the safety of all personnel and aircraft inspection integrity.

6.1.2. During pre- and post-flight inspections, the inspection of all bays and access panels will include a visual check for potential BTS. In addition, maintenance personnel who are servicing aircraft, conducting daily inspections, and troubleshooting maintenance discrepancies will remain vigilant for BTS incursion. At the completion of daily maintenance, maintenance personnel will ensure all intakes are plugged and all door/panels are secured, which should greatly reduce the possibility of nighttime BTS entry.

6.2. Exemptions. Any aircraft flying missions that are not scheduled to touch down off-island are exempt from USDA WS inspection.

6.2.1. Emergency response exemption. Since delaying an immediate launch for SAR or MEDEVAC is potentially life-threatening to the victim(s), HSC-25 will not delay such missions in order to be inspected. HSC-25 is responsible for informing USDA WS of the short-notice mission upon receipt; if the inspection is not conducted, USDA WS is responsible for making any notification to agencies they deem applicable at the intended destination.

6.3. USDA Notifications. HSC-25 will provide USDA WS a Flight Schedule the evening prior to each Fly Day. The Flight Schedule will annotate the BTS Inspection Time as coordinated between HSC-25 and USDA WS, as well as any known missions that will require HSC-25 to put wheels down anywhere other than Guam soil.

6.3.1. HSC-25 will notify USDA WS of any changes to this schedule when they involve an aircraft taking off during the hours of darkness, at the earliest opportunity once HSC-25 is aware of the change. HSC-25 will also notify USDA WS of any short-notice/emergency flights that would normally require inspection as soon as feasible, but will not delay an emergency response in order to receive an inspection.

6.3.1. **Cargo Inspection Notifications.** HSC-25 routinely moves cargo for NSWU-1, EODMU-5 and MSS-7, as well as MSC and AF SFS. Any unit transporting cargo via HSC-25 is responsible for clearing their own cargo through USDA WS prior to it being transported to or by HSC-25.

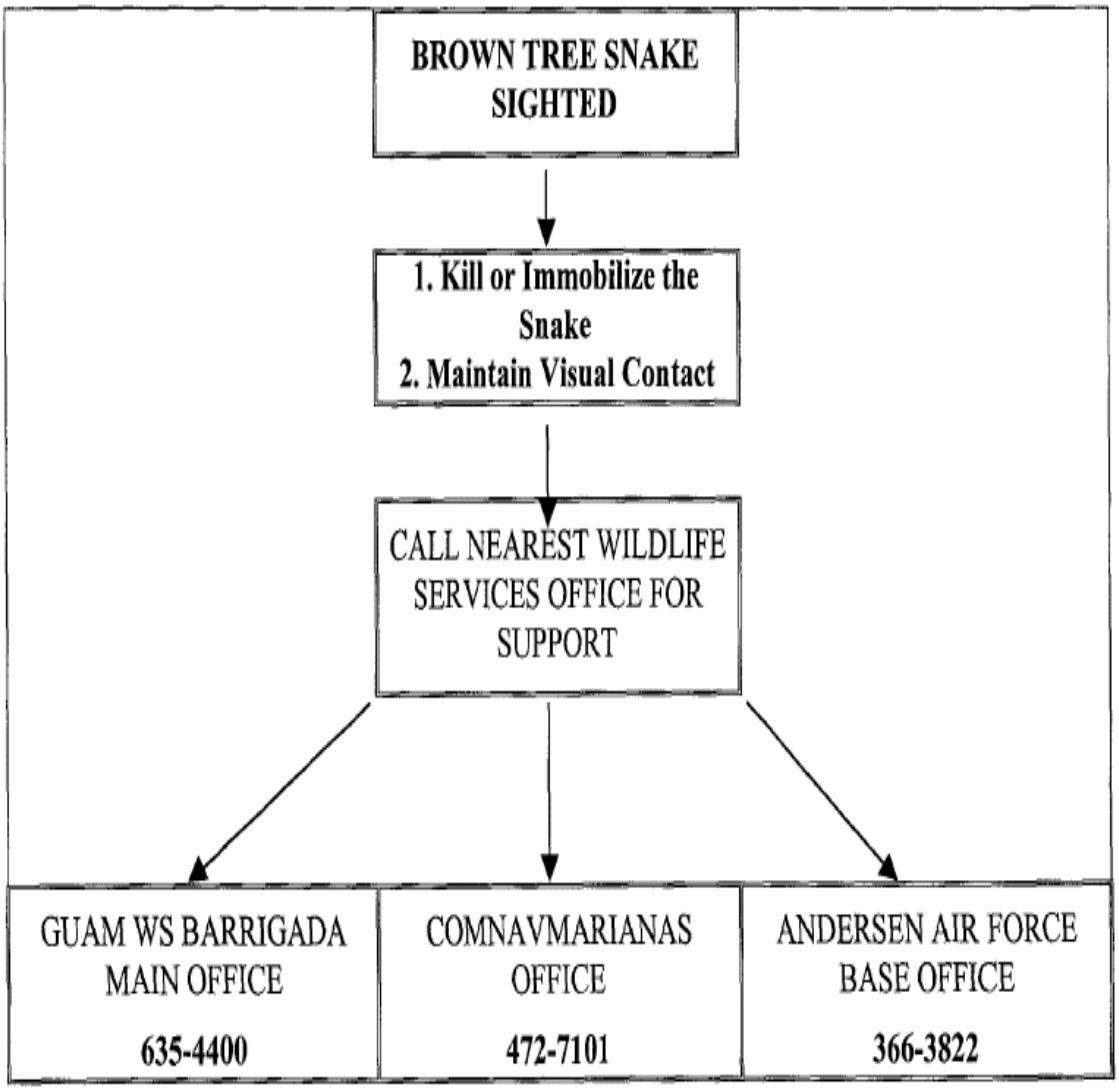
6.3.2. HSC-25 will inform units making requests for cargo transportation of the USDA WS inspection requirement. Units are responsible for notifying USDA WS of the cargo location and estimated pickup time NLT 3 hours prior to the intended pickup time.

6.3.3. HSC-25 will also brief USDA WS inspectors of any known cargo transport missions during their morning inspection, to assist USDA WS in making arrangements for an inspection with the unit that owns the cargo.

6.4. Documentation Requirements. USDA WS will notify 36 WG Command Post upon completion of HSC-25 aircraft inspections, using the tail numbers of inspected aircraft as a reference. 36 WG Command Post will annotate completed inspections in the Access database, annotating the entry with the initials of the USDA WS personnel making the notification.

MICHAEL R. BOERA, Col, USAF
Commander, 36th Wing

Table 1: BTS Emergency Response Procedures



* This chart refers to brown tree snakes found in cargo and cargo or flightline areas only. If brown tree snakes are found in residential areas there is no need for residents to notify Wildlife Services. Residents can just kill and dispose of the snake.

Attachment 2. BTS Inspection Contact Information.

Subject: USDA Canine Inspection Contact Phone Numbers

Date: March 15, 2006

To: All Cooperators

USDA-Wildlife Services canine inspection hours and contact telephone numbers are listed below. Please take note of the different telephone numbers for locations north and south of the village of Hagatna.

MONDAY-FRIDAY

	North of Hagatna	South of Hagatna
2200 – 0530 hrs:	888-5708	888-5706
0530 – 2200 hrs:	888-5707	888-5705

SATURDAY-SUNDAY
Call 888-5705 or 888-5709 regardless of location.

If no message can be left at the phone numbers listed above, please try to contact our Andersen AFB Team Leader at 888-5713, or Navy Team Leader at 888-5727 to schedule an inspection.

If you have any questions or concerns in regards to this memo, please feel free to contact me at Andersen AFB at 366-3822.

Sincerely,

Jason C. Gibbons
Supervisory Wildlife Biologist
Canine Program Manager, Acting
USDA/APHIS/Wildlife Services, Guam

6. Measures and resources to ensure the sustainability of mongoose eradication interventions

A. Amami-Oshima Island

As 'Phase 2 Small Indian Mongoose Control Plan for Amami-Oshima Island' (hereinafter 'Phase 2 Plan', planning period: from April 2013 to March 2023) aims to achieve complete eradication of mongooses from entire Amami Oshima Island by JFY 2022, efforts have been made to capture and monitor mongooses, as well as to establish a methodology to scientifically confirm the eradication of the mongooses. This project has been given the highest priority in budget allocation among all the invasive species management projects in the country, and the best possible efforts have been made to achieve the target. (The budget for JFY2019 is around JPY 0.2 billion or around USD 1.8 million.)

In case that eradication of mongooses is not confirmed at the end of Phase 2 Plan, next phase of the plan would be formulated to tackle this issue thoroughly, with efforts to secure financial resources for mongoose controls (allocate more funding than the current level, if necessary) and further intensify the interventions.

Moreover, after the planning period of Phase 2 Plan (after the achievement of mongoose eradication is confirmed), a monitoring plan will be developed to check if the eradication status of mongooses is maintained, while utilizing the know-how and human resources accumulated by the eradication project, with securing necessary budget to firmly implement the plan (see below).

(Supplementary information) Possible monitoring program after the achievement of mongoose eradication is confirmed (including measures in case remaining or reinvaded mongooses were confirmed)

1) Monitoring program considering the possibility that some mongooses remain
   (1) Monitoring using censor cameras and other tools
   (2) Gathering sighting information from residents
   (3) Monitoring using detection dogs in case any information suggesting presence of mongooses is reported

2) Monitoring at the entry points to the island and their surroundings considering potential re-invasion of mongooses
   (1) Monitoring in the vicinity of ports and airports
   (2) Gathering sighting information from residents

3) Immediate capturing and eradication in case a remaining or re-invaded mongoose is confirmed.

(1) Setting traps and other devices near the place where the mongoose is found
(2) Additional installation of monitoring tools such as censor cameras
(3) Capturing using detection dogs

*Note: With respect to the item 3) above, a management policy will be formulated with advice from experts, to enable concerned parties to take prompt and consistent actions based on the scientific ground.

B. Northern part of Okinawa Island

In Northern part of Okinawa Island, the control project will continue under 'Phase 3 Small Indian Mongoose Control Plan for the Northern Part of Okinawa Island' (hereinafter 'Phase 3 Plan', planning period: from April 2017 to March 2027) as transferring expertise from Amami-Oshima Island, and aiming complete eradication from the area by JFY 2026 (annual budget is around JPY 0.2 billion for JFY 2019 or around USD 1.8 million.).

In case that eradication of mongooses is not confirmed at the end of Phase 3 Plan, next phase of the plan will be developed to tackle this issue thoroughly, with efforts to secure financial resources for the mongoose controls (allocate more funding than the current level, if necessary) and intensify the interventions.

Furthermore, after planning period of Phase 3 Plan (after the achievement of mongoose eradication), the same measures as those in Amami-Oshima Island will be taken, and the maintenance work of the northward migration prevention fences for mongooses together with the monitoring program around the fences will be continued.

7. Others

Monitoring Plan for Amami-Oshima Island, Tokunoshima Island, Northern Part of Okinawa Island, and Iriomote Island, nominated for Inscription on the World Heritage List

(English translation)

August, 2019

Ministry of the Environment, Forestry Agency, Agency for Cultural Affairs,
Kagoshima Prefecture, Okinawa Prefecture,
Amami City, Yamato Village, Uken Village, Setouchi Town, Tatsugo Town,
Tokunoshima Town, Amagi Town, Isen Town,
Kunigami Village, Ogimi Village, Higashi Village,
Taketomi Town

Table of Contents

Glossary

Below are some of the terms that appear in the text and we tried to explain them in plain words for the users of the Plan. The terms are based on examples of the Comprehensive Management Plan for Amami-Oshima Island, Tokunoshima Island, Northern Part of Okinawa Island, and Iriomote Island, Nominated for Inscription on the World Heritage List (hereinafter, referred to as 'the Comprehensive Management Plan').

Outstanding Universal Value (OUV)

- Cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity.

Nominated Property

- The whole area of 'Amami-Oshima Island, Tokunoshima Island, Northern Part of Okinawa Island, and Iriomote Island' (i.e. all of the five component parts in the four regions) nominated for inscription on the World Heritage List (Figure 1). The area is strictly protected by legal measures.

Buffer Zones

- Areas adjoining and surrounding the nominated property (Figure 1). The conservation of the nominated property are enhanced by the restriction of resource use and development in buffer zones through laws and custom measures.

Surrounding Conservation Areas

- Areas defined to surround the nominated property and buffer zones (Figure 1). A wide range of efforts that are considered necessary for protecting the nominated property shall be undertaken in this area, such as the conservation by legal and custom measures, measures against alien species, measures to prohibit illegal collection of endemic and threatened species.

Target District of the Plan

- It refers to the nominated property, buffer zones, and surrounding conservation areas that are target scope of this Plan and the Comprehensive Management Plan (Figure 1).

Component Parts

- They refer to five parts in the four regions within the nominated property: one in Amami-Oshima Island, two in Tokunoshima Island, one in Northern part of Okinawa Island, and one in Iriomote Island.

Serial Properties

- Properties, including this nominated property, representing the OUV through plural component parts that are separately located but share a common value, are called 'serial properties'.

Threatened Species

- It refers to the following three categories that are defined as 'threatened species' on the IUCN Red List that International Union for Conservation of Nature (IUCN) prepares to specify worldwide threatened wildlife.
  - CR: Critically Endangered
  - EN: Endangered
  - VU: Vulnerable

Administrative Organs

- Organizations that are in charge of relevant systems regarding the conservation of natural environment and its sustainable use in the target districts of this Plan, in accordance with the Plan and Comprehensive Management Plan. They include the Ministry of the Environment, Forestry Agency, Agency for Cultural Affairs, Kagoshima Prefecture, Okinawa Prefecture, Amami City, Yamato Village, Uken Village, Setouch Town, Tatsugo Town, Tokunoshima Town, Amagi Town, Isen Town, Kunigami Village, Ogimi Village, Higashi Village, and Taketomi Town.

Comprehensive Management Plan

- It is a plan that clarifies basic directions regarding the operation of relevant systems and the promotion of respective projects, for the purpose of appropriate and smooth advancement of the conservation and management of natural environment in the target district of the Plan. This could be achieved by the administrative organs to closely coordinate and cooperate with various stakeholders, including local residents, tourism operators, those who are engaged in agriculture and forestry, researchers, local bodies, and other visitors.

Action Plan

- It is a plan to extract concrete issues to tackle with and to articulate their contents, implementing periods, role allocation, goals to achieve, and evaluation indicators, on the foundation of respective characteristics and challenges in the four regions, under the Comprehensive Management Plan that states the overall goals and basic management directions. It shall be operated as part of and in mutual coordination with the Comprehensive Management Plan.

Indicators for Monitoring

- These are indicators to continuously investigate and evaluate in the same method for a long-term period, as to whether or not the OUV of the nominated property is maintained into the future, together with the state of their conservation and impact factors. These indicators shall represent the OUV of the nominated property, in addition to items and phenomena that are considered to be of significant impacts on the OUV.

Adaptive Management

- It refers to a management method to appropriately operate, through continuous monitoring of conservation state of the OUV and relevant factors that impact on the OUV and thereby reviewing the Comprehensive Management Plan and Action Plans.

Invasive Alien Species

- It refers to alien species that considerably impact on local ecosystems and threaten, or might threaten biodiversity, such as small Indian mongoose (*Herpestes auropunctatus*), cats, etc.

Scientific Committee on Amami-Oshima Island, Tokunoshima Island, Northern Part of Okinawa Island, and Iriomote Island Natural World Heritage Nominated Property

- A committee consisting of experts regarding the conservation and management of natural environment in the target district of the Plan. It evaluates the state of conservation of the OUV in the Plan and provides advice on adaptive conservation and management in the Comprehensive Management Plan.

Regional Liaison Committee on Amami-Oshima Island, Tokunoshima Island, Northern Part of Okinawa Island, and Iriomote Island Natural World Heritage Nominated Property

- A committee that was established as a platform for communication and coordination among administrative organs, for the purpose of promoting integrated commitments of the administrative organs to implement appropriate conservation and control of the target

district of the Plan, in close coordination and collaboration among them, based on the Comprehensive Management Plan.

Sub-local Meetings

- Meetings established for the respective four regions, i.e. Amami-Oshima Island Sub-local Meeting, Tokunoshima Island Sub-local Meeting, Northern Part of Okinawa Island Sub-local Meeting, and Iriomote Island Sub-local Meeting, under the Regional Liaison Committee, as a platform of communication and coordination to consider opinions from local communities, for the administrative organs to implement the conservation and management based on the Comprehensive Management Plan. Participants of the Sub-local Meetings include the administrative organs, related bodies, NPOs, and other entities. The Sub-local Meetings are in charge of consensus building regarding the formulation and review of local action plans, communication and coordination, progress management, inspection of achievements, etc. to promote appropriate conservation and management of the target district of the Plan. The Sub-local Meetings shall report to and coordinate with Regional Liaison Committee, as necessary.

1. Purpose

‘Amami-Oshima Island, Tokunoshima Island, Northern Part of Okinawa Island, and Iriomote Island,’ nominated for inscription on the World Heritage List (hereinafter, referred to as ‘‘the nominated property’’) is a ‘serial property’ consisting of five component parts in the four regions, i.e. Amami-Oshima Island, Tokunoshima Island, and Northern part of Okinawa Island that are located in Central Ryukyus, and Iriomote Island in South Ryukyus. With its unique speciation processes in Central Ryukyus and South Ryukyus that reflect Ryukyu Chain’s geological history, the nominated property has provided irreplaceable habitats to a number of terrestrial organisms including endemic and/or threatened species, such as Iriomote cat (*Prionailurus bengalensis iriomotensis*, IUCN Red List: CR), Okinawa woodpecker (*Sapheopipo noguchii*, CR), Amami rabbit (*Pentalagus furnessi*, EN), Okinawa rail (*Gallirallus okinawae*, EN), etc. The nominated property embraces Outstanding Universal Value (hereinafter, referred to as the ‘OUV’) that threatened species and their habitats possess in terms of academic or conservation senses; it is required to maintain or enhance the OUV for the future. Therefore, administrative organs shall promote their adaptive management based on scientific knowledge, in coordination with related government agencies and relevant bodies, in accordance with their Action Plans on the foundation of the Comprehensive Management Plan.

In this regard, the Monitoring Plan for Amami-Oshima Island, Tokunoshima Island, Northern Part of Okinawa Island, and Iriomote Island, nominated for inscription on the World Heritage List ((hereinafter, referred to as ‘the Plan’) clarifies basic policies regarding the monitoring of natural environments and human activities as part of the management of the nominated property. In addition, relevant procedures shall be stipulated to properly comprehend and evaluate the state of conservation of the nominated property and implement management on the basis of survey items and their contents, monitoring results, and so forth.

2. Basic Concept

In order to maintain and enhance the OUV for the future in the nominated property, monitoring shall be conducted on the conservation state of endemic and/or threatened species indicating the OUV, their habitats, and impact factors.

As impact factors for the OUV, there are two main factors: 1) factors that have possible impacts in the future, such as possibilities of new invasive alien species to enter, environmental loads by new tourism use, etc., and 2) factors that currently affect, such as negative impacts by invasive alien species that have already settled down, traffic accidents of main endemic and/or threatened species indicating the OUV, and their collection pressures. After extracting impact factors on the basis of these recognitions, effective data collection and appropriate scientific evaluation shall be

conducted to analyze and examine relevance between these impact factors and conservation conditions of the OUV.

In addition, in the four Islands including the nominated property, local residents have regarded mountains and forests as part of their living sphere through people's traditional livelihoods, faiths, and so forth. There is a historical background where local residents have used their natural environments over long period of time; people's lives have been supported by their natural environments. Based on these local characteristics, it is preferable for administrative organs to request local residents and local stakeholders to continuously and actively participate in monitoring processes, and such monitoring shall be considered, including the system that secures the opportunities to disclose and share monitoring results.

Since monitoring needs to be continuously conducted in the same method to comprehend long-term changes, respective indicators and survey methods should not be changed in principle. Meanwhile, it is important to review the Plan considering knowledge that will be obtained through actual operations, in order to enhance the Plan's effectiveness. Therefore, a certain flexibility shall be permitted in terms of changes, removal, and addition of indicators and changes in survey methods during the three years since the launching of the Plan's operation, as far as there are no significant impacts on the evaluation of conservation state of the OUV.

3. Period of the Plan

The Plan shall make a mid-term monitoring plan for the coming ten years from JFY2020 to JFY2029. The Plan shall be considered to be continued or changed around every five years.

4. Target Scope of the Plan

In addition to the nominated property, the Plan includes buffer zones and surrounding conservation areas as its target scope in order to maintain and enhance the OUV (Figure 1).

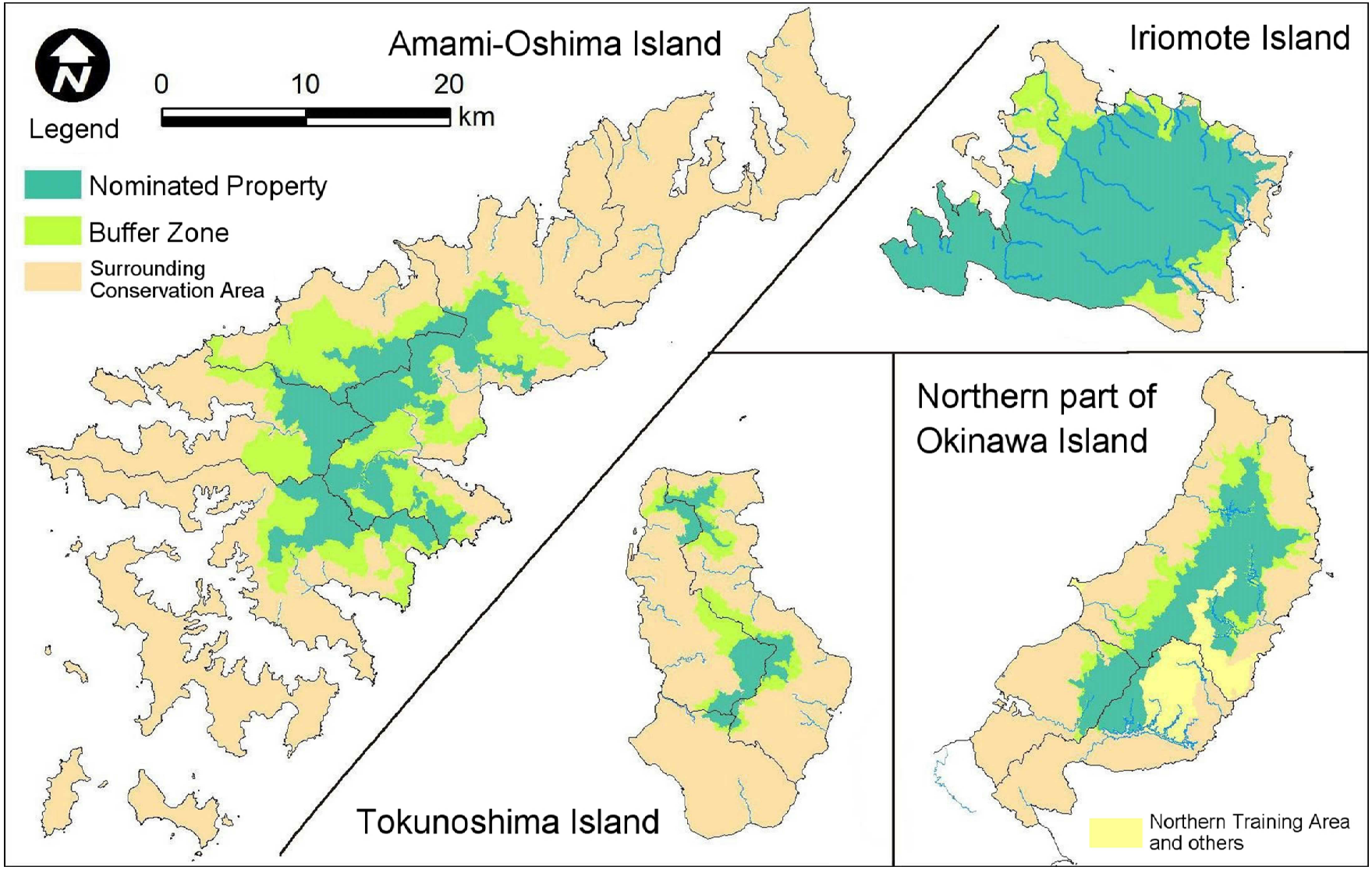


Figure 1. Target District of the Plan

5. Indicators for Monitoring

In order to secure sufficient and effective indicators to maintain and enhance the OUV in the future, selection criteria of indicators, a list of indicators, and implementing entities of the survey shall be defined. With regard to a policy for changes, removal, and addition of indicators, it shall be defined in '9. Revision of the Plan'.

(1) Selection Criteria for Indicators

On the foundation of the following five 'monitoring perspectives' that are described in the nomination document '6.a. Key Indicators for Measuring the State of Conservation', indicators shall include state of endemic and/or threatened species that indicate the OUV, together with any factors that impact, or are considered to impact, on them. In addition to the main indicators that are written in the nomination document, any other matters that are considered necessary shall be examined as indicators. In selecting indicators, criteria for respective 'monitoring perspectives' are have been set (Table 1). Indicators shall be in accordance with these criteria; they shall be selected in light with their possibilities of continuous implementation and adopted in the Plan.

Table 1. Monitoring Perspectives and Criteria for Indicators

Monitoring Perspectives	Criteria
1. Endemic and/or threatened species of the OUV are maintained.	(1) State of Conservation of Species Indicators that qualitatively and/or quantitatively show species state, such as fluctuations in the number of individuals and their distributions. These indicators shall be selected from endemic and/or threatened species indicating the OUV that are mainly distributed in the nominated property and buffer zones. They shall represent conservation state of diverse habitats necessary for the maintenance of various endemic and/or threatened species indicating the OUV.
	(2) State of Conservation of Habitats Indicators that qualitatively and/or quantitatively show conservation state of biotic/non-biotic environments, such as old-aged forests and inland waters necessary for the maintenance of endemic and/or threatened species indicating the OUV in the target district of the Plan.

Monitoring Perspectives	Criteria
2. Human impacts on endemic and/or threatened species of the OUV are reduced and past impacts are improved.	(1) Non-natural death of individuals Indicators that qualitatively and/or quantitatively show the number of traffic accidents, etc. that are visually discoverable. These indicators shall be selected from endemic and/or threatened species indicating the OUV in the target district of the Plan.
	(2) Capture and collection of individuals Indicators that qualitatively and/or quantitatively show the number of illegal capture and collection pressure in the target district of the Plan.
3. Threatening alien species are reduced	(1) State of invasive alien species Indicators that qualitatively and/or quantitatively show the state of alien species that are confirmed and/or concerned to have invaded and settled in the target district of the Plan, through fluctuations in the number of individuals and their distributions. These indicators shall be selected from alien species whose serious impacts on endemic /or threatened species indicating the OUV are confirmed and/or concerned.
4. Tourism use of the nominated property and its neighborhood is conducted in a sustainable manner	(1) State of tourism use Indicators that qualitatively and/or quantitatively show the state of tourism use that might affect on natural environments in the target district of the Plan.
	(2) Environmental loads caused by tourism use Indicators that qualitatively and/or quantitatively show the state of environmental loads and their scales in the target district of the Plan.
5. Impacts of climate change and disasters or their signs are grasped at an early stage	(1) Meteorological changes and areal changes of forests Indicators that qualitatively and/or quantitatively show areal conservation state of forests that are necessary for the maintenance of endemic and/or threatened species indicating the OUV and meteorological changes that might impact on them in the target district of the Plan.
	(2) Meteorological changes and changes in the fauna Indicators that qualitatively and/or quantitatively show changes in the avifauna in fixed sites that well represent the nominated property.

Meanwhile, when any sudden large-scale disasters, such as earthquakes, tsunami, typhoons, accidents, etc. occur in the target district of the Plan, administrative organs shall set 'emergency indicators' in accordance with their impacts, as necessary, conduct surveys, and implement '6. Evaluation of the state of conservation' considering the results.

(2) List of Indicators

Indicators that are selected on the basis of monitoring perspectives and selection criteria in Table 1, survey items, evaluation periods, implementing entities, etc. for respective indicators shall be shown in Annex 'List of indicators'.

In the meantime, with regard to the state of conservation of the nominated property, respective administrative organs shall exert their endeavors to collect and accumulate knowledge secondarily obtained from surveys of respective indicators, and expand referential information obtained from local residents' cooperation and information offering; the obtained knowledge can be used as additional information for respective indicators.

(3) Implementing Entities of the Survey

The main implementing entities in the surveys based on the Plan are administrative organs. Meanwhile, there are considerably many endemic and/or threatened species indicating the OUV in the nominated property, and they are diverse in taxonomic groups. Therefore, factors that might negatively affect on them are assumed to be diverse as well. In this regard, it is favorable to use relevant information obtained from people and organizations that have knowledge and experiences in various fields, from government agencies and researchers to local stakeholders, whereas the monitoring per se should be implemented by the responsibility of administrative organs. Based on this understanding, administrative organs shall call for active participation in the monitoring processes to local stakeholders, eco-tour guides, researchers, and local residents, conduct the communication and coordination with them, and attempt to expand those activities in the future. Meanwhile, local residents and research institutes, etc. are positioned as implementing entities in part of survey items and sites; in addition to these, a system, or a contact point, shall be established to enable the monitoring, such as reports, through the participation of many local residents, etc.

Respective surveys shall be conducted by implementing entities that are shown in Annex 'List of indicators', whereas administrative organs shall aggregate and compile survey results.

6. Evaluation of the State of Conservation

(1) Evaluation Regarding Respective Indicators

With regard to survey results of respective indicators, administrative organs shall conduct a four-grade evaluation (Table 2) based on qualitative and quantitative criteria for respective areas, for every evaluation periods of respective indicators. The administrative organs shall set numerical goals (quantitative criteria), as required, together with qualitative criteria, for a

comprehensive evaluation. When individual review committees based on project plans, etc. are established, review results in these review committees shall be reflected on the evaluation. The administrative organs shall report monitoring results and evaluations to 'the Scientific Committee on Amami-Oshima Island, Tokunoshima Island, the Northern Part of Okinawa Island, and Iriomote Island Natural World Heritage Nominated Property (hereinafter, referred to as 'Scientific Committee')', to obtain scientific advice regarding the evaluation and, if necessary, review the evaluation.

Table 2. Evaluation Criteria

Evaluation	Qualitative Criteria	Quantitative Criteria (partial)
S	Continuous enhancement of the OUV are expected with no negative impacts or potential impacts.	With regard to respective survey items, numerical goals shall be set in four stages, as necessary, based on experts' advice. In case of evaluation, the level of achievement of numerical goals, together with qualitative evaluation criteria, shall be comprehensively evaluated.
A	There are no negative impacts or potential impacts on the OUV. Otherwise, minor negative impacts or potential impacts on the OUV are recognized, but the situation is expected to improve through current efforts.	
B	A certain level of negative impacts or potential impacts on the OUV are recognized. The situation is expected to improve through current efforts, however, it is desirable to review project plans, etc. regarding the conservation and management. If there is no related project plan, it is required to formulate one.	

Evaluation	Qualitative Criteria	Quantitative Criteria (partial)
C	More than a certain level of impacts or potential impacts on the OUV are recognized, and the situation is not expected to improve through current efforts, together with a risk to damage the OUV in the future; therefore, project plans, etc. regarding the conservation and management need to be considerably revised. If there is no related project plan, it is strongly required to formulate one.	

(2) Comprehensive Evaluation

The administrative organs shall conduct a four-grade evaluation (Table 2) in respective areas, every five years in general, on the basis of qualitative and quantitative criteria that are the same as '(1) Evaluation Regarding Respective Indicator', for respective 'monitoring perspectives', as comprehensive evaluations for respective monitoring indicators. In addition, the administrative organs shall report these comprehensive evaluation results to the Scientific Committee, and obtain scientific advice. The evaluation shall be reviewed, as required.

7. Procedures to Reflect Evaluation Results on Management

Every year, the administrative organs shall report results of '6. Evaluation of the State of Conservation' and relevant advice from the Scientific Committee regarding the management of the nominated property to the Regional Liaison Committee on Amami-Oshima Island, Tokunoshima Island, Northern Part of Okinawa Island, and Iriomote Island Natural World Heritage Nominated Property (hereinafter, referred to as 'the Regional Liaison Committee') and Sub-local Meetings in the four regions. The Regional Liaison Committee shall review the Comprehensive Management Plan and Action Plans for respective areas, on the basis of reports' contents and opinions of Sub-local Meetings, as necessary. Based on changes in respective plans, responsible organizations shall implement the reviewed project contents and manage the nominated property (Figure 2).

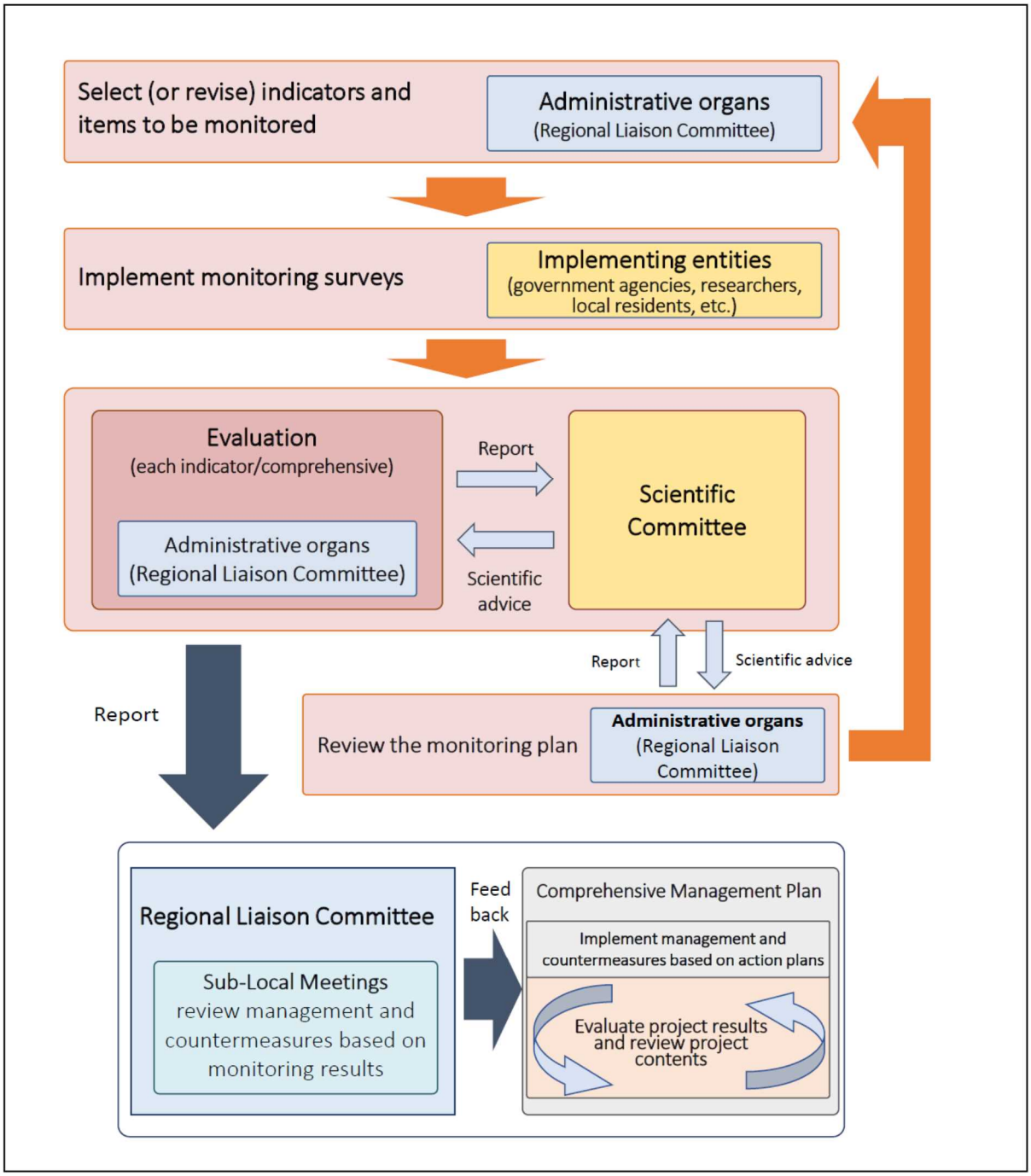


Figure 2. Outline of the system for reflecting evaluation results in management

8. Information Sharing and Disclosure

The administrative organs shall exert their endeavors to share relevant information among related government agencies, related bodies, and researchers, and to promote effective use of the information for its appropriate conservation and management of the nominated property.

The official website of the nominated property (http://kyushu.env.go.jp/okinawa/amami-okinawa/index.html) shall disclose monitoring results and evaluations based on the Plan. It shall not include any information regarding habitats of rare species, since its disclosure is likely to negatively affect on the state of conservation.

9. Revision of the Plan

(1) Changes, Removal, and Addition of Indicators for Monitoring

Changes, removal, and addition of indicators shall be conducted, as required. The administrative organs shall change and remove indicators, at the Regional Liaison Committee on the basis of advice from the Scientific Committee. Especially for any removal of indicators, it is required to fully consider its necessity beforehand. As for any addition of indicators, administrative organs can add, as required, new monitoring indicators that meet '5. (1) Selection Criteria for Indicators for Monitoring' to the Plan, at the Regional Liaison Committee on the basis of advice from the Scientific Committee.

(2) Revision of the Entire Plan

After five years, the midpoint of the Plan's period, the continuation/change of the entire Plan shall be considered, and revision shall be made, as required. In addition, a plan for the next period shall be formulated before the end of the Plan's period.

Annex. List of indicators

I. Maintenance of endemic and/or threatened species of the OUV										
Category	No.	Indicators	Survey items	Survey objectives	Survey/evaluation cycle	Implementing entities	Areas			
							Amami-Oshima Is.	Tokunoshima Is. (a) (b)	Northern Part of Okinawa Is.	Iriomote Is.
A. Species conservation state	1	Status of the Amami rabbit	Number of pellets counted based on line transect surveys	Pellet count surveys shall be conducted in around 20 transect lines set on Amami-Oshima Island and around 10 transect lines set on Tokunoshima Island, for the purpose of understanding the population trend.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓		
	2	Status of the Amami thrush	Number of birds based on a simultaneous census	The simultaneous census based on visual observation and birdcalls shall be conducted by MOE officers, staff members of Amami ornithologists' club, and volunteering students, for the purpose of understanding the population trends.	Annually	Okinawa Amami Nature Conservation Office, MOE Amami ornithologists' club	✓			
	3	Status of the Okinawa rail	Distribution and population estimates based on play-back surveys	Play-back surveys shall be conducted at around 250 sites in Northern part of Okinawa Island, for the purpose of estimating the population and distribution.	Annually	Okinawa Amami Nature Conservation Office, MOE Nature Conservation Division, Okinawa Prefecture			✓	
	4	Status of the Okinawa woodpecker	Distribution based on play-back surveys	Play-back surveys shall be conducted at around 50 sites in Northern part of Okinawa Island, for the purpose of understanding the distribution.	Annually	Okinawa Amami Nature Conservation Office, MOE			✓	
	5	Status of frogs	Frequency of occurrence based on line transect surveys	Line transect surveys at night shall be conducted in Okuni forestry road (Okuni-rindo), for the purpose of understanding the population trend of each frog species.	Annually	Okinawa Amami Nature Conservation Office, MOE Nature Conservation Division, Okinawa Prefecture			✓	
	6	Status of the Iriomote cat	Use of territories based on camera surveys at multiple fixed sites	Camera surveys shall be conducted at around 20 sites on Iriomote Island, for the purpose of confirming the health conditions and reproductive status of individual cats.	Annually	Okinawa Amami Nature Conservation Office, MOE Kyushu Regional Forest Office, Forestry Agency				✓
	7	Status of the crested serpent eagle	Number of birds based on line transect surveys	Line transect surveys shall be conducted based on visual observation and birdcalls in four transect lines set on Iriomote Island, for the purpose of understanding the population trend.	Annually	Okinawa Amami Nature Conservation Office, MOE Okinawa Regional Research Center, Tokai University				✓

	8	Overall status of the species of the OUV	Locations of rare animal occurrences recorded in camera surveys, patrols, and distribution surveys, etc.	Data of animal and plant species indicating the OUV shall be accumulated based on information including visual observation of individual animals, hearing of animals, and public information from local residents. With regard to some species, such as ground geckoes and Ryukyu black-breasted leaf turtles, the distributions shall be investigated, as necessary.	Annually	Okinawa Amami Nature Conservation Office, MOE Kyushu Regional Forest Office, Forestry Agency	✓	✓	✓	✓
			Location of rare plant occurrences recorded in inspections, patrols, and distribution surveys, etc.	Data of plant species indicating the OUV shall be accumulated based on information including findings of individual plants and public information from local residents. With regard to some plant species, such as *Dendrobium okinawense* and *Platanthera sonoharae*, the distributions shall be investigated, as necessary.	Annually	Okinawa Amami Nature Conservation Office, MOE Kyushu Regional Forest Office, Forestry Agency	✓	✓	✓	✓
			Changes in RL categories of major species that are selected from the species of the OUV, based on experts advice	Quantitative analyses shall be conducted every five years regarding changes in the RL categories, for the purposes of regularly overviewing changes in the state of conservation regarding the entire species indicating the OUV and utilizing the information to undertake necessary measures.	Every 5 years	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
B. Habitat conservation status	9	Changes in the total area of forests	Satellite images	Forest status shall be assessed based on satellite landscape images, together with analyses of meteorological data including temperatures, precipitations, and typhoons, etc., for the purpose of detecting the vegetation changes and gap formations.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
			Unmanned aerial vehicle (UAV) images	Aerial high-resolution movies shall be taken using Unmanned Aerial Vehicle (UAV), for the purpose of understanding the changes in the forest conservation status.	Every 5 years	Kyushu Regional Forest Office, Forestry Agency			✓	✓
	10	Environmental changes in major habitats	Landscape photos at fixed sites	Landscape assessments shall be conducted based on camera surveys at several fixed sites in old-growth forests, mountain streams, and cloud belts, together with analyses of meteorological data including temperatures, precipitations, typhoons, etc., for the purpose of understanding environmental changes.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓

II. Mitigation of anthropogenic impacts and improvement on past impacts on endemic species and/or threatened species of the OUV										
A. Animal deaths from unnatural causes	11	Occurrences of road accidents	Number of road accidents involving the Amami rabbit, Okinawa rail, long-haired rat, and Iriomote cat	Necropsies shall be conducted when dead or injured individuals are found by inspections, patrols, and reports from municipalities and local residents, for the purpose of understanding the trend in traffic accident damages.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
	12	Predation by alien species	Number of predation damages by dogs and cats on the Amami rabbit, Okinawa rail, long-haired rat, and Okinawa woodpecker	Necropsies and DNA analyses shall be conducted when dead or injured individuals are found by inspections, patrols, and reports from municipalities and local residents, for the purpose of understanding the trend in predation damages by dogs and cats.	Annually	Okinawa Amami Nature Conservation Office, MOE Conservation & Animal Welfare Trust	✓	✓	✓	
B. Capture and collection of animals and plants	13	Information on poaching and smuggling of animals and plants	Number of cases/suspected cases of poaching and smuggling (illegal capture/collection and taking out)	The number of poaching and smuggling of rare animals and plants shall be investigated by inspections, patrols, and reports from related agencies, municipalities, and local residents, for the purpose of understand the trend in damages and discussing measures at the liaison committee meetings comprised of administrative organs and private companies.	Annually	Liaison meeting on measures against poaching and smuggling of rare wildlife species in the Amami Island Group region Liaison meeting on measures against poaching and smuggling of rare wildlife species in Okinawa region	✓	✓	✓	✓
			Number of traps to catch animals	The number of traps (insect collection traps) shall be investigated by inspections, patrols, and reports from municipalities and local residents, for the purpose of understanding the trend in the capture pressure.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
III. Decrease of alien species that pose threats										
A. Status of invasive alien species	14	Status of the small Indian mongoose	CPUE (relative abundance) and distribution of the mongoose	The trend and range of CPUE (Catch Per Unit Effort) of mongoose control projects shall be understood.	Annually	Okinawa Amami Nature Conservation Office, MOE Nature Conservation Division, Okinawa Prefecture	✓		✓	
	15	Distribution status of cats and cat keeping	Distribution status of cats in the nominated property and buffer zones	Information shall be collected on camera shooting, capture status, and abandonment of cats, for the purpose of understanding the trend in invasions of cats into the nominated property and the buffer zones.	Annually	Okinawa Amami Nature Conservation Office, Nature Conservation Division, Okinawa Prefecture	✓	✓	✓	
			Number of pet cats	The number of new registrations of pet cats and microchipped cats shall be investigated, for the purpose of understanding the trend in numbers of pet cats as the source of feral and stray cats.	Annually	Amami City, Yamato Village, Uken Village, Setouchi Town, Tatsugo Town Tokunoshima own, Amagi Town, Isen Town, Kunigami Village, Ogimi Village, hibachi Village, Taketomi Town, and of Veterinary Medical Association of the Oshima region	✓	✓	✓	✓

	16	Invasion status of alien species	Number and locations of alien species found in the nominated property and buffer zones	Information shall be gathered from patrols conducted by officers of MOE and Forestry Agency as well as reports from municipalities and local residents, for the purpose of understanding distributions and invasions of alien species.	Annually	Okinawa Amami Nature Conservation Office, MOE Kyushu Regional Forest Office, Forestry Agency Okinawa Prefecture, Kagoshima Prefecture, municipalities, and local residents	✓	✓	✓	✓
			Number and locations of alien species found in the surrounding conservation area	Line transect surveys extending to several kilometers per site at around 100-200 sites in total shall be conducted in places within the vicinity of the nominated property, where unintentional invasions are expected from outside and inside the country. The surveys are for the purpose of understanding the invasion status of alien species listed in the List of Invasive Alien Species, which has been created according to the degrees of priorities.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
Ⅳ. Sustainable tourism use in the nominated property and its surrounding areas										
			Number of entries and visitors for each island (tourism statistics)	The trend in the number of entries and visitors shall be investigated.	Annually	Planning Division, Oshima Branch Office, Kagoshima Prefecture Department of Culture, Tourism, and Sport, Tourism Policy Division, Okinawa Prefecture	✓	✓		✓
			Total capacity of accommodations	The trend in the number of entries and visitors shall be investigated.	Annually	Department of Culture, Tourism, and Sport, Tourism Policy Division, Okinawa Prefecture			✓	✓
			Number of visitors to Northern part of Okinawa Island (National Transportation Census)	The trend in the number of passing vehicles that enter into Northern part of Okinawa Island shall be investigated.	Every 5 years	Okinawa General Bureau, Cabinet Office			✓	

A. Status of tourism use	17	Status of tourism use, including ecotourism	Users of facilities related to natural environments	The trend in the number of facility users whose main purpose of tourism is related to natural environment among all entries shall be investigated.	Annually	Okinawa Amami Nature Conservation Office, MOE Kagoshima Prefecture, Amami City, Tatsugo Town, Kunigami Village	✓		✓	✓
			Number of registered ecotour guides and entities that have signed a conservation use agreement	The trend in the number of registered ecotour guides (or entities) and the entities that have signed a conservation use agreement (Northern part of Okinawa Island and Iriomote Island) shall be investigated.	Annually	Liaison meeting of ecotour guides on Amami-Oshima Island, Liaison meeting of ecotour guides on Tokunoshima Island, Wide Area Administration Association of Amami Islands, Yambaru three villages forest tourism meeting, and Taketomi Town	✓	✓	✓	✓
			Number of visitors at the major ecotour sites	The trend in the number of visitors shall be investigated by user counters, etc. at major ecotour sites.	Annually	Okinawa Amami Nature Conservation Office, MOE Kyushu Regional Forest Office, Forestry Agency Tropical Biosphere Research Center, University of the Ryukyus Kagoshima Prefecture, Yamato Village, Uken Village, and Kunigami Village	✓	✓	✓	✓
			Status of ecoutour use at the major locations on each island	The trend in use status and tourism types shall be investigated by identifying the ecotour sites inside the Island and visualizing them on a map.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
B. Environmental impact of tourism	18	Environmental changes in ecotour sites	Landscape photos at fixed ecotour sites	Landscape assessment shall be conducted.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
			Monitoring at fixed major ecotour sites	Monitoring shall be conducted at major ecotour sites and along footpaths, for the purpose of understanding the changes in natural environment, such as changes in vegetation due to tourism use.	Annually	Okinawa Amami Nature Conservation Office, MOE Tropical Biosphere Research Center, University of the Ryukyus				✓

Ⅴ. Early detection of the impacts or signs of climate change and disasters										
A. Climate change and forest areas	9	Changes in the total area of forests	Satellite images	Forest status shall be assessed based on satellite landscape images, together with analyses of meteorological data including temperatures, precipitations, and typhoons, etc., for the purpose of detecting the vegetation changes and gap formations.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
			Unmanned aerial vehicle (UAV) images	Aerial high-resolution movies shall be taken using Unmanned Aerial Vehicle (UAV), for the purpose of understanding the changes in the forest conservation status.	Every 5 years	Kyushu Regional Forest Office, Forestry Agency			✓	✓
	19	Changes of forests in model areas	Number of woody plant species, species composition, above-ground carbon stocks, coverage of forest floor and shrubs, at a fixed site in nominated property on each island	The secular changes with the trends at the fixed sites across the country shall be compared, for the purpose of detecting responses to climate change and impacts of typhoons in the nominated property.	Annually to every 5 years	Biodiversity Center of Japan, MOE	✓		✓	✓
			Monitoring on terrestrial plants	Monitoring of the specified plant communities in the nominated property shall be conducted based on climate change adaption plan.	Every 5 years	National Institute for Environmental Studies, Kagoshima University, and Ryukyu University	✓	✓	✓	✓
B. Climate change and fauna	20	Fauna and changes in main habitats	Number of bird species, species composition, and biomass at a fixed site in the nominated property on each island	The trend at the fixed sites across the country and their secular changes shall be compared, for the purpose of detecting the impacts of climate change in the nominated property.	Annually to every 5 years	Biodiversity Center of Japan, MOE	✓		✓	✓
	10	Environmental changes in major habitats	Landscape photos at fixed sites	Landscape assessments shall be conducted based on camera surveys at several fixed sites in old-growth forests, mountain streams, and cloud belts, together with analyses of meteorological data including temperatures, precipitations, typhoons, etc., for the purpose of understanding environmental changes.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓

Other				
Regardless of the abovementioned matters, a system (contact point) which enables monitoring (reporting, etc.) through participation of many local residents shall be established.	Okinawa Amami Nature Conservation Office, MOE and local residents	✓	✓	✓	✓

Amami-Oshima Island, Tokunoshima Island, Northern Part of Okinawa Island, and Iriomote Island, nominated for inscription on the World Heritage List

Framework of Tourism Management Plans

Overarching Management Plan for Four Islands

The Comprehensive Management Plan

- Visitation to the property provides an opportunity to deepen understanding of the heritage value. On the other hand, visitation could also become a negative factor compromising the heritage value, visitors' expectations and satisfactions, if the growth of the visitors lead to uncontrolled expansion of tourism industry and excessive use.
- Therefore, Comprehensive Management Plan intends to ensure long-term maintenance of heritage value, by reducing the burden on the nominated property from its tourism use through measures including proper usage control and others to prevent increase of entry into the nominated property.

<Tourism management policy for each zones>

i) Nominated property: Promoting in-depth experience in nature with an appropriate use management, while controlling and restricting visitors' entry by establishing rules and regulations for proper use.

ii) Buffer zone: Ensuring buffering functions in controlling and restricting the visitor's entry to the nominated property, by taking in a certain amount of conservation-oriented tourists in buffer zones.

iii) Surrounding Conservation Area: Taking the impact of tourism on the regions and its capacity into the consideration, accepting, mass tourism to deter the visitors' flow to the nominated property. Upgrading functions and/or establishing of visitor facilities where visitors can obtain necessary information such as the interpretation of the value, zoning and rules of the property.

Plans for Each Region

Amami-Oshima Island

- Number of inbound visitors and travelers: Approx. 470,000 / year (2017)

Action Plan for Amami-Oshima Island

Master Plan of the Amami Island Group Sustainable Tourism (in force)

Concrete Regulations/ Measurements (examples)

- Regulations on the area where concentrations of uses are anticipated (examples).

<u>Kinsakubaru National Forest</u> (nominated property)

Reach by car and walking inside.

<User Rules>

- Visitors must be accompanied by a certified guide.
- One guide can attend 15 persons at maximum.
- Max. 10 vehicles at the same time.
- Time limit for one visit is 120 min, etc.

<u>Sutarumata Line forest road (nominated property)</u>

Wildlife spotting by car during nighttime.

- Installation of warning signs and road humps.
- Monitoring traffic volume.

- Certification system of ecotour guides.
  - A certified guide has to satisfy the conditions including sufficient guiding experiences, completion of training programs, and the contributions to conservation of local environment.

Tokunoshima Island

- Number of inbound visitors and travelers: Approx. 130,000 / year (2017)

Action Plan for Tokunoshima Island

Master Plan of the Amami Island Group Sustainable Tourism (in force)

- Regulations on the area where concentrations of uses are anticipated (examples).

<u>Yamakubiri Line forest road (nominated property)</u>

Wildlife spotting by car during nighttime.

<User Rules>

- Visitors must be accompanied by a certified guide.
- One guide can attend 10 persons at maximum.
- Maximum vehicle usage is 3 vehicles/day in summer, and 4 vehicles/day in winter.
- Intervals of the each vehicles need to be kept more than one hour.
- Speed limit 15 km/ hour, etc. .

<u>Mikyo Line and Hagedake Line forest roads (nominated property)</u>

- Visitors must be accompanied by a registered guide.

- Certification system of ecotour guides. (same as Amami-Oshima Island)

Northern part of Okinawa Island

- Number of inbound tourists: Approx. 670,000 / year (estimated: 2017)

Action Plan for Northern part of Okinawa Island

Sustainable Tourism Master Plan of the Northern Part of Okinawa Island (to be completed and submitted in Feb 2020)

- Achieving proper visitor management with Yambaru Forest Tourism.
- Designation of the field categories, such as the fields shall not to be utilized for tourism (the 9th station and above section of the trail to Mt. Yonaha, etc.), and the fields open for limited uses (Mt. Ibu, etc.).
- Formulation and implementation of certified guide system in close coordination with field management.
- Closure of forest roads.
  - Installation of gates along 20 forest roads in the nominated property.
  - Closure time: 19h00 – 05h00 (next morning)
- Systematically directing tourist to circular tours mainly in Surrounding Conservation Area (e.g. Hiji-otaki falls, Kunigami village forest park).

Iriomote Island

- Number of tourists: Approx. 320,000 / year (2017)

Action Plan for Iriomote Island

Visitor Control Master Plan for Sustainability of Iriomote Island (to be completed and submitted in Feb 2020)

- Measures for control and dispersal of the tourist volume.
- Setting user rules for the fields based on Ecotourism Promotion Act.
- Tourist guide ordinance (enacted).
  - Obligation to receive a license to operate paid tourist guide services.
  - Obligation to participate in training and educational programs, etc.
  - Obligation to report on the status of guide services provided, and environmental conditions of the fields.
- Establishing organization central for tourism management.
- Considering introduction of entrance fee to be utilized for nature conservation on Iriomote Island.
- Monitoring impacts on natural environment caused by tourism use.

TORII Toshio
Director-General
Nature Conservation Bureau
Ministry of the Environment

HONGO Koji
Director-General
Forestry Agency

Government of Japan
November, 2019

Supplementary Information for IUCN Evaluation of the "Amami-Oshima Island, Tokunoshima Island, Northern part of Okinawa Island and Iriomote Island" (Japan)

Government of Japan

February, 2020

Table of Contents

Signature on behalf of the State Party

1. Current status of logging/timber extraction activities in the buffer zones

Historically, people on Amami-Oshima Island, Tokunoshima Island, and in the northern part of Okinawa Island have traditionally logged forests to use forest resources for timber, fuelwood, and other products. Traditional logging has supported livelihoods of local communities, and forest resources in the regions have deeply linked to their traditional culture as seen in ceremonies, religious beliefs, woodcraft furniture and textile dyeing. These interactions have fostered unique characteristics of the rural communities in harmony with nature.

The regions have a long history of sustainable forest use. For example, forests in the northern part of Okinawa Island have more than 300 years' history of sustainable resource management, with its roots in the "*Somayama* system" established by the Ryukyu Kingdom Government. The "*Somayama* system" is a series of regulatory policies for forest management and use, including prescribed management rules and limitations, as well as penalties for violations.

Dominated by Castanopsis (*Castanopsis sieboldii*) which have a great capacity for sprouting, forests in these regions demonstrate rapid regrowth and high resilience. Above-ground biomass, stem density, tree species diversity in the regions are reported to recover quickly (see Box. 5, p. 113 of the nomination dossier, also attached Appendix 1-1). Thanks to this characteristic, conservation of rare and/or endemic species has been ensured while forest operations conducted. In fact, it is confirmed that certain rare species, represented by Amami rabbit, Okinawa rail, and Okinawa woodpecker, use secondary vegetation in post-logging sites as a part of their habitats. Besides, environmentally sound logging measures, as described later, have been introduced in recent years, with the efforts of logging operators and related organs.

Buffer zones in the four regions of the nomination are mostly designated as Class II Special Zone, while others are covered with relevant zonal classifications of national parks (Amami-Oshima Island and Tokunoshima Island: designated in 2017, Northern part of Okinawa Island: designated in 2016 and expanded in 2018, Iriomote Island: completed a major expansion in 2016). Regulations on logging/timber extraction activities have become effective by these designations, and any felling tree(s) or bamboo including logging/timber extraction activities in the buffer zones need to obtain a prior permission from the Government (Ministry of the Environment) based on Natural Parks Act.

Outlines of logging/timber extraction activities in the buffer zones on Amami-Oshima Island, Tokunoshima Island, and in the northern part of Okinawa Island are shown in Appendix 1-2. Iriomote Island has no logging/timber extraction activities in its buffer zones, nor has plans in future.

Pursuant to Natural Parks Act, an in-advance application to the Ministry of the Environment is required for any felling tree(s) or bamboo including logging/timber extraction activities planned in the buffer zones. All the applications shall be reviewed in accordance with regulatory standards, and permissions shall not be granted when negative effects on natural environment are predicted. To grant a permission, the area of logging/timber extraction activities should be kept to the minimum extent possible, logging/timber extraction activities at post-logging sites need to be suspended for more than the prescribed period, and the site for logging/timber extraction activities has to be spatially dispersed from one another. During the review process of the application, a logging operator may be ordered to relocate the site and/or reduce the area for logging/timber extraction activities when needed. These regulations, together with the abovementioned high degree of resilience of the forests, ensure to maintain above-ground biomass, stem density, tree species diversity at higher level, as well as to secure the habitats of rare species in the buffer zones. Furthermore, additional measures have been implemented to take a cautious approach for natural environment and forest ecosystem which include: securing the reserved belts of forests (reserving forests located within a certain distance from the nominated property without logging, etc.), avoiding logging along major ridges and their surroundings, halting logging during breeding periods of certain rare species, selecting suitable logging methods to reduce disturbance on forest floors (using chainsaws instead of heavy harvesting machineries, etc.), and adopting cable yarding systems which fully minimize loading pressure on forest floors.

Although the laws and regulations may allow small scale and limited tree(s) or bamboo felling activities, it is predicted that logging/timber extraction activities in the buffer zones will decrease in future, because the effective regulations on logging have been introduced with the designations of the national parks. Over the centuries, the forest resources in the regions have traditionally been utilized in a sustainable manner, as seen in the example of "*Somayama* system" mentioned earlier. From now on, a large scale commercial logging will not be operated, and it is considered that logging/timber extraction activities will be decreased.

As explained above, the logging/timber extraction activities operated in the buffer zones

under these regulations and the guidance from the Ministry of the Environment will not pose significant threats on the Outstanding Universal Value of the property. This is further ensured by continuous monitoring on the forest ecosystems and necessary management actions as appropriate.

In addition, the logging/timber extraction activities undertaken in the buffer zones in compliance with the abovementioned regulations are noted as sustainable forest use, in the report compiled by Mr. Bastian Bertzky (submitted as Annex 1 of the nomination dossier) based on his observations at the post-logging sites in November 2018.

Box 5. Highly resilient forest dominated by Castanopsis

The four regions containing the nominated property are high in biodiversity and essential as habitats to endemic species and rare species. On the other hand, on Amami-Oshima Island and in the north of Okinawa Island, local forest resources have been used for timber, fuel wood, etc, since old times, and a certain level of forestry operations are conducted around the nominated property. The reasons for the two islands having been successful in both conserving endemic/rare species and engaging in the forestry industry include the high regeneration ability of the forests dominated by Castanopsis, a tree species with a strong sprouting power (Hirata et al. 1979). For example, a study was conducted to examine the sprouting ability of Okinawa's Castanopsis forests. The following is a report about the recovery process of a forest located in a former logging site in the north of Okinawa Island (Osawa et al. 2003).

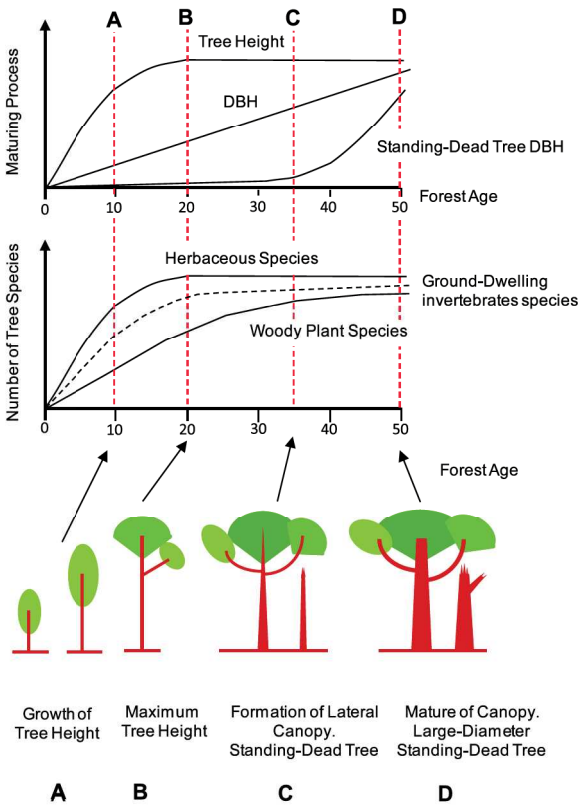


Figure 2-23: Regeneration process and structural characteristics of forests on northern part of Okinawa Island (Osawa et al. 2003, partly modified)

Immediately after logging, pioneer broadleaved trees are dominant. Castanopsis appear from the 10th year and their height and stem diameter (diameter at breast height; DBH) increase year after year, up to around the 20th year since the deforestation (A and B in Figure 2-23).

Around the 20th to 30th year since the deforestation, the accumulated number of species constituting the forest canopy reaches the upper limit at 80 to 85. The broadleaved trees are replaced by new dominant species, such as Castanopsis, *Schima wallichii* ssp. *liukiuensis*, Japanese snowbell (*Styrax japonica*), and *Distylium racemosum*. While the tree height almost reaches the upper limit of 15 m, DBH (diameter at breast height: ca. 25 cm at this stage) continues to increase. This is the stage when the growth of DBH outperforms that of tree height (C in Figure 2-23).

Around the 35th year after the deforestation, the structure of the forest layers consisting of canopy, subcanopy, and understory trees becomes clearer. Castanopsis and other canopy trees stretch their lateral branches further, while increasing the stem diameter (at this stage, DBH reaches around 30 cm at the maximum). As a forest tree community enters an adjustment phase, small-diameter trees are thinned out, and a rapidly increasing number of standing-dead trees begin to stand out (C and D in Figure 2-23). At this stage, a forest becomes able to meet habitat requirements of certain endemic/rare species such as Okinawa woodpeckers, which need, for nest building, large-diameter (DBH ≥ 20 cm) and rotten-centre trees. In addition, threatened epiphytic plants, such as *Dendrobium okinawens*, tend to grow on large-diameter trees, and it is thought that long-term stable forests are important for such trees (Abe et al., 2018).

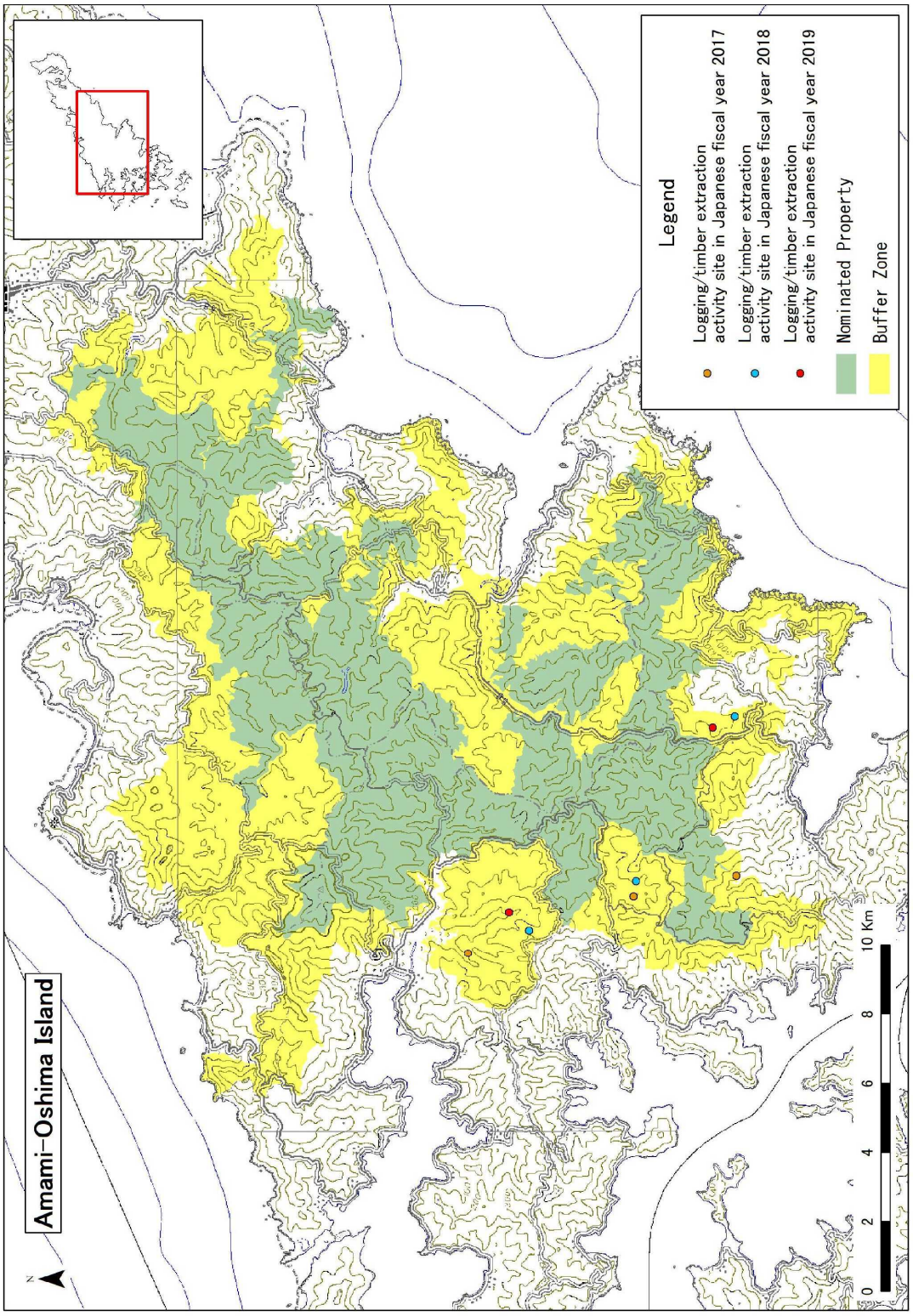
After 50 or more years have passed since deforestation, a forest has become composed of large-diameter trees with DBH of around 65 cm at the maximum, and there may be some changes in their physical structure, such as hollows and shoots arising from thick lateral branches. A forest structure diversifies further, and some of large diameter trees having DBH of around 60 cm become snags (D in Figure 2-23). At this stage, a forest becomes able to meet habitat requirements of certain endemic/rare species such as Yanbaru long-armed scarab beetles, which need tree hollows that have a sufficient level of humic substances to feed their larvae.

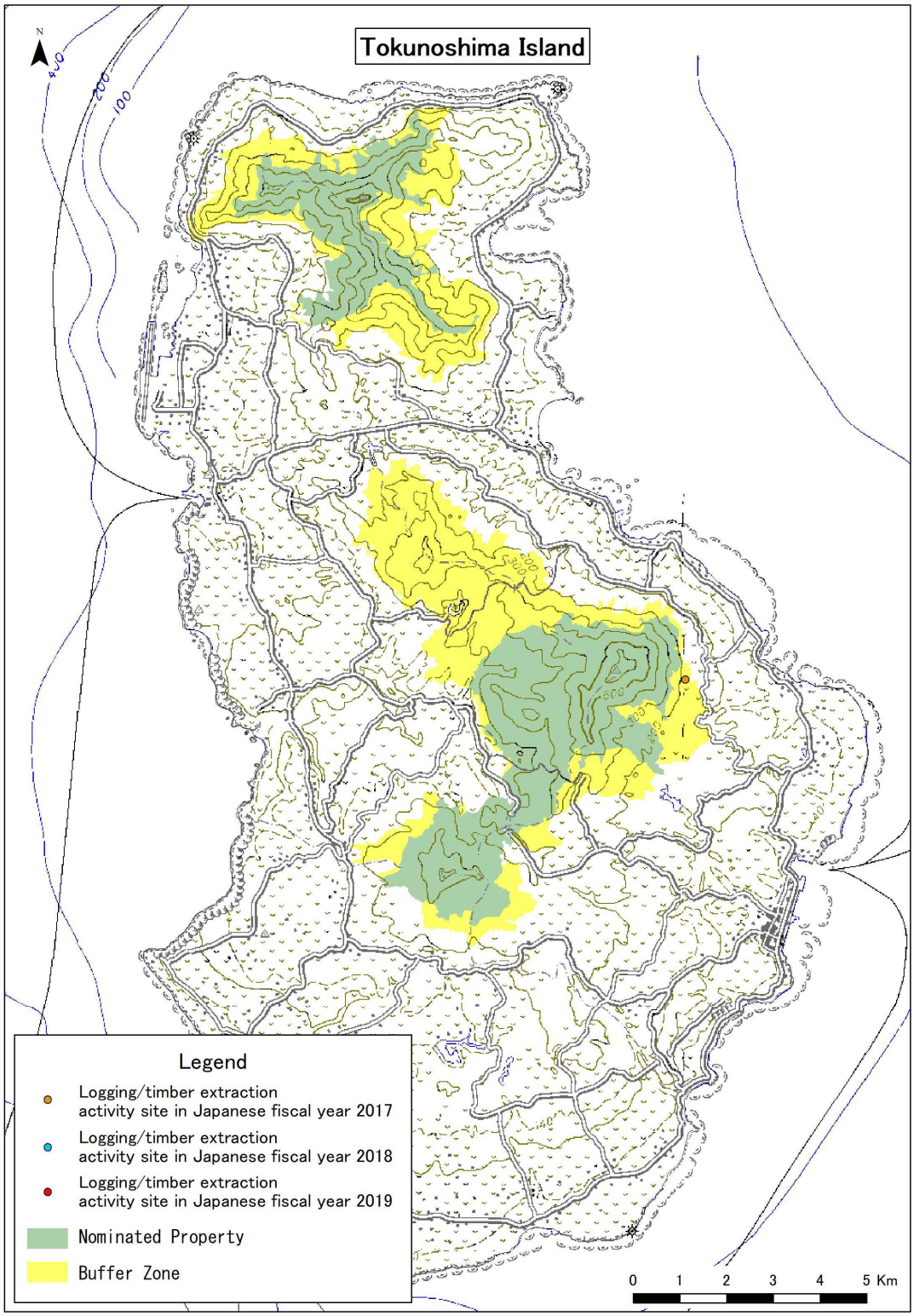
Amami-Oshima Island's chinquapin forests always recover from logging and restore itself in a relatively short period of time. However, large-diameter trees need a longer span of time to recover, and approximately 80 years after a selective cutting and approximately 110 years after a complete cutting are required to return to a state similar to that of the original primary forest (Shimizu et al. 1988).

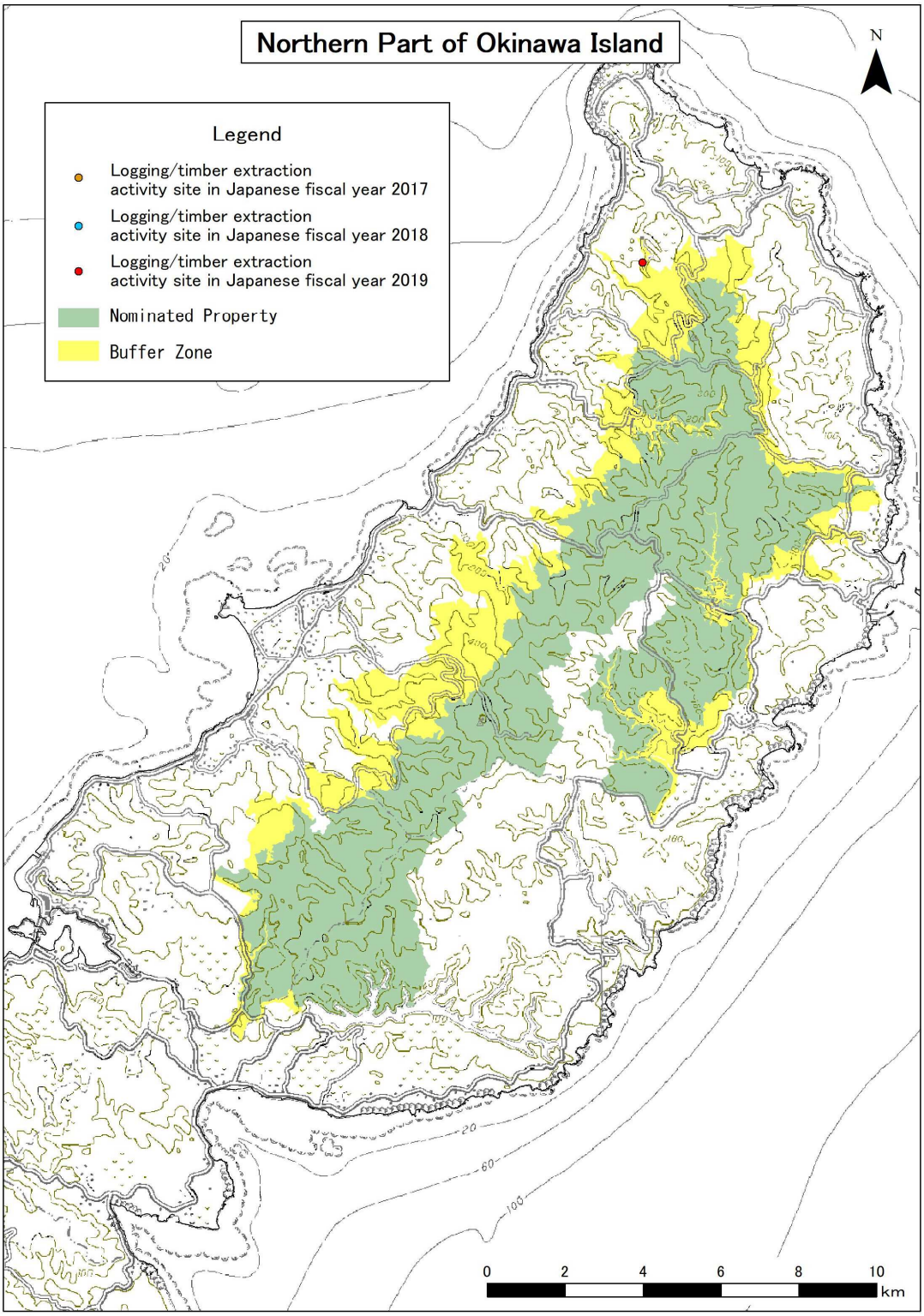
It should be noted that the rapid sprout regeneration and growth of underbrush help prevent sediment runoff and contribute to the smooth restoration of forest.

Appendix 1-2-1

Maps of the logging/timber extraction activity sites




Tokunoshima Island
Legend
Logging/timber extraction activity site in Japanese fiscal year 2017
Logging/timber extraction activity site in Japanese fiscal year 2018
Logging/timber extraction activity site in Japanese fiscal year 2019
Nominated Property
Buffer Zone
0 1 2 3 4 5 Km


Northern Part of Okinawa Island
N
Legend
Logging/timber extraction activity site in Japanese fiscal year 2017
Logging/timber extraction activity site in Japanese fiscal year 2018
Logging/timber extraction activity site in Japanese fiscal year 2019
Nominated Property
Buffer Zone
0
2
4
6
8
10
km

Outlines of logging/timber extraction activities in the buffer zones on Amami-Oshima Island

JFY*	Location		Forest composition	Logged area (ha)	Average diameter (cm)	Tree age (year)
2017	Agina	-	Castanopsis (*Castanopsis sieboldii*), Quercus (*Quercus miyagii*), and other broadleaved trees	1	30	32
	Shinokawa	-	Other broadleaved trees	9	26	52
	Yuwan	1st section	Castanopsis (*Castanopsis sieboldii*), other broadleaved trees, and Ryukyu pine (*Pinus luchuensis*)	3	30	47
		2nd section	Castanopsis (*Castanopsis sieboldii*), other broadleaved trees, and Ryukyu pine (*Pinus luchuensis*)	9	33	49
		3rd section	Castanopsis (*Castanopsis sieboldii*) and other broadleaved trees	7	33	45
		4th section	Castanopsis (*Castanopsis sieboldii*), other broadleaved trees, and Ryukyu pine (*Pinus luchuensis*)	8	33	43
		5th section	Castanopsis (*Castanopsis sieboldii*) and other broadleaved trees	4	33	48
2018	Aminoko	-	Other broadleaved trees	9	24	48
	Shinokawa	-	Other broadleaved trees	6	26	52
	Yuwan	-	Castanopsis (*Castanopsis sieboldii*), other broadleaved trees, and Ryukyu pine (*Pinus luchuensis*)	6	33	45
2019	Aminoko	-	Other broadleaved trees, Japanese cedar (*Cryptomeria japonica*)	6	26	49
	Yuwan	1st section	Castanopsis (*Castanopsis sieboldii*), other broadleaved trees, Ryukyu pine (*Pinus luchuensis*), and Japanese cedar (*Cryptomeria japonica*)	7	33	49
		2nd section	Castanopsis (*Castanopsis sieboldii*), other broadleaved trees, Ryukyu pine (*Pinus luchuensis*), and Japanese cedar (*Cryptomeria japonica*)	2	33	46

Statistics in the table contain approximate figures. The table shows the records after the designation of the national park (in the past three years), due to availability and consistency of the data.

* JFY: Japanese fiscal year, which starts in April and ends in March next year.

[Regulations on the logging/timber extraction activities in the buffer zones on Amami-Oshima Island based on Natural Parks Act]

To conserve natural environment, all applications are subjected to rigorous review in accordance with the more comprehensive set of regulatory standards, compare to the other regions of the nomination. After mandatory on-site confirmations, permissions shall be granted only if applications meet the conditions. When granted, the area for the logging/timber extraction activities should be kept to the minimum extent possible.

Key regulatory standards for reviewing applications

- A site for logging/timber extraction activities shall not be adjacent to other logging and/or logged sites where forest regeneration has not taken place yet, or took place in the past five years.
- Trees and/or bamboos shall not be logged until they reach the standard cutting age.
- Logging/timber extraction activities shall not be operated around visitor facilities and other specified locations.
- Forests located within a certain distance from the nominated property shall not be logged.
- Forests used as habitats by certain rare species shall not be logged.
- Forests along major ridges and their surroundings shall not be logged.
- Suitable logging methods shall be selected to reduce disturbance on forest floors (using chainsaws instead of forestry vehicles and/or heavy machineries, etc.).
- Cable yarding shall be applied to fully minimize loading pressure on forest floors.

※The ratio of private lands on the island is higher compared to the other regions of the nomination. Therefore, it is required to secure buffering function for conserving the nominated property while obtaining understanding and support from stakeholders, in particular from landowners (owners of the forests), on Amami-Oshima Island. Thanks to the cooperation from the landowners, these private lands have been designated as regulated areas in the national park, and now, logging/timber extraction activities in the surroundings of the nominated property have been appropriately managed by the Ministry of the Environment. As a result, the total area of logging/timber extraction activities has gradually been decreasing after the designation of the national park, and this trend is considered to be accelerated in future.

Outlines of logging/timber extraction activities in the buffer zones on Tokunoshima Island

JFY*	Location		Forest Composition	Logged area (ha)	Average diameter (cm)	Tree age (year)
2017	Inokawa	1st section	Castanopsis (*Castanopsis sieboldii*) and other broadleaved trees	2	18	36
		2nd section	Castanopsis (*Castanopsis sieboldii*) and other broadleaved trees	1	20	54
2018	-	-	-	-	-	-
2019	-	-	-	-	-	-

Statistics in the table contain approximate figures. The table shows the records after the designation of the national park (in the past three years), due to availability and consistency of the data.

* JFY: Japanese fiscal year, which starts in April and ends in March next year.

Outlines of logging/timber extraction activities in the buffer zones in the northern part of Okinawa Island

JFY*	Location		Forest Composition	Logged area (ha)	Average diameter (cm)	Tree age (year)
2017	-	-	-	-	-	-
2018	-	-	-	-	-	-
2019	Ginama	-	Castanopsis (*Castanopsis sieboldii*) and Schima species (*Schima wallichii* ssp. *liukiuensis*) ,etc.	2	16	65

Statistics in the table contain approximate figures. The table shows the records after the designation of the national park (in the past three years), due to availability and consistency of the data.

* JFY: Japanese fiscal year, which starts in April and ends in March next year.

Outlines of logging/timber extraction activities in the buffer zones on Iriomote Island

JFY*	Location		Forest Composition	Logged area (ha)	Average diameter (cm)	Tree age (year)
2017	-	-	-	-	-	-
2018	-	-	-	-	-	-
2019	-	-	-	-	-	-

* JFY: Japanese fiscal year, which starts in April and ends in March next year.

Iriomote Island has no logging/timber extraction activities in its buffer zones, nor has

plans in future.

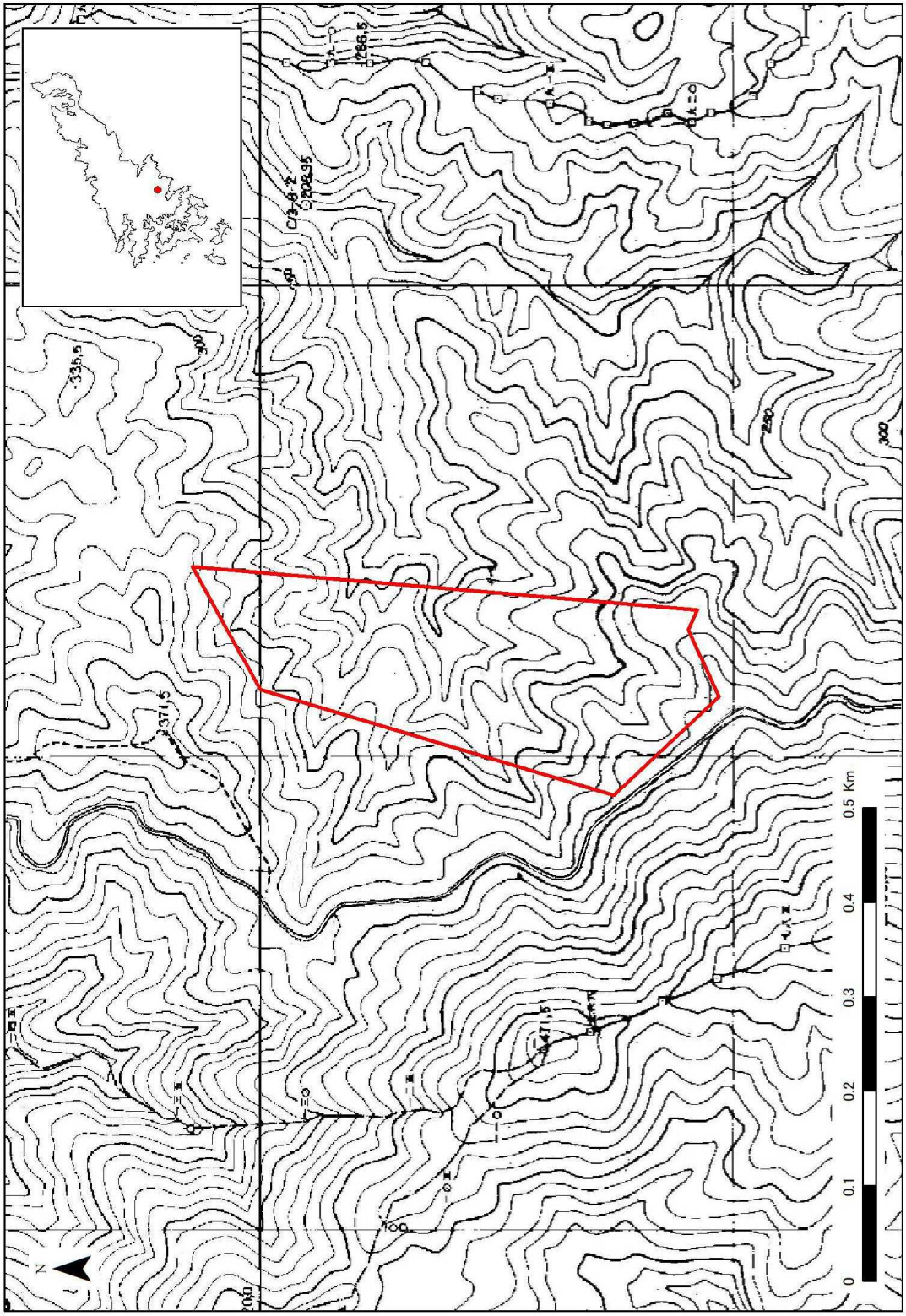
[Regulations on the logging/timber extraction activities in the buffer zones on Tokunoshima Island and in Northern part of Okinawa Island based on Natural Parks Act]

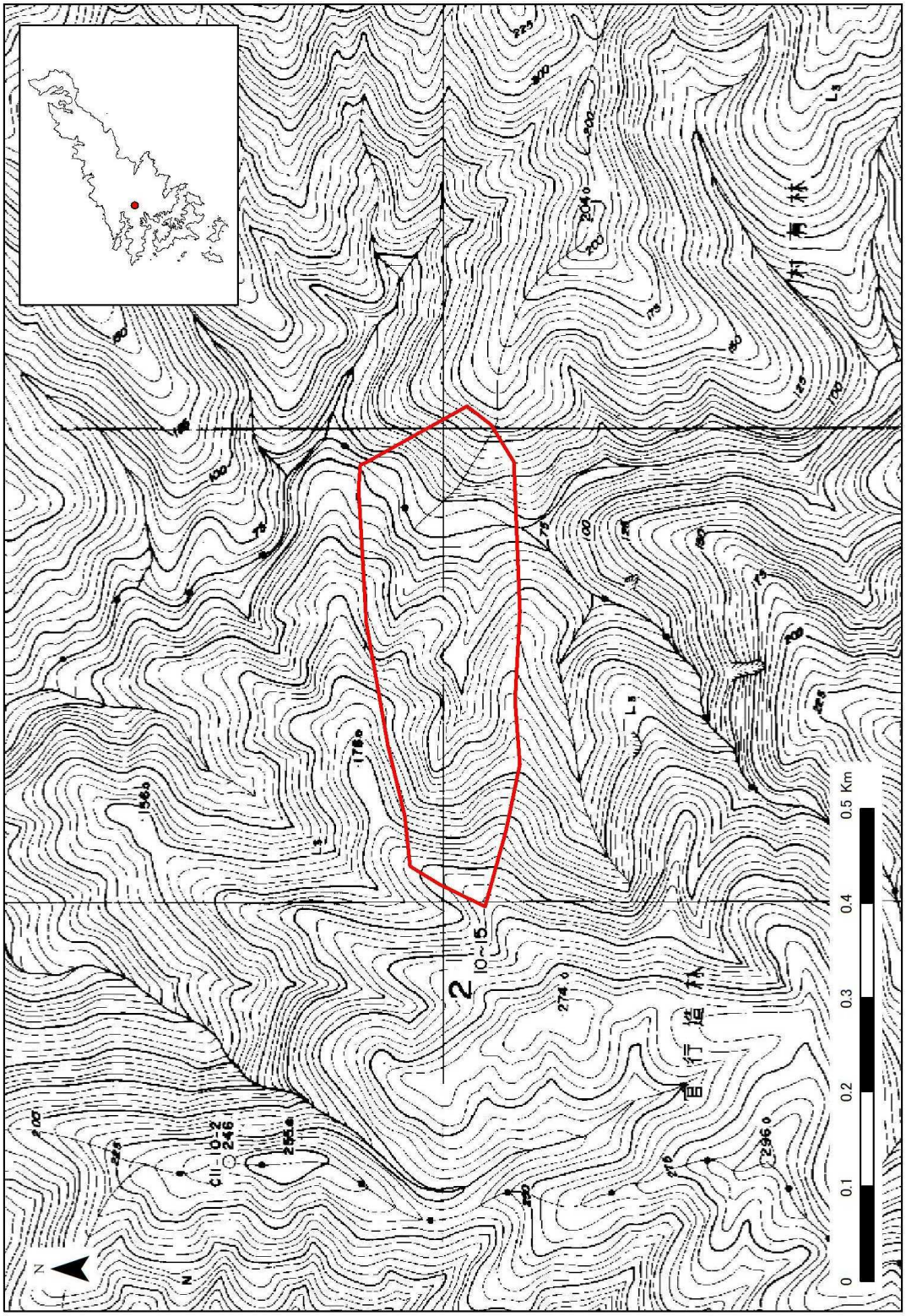
Key regulatory standards for reviewing applications

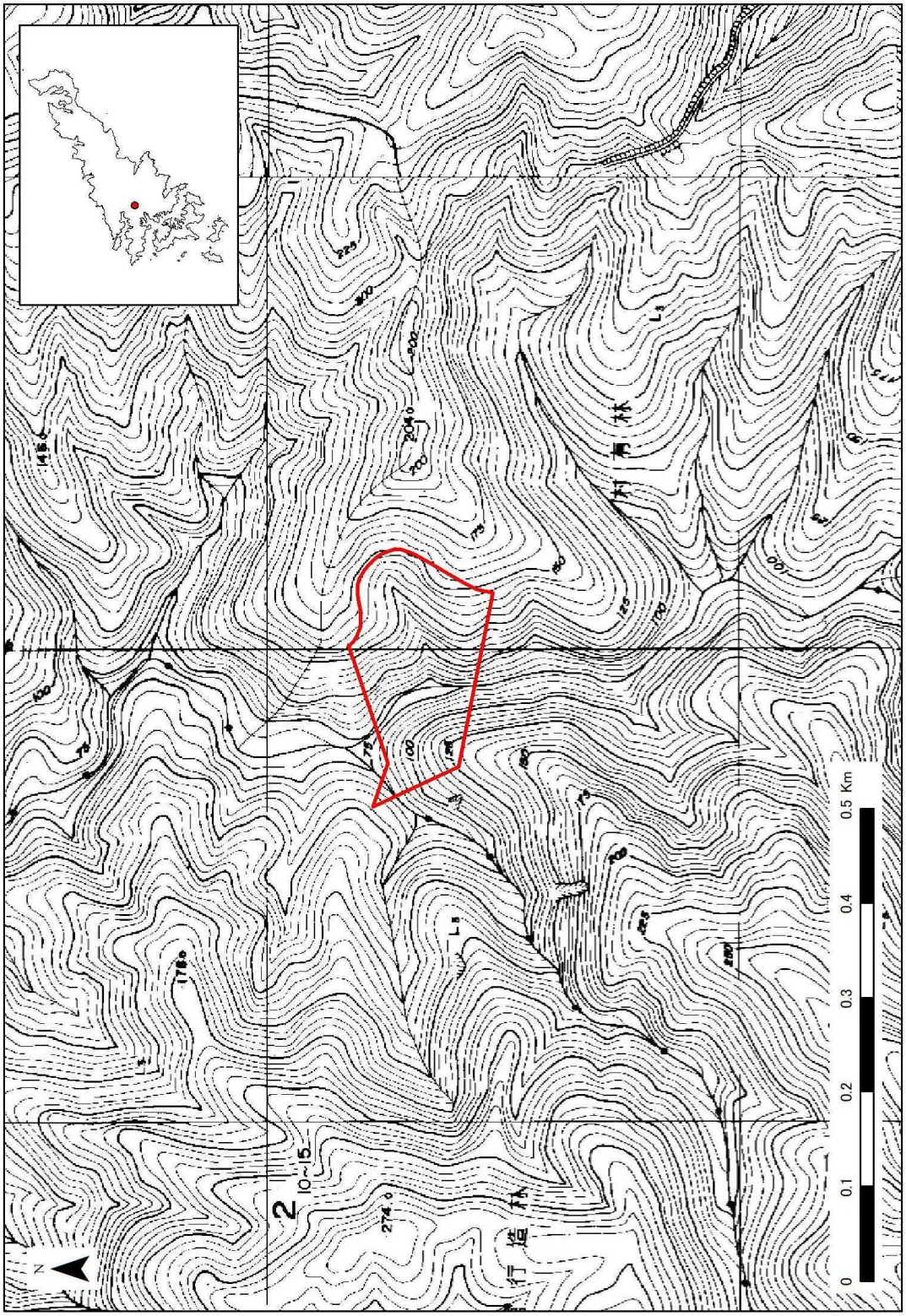
- A site for logging/timber extraction activities shall not exceed 2 ha in principle.
- A site for logging/timber extraction activities shall not be adjacent to other logging and/or logged sites where forest regeneration has not taken place yet, or took place in the past five years.
- Trees and/or bamboos shall not be logged until they reach the standard cutting age.
- Logging/timber extraction activities shall not be operated around visitor facilities and other specified locations.

※Additional considerations have been formulated in the northern part of Okinawa Island that includes halting logging during the breeding periods of certain rare wildlife such as Okinawa woodpeckers, which use trees for nesting.

Detailed maps of the logging/timber extraction activity sites operated in Japanese fiscal year 2019




2
10~15
0
0.1
0.2
0.3
0.4
0.5 Km


N
0
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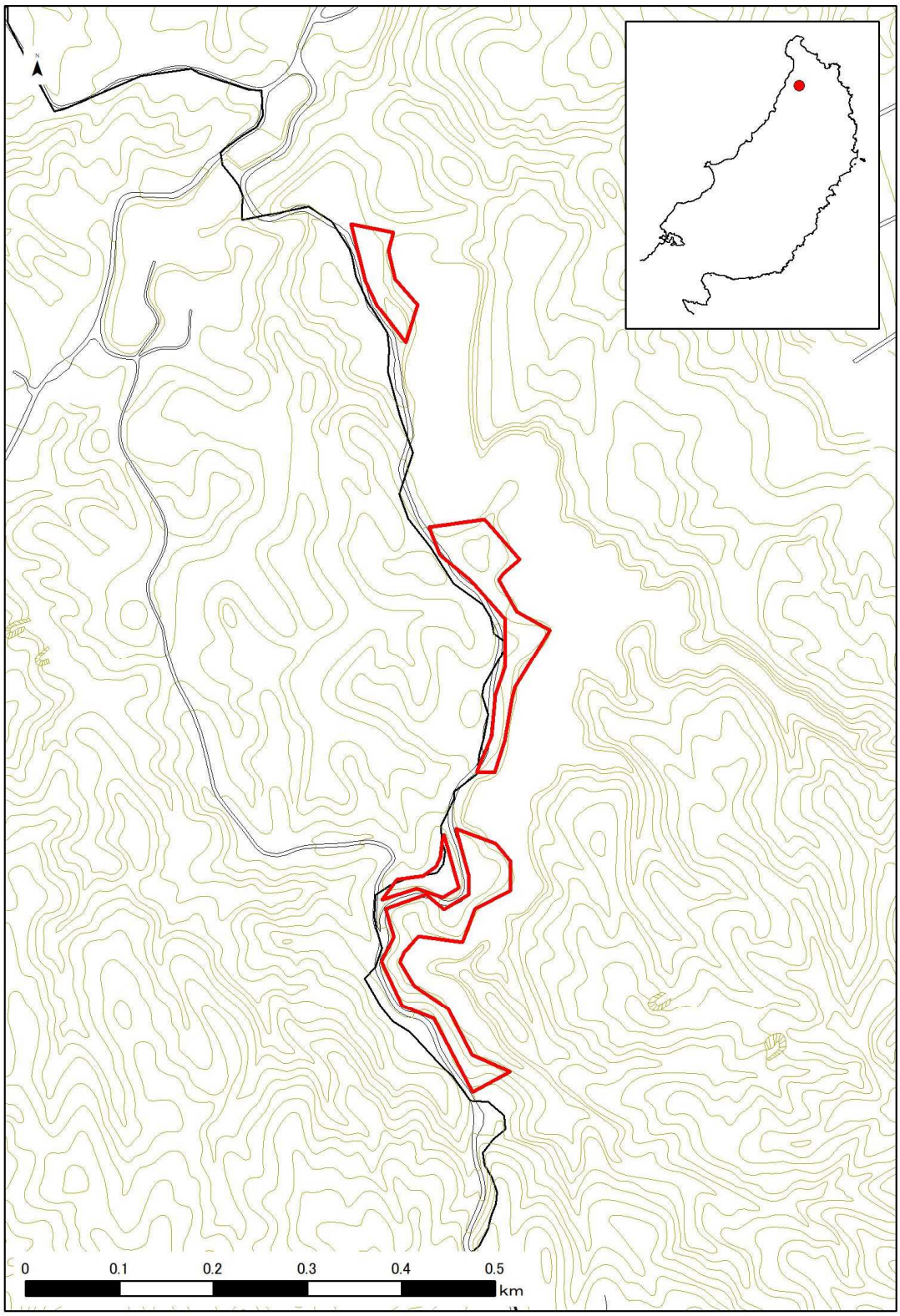

N
0
0.1
0.2
0.3
0.4
0.5
km

Photos of the post-logging sites and the recovery condition of the forests in the buffer zones on Amami-Oshima Island and in the northern part of Okinawa Island (examples)

-Photos of a post-logging site on Amami-Oshima Island

-Photos of a post-logging site in the northern part of Okinawa Island

-Logging operation

- Photos showing the recovery condition of the forests on Amami-Oshima Island

After logging

3 years after

5 years after

7 years after

9 years after

2 . Options for long-term river restoration

The reason for the long-standing existence of river structures in this nominated property is as follows. On the steep terrain of small island areas with extremely short rivers, such as the ones in this nomination, the rivers are characterized by running rainwater off into the ocean in a relatively short time. In addition, because plane lands are limited on these islands, residential areas and arable lands are concentrated in the narrow flat areas along rivers and around the river mouths. Consequently, people suffer from frequent occurrence of water shortage and floods on the flat areas which are distinctive characteristics of these islands. For the residents on these islands, it is quite important to make the best use of limited water resource and to protect their livelihoods from floods which caused casualties in the past. Therefore, river structures such as water utilization dams, intake weir, check dams, and sabo check dams have been installed on the rivers in this region, and they are indispensable for securing water source for the livelihood of local community and for protecting lives and assets of local residents from disasters.

In such circumstances, various mitigation-oriented measures have been taken to avoid negative influences of river structures on species that constitute a part of biodiversity value of the nominated property, notably on Amami-Oshima Island where healthy populations of Ryukyu ayu-fish live.

More specifically, on Amami-Oshima Island, five rivers with a large number of fish swimming up were identified as the prioritized rivers for the protection of Ryukyu ayu-fish and other species. For these rivers, a long-term restoration program was developed, taking the ecosystem conservation into consideration, and measures to improve river structures such as installments of fish ladders have been implemented sequentially. And now, actual runs have been observed in these rivers. Those improvement works were implemented with careful consideration such as avoiding spawning season of fish and preventing turbid water from being generated.

Also, population surveys of the Ryukyu ayu-fish have been conducted for more than 30 years along the major rivers on Amami-Oshima Island in collaboration with fish experts. The results of this survey, together with the opinions expressed in the meeting of experts, have been reflected on the review and implementation of the conservation measures.

In addition, the Government of Japan recognizes the importance of river restoration

(including the removal of river structures) as well as the mitigation measures, and is ready to work diligently on the nature-based technology and approaches.

The situations of rivers vary in each of the four islands, and according to the situation of each island, surveys to monitor diadromous fish and other kinds will be continued to find whether the impacts by river structures exist or not. If necessary, the intensification of surveillance efforts will be considered. Following the results of these surveys and the advice of experts in the field of fish, plants and others, strategies or plans to counteract negative impacts of river structures, including future restoration of rivers, will be formulated, and necessary measures will be taken.

<The State Party's attitude for long-term recovery of the rivers and streams >

In terms of the measures related to the conservation and recovery of the river environments in Japan, the River Law was revised in 1997. Improvement and conservation of river environment was newly added to the purpose of the law which had been limited to the flood control and water use. Furthermore, the Basic Strategy for Nature-Oriented River Management was formulated in 2006, which promotes the conservation and creation of habitats for living and propagation of animals and plants as well as diverse river sceneries.

Also, according to the Basic Environmental Plan, which was adopted by the Cabinet in 2018 as a national fundamental plan for conservation of environments in Japan, the Government of Japan promotes Green Infrastructure and Eco-DRR (Ecosystem-based disaster risk reduction). Green Infrastructure is a program promoting creation of sustainable and attractive nation and region through making use of the diverse functions that natural environment contains (e.g. provision of habitats for creatures, formation of good land/seascapes, restriction of rising temperature, disaster prevention/mitigation) in not only hard aspects of projects but also soft aspects such as land uses. Eco-DRR is a program recognizing the ecosystem functions that contribute to the reduction of disaster risks, and it promotes the disaster prevention/mitigation measures taking advantage of ecosystems by active conservation and restoration efforts.

Following these policies of the national government, Kagoshima Prefectural Government, for example, promotes public projects with consideration for biodiversity, as an item

stipulated in the Kagoshima Prefectural Biodiversity Strategy and Action Plan. In this plan, the following actions are specified: adoption of Nature-Oriented River Management as a basic strategy for river improvement work, conservation of diverse water environments including riffles and pools important for fish habitats, and improvement of water environment by establishing fish ladders and so on. Furthermore, in the Amami Island Group Promotion and Development Plan, public project for nature restoration is included as one of the measures to conserve the island's value worthy of a world natural heritage, in order to conserve and restore the habitats for animals and plants including Ryukyu ayu-fish.

3. Progress update on the proposed extension of the buffer zones

The inclusion plan of the river mouths of the Yakugachi and Katoku Rivers and the neighboring beach areas into the buffer zones had already been explained to the related municipalities and local communities, and the plan was agreed on the condition that Katoku settlement disaster prevention work, which would be indispensable to protect the lives and assets of local residents, would not be cancelled. Then, following the approvals from the Scientific Committee and the Regional Liaison Committee, the Government of Japan has decided to include these areas into the buffer zones. Relevant maps and table are appended (Appendix 3-1).

Concerning the Katoku River which IUCN had pointed out as the last free-flowing river within the Amami-Oshima Island component, the Government of Japan has confirmed that there will be no new construction of river structures in the future.

The above-mentioned Katoku settlement disaster prevention work has already been decided to be implemented as an erosion control project to protect the lives and assets of local residents from disasters such as typhoons, considering the strong requests from the local residents.
Currently, the beach in front of the settlement has no function for disaster prevention after the sand dune, located in the innermost of the beach, was eroded by typhoons. The project needs to be started as soon as possible; however, at this point, the work is planned to start after autumn in 2020.
Taking into account the environmental impact, several alternatives including the options without constructing structures were deliberated in the planning and designing of the project. After the deliberation, it was concluded to build a backmost revetment under the necessity of disaster prevention; however, the area of its installation was minimized and the construction method with consideration for the ecosystem and land/seascape, such as sand cover in front of the revetment and planting on it, was adopted. These examinations were conducted on the basis of the opinions from experts on ecosystems as well as ocean engineering.

Since the site of the construction work is distant enough from the river and there will be no work on the river itself, the project will not affect the river.
The environmental monitoring will be continued after the construction work, and in case serious negative impacts on the free-flowing state of the Katoku River would be confirmed in the monitoring, improvement plans should be considered, in

consultation with local residents and taking the advice from experts into account, in order both to mitigate the impacts and to protect the lives and assets of the local residents.

As for the further extension of the nominated property or the buffer zones, there is no plan at this stage. However, should the necessity arise in future to conserve the Outstanding Universal Value of the property, there is a possibility of extension to the terrestrial area adjacent to the current nominated property or the buffer zones, in consultation with the local communities.

< The technical review process for the Katoku settlement disaster prevention work >

In terms of the long-term beach profile dynamics, the coastline of Katoku beach has not been continuously retreating, and the sand beach has been maintained with some fluctuation of its shape and width. The analysis of the aerial photos taken from 1946 to 2015 and the topographic maps from 1920 to 2006 show that there is no evidence of progressing erosion of sand beach before the erosion caused by typhoons in 2014.
Before the erosion, there had been a sufficient sized sand dune maintained between the settlement including residential area, arable lands and a cemetery, and the foreshore. This sand dune had high disaster prevention function to protect the hinterland from the erosion by wind waves.

However, the sand dune which had been a natural breakwater was eroded by the extreme wind waves of the typhoons No.18 and No.19 in October 2014. By this erosion, total area of about 1,700 m^2 which consisted of private land, including dry fields and a small hut in the hinterland of the sand dune, was lost. Also, the erosion of the sand dune formed a beach cliff of about five meters high adjacent to the houses and the cemetery, and this situation has been continuing up until now.

Then, 26 residents from the Katoku settlement requested the Setouchi Town Hall to take urgent measures such as a bank revetment since their daily life was being threatened by the rapid progress of the dune erosion caused by the repeated typhoons.
In response to their request delivered by the Setouchi Town Hall, Kagoshima Prefectural Government set up a review committee for the Katoku settlement

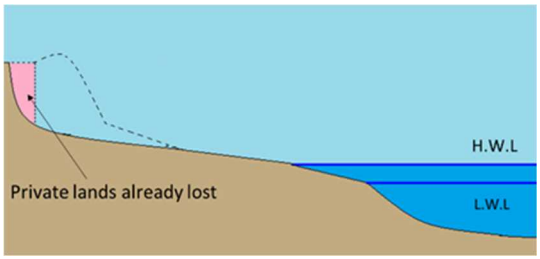
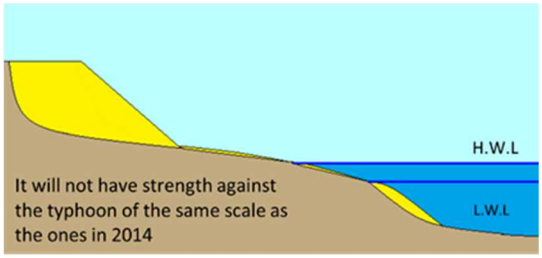
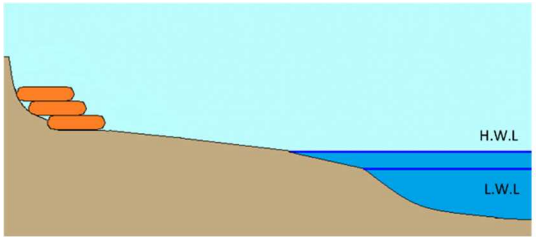
erosion control project, which consisted of experts on ecosystems, ocean engineering, local concerned people and a member of nature conservation group (members of the committee are shown in Appendix 3-2). This committee was convened three times from 2017 to 2018.

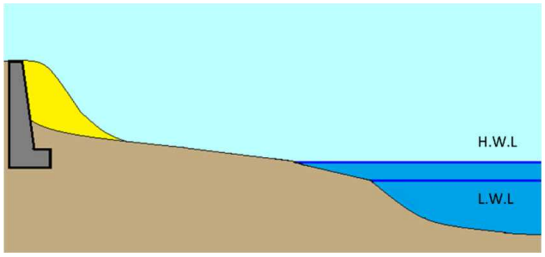
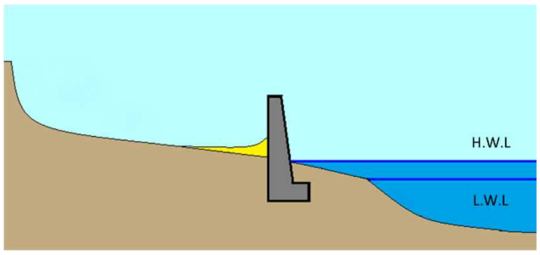
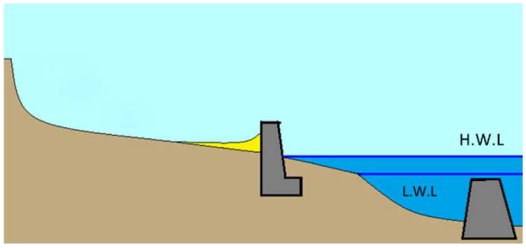
The committee members discussed the following six methods of construction: 1) no measures, 2) artificial nourishment, 3) geosynthetic structure, 4) backmost revetment (adopted method), 5) front revetment and 6) offshore protection structure. For the linear structure i.e. 3) - 6), length of 530 m was originally planned.

During the committee meetings, the following comments were expressed by experts and shared among committee members:

- If a storm surge comes to Katoku beach, high waves will hit directly to the base of the beach cliff where the most part of the sand dune was already eroded; it will advance the erosion and slope failure,
- Considering that the current distance between the eroded beach cliff and the cemetery is only about three to four meters at the central part of the coast, the beach with the eroded sand dune offers no disaster prevention function,
- Natural recovery of the sand dune is considered to require several decades; therefore, the current sand beach cannot be left as it is, from the viewpoint of disaster prevention,
- Bringing in a large amount of sand from outside to this beach for artificial nourishment is inappropriate,
- The area where the erosion of the sand dune is extensive and where the houses and cemetery requiring the protection exist in the hinterland should be considered as a high-risk area and permanent disaster prevention measures need to be explored.

Followings are the overview of the discussions of the committee on each of the construction methods from 1) to 6);

No.	Method of construction	Schema of the work	Overview of the discussion at the committee
1)	No measures		It was not the sand beach but sand dune that had protective function for private lands from erosion. The current central part of the beach which lost the sand dune does not have disaster prevention function as it is. It is anticipated to take several decades for the natural recovery of the sand dune.
2)	Artificial nourishment		It was not the sand beach but sand dune that had protective function for private lands from erosion. So, stable function of disaster prevention cannot be expected by the artificial nourishment of the sand beach with additional sands. Even if the large amount of sand is transported to form a sand dune, we cannot expect the disaster prevention function against the typhoon of the same scale as the ones in 2014, considering the fact that parts of the private land in the hinterland of the sand dune was washed away in 2014. (The national and local governments are responsible for protection of private land). Besides, it is difficult to secure large amount of sand locally, and it is not appropriate to bring in large amount of alien material from the viewpoint of giving emphasis on natural processes.
3)	Geosynthetic structure		The geosynthetic structure of sand packs does not last for ten years because of aging degradation. In case the sack is made of polypropylene or similar materials, it may cause a problem of microplastics.

4)	Backmost revetment		This method was considered as a realistic option. However, the length of revetment was reduced from the original plan of 530 m to 180 m, which covers the area with the most extensive dune erosion. → This method was adopted.
5)	Front revetment		Comparing to above 1) to 4), impacts on the land/seascape and the continuity of the coastal ecosystems are large, thus it was not considered as a realistic option.
6)	Offshore protection structure		Submerged breakwater, i.e. blocks placed under water in the ocean, does not absorb strong waves. Quite large scale of breakwater should be necessary for its sufficient function.

Positional relationship of the planned revetment and highest tide level (HWL)

※ This figure shows the observed location of HWL on 18th November 2016 (18.7 lunar day, medium tide level)

Based on the discussion above, the review committee decided to adopt the backmost

revetment method, i.e. 4) above, making use of remaining sand dune in both sides of the beach. They recommended the following principles, and in accordance with them, the prefectural government decided to proceed to work:

1) to select the area where the erosion of the sand dune is extensive and where the houses and the cemetery requiring the protection exist in the hinterland (the length of this area is 180 m which is one third of the original plan of 530 m), and to install the revetment there,
2) to conduct continuous monitoring of the beach area other than the area above,
3) to avoid and mitigate possible negative impacts on the wild animals.

Furthermore, the revetment will be covered by sand, and native plants such as *Pandanus odoratissimus* will be planted on it to secure continuity of ecosystems and conservation of land/seascape. With these sand cover and planting, it is expected that the growth of the sand dune will be facilitated and the settlement will be protected from airborne salt droplets and blown sand. (These sand cover and plantings do not serve the function of disaster prevention.)

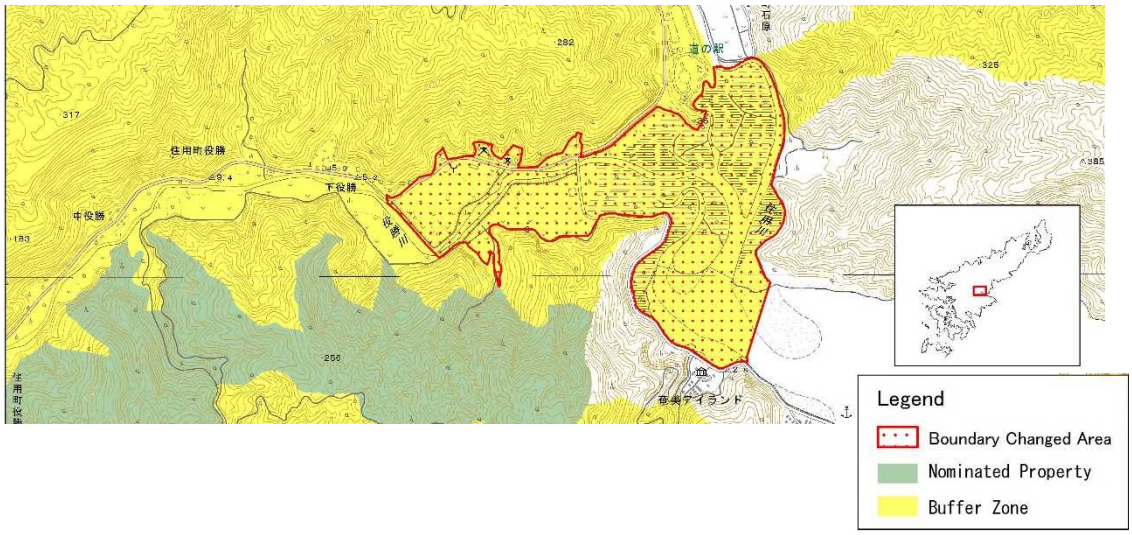
It is clear from the field survey and analysis of aerial photos that the coastal erosion and the damage of the sand dune forest on Katoku beach are concentrated in the central part of the beach, without being uniformed along the coast.
The revetment will be installed in the minimum required area (180 m in the central part of the beach) where the external force from typhoons is concentrated and the erosion of the sand dune is extensive. Both ends of the revetment will be attached to the remaining sand dune with vegetation, where the erosion is small and the function as natural breakwater still remains.
Also, the place for installment of the revetment will be in the inland side, which is separated from the surf zone to a maximum extent in cross section of the beach, and will not be affected by waves in normal times. Therefore, in normal times, there is no possibility that the scouring occurs inside and at both ends of the revetment by reflex flow of waves hit to the revetment.
In situation where the wave will erode the front cover of sand and make the revetment exposed, the residential area, crop field and the cemetery in the hinterland would be damaged without the revetment; therefore it is necessary to make the revetment because there is no other effective alternative to the revetment.
At the both ends of the revetment, the process of coastal erosion and beach recovery (progress of accretion) will be carefully monitored for the time being. In order not to cause erosion around the facilities, and to maintain sufficient function of disaster

prevention in the future, necessary management activities, including reinforcement of the sand dune and the front surface of the revetment by small scale sand nourishment, will be conducted depending on the conditions.

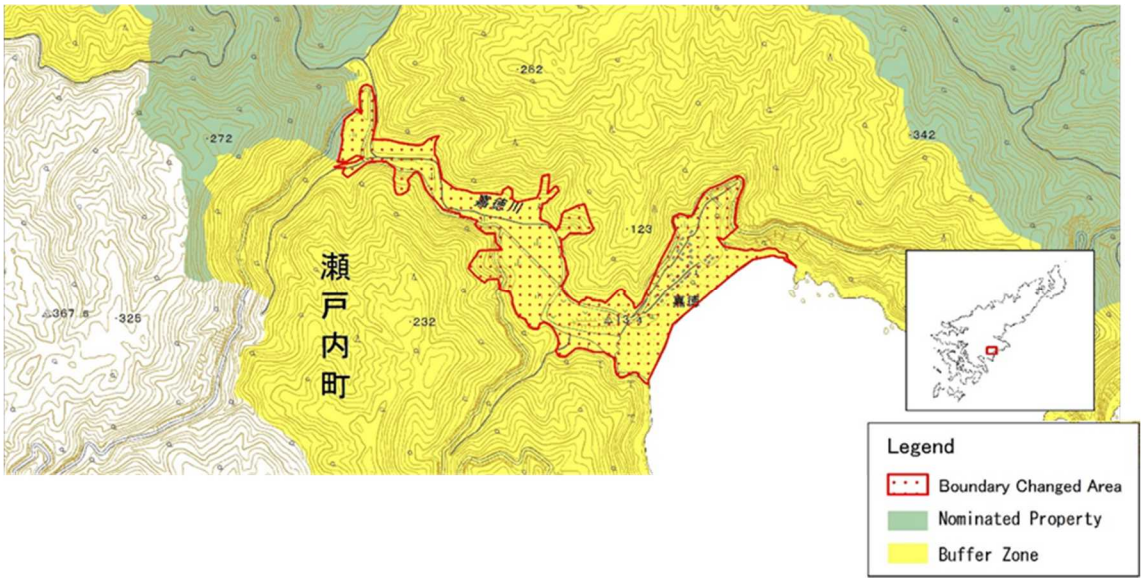
The technical explanation above was advised by Professor Ryuichiro Nishi, an expert of ocean engineering.

< Reference 1 >
In the Katoku river, the occlusion of the river mouth can happen with sea sand blown by typhoon or strong wind. When it happens and the connectivity of river and ocean is lost, the flow of the water is recovered by dredging of accumulated sea sand. Causal association between dredging activities and the beach erosion is not recognized although there may be some concerned people. From the viewpoint of utmost respecting the natural processes of the rivers as much as possible, this dredging is not a regular work and has not been carried out in the recent past.

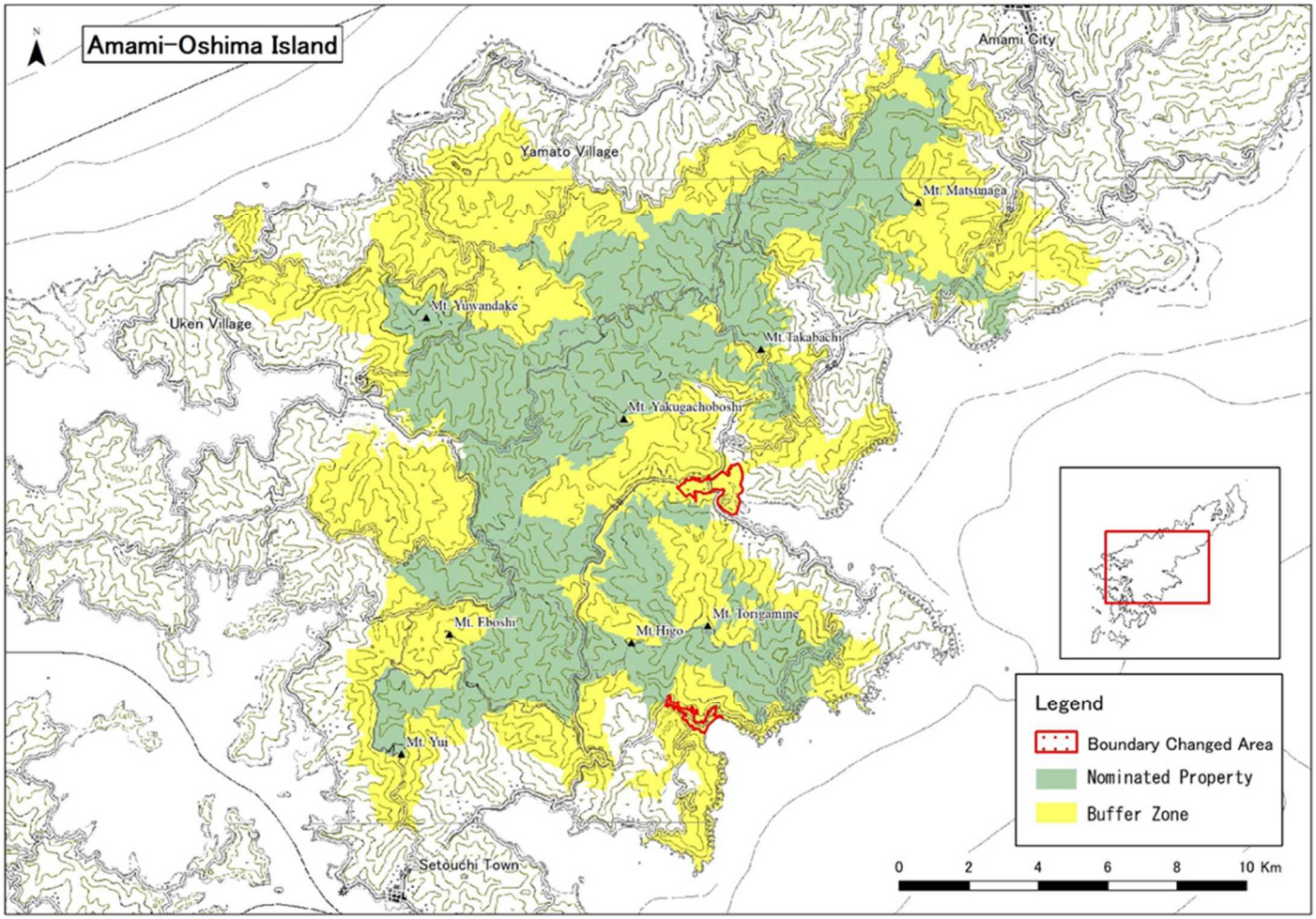
< Reference 2 >
Concerning the dam construction plan on a tributary of the Urauchi River on Iriomote Island, which was inquired by IUCN, the Government of Japan confirms that there is no such plan.



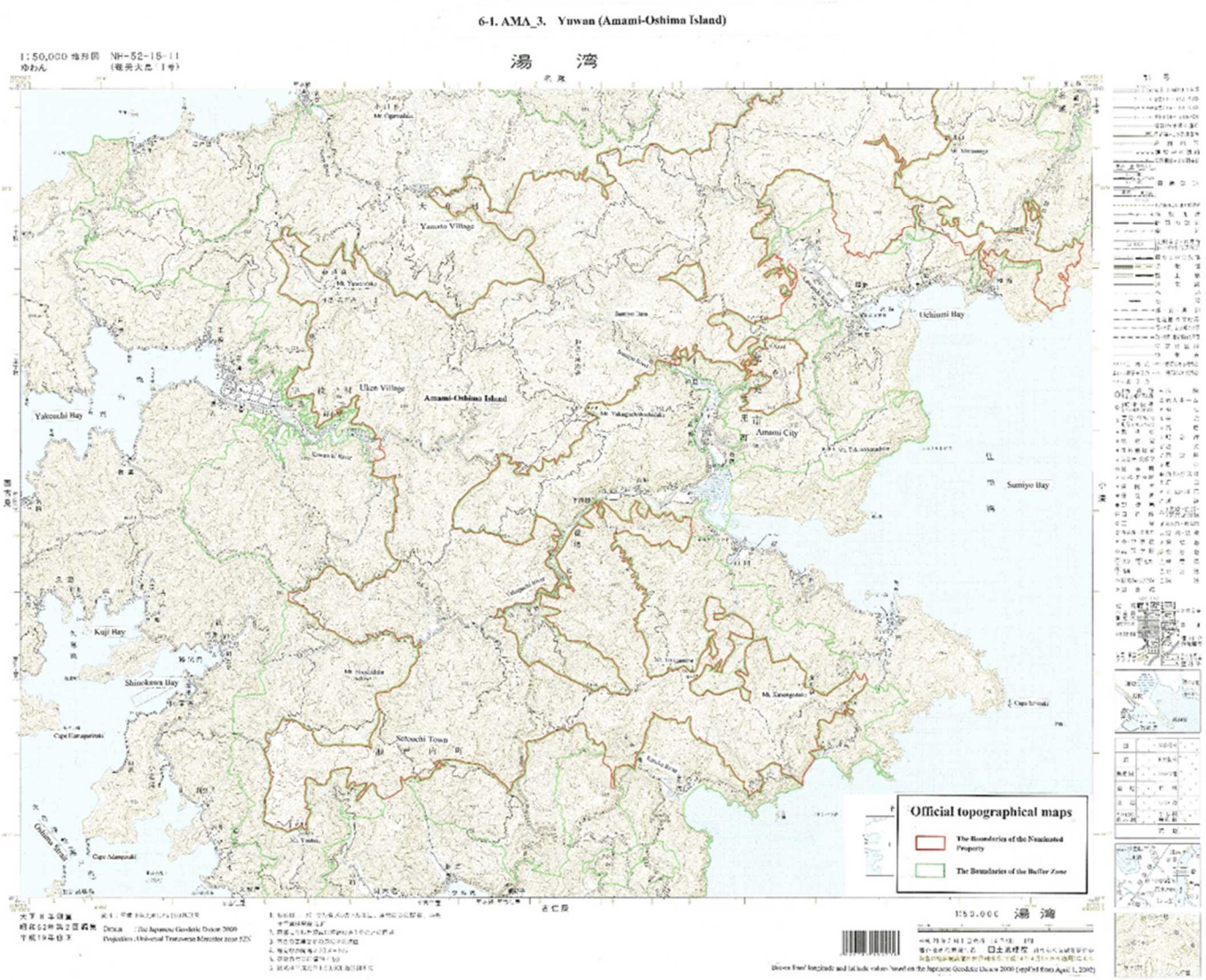
The extended buffer zone in the Yakugachi River mouth and mangrove forest area



The extended buffer zone in the Katoku River estuary and Katoku beach



Nominated property and buffer zones on Amami-Oshima Island (after extension of buffer zones)



Boundary of the extended buffer zones shown on the official topographic map

Areas of the component parts and buffer zones of the nominated property after amendment of the boundary of buffer zones

	Nominated area (ha)	Buffer zones (ha)	Changes of areas (ha)
Amami-Oshima Island	11,640 (no change)	14,505 →14,663	＋158
Tokunoshima Island	2,515 (no change)	2,812 (no change)	(no change)
Northern part of Okinawa Island	7,721 (no change)	3,398 (no change)	(no change)
Iriomote Island	20,822 (no change)	3,594 (no change)	(no change)
Total	42,698 (no change)	24,309 →24,467	＋158

The member list of the review committee for the Katoku Settlement Erosion Control Project

Name	Affiliation and title	Area of expertise
HATTORI Syosaku	Specially Appointed Researcher, The Institute of Medical Science, The University of Tokyo	Expert (ecosystems, flora and fauna)
NISHI Ryuichiro	Professor, Faculty of Fisheries, Kagoshima University	Expert (ocean engineering, coastal environment, fisheries oceanography)
SUZUKI Hiroshi	Professor, Faculty of Fisheries, Kagoshima University	Expert (marine biology, marine ecology, biogeography)
TAKADA Nobuyuki	Manager, Social Education Division, Setouchi Town Board of Education	Administrative agency
TOKUDA Hiroya	Chief of Katoku community	Representative of local residents
TSUNEDA Mamoru	President, Amami Natural Environment Research Group	Nature conservation organization (local NGO)
UEHARA Yasushi	Manager, Construction section, Setouchi Town	Administrative agency

4. Development status of the tourism management plans, including a cap on tourist numbers

Possible increases in tourism use to the nominated property and measures to keep them at an appropriate level are considered to be one of the critical issues for maintaining the Outstanding Universal Value and ensuring sustainable use. Therefore, under the concept of tourism management set forth in Comprehensive Management Plan for Amami-Oshima Island, Tokunoshima Island, Northern Part of Okinawa Island, and Iriomote Island for Inscription on the World Heritage List, each of the four regions containing the nominated property has formulated a basic plan for tourism management to stipulate basic policies and measures based on its actual situation of tourism (The framework of tourism management plans are shown in Appendix 4-1, which was submitted in the supplementary information of November 2019).

On Iriomote Island, the Visitor Control Master Plan for Sustainability of Iriomote Island (Appendix 4-2) was agreed and established in January 2020, at the sub-local meeting composed of relevant administrative organs and related local groups. Towards its formulation, a working group had been set up by local tourism, transportation, and other business operators to discuss how to make it an effective plan, in addition to holding opinion exchange meetings with local communities and other relevant parties. One of the characteristics of tourism on Iriomote Island is that many tourists are day-trippers based on Ishigaki Island. Also, there are seasonal fluctuations such that the eastern area is frequently visited in winter, whereas the western area is more often used in summer. The plan aims to manage the number of tourists and disperse/equalize tourism use by setting standard values for the annual carrying capacity of tourists (330,000 people per year) based on past trends of tourists entering the areas and daily carrying capacity of tourists (1,230 people per day). For the efficient operation of the plan, measures will be taken in collaboration with ferry companies, as ferries are the only way to get to Iriomote Island. This is the first attempt in Japan to set up and operate a carrying capacity on an inhabited island. The standard values are calculated based on the past numbers of tourists and water supply, which take into consideration the ratio of tourists who stay on the island to day-trippers as well as the average number of nights that the tourists stay on the island. In order to realize adaptive management taking into accounts the impacts on ecosystem and daily life of local people, monitoring surveys are being conducted on the number of tourists entering the island, carrying capacity of accommodations, and impacts on natural environment caused by tourism use in collaboration with experts, based on the monitoring plan. The results will be reflected to

improve the future carrying capacity.

Currently, an overall vision of ecotourism promotion is being developed, in accordance with the Ecotourism Promotion Act. This vision will include developing rules for the areas used for tourism, and setting the maximum number of tourists in areas where tourist use is particularly concentrated. In addition, the Ordinance on Tour Guide Service Providers in Taketomi Town will be enforced in April 2020. With the enforcement of this ordinance, the person who wishes to conduct a guide business on Iriomote Island will be obliged to obtain a license and take necessary courses. The ordinance will ensure compliance with the rules for the areas used for tourism in conjunction with the overall concept of ecotourism promotion.

In Northern Part of Okinawa Island, after serious discussions carried out on various occasions with related stakeholders and local communities, the sub-local meeting consisting of relevant administrative organs and related local groups in the northern part of Okinawa Island agreed and formulated the Sustainable Tourism Master Plan of the Northern Part of Okinawa Island (Appendix 4-3) in February 2020. In this region, efforts are being made to set restrictions and develop rules for areas where intensive visitor use is expected, in coordination with operation of a certified guide system.

On Amami-Oshima and Tokunoshima Islands, the Master Plan of the Amami Island Group Sustainable Tourism, which has already been submitted as an appendix to the nomination dossier, was developed in March 2016, after serious discussions with local stakeholders. Based on this plan, measures are taken such as setting limits on the amount of use in the areas where visitors are expected to concentrate and making it mandatory to accompany a certified guide.

In all of the four regions, serious consultations and coordination with local communities and stakeholders will be continued and various measures will be taken to ensure that tourism use in each region will not affect the nominated property.

Steady implementation of the above comprehensive measures for tourism management will consistently reduce roadkills of rare species representing the Outstanding Universal Value of the four regions including Iriomote Island. Furthermore, the following measures against roadkills will be promoted, in accordance with the advice from the experts of the Protection and Recovery Review Conference and others.

Currently, four measures are widely implemented, i.e. 1) installation of road signs to prevent roadkills, 2) improvement of road structures by installation of underpasses and rumble strips (pavement marker with decelerating effects) on main roads, 3) installation of fences (that are connected to underpasses where appropriate) to prevent animals from entering roads, and 4) awareness raising for tourists and local communities (refer to 4. a. 2. 2 of the nomination dossier and Appendix 4-4). All vehicles, including not only rental cars for tourists but also vehicles of local people, are considered as the targets for the measures.

Monitoring on roadkills will be steadily implemented according to "the Monitoring Plan for Amami-Oshima Island, Tokunoshima Island, Northern Part of Okinawa Island, and Iriomote Island, nominated for Inscription on the World Heritage List" (developed in August 2019, and submitted in the supplementary information of November 2019). The identified monitoring indicators related to population dynamics of rare species and tourism (e.g. the number of visitors) (Appendix 4-5) will be comprehensively evaluated and reviewed based on the advice of the Scientific Committee, in order to achieve effective management. This includes selecting the most effective measures from the above 1) to 4), and where necessary, setting priority areas, controlling the number of tourists, and developing methods to prevent accidents using new technologies. As an example of the monitoring surveys on Iriomote cats, individual identification using camera traps has been continuously carried out for 30 years since 1989 to monitor unnatural injuries, changes of resident cats, information on roadkills, and so on at about 20 locations on Iriomote Island. Various measures against roadkills are implemented in light of information accumulated to date, analysis results, and the advice from Iriomote Cat Protection and Recovery Review Conference that is established based on Act on Conservation of Endangered Species of Wild Fauna and Flora. The conference includes experts such as Dr. Masako Izawa, who is a member of the IUCN/SSC Cat Specialist Group as well as an Assessor of the IUCN Red List for the Iriomote cat (Appendix 4-6). (Iriomote cats were thought to have been distributed mainly in the inhabited coastal lowland areas with roads and farmlands. The number of adult individuals in those areas was estimated at around 100. However, the recent studies indicate that the cat also lives in the inland montane areas where there are only small paths and the car cannot enter or pass through, with about the same density level as in the lowland areas.)

Furthermore, additional three new measures are being prepared, i.e. 5) installation of a device on rental cars and tourism business operator' vehicle so that it warns when the

car reaches to the level of speed that cannot avoid roadkills, 6) considering development of a new animal entry prevention fence that can be easily installed at the necessary locations and a flashing warning light for animals entering roads, 7) establishment of a permanent maintenance system to keep underpass entrances favorable for wildlife use. Other necessary measures will also be taken, including the introduction of the latest technology (Appendix 4-4). As for monitoring of vehicles, a new technology is being developed and demonstrated in cooperation with researchers to obtain information on traffic volume and speed through setting a device that acquires Bluetooth information from the driver's mobile terminals. The utilization of obtained information will be considered in the future.

The measures 1) to 7) are valid for all kinds of animals that may enter roads. Regarding species other than rare species that serve as monitoring indicators, efforts will be made to identify particularly damaged species, and if necessary, species-specific measures will be considered.

Ministry of the Environment (MOEJ) has set up a 24-hour contact point with practical supports from local stakeholders and other authorities on each of the four islands to respond promptly to roadkills of rare species or other species. Information (report) has been received from patrol staff, staff of local municipalities, local residents, and tourists. When an accident is reported to the contact point, MOEJ staff and related parties immediately check the site, rescue the animal, temporarily keep it at MOEJ's Wildlife Conservation Center or other relevant facilities, and then treatment and rehabilitation is performed in cooperation with related parties and veterinary institutions, in accordance with a series of workflow.

Amami-Oshima Island, Tokunoshima Island, Northern Part of Okinawa Island, and Iriomote Island, nominated for inscription on the World Heritage List

Framework of Tourism Management Plans

Overarching Management Plan for Four Islands

The Comprehensive Management Plan

- Visitation to the property provides an opportunity to deepen understanding of the heritage value. On the other hand, visitation could also become a negative factor compromising the heritage value, visitors' expectations and satisfactions, if the growth of the visitors lead to uncontrolled expansion of tourism industry and excessive use.
- Therefore, Comprehensive Management Plan intends to ensure long-term maintenance of heritage value, by reducing the burden on the nominated property from its tourism use through measures including proper usage control and others to prevent increase of entry into the nominated property.

<Tourism management policy for each zones>

i) Nominated property: Promoting in-depth experience in nature with an appropriate use management, while controlling and restricting visitors' entry by establishing rules and regulations for proper use.

ii) Buffer zone: Ensuring buffering functions in controlling and restricting the visitor's entry to the nominated property, by taking in a certain amount of conservation-oriented tourists in buffer zones.

iii) Surrounding Conservation Area: Taking the impact of tourism on the regions and its capacity into the consideration, accepting, mass tourism to deter the visitors' flow to the nominated property. Upgrading functions and/or establishing of visitor facilities where visitors can obtain necessary information such as the interpretation of the value, zoning and rules of the property.

Plans for Each Region

Amami-Oshima Island

- Number of inbound visitors and travelers: Approx. 470,000 / year (2017)

Action Plan for Amami-Oshima Island

Master Plan of the Amami Island Group Sustainable Tourism
(in force, recorded in the nomination dossier appendices)

Concrete Regulations/ Measurements (examples)

- Regulations on the area where concentrations of uses are anticipated (examples).

Kinsakubaru National Forest (nominated property)

Reach by car and walking inside.

<User Rules>

- Visitors must be accompanied by a certified guide.
- One guide can attend 15 persons at maximum.
- Max. 10 vehicles at the same time.
- Time limit for one visit is 120 min, etc.

Sutarumata Line forest road (nominated property)

Wildlife spotting by car during nighttime.

- Installation of warning signs and road humps.
- Monitoring traffic volume.

- Certification system of ecotour guides.
  - A certified guide has to satisfy the conditions including sufficient guiding experiences, completion of training programs, and the contributions to conservation of local environment.

Tokunoshima Island

- Number of inbound visitors and travelers: Approx. 130,000 / year (2017)

Action Plan for Tokunoshima Island

Master Plan of the Amami Island Group Sustainable Tourism
(in force, recorded in the nomination dossier appendices)

- Regulations on the area where concentrations of uses are anticipated (examples).

Yamakubiri Line forest road (nominated property)

Wildlife spotting by car during nighttime.

<User Rules>

- Visitors must be accompanied by a certified guide.
- One guide can attend 10 persons at maximum.
- Maximum vehicle usage is 3 vehicles/day in summer, and 4 vehicles/day in winter.
- Intervals of the each vehicles need to be kept more than one hour.
- Speed limit 15 km/ hour, etc. .

Mikyo Line and Hagedake Line forest roads (nominated property)

- Visitors must be accompanied by a registered guide.

- Certification system of ecotour guides.
  (same as Amami-Oshima Island)

Northern part of Okinawa Island

- Number of inbound tourists: Approx. 670,000 / year (estimated: 2017)

Action Plan for Northern part of Okinawa Island

Sustainable Tourism Master Plan of the Northern Part of Okinawa Island
(completed and submitted in Feb 2020)

- Achieving proper visitor management with Yambaru Forest Tourism.
- Designation of the field categories, such as the fields shall not to be utilized for tourism (the 9th station and above section of the trail to Mt. Yonaha, etc.), and the fields open for limited uses (Mt. Ibu, etc.).
- Formulation and implementation of certified guide system in close coordination with field management.
- Closure of forest roads.
  - Installation of gates along 20 forest roads in the nominated property.
  - Closure time: 19h00 – 05h00 (next morning)
- Systematically directing tourist to circular tours mainly in Surrounding Conservation Area (e.g. Hiji-otaki falls, Kunigami village forest park).

Iriomote Island

- Number of tourists: Approx. 320,000 / year (2017)

Action Plan for Iriomote Island

Visitor Control Master Plan for Sustainability of Iriomote Island
(completed in Jan and submitted in Feb 2020)

- Measures for control and dispersal of the tourist volume.
- Setting user rules for the fields based on Ecotourism Promotion Act.
- Tourist guide ordinance (enacted).
  - Obligation to receive a license to operate paid tourist guide services.
  - Obligation to participate in training and educational programs, etc.
  - Obligation to report on the status of guide services provided, and environmental conditions of the fields.
- Establishing organization central for tourism management.
- Considering introduction of entrance fee to be utilized for nature conservation on Iriomote Island.
- Monitoring impacts on natural environment caused by tourism use.

Visitor Control Master Plan for Sustainability of Iriomote Island (formulated in Jan. 2020)

Aim and Basic Policy

Reduce negative effects caused by tourism on environment and daily life of the local people, while further expand positive effects of tourism to local communities, and conserve and hand over the island's proud nature and life towards the future.

- **Control rapid growth of the tourists entering the area, and minimize the environmental and social impacts on Iriomote Island. Set indicators and standard values,** and implement adaptive tourism management, **which takes necessary actions while monitoring the effects on the environment and society.**
- Promote proper tourism use comprehensively and systematically by implementing measures for visitor management on Iriomote Island, which include **introduction of restriction of the entry to certain fields, and capacity building for guide business operators**.

Management of visitor numbers on the entire island

Indicator 1 : Standard values for annual carrying capacity of tourists

In 2020 330,000 people

Indicator 2: Standard values for daily carrying capacity of tourists

Capacity of the water supply system = 1,230 people

*It is set based on the the ratio of tourists who stay on the island to day-trippers as well as the average number of nights that tourists stay on the island

- The standard values will be reviewed based on the results of **monitoring surveys concerning impacts on natural environment and local communities.**
- Based on standard values, measures will be taken to manage the number of tourists and disperse/equalize tourism use. For their effective implementation, **those measures will be carried out in collaboration with ferry companies, as ferries from Ishigaki Island are the only way to get to Iriomote Island**.

Realization of tourism use that does not impact natural environments

Use rules for each field (Ecotourism Promotion Act)

All fields

- Area restriction for tourism use
- Limit of the number of tourists per guide
- Compliance matters for guides and tourists

Specific fields

- Mandatory to accompany a guide
- Cap on tourist numbers for entering
- In-advance permit for entering
- Target area : Hinai River, etc.

License system for guides (Ordinance of Taketomi Town)

- Obligation to obtain license to operate guide business on Iriomote Island
- Compliance matters for guides
- Obligation to take necessary training courses

Appendix 4-2-2

Visitor Control Master Plan for Sustainability of Iriomote Island

January 2020

Iriomote Island Sub-local Meeting

Table of Contents

1. Visitor Control Master Plan

1.1 Necessity of Visitor Control

Tourism industry has been flourishing on Iriomote Island, but at the same time, the natural environment and lives of local residents have been affected by tourism. A survey of residents' opinions was conducted in 2017 about the inscription of Iriomote Island as a natural property on the World Heritage List; concerns were expressed about the impact on the natural environment and daily lives and the shortage of infrastructure that might occur due to an increase in the number of visitors.

In addition, the IUCN evaluation report (2018) pointed out, concerning Iriomote Island and other components of the nominated property, that an adequate visitor control mechanism should be established according to the capacity. Based on this, the basic policy of the revised comprehensive management plan was adopted to develop individual tourism management plans for each of the four regions of the property, with a view to realizing proper tourism management. It also stipulates the zonal policies of tourism use for the nominated property, buffer zone, and surrounding conservation area, as shown in the schematic diagram below.

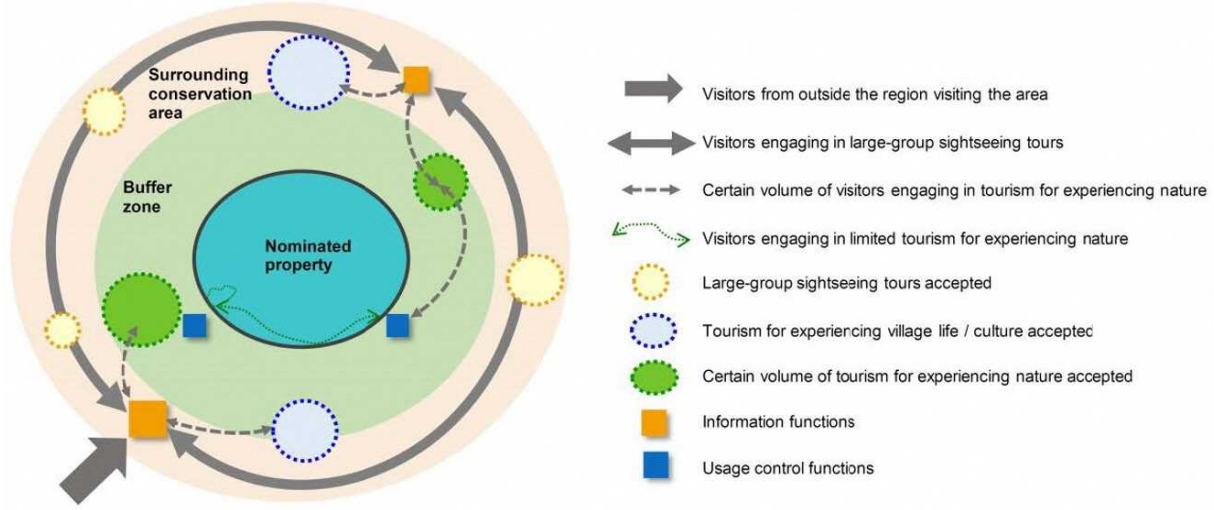


Fig. Tourism use policies for each zone [schematic diagram]

1.2 Overview of Opinions Obtained at Hearing Sessions and Working Groups

The overview of opinions that were obtained at hearing sessions on sustainable tourism on Iriomote Island and at the working group for the development of the sustainable tourism master plan for Iriomote Island, which was held during the process of the examination of this plan, is provided below.

<Representatives of residents>

- The number of tourists must be reduced for sustainable tourism.
- There are problems with waste, toilets, and sewage treatment caused by the increase in the tourist number.
- Some bad-mannered tourists walk around the local area in a bathing suit or enter a sacred place.
- The increase in the tourist number causes congestion on regular ferries and affects the lives of local residents.
- Members of the local fire brigade must go into action when a tourist gets injured, which has become a burden on them.
- Improvements in the local infrastructure for local people's daily life and receiving tourists are needed more than tourism promotion.
- Systems for the conservation of traditional culture and nature and special rules on Iriomote Island are necessary.
- There is a possibility that Iriomote cats were hit by cars due to insufficient grass cutting along streets in some cases.
- The introduction of a tax should be considered for entering the island to reduce the number of tourists and to use tax revenues for the costs of maintaining mountains and grass cutting.
- Only tour operators enjoy an advantage by using nature. Residents suffer a disadvantage.
- It is desirable to create a system to bring benefits of tourism to local society (e.g. development of a market at a port).

<Experts>

- If the number is determined, it should be used as an indicator for monitoring and managing tourists. It does not make much sense to set the acceptable number of tourists.
- It is more important to identify impacts on and problems with the value of Iriomote Island and to manage tourists for preventing the impacts and problems than to determine a numerical figure for an acceptable capacity.
- The numerical figure for an acceptable capacity can be determined based on physical aspects (e.g. ships and accommodation facilities) and psychological aspects (e.g. degree of congestion), but it is difficult to determine the capacity based on impacts on ecosystems.
- The seriousness of problems and impacts and the number of people who will suffer from problems and be affected can be considered specifically according to the field concerned.
- There are two objectives to collecting entrance fees: securing the financial source to conserve the

natural environment and controlling the number of people entering the island. On Iriomote Island, it is difficult to collect a fee for the latter objective because the fee would be very expensive.

- In general, in order to control and disperse the number of users, it is effective to limit the number of users from the physical aspect, such as the capacity of transportation and accommodation facilities, etc., in addition to setting entrance fees.
- If entrance fees are introduced, it is desirable to forcibly collect the fees at the entrance of the island.
- It is considered that entrance fees can be used for the operation and management of the system, improvements in infrastructure for residents, and conservation of the natural environment, etc.
- According to the survey of tourists on Iriomote Island, many respondents requested the use of an entrance fee for nature conservation.
- Entrance fees should be considered based on the opinions of local residents.

<Tourism and transportation organizations>

- The number of people entering the island varies depending on the tourism pattern (round tours, experience-oriented tours, day tours, or overnight tours) and season.
- As the number of tourists on round tours has been declining, limitations on the number of tourists should be determined according to the field concerned.
- At terminals and other transportation bases on remote islands, it is desirable to inform tourists of rules in multiple languages.
- Although Ishigaki Island has been the major destination of package tours, tourism options should be proposed proactively by Iriomote Island.
- For having tourists spend money in the region, it is necessary to promote overnight stays through comprehensive efforts for transportation, accommodation facilities, and food.
- Concerning entrance fees, it is necessary to examine who should pay a fee, where to collect the fee, the price of the fee, and the purpose of the use of the fee.
- It is necessary to improve the toilets and other facilities. For their improvement, a maintenance and management system should also be considered.

<Local organizations>

- For determining a numerical number for an acceptable capacity, a basis should be provided. In terms of burdens (water and waste, etc.), the capacity should be determined by considering the number of tourists depending on the tourism pattern (round tours, experience-oriented tours, day tours, or overnight tours) and season.
- Tourists staying overnight spend money in the region, but the environmental burden is increased by

their stay.

- Entrance fees should be forcibly collected on a ship from people entering the island and should not be collected from residents.
- Entrance fees should be used for cleaning the beach, cutting grass, and maintaining toilets.
- The advantage of Iriomote Island is its nature. Developments are not necessary for the island like those implemented on the main island.
- For spreading positive effects to the island, it is considered effective to hold a market using light trucks and develop products using local agricultural products.

<Administrative organizations>

- For determining a numerical number for an acceptable capacity, a basis should be provided. The capacity should be determined carefully by considering the number of tourists depending on the tourism pattern (round tours, experience-oriented tours, day tours, or overnight tours) etc.
- It is desirable to prepare facilities that can provide information on the natural environment of Iriomote Island and rules for conserving the environment.
- It can be considered that entrance fees are collected from tour operators or directly from visitors.
- By creating a brand and obtaining certification, it is desirable to achieve a balance between the conservation of World Heritage sites and the promotion of local industries.

<Working groups>

- The accommodation capacity and number of restaurants are insufficient in the region, but tourist reception facilities cannot be newly established to respond to tourist demand owing to the shortage of human resources and aging of the population.
- If facilities are maintained by the local administration, conditions of facility locations and issues should be identified appropriately in advance and effective maintenance methods should be examined for solving the issues.
- It may be possible to obtain visitors' understanding for entrance fees for environmental conservation, but a simplified collection method, clarification of the purpose of use, and elimination of a sense of inequality should be fully examined.
- For gaining the understanding of residents of the island, it is necessary to inform them of correct information on the contribution of the tourism industry to local communities.
- For preventing trouble caused by visitors, it is necessary to provide information and disseminate rules on the culture, lifestyle, and traditions of the island.

- For protecting Iriomote cats, it is necessary to control observation tours, examine new traffic accident countermeasures, and consider methods to notify tourists of the presence of the cats.

1.3 Challenges

Challenges of tourism on Iriomote Island that have been pointed out by working groups are summarized below:

[Environment]

- For financial reasons, it is difficult to develop or manage infrastructure according to the number of visitors and adequately respond to the temporary increase in the environmental burden.
- The amount of traffic and speed of vehicles might increase owing to changes in tourism patterns of visitors and road improvements, which might cause roadkill of Iriomote cats and other rare animals.
- Number of Visitors enter forests might increase and illegal collection of plants might occur, which could affect habitat environments and decrease the number of rare living creatures.
- Guide business operators engaging in tourism for experiencing nature have been rapidly increasing, and some of them do not have an awareness of securing the safety of users or considering the natural environment. In addition, no organization controls guide business operators, which prevents the operators from sharing information and collaborating with one another.
- The number of users in tourism fields for experiencing nature has been increasing. There are opinions that some fields have already been excessively used, and the natural environment and users' comfort have deteriorated and decreased. In addition, fields have spread and expanded in a disorderly manner.

[Lives of local residents]

- Rare living creatures and the rich natural environment of Iriomote Island and the knowledge and culture of the island necessary to coexist with the living creatures while conserving the natural environment have become tourism resources and attracted many visitors. However, on the other hand, there is concern that the value of the island is being damaged by tourism.
- Regular ferry services are full in the busy seasons of tourism, which affects local residents who use the services.
- Residents of the island feel discomfort and are aware of danger due to bad-mannered visitors who walk around the local area in a bathing suit and enter a sacred place or privately owned area as well as drivers who do not lower their speed when passing through the

residential area of local communities.

- There are opinions that residents cannot experience the ripple effects of tourism on the local economy, and tourism has not sufficiently contributed to local communities.

[Economy]

- In 2007, when the number of visitors marked a record high, visitors far exceeding the capacity of the reception system of tour operators and the tourism infrastructure (toilets and other facilities, etc.) of Iriomote Island adversely affected the natural environment and lives of local residents of the island as well as decreased visitors' comfort and satisfaction.
- In the past, Iriomote Island accepted visitors without restriction in response to the need of tour operators and agents outside the island that sent visitors.
- In the past 10 years, the number of visitors on Iriomote Island has repeatedly increased and decreased in a relatively short period and the difference in changes in the number of visitors has been large. Visitor numbers tend to increase and decrease depending on external conditions.
- The capacity of accommodation facilities and restaurants is insufficient in the region, but tourist reception facilities cannot be newly established to respond to tourism demand owing to the shortage of human resources and aging of the population.

2. Concept of the Plan

2.1 Aim

The aim of visitor control on Iriomote Island is as follows:

Reduce negative effects caused by tourism on environment and daily life of the local people, while further expand positive effects of tourism to local communities, and conserve and hand over the island's proud nature and life towards the future.

2.2 Basic Ideas

In a period when the number of tourists marked a record high on Iriomote Island, tourism had various impacts on the lives of local residents and the natural environment of the island. Meanwhile, as the number of tourists of the island has been changing over a relatively short period owing to external conditions, the tourist number may significantly increase as a result of the inscription of the island on the World Heritage List as a component of the property.

Based on the aforementioned experience of the island and in anticipation of the inscription of the island on the World Heritage List as a component of the property, it is necessary to **control rapid increases in tourist number and minimize impacts on both the environment and local communities**. To do so, **adaptive measures will be taken as necessary** from the following four viewpoints **by setting indicators and standard values and monitoring the impact on the environment and local communities.**

Viewpoint (1): Management of the total carrying capacity by using the annual number of tourists as an indicator

On Iriomote Island, there is concern that the environment and local communities might be affected by a rapid increase in the tourist number in association with the movement towards the inscription of the island as a natural property on the World Heritage List.

In order to minimize the impact of a rapid increase in the tourist number on the environment and communities, the **standard value for the total number of annual tourists will be set based on the past trend of changes in the number of tourists. If the total number exceeds the annual standard value, the standard value for the daily number of tourists will be revised and measures to strengthen the efforts, etc. will be promptly taken.**

Viewpoint (2): Management of the daily carrying capacity during busy seasons by using the daily number of tourists as an indicator

On Iriomote Island, the water supply capacity in some areas reaches its limit during a busy season such as in summer and during the "Golden Week" holiday season in May. The lives of local residents are temporarily affected by tourism.

In order to avoid the impact on the lives of local residents during busy seasons, the number of tourists in the season will be controlled, and the seasons when tourists visit the island will be dispersed and equalized by **setting the standard value for the carrying capacity of tourists per day by using the water supply capacity as an indicator and introducing an effective system to control the congestion of tourists so as not to exceed the standard value.**

Viewpoint (3): Management of tourism patterns by using the rate of stay and the average number of nights stayed as an indicator

In order to reduce the impact of tourism on the environment and lives of local residents of Iriomote Island and increase ripple effects on local communities of the island, it is necessary to change the current tourism pattern focusing on day tours to a pattern focusing on overnight stays by which tourists spend time learning and experiencing the nature and culture of the island under the proper management.
In order to shift the tourism pattern of Iriomote Island to that focusing on quality rather than on the number of tourists, **it is necessary to establish a system in which revenues and employment generated by tourism support local communities, the economy, and environmental conservation, by using the rate of stay and the average number of nights stayed by tourists on Iriomote Island as an indicator and identifying changes in the tourism pattern through comparisons between the latest value and the indicator.**

Viewpoint (4): Tourism management by setting a new indicator to measure the impact and positive effect on the lives of local residents

On Iriomote Island, there is concern that the daily lives of residents might be affected by increases in the amount of traffic and speed of vehicles, distress and other accidents, and congestion of regular ferry services and parking areas due to the increases in tourist number and changes in the tourism pattern.
On the other hand, tourism is the major industry of Iriomote Island, and employment and revenue generated by tourism support communities and the economy of the island. Therefore, on Iriomote Island, tourism needs to be managed while monitoring both the impact and ripple effects on the lives of local residents.

Based on the situation above, necessary data will be categorized and accumulated to **set a new indicator to measure the impact and ripple effects of tourism on the lives of local residents and systematically promote efforts to reduce the impact and increase the ripple effects.**

2.3 Progress Management and Revision of the Plan

This plan is subordinate to the Action Plan for Iriomote Island developed in association with the nomination as a Natural World Heritage property. As with the action plan, this plan checks the progress of the efforts every year and conducts an inspection on the relationship between each indicator and standard value on a regular basis based on monitoring results in order to make revisions and take necessary measures.

The tourism statistical data to be the basis for the calculation of the standard values will be updated in the future. Therefore, a review on the setting of indicators and standard values will be made in FY 2021, based on the latest trends of indicators, such as the result of the number of tourists and the impact on the environment and lives of local residents, etc., and various statistical data.

3. Setting Indicators and Standard Values for Visitor Control

<(1) Annual number of tourists>

By setting the year 2018 as the reference year of this plan, the annual average number of tourists over the past 10 years is calculated (the data for 2011, which was greatly affected by the impact of the Great East Japan Earthquake, is excluded as a special year), and the average number is set as the standard value for the total annual number of tourists until 2021. By comparing the average number with the number of tourists in 2018, the reference year, the standard value for changes in the annual number of tourists is set as follows.

○ The annual average number of tourists over the past 10 years excluding 2011 is 332,255 people ≈ 330,000 people (A)

○ The number of tourists in 2018, the reference year, is 301,414 people (B)

○ The formula for the rate of change between (A) and (B) is: ((A) - (B)) / (B) = Approx. 0.1 (10%)

The standard value for the total annual number of tourists = 330,000 people
The standard value for changes in the annual number of tourists = 10%
The maximum range of change to be the standard = Within 10% increase or decrease of the annual number of tourists (330,000 people) ≈ 300,000 to 360,000 a year

The annual maximum number of tourists in 2020
300,000 people (in the reference year) × 1.1 (increase by 10%) = 330,000 people
The annual maximum number of tourists in 2021
330,000 people (the annual maximum number in 2020) × 1.1 (increase by 10%) = 363,000 people => 360,000 people ≤ 360,000 people (maximum range)

***The standard value for 2022 and after will be set separately.**

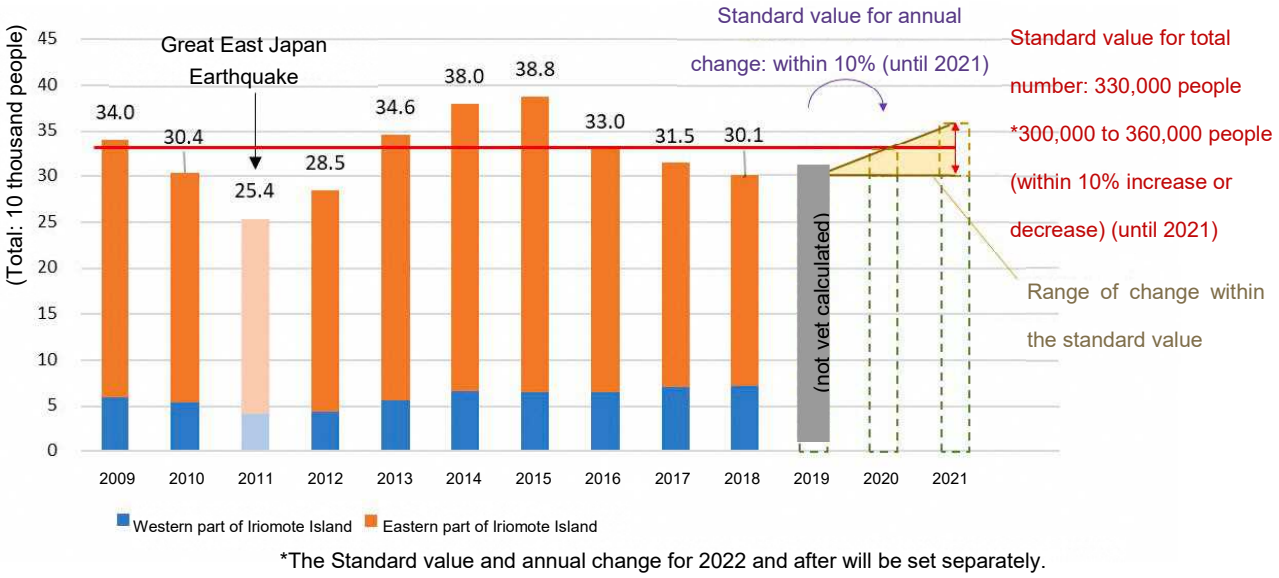


Fig. Image of Standard values for the total annual number of tourists and annual change

<(2) Daily number of tourists>

Based on the situation of Iriomote Island, where tourism affects the lives of local residents (e.g. the water supply capacity reaches its limit in summer and other busy seasons), the standard value for the carrying capacity of tourists per day is set as follows by using the water supply capacity as an indicator.

○ Planned population of water supply on five islands, including Iriomote Island: 5,630 people (Taketomi Town Water Business Overview) (A)

○ A × Approx. 55% (the ratio of the amount of water used on Iriomote Island to that on related five islands) (380,437 m^3 / 693,337 m^3 in FY 2018) [Note 1)] = Approx. 3,097 people (B)

○ B - 2,476 people (the population of Iriomote Island as of December 2018) = 621 people (planned population of surplus water supply) (C)

○ C × 79% [Note 2)] (the percentage of tourists out of the number of people entering the island excluding residents in FY 2018) = Approx. 491 people (the limit value for the planned population of the supply of water used by tourists) (D)

○ 491 (D: the number of people calculated based on the amount of water used per resident) / 0.30 (the percentage of the amount of water used by tourists (approx. 30% of the amount of water used by residents) [Note 3)]) = 1,636 people (the acceptable number of guests staying on the island) (E)

○ E × Approx. 75% [Note 4)] (the number of new tourists who have arrived at Iriomote Island on a certain day / the total number of tourists on Iriomote Island that day) = 1,227 people (the acceptable number of tourists per day) ≈ 1,230 people

The standard value for the carrying capacity of tourists per day = 1,230 people

Note 1: The amount of water used (total amount indicated on water meters) in FY 2018: Iriomote Island: 380,437 m^3; Kohama Island: 245,644 m^3; Kuroshima Island: 55,732 m^3; Hatoma Island: 8,950 m^3; Aragusuku Island: 2,574 m^3; The total amount of the five islands: 693,337 m^3; The percentage of Iriomote Island: Approx. 55%

Note 2: According to the questionnaire of the Taketomi Town Tourist Statistical Survey conducted in FY 2015, the number of respondents, excluding residents, boarding a ship to Iriomote Island (Ohara Port and Uehara Port) was 1,389 people. Of the respondents, the number of tourists was 1,093 people. Accordingly, the percentage of tourists out of the number of people entering the island excluding residents is: 1,093 / 1,389 × 100 ≈ 79%

Note 3: The percentage of the amount of water used per overnight guest is around 85% of the amount of water used by residents, and the percentage of tourists making a day trip is around 15% of the residents. (Refer to the Taketomi Town business plan on changes in public sewerage for conservation of specific environment.) Of the visitors of Iriomote Island, the percentage of those who stay on the island is around 22%. (Refer to the Taketomi Town Tourist Statistical Survey.) Based on these percentages, the percentage of the amount of water used by tourists

of Iriomote Island out of the amount of water used by residents, without considering overnight guests staying on the island from the previous day, is: (0.22 × 0.85) + (0.78 × 0.15) ≈ 0.30 (30%).

Note 4: Based on the percentage of stay (22%) and the average number of nights stayed by tourists (1.55 nights) (refer to the Taketomi Town Tourist Statistical Survey), the percentage of overnight guests out of the number of tourists is: 0.22* × 1.55 = 0.341 (34.1%). Based on the assumption that 34.1% of tourists of the day stay from or before the previous day, the percentage of tourists out of the number of guests staying on the island is: 1 / (1 + 0.341) ≈ 75%.

*According to the estimated value, the number of days exceeding the standard value of the number of tourists on Iriomote Island (1,230 people) was 12 in FY 2018, and the total number of tourists exceeding the standard value was 805. The maximum number of tourists per day was 1,378 (148 people more than the standard value).

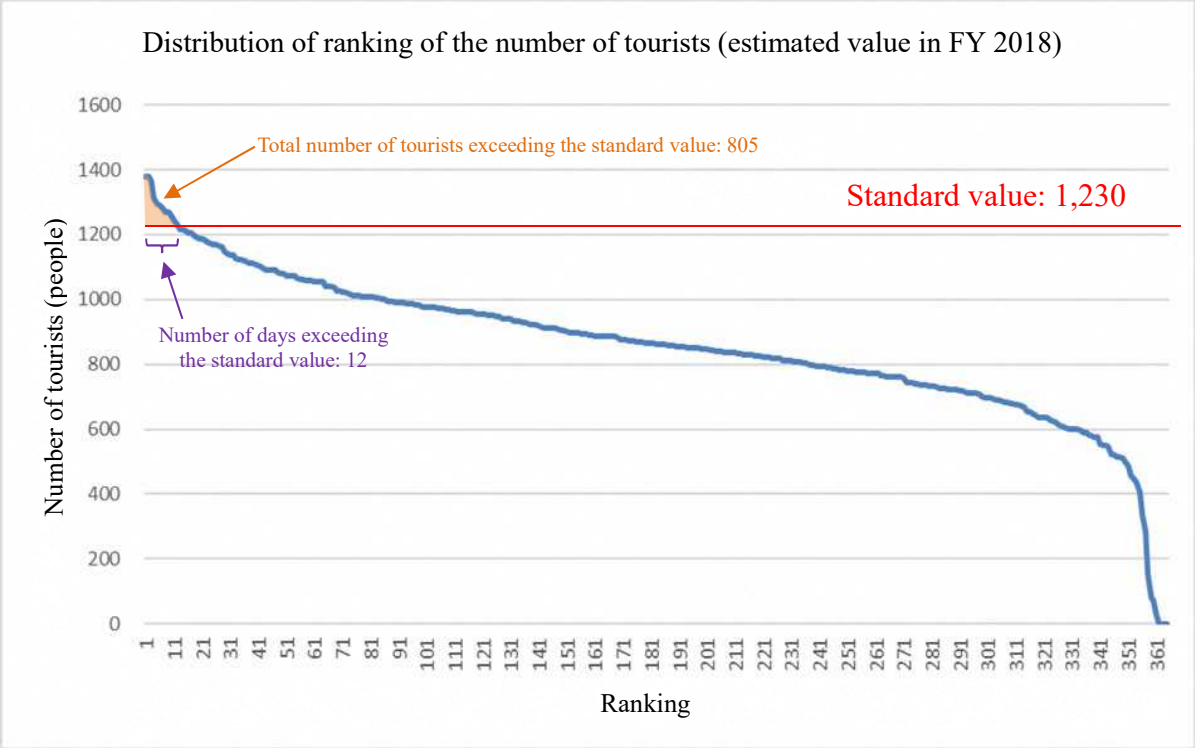


Fig. Distribution of ranking of number of tourists per day (estimated value in FY 2018)

< (3) Rate of stay and average number of nights stayed >

Based on the results of a questionnaire of the Taketomi Town Tourist Statistical Survey conducted once every five years, the rate of stay and the average number of nights stayed are to be calculated and compared with the latest values to ascertain changes in tourism patterns.

The calculation method for each indicator and the actual value of each indicator, which will be the standard value, calculated based on the latest survey in FY 2015 are as follows.

○ Rate of stay (A): Tourists staying overnight on Iriomote Island / Tourists visiting Iriomote Island

○ Average number of nights stayed (overnight guests) (B): The average of the number of nights stayed by tourists staying overnight on Iriomote Island

○ Average number of nights stayed (total): The average of the number of nights stayed by tourists visiting Iriomote Island ((A) × (B))

List: Actual value of indicators for the rate of stay and the average number of nights stayed

Item	FY 2015
Rate of stay	22%
Average number of nights stayed (overnight guests)	1.55 nights
Average number of nights stayed (total)	0.34 night

Standard value of the rate of stay: 22% or more
Standard value of the average number of nights stayed (overnight guests): 1.55 nights or more
Standard value of the average number of nights stayed (total): 0.34 nights or more

*The numerical target of the average number of nights stayed set by Taketomi Town in its basic plan for tourism promotion (referring to the average number of nights stayed (total) provided above) is as shown below. The town aims to increase the current average number of nights stayed (0.68 night/person) to the target value (1.0 night/person).

Numerical target 2: Average number of nights stayed (total number of overnight guests)

■ **Current situation**

• Average number of nights stayed by tourists: 0.68 night/person (2015)

■ **Target**

• Average number of nights stayed by tourists: 1.0 night/person (2022)

The average number of nights stayed by tourists is less than one night per person. In order to increase the number of nights stayed, the system to accept domestic and international tourists will be improved and efforts will be made to shift the tourism pattern from round tours based in Ishigaki Island to overnight tours using programs that cannot be experienced on day tours, by introducing tours to watch the island's beautiful natural phenomena (rising/setting sun and starry sky, etc.) and participate in traditional arts.

Fig. Numerical target of the average number of nights stayed set in Taketomi Town Basic Plan for Tourism Promotion (March 2018)

4. Basic Policies for Visitor Control

To achieve the aims of this plan, five basic policies have been set out based on the basic ideas.

Policy 1: Developing the visitor control system on the initiative of Iriomote Island
A system is to be developed to reduce the impact of tourism on the environment and the lives of local residents by properly managing and guiding visitors entering the island and their behavior on the island. Tourist acceptance policies and utilization rules are to be determined on the initiative of Iriomote Island to establish a system for observing and working on the policies and rules through cooperation with business operators inside and outside the island.

Policy 2: Realizing sustainable use of the nature of Iriomote Island without damaging it
In tourism for experiencing nature on the island, proper use of the natural environment is to be realized without deteriorating the environment, through the introduction of rules for use of fields and access control and the development of guide business operators and licensing system for the operators.

Policy 3: Implementing a system to charge visitors for the costs to reduce the environmental burden
On Iriomote Island, the idea of charging visitors for costs is to be introduced after obtaining their understanding and cooperation. The costs to reduce the environmental burden, which has been increasing with tourism, are to be charged to visitors. Money collected from visitors will be used for nature conservation.

Policy 4: Actively conveying to visitors the nature, life, history, and culture of the island
In order to allow visitors to become aware of the environment and lives of local residents of Iriomote Island and respect the history and culture of the island, efforts are to be made to promote and disseminate the particularity of Iriomote Island, special rules and manners to be observed and respected, and thoughts of residents of the island.

Policy 5: Developing a system whereby tourism-related industries contribute to local communities and economy
The contribution of business operators engaging in tourism of Iriomote Island is to be increased and widely communicated to residents of the island, and a system whereby the economic effects of tourism-related industries spread to the all local communities is to be developed so that the lives of residents of the island are supported by tourism.

5. Major Actions

Basic policy	Actions / projects	Implementing agency	Description	Area	Year of implementation		
					2019	2020	2021
Policy 1: Developing the visitor control system based on the initiative of Iriomote Island	Adaptive visitor control by monitoring	MOE, Okinawa Prefecture, Taketomi Town, marine transportation companies	Based on the results of monitoring visitor control indicators and the impact on the environment and lives of local residents, the capacity of tourists accepted per day is to be regularly revised. If an indicator for (1) the annual number of tourists or (2) the daily number of tourists exceeds the standard value, efforts described below will be strengthened or other measures will be promptly taken. **<Monitoring of visitor control indicators>** • Ascertaining the annual number of tourists. • Ascertaining the daily number of tourists. • Ascertaining the rate of stay and the average number of nights stayed. **<Monitoring of the impact on the environment and lives of local residents>** • Ascertaining the amount of water supply and waste treatment. • Ascertaining the number of rental cars, buses, taxies, and private cars owned on the island. • Ascertaining the amount of traffic and speed of vehicles on the island. • Ascertaining the number of distress calls and other accidents on the island. • Ascertaining the congestion situation of regular ferry services and parking areas. • Ascertaining the number of visits to medical institutions on the island by tourists. • Collecting opinions on the impact on the lives of local residents at working groups. • Survey of the impact of the use on the natural environment (details are described in actions for policy 2). **<Monitoring of economic ripple effects of tourism>** • Ascertaining the number of workers in tourism-related industries and the rate of habitation on the island. • Ascertaining the amount of tax paid by tourism-related industries.	Entire Iriomote Island	Consideration	Implementation	

Basic policy	Actions / projects	Implementing agency	Description	Area	Year of implementation 2019	2020	2021
Policy 1: Developing the visitor control system based on the initiative of Iriomote Island	Controlling the rapid increase in the tourist number on Iriomote Island and dispersion and equalization of the season when tourists visit the island	MOE, Okinawa Prefecture, Taketomi Town, marine transportation companies, related organizations	For preventing the serious impact of tourism on the natural environment and lives of local residents, administrative agencies and related organizations will collaborate to take the following actions towards controlling the rapid increase in the tourist number and dispersion and equalization of use in a busy season (in summer and during long holiday season ("Golden Week")). Since it is necessary to gain the cooperation of related organizations for taking these actions, coordination is to be performed and an agreement is to be concluded if possible. **<Actions for controlling the number of tourists and dispersion and equalization of the season when tourists visit the island>** • Providing a calendar showing the crowd forecast and information on busy hours to tourists for avoiding concentrated use. • Introduction of a method and system to avoid concentrated use of facilities and transportation, such as an advanced reservation system with a designation of time and setting variable fees, etc. • Promoting equalization of hours of concentrated use by changing the course schedule of day tours. • Asking for the cooperation of travel agencies and airline companies with visitor guidance and strengthening dissemination activities.	Entire Iriomote Island		Consideration →	Implementation →
	Establishment of an organization central to proper tourism management	MOE, Taketomi Town, etc.	As an organization that performs total coordination for conserving the environment of Iriomote Island and will be central to proper tourism management, the Iriomote Foundation (tentative name) is to be established. The Foundation will play the following roles in the future. • Operation of the licensing system for tourist guides and development of human resources based on the Tourist Guide Ordinance. • Operation of the access control and management for disseminating rules based on the Overall Concept for Promoting Ecotourism. • Constant operation of the secretariat of the promotion council based on the Overall Concept for Promoting Ecotourism. • Management of entrance fees, etc. and implementation of the conservation project by operating the system to charge visitors based on the introduction of the system. • Monitoring on the impact of use and results of the conservation project.	Entire Iriomote Island		Consideration →	

Basic policy	Actions / projects	Implementing agency	Description	Area	Year of implementation		
					2019	2020	2021
Policy 1: Developing the visitor control system on the initiative of Iriomote Island	Maintenance and management of facilities for reducing the impact of tourism on the environment and lives of local residents	MOE, Forestry Agency, Okinawa Prefecture, Taketomi Town, marine transportation companies, related organizations	To reduce the impact of stays and activities of tourists on Iriomote Island on the environment and lives of local residents of the island, actions are to be taken for wastewater and excrement treatment, preventing rare living creatures from being involved in a traffic accident, and maintenance and management of necessary facilities. **<Actions to reduce impact>** • Improvement, maintenance, and management of toilets and parking areas, etc. at ports and base facilities. • Cutting grass along streets to prevent Iriomote cats and other wild animals from being involved in a traffic accident. • Efforts to enhance congestion mitigation of regular ferry services and parking areas at ports. • Securing a certain use of transportation means for local residents by setting the daily number of tourists. • Reducing plastic bottles and other waste. • Development of tourist reception facilities in the surrounding conservation area. • Measures for preventing stranding and other accidents (installing signs for calling for attention, the establishment of a rescue/communication system, etc.).	Entire Iriomote Island		Implementation	

Basic policy	Actions / projects	Implementing agency	Description	Area	Year of implementation		
					2019	2020	2021
Policy 1: Developing the visitor control system on the initiative of Iriomote Island	Promotion of overnight stays	Taketomi Town, related organizations	To increase the number of repeat tourists and tourists staying overnight who have an understanding and become fans of Iriomote Island, the strategic attraction is to be conducted and programs for attracting such tourists and the acceptance system are to be enhanced and developed. Through cooperation between the public and private sectors and voluntary efforts of private business operators, overnight stays are to be promoted by attracting tourists that Iriomote Island wishes to receive. **<Actions to promote overnight stays>** • Tourist attraction targeting a segment that understands the attractiveness and value of the natural environment and traditional culture of Iriomote Island and delivers the attractiveness of the island as fans of the island. • Continuous implementation of tour plans on experience-oriented overnight stays (island school, etc.). • Enhancement of accommodation programs that introduce tours to watch the island's beautiful natural phenomena (rising/setting sun and starry sky, etc.) and participate in traditional arts, and human resources development for the enhancement. • Strengthening the capacity to send tourism information of Iriomote Island (information on accommodation facilities, activities, restaurants, etc.).	Entire Iriomote Island	Implementation		

Basic policy	Actions / projects	Implementing agency	Description	Area	Year of implementation		
					2019	2020	2021
Policy 2: Realizing sustainable use of the nature of Iriomote Island without damaging it	Development of Overall Concept for Promoting Ecotourism of Iriomote Island	Taketomi Town, Okinawa Prefecture, MOE, Forestry Agency	For the use of nature experience fields in a well-ordered manner and with less impact on natural environment, an enforceable system for proper use of fields is to be established by developing the Overall Concept for Promoting Ecotourism of Iriomote Island (Overall Concept), which specifies rules for proper use and the control method as described below and obtaining a national certification. **<Natural tourism resources>** Fields on Iriomote Island that are used for experiencing nature will be designated as nature tourism resources, and general utilization rules and rules for each field (restrictions on available zones and the acceptable number of tourists per business operator or tourist guide) will be described in the Overall Concept. The effectiveness of the rules will be secured by specifying the compliance obligation in the Taketomi Town Tourist Guide Ordinance described later. **<Specified natural tourism resources>** By designating fields of concentrated use as specified natural tourism resources in the Overall Concept, effective behavior regulations and access controls are to be set under the Ecotourism Promotion Act. In addition, a system is to be established to oblige persons entering the fields to make a prior application and to be accompanied by a tourist guide licensed by Taketomi Town. **<Dissemination of utilization rules and access control system>** The website of the Ecotourism Promotion Council of Iriomote Island will be developed to inform users of the determination of the utilization rules and access control system based on the Overall Concept and the introduction of the licensing system based on the Taketomi Town Tourist Guide Ordinance.	Nature experience fields on Iriomote Island *Hinai River and Nishida River are set as specified natural tourism resources for the time being.	Consideration	Implementation	

Basic policy	Actions / projects	Implementing agency	Description	Area	Year of implementation		
					2019	2020	2021
Policy 2: Realizing sustainable use of the nature of Iriomote Island without damaging it	Enactment and enforcement of the Taketomi Town Tourist Guide Ordinance	Taketomi Town	For operators that intend to provide tourist guide services utilizing natural resources in the entire land area of Iriomote Island (including rivers and coastal areas), the Taketomi Town Tourist Guide Ordinance and enforcement regulations of the Ordinance are to be established and enforced. As conditions for the provision of the services, the ordinance will require the operators to make an application to Taketomi Town for obtaining the license of the mayor of the town. The ordinance will specify the following items as requirements for the license. **<u><Provisions of the Taketomi Town Tourist Guide Ordinance (excerpt)></u>** • Requirements for application for license: Business performance on Iriomote Island, certificate of attendance of emergency life-saving course, certificate of belonging to a community center of Iriomote Island (or evidence showing results of regional promotion), attendance of courses and training specified in the rules, etc. • Items to be observed by tourist guides and their obligations: Explanation of utilization rules to users, bringing and presenting the license, report on the destruction of the natural environment, and so forth. • Instruction and recommendation, etc.: Instructions, recommendations, orders, and disclosure measures to violators. • Administrative action: Business suspension order for a certain period and revocation of the license in case of violation of the ordinance or related laws and regulations by a tourist guide.	Entire Taketomi Town	Consideration	Implementation	Continuation
	Survey of the impact of use of nature on the natural environment	MOE, related organizations	A monitoring survey of the use of nature on the natural environment is to be conducted, in order to prepare for the potential impacts in the nominated property and buffer zone and other nature experience fields. Specifically, a monitoring survey of the vegetation along the pathways of each field and fixed-point monitoring of locations likely to be affected (spread of pathways, fixed-point photographing) are to be conducted from FY 2019 to ascertain the conditions of the fields before the inscription on the World Heritage List. The monitoring survey of the impact of the use of nature on the natural environment will be continuously conducted on a regular basis so that accurate measures can be taken when the natural environment is likely to deteriorate. A plan for the implementation and method of monitoring surveys conducted on Iriomote Island like those described above is to be developed.	Nature experience fields on Iriomote Island	Implementation	Continuation	

Basic policy	Actions / projects	Implementing agency	Description	Area	Year of implementation		
					2019	2020	2021
Policy 3: Implementing a system to charge visitors for the costs to reduce the environmental burden	Introduction of a system to charge visitors (entrance fee)	MOE, Taketomi Town	A system is to be established to collect entrance fees from tourists by charging them for the costs to conserve the natural environment and maintenance and management of infrastructure equipment. An examination will be made by FY 2020, and specific efforts will be made after FY 2021 based on the results of the examination. After ensuring the transparency of the revenue of entrance fees by the Iriomote Foundation (provisional name) to be established separately, the foundation will manage and operate the revenue to use it for activities and survey for the conservation of the natural environment and the maintenance and management of infrastructure equipment for reducing the environmental burden. The specific purpose of use, the price of entrance fees, method and place of collection and payment, and positioning of the system (mandatory or voluntary) will be examined based on the opinions of experts and local residents.	Not yet determined	Consideration		
Policy 4: Actively conveying to visitors the nature, life, history, and culture of the island	Awareness-raising activities for promoting tourism rules and manners on Iriomote Island	MOE, Forestry Agency, Okinawa Prefecture, Taketomi Town, marine transportation companies, related organizations	Awareness-raising activities are to be carried out to ensure tourists visiting Iriomote Island give due consideration to the reduction of the impact on the natural environment, local communities, and lives of local residents. The activities will provide proper information to tourists about unique, special conditions of Iriomote Island in terms of geography, society, and natural environment as well as the lifestyle and culture of the island deeply connected to nature behind the conditions so that tourists understand the rules and manners to be observed and respected on the island. **Awareness raising activities** • Distribution of the Iriomote Island Manners Book and other brochures as well as promoting the activities to tourists at transportation facilities to be the tourism entrance of Iriomote Island, base facilities, accommodation facilities, restaurants, etc. • Posting the details of the activities on the websites of administrative agencies and a website to be created to provide information on tourism use of Iriomote island • Implementation of traffic safety campaigns at ports and on streets and providing information on the number of Iriomote cats involved in a traffic accident • Providing information and calling for attention to individual users and people collecting insects, etc. • Promoting information sharing with residents and strengthening the acceptance system using a glossary in multiple languages	Entire Iriomote Island	Implementation		

Basic policy	Actions / projects	Implementing agency	Description	Area	Year of implementation		
					2019	2020	2021
Policy 4: Actively conveying to visitors the nature, life, history, and culture of the island	Development of facilities for disseminating the heritage value and rules for use	MOE, Okinawa Prefecture, Taketomi Town,	A large-scale renovation of the Iriomote Wildlife Conservation Center, which is the base facility for wildlife conservation, is to be carried out to promote conservation of Iriomote cats and other wild animals and proper tourism use by displaying the details of activities for traffic accident prevention and providing backyard tours. In addition, an examination is to be made on the necessity of the World Heritage Center and other new base facilities which will be central to field management activities and the dissemination of rules to users and have a role in disseminating the heritage value.	Entire Iriomote Island	Consideration	Implementation	
Policy 5: Developing a system whereby tourism-related industries contribute to local communities and economy	Promotion of actions that contribute to local society through cooperation with tourism-related operators	MOE, Okinawa Prefecture, Taketomi Town, related organizations	Regional contribution is to be promoted through cooperation with tourism-related operators on Iriomote Island, such as tourist guides, accommodation industry, and transportation industry, and enterprises participating in the joint venture for promoting Natural World Heritage properties established for environmental conservation and regional promotion in Okinawa Prefecture. **Actions that contribute to local society** • Nature experience activities for local children carried out by tourist guides. • Selling products and tours containing donations related to local nature and culture. • Proactive use of products of the island to food menus and souvenir goods. • Disseminating information on ripple effects of tourism on local communities and economy. • Awareness-raising activities intended for local residents on the contribution of the inscription as a Natural World Heritage property to the conservation of the natural environment and the development of local communities.	Entire Iriomote Island		Consideration	Implementation

Appendix 4-3

Sustainable Tourism Master Plan of Northern Part of Okinawa Island

February 2020

Northern Part of Okinawa Island Sub-local Meeting

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1. Sustainable Tourism Master Plan

1.1 Necessity of Sustainable Tourism

The IUCN evaluation report 2018 pointed out, concerning Amami-Oshima Island, Tokunoshima Island, Northern Part of Okinawa Island, and Iriomote Island (nominated by Japan), that an adequate visitor control mechanism, tourism management facilities, interpretation system, and monitoring arrangements should be established according to their interest to visitors and carrying capacities in order to pursue the activation of the tourism development plan and the visitor management plan.

Based on this, the comprehensive management plan for Amami-Oshima Island, Tokunoshima Island, Northern Part of Okinawa Island, and Iriomote Island was revised for re-nomination, and the basic management policies to develop a tourism management plan based on the actual conditions of the four regions constituting the property was adopted to realize a proper tourism management. It also stipulates the zonal policies of tourism use for the nominated property, buffer zone, and surrounding conservation area, as shown in the schematic diagram below.

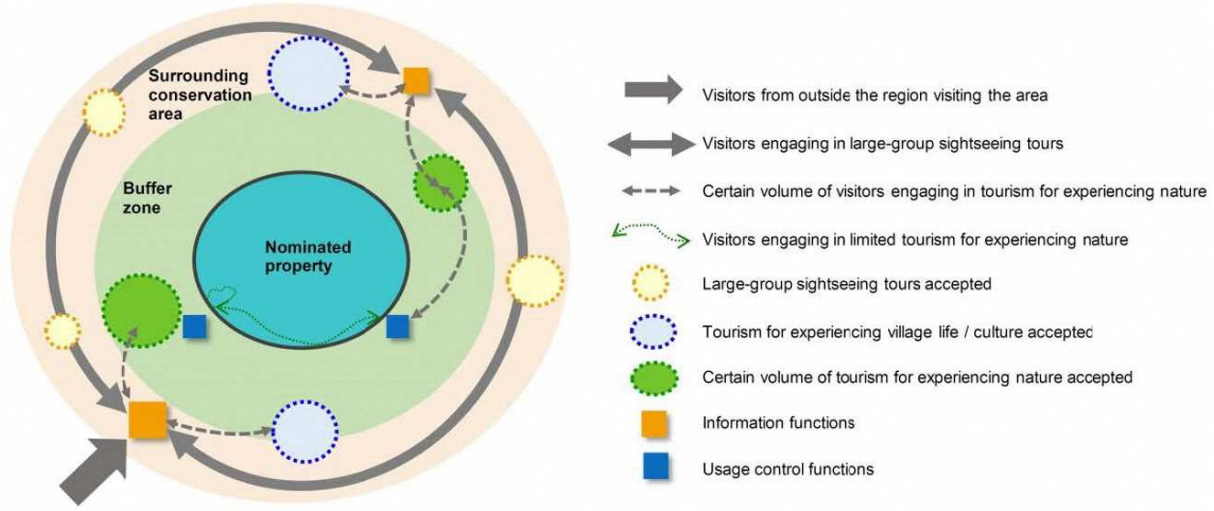


Fig. 1 Tourism use policies for each zone [schematic diagram]

1.2 Principles for Sustainable Tourism at World Heritage Properties

Concerning sustainable tourism, the Principles for Sustainable Tourism at World Heritage Properties (page 88 of World Heritage Resource Manual, Managing Natural World Heritage, UNESCO/IUCN/ ICOMOS/ICCROM (2012)) were published by IUCN. The aim of the principles is that tourism and visitation at World Heritage properties contribute to the long-term sustainability of their heritage values and sense of place, while generating cultural and socio-economic benefits to the local population and surrounding region.

Principle 1: Contribution to World Heritage objectives	Tourism development and visitor activities associated with World Heritage properties must contribute to and must not damage the protection, conservation, presentation and transmission of their heritage values. Tourism should also generate sustainable socio-economic development and equitably contribute tangible as well as intangible benefits to local and regional communities in ways that are consistent with the conservation of the properties.
Principle 2: Cooperative partnerships	World Heritage properties should be places where all stakeholders cooperate through effective partnerships to maximize conservation and presentation outcomes, while minimizing threats and adverse impacts from tourism.
Principle 3: Public awareness and support	The promotion, presentation and interpretation of World Heritage properties should be effective, honest, comprehensive and engaging. It should mobilize local and international awareness, understanding and support for their protection, conservation and sustainable use.
Principle 4: Proactive tourism management	The contribution of tourism development and visitor activities associated with World Heritage properties to their protection, conservation and presentation requires continuing and proactive planning and monitoring by site management, which must respect the capacity of the individual property to accept visitation without degrading or threatening heritage values. Site management should have regard to relevant tourism supply chain and broader tourism destination issues, including congestion management and the quality of life for local people. Tourism planning and management, including cooperative partnerships, should be an integral aspect of the site management system.
Principle 5: Stakeholder empowerment	Planning for tourism development and visitor activity associated with World Heritage properties should be undertaken in an inclusive and participatory manner, respecting and empowering the local community including property owners, traditional or indigenous custodians, while taking account of their capacity and willingness to participate in visitor activity.
Principle 6: Tourism infrastructure and visitor facilities	Tourism infrastructure and visitor facilities associated with World Heritage properties should be carefully planned, sited, designed, constructed and periodically upgraded as required to maximize the quality of visitor appreciation and experiences while ensuring there is no significant adverse impact on heritage values and the surrounding environmental, social and cultural context.
Principle 7: Site management capacity	Management systems for World Heritage properties should have sufficient skills, capacities and resources available when planning tourism infrastructure and managing visitor activity to ensure the protection and presentation of their identified heritage values and respect for local communities.
Principle 8: Application of tourism-generated revenue	Relevant public agencies and site management should apply a sufficient proportion of the revenue derived from tourism and visitor activity associated with World Heritage properties to ensure the protection, conservation and management of their heritage values.
Principle 9: Contribution to local community development	Tourism infrastructure development and visitor activity associated with World Heritage properties should contribute to local community empowerment and socio-economic development in an effective and equitable manner.

Source: UNESCO/ IUCN/ICOMOS/ICCROM. Managing Natural World Heritage. UNESCO World Heritage Centre, 2012
Original source: World Heritage Committee document, "WHC-10/34.COM/INF.5F.1"

1.3 Challenges and Necessary Actions Related to Each of the Principles for Sustainable Tourism

The present challenges for sustainable tourism in Northern Part of Okinawa Island (Yambaru) and proposals to address the challenges are described below according to the Principles for Sustainable Tourism.

Principle 1: Contribution to World Heritage objectives

- For sustainable tourism associated with World Natural Heritage, rules for proper tourism use should be developed and appropriate information and guidance should be provided to visitors so that activities for presenting and experiencing heritage values can be carried out in the buffer zone and surrounding conservation area to the extent possible, in order to permanently conserve the nominated property, which comprises a vulnerable natural environment.

Principle 2: Cooperative partnerships

- For the realization of sustainable tourism associated with World Natural Heritage, the three villages of Northern Part of Okinawa Island need to work together. To do so, in addition to individual efforts made by each village, a mechanism needs to be put in place to ensure that they collaborate and cooperate together, having the same understanding and policies, in collaboration with the national government and Okinawa Prefecture.

Principle 3: Public awareness and support

- The core of the attractiveness and value of Northern Part of Okinawa Island from the viewpoint of World Heritage consists in biodiversity. It is necessary to explore effective ways of interpretation and information about unique animals and plants of the region for tourists without negative impact on them.
- Yambaru forests have been maintained properly to the present because they have been sustainably used as the source of livelihood for local residents. Likewise, if nature can benefit local residents as the source of livelihood through sustainable tourism, the natural environment can be conserved, and the property can also be continuously conserved.
- With a view to assuring the appropriate settings for World Natural Heritage, efforts should be made to raise local residents' awareness of environmental conservation, including lifestyle with less burden on the environment, promotion of environmentally-friendly agriculture, and use of tourism revenues for environmental conservation, etc.

Principle 4: Proactive tourism management

- To make the surrounding conservation area a center of tourism, various tourism options need to be developed, focusing on the utilization of resources such as local culture, history, and agricultural, forestry, and fisheries industries.

- To increase visitors' satisfaction and thereby encourage visitors to visit Yambaru repeatedly, it is necessary to create attractive tourism programs and improve the system to receive visitors as a matter of priority, taking into consideration how the target visitors move from place to place and spend money for tourism. Then, discussions about how to attract and guide tourists should be made.
- Based on the recognition that the number of tourists is likely to increase in the future, measures to prevent overuse should be examined and taken in a proactive manner.
- Indicators to evaluate the outcomes of the tourism master plan should include not only the number of tourists and tourism revenues, but also aims from a broader perspective based on the ideas of SDGs, such as the environment, lives of residents, and education. They will make it possible to pursue balanced, sustainable tourism.

Principle 5: Stakeholder empowerment

- It is necessary to build momentum and enhance motivation for the ownership and participation of local communities and establish relationships with local communities so that local residents can proudly explain the attractiveness of the locality to tourists, recognizing the value not only of nature, but also of local history and culture, including the cooperative store system.
- Proactive efforts should be made for nature learning and environmental education through collaboration with local residents and schools so that local residents and children can understand the value and attractiveness of Yambaru's nature.
- As for human resources development, it is necessary to put in place a system to enable local residents to receive economic benefits from tourism by training not only nature guides but also local tourist coordinators and community guides who can play a central role in local communities.
- To improve the quality of nature guides, it is necessary to develop certification standards, carry out lectures on a regular basis, and ensure the availability of guides with a certain level of skill in a stable manner.
- It is necessary to strengthen the operation capacity of organizations that promote sustainable tourism of the three villages (e.g. tourism associations). While public financial support will be provided for the time being, it is necessary to secure stable and profitable projects and promote collaboration with other related organizations so that they can operate independently in the future.

Principle 6: Tourism infrastructure and visitor facilities

- It is necessary to provide information in an effective manner at the gateway facility of the property and key facilities of the three villages, not only about tourist destinations of the entire three villages, but also about the World Heritage value and the importance of the animals and plants that cannot be seen elsewhere by introducing the latest information system and strengthening the existing information function.

- It is necessary to develop tourism options taking advantage of the different strong points of the three villages, improve the system to receive visitors, secure transportation means to move around the three villages without depending on rental cars, deliver comprehensive tourist attraction and information transmission, and strengthen coordination among the core facilities of the relevant villages.
- If services (e.g. transportation services using electric vehicles) and facilities (e.g. accommodation facilities) are provided and operated in the area with a high level of consciousness of environmental conservation, the number of environmentally conscious visitors may increase, which would also result in an increase in consumption.
- It is necessary to consider introducing alternative transportation means for visitors coming to Yambaru, without excluding various possibilities other than the existing bus routes.
- With regard to the pathways that visitors are allowed to use, it is necessary to clarify the responsible persons or organizations in charge of maintenance and carry out proper maintenance and management on a continual basis.

Principle 7: Site management capacity

- It is necessary to make effective use of valuable information, knowledge, and skills of local residents for heritage management, with advice from experts and other people, and also to enable local communities to benefit economically from survey and management activities through payments of wages or fees.

Principle 8: Application of tourism-generated revenue

- It is desirable that a part of the revenues gained thanks to the brand power of World Heritage should be used to fund the conservation of the nominated property as World Heritage.

Principle 9: Contribution to local community development

- If visitors are provided with opportunities to present and experience heritage value in a new tourism program, employment and revenue will be generated locally. A system to distribute the revenue to local communities and for the conservation of heritage value needs to be developed.
- Tourism should serve as a comprehensive industry that contributes to the livelihood of local residents engaged in various industries, including the primary industry providing food, the secondary industry processing souvenir goods, the tertiary industry providing accommodation and restaurant services, and so forth
- Local agricultural products should be promoted as new local specialties, taking the opportunity of World Heritage List inscription, and should be advertised to tourists, for example through programs in which visitors can experience harvesting etc.

• Tourism should be linked to the further development of local society and alleviating population decline through collaboration with other industries, an increase in local consumption, employment creation, and so forth

2. Concept of Sustainable Tourism in Northern Part of Okinawa Island

2.1 Aim

This master plan sets out the following aim and basic policies for achieving it and identifies specific activities to be implemented in a comprehensive and systematic manner.

Develop sustainable tourism into a comprehensive industry that supports the natural environment of Northern Part of Okinawa Island and local history, culture, economy, and society by fostering the local community's understanding of sustainable tourism and building capabilities of receiving visitors.

2.2 Basic Ideas

The basic ideas of sustainable tourism are set out as follows, based on the Comprehensive Management Plan for Amami-Oshima Island, Tokunoshima Island, Northern Part of Okinawa Island, and Iriomote Island, which are nominated for inscription on the World Heritage List, the Principles for Sustainable Tourism at World Heritage Properties, and the situation of Northern Part of Okinawa Island.

1: Guiding visitors to the surrounding conservation area and strengthening the capability to receive visitors

If Northern Part of Okinawa Island is inscribed on the World Heritage List as a component of the nominated property, the number of visitors is likely to increase. To conserve the nominated property including its vulnerable natural environment into the future, the number of visitors coming to the nominated property and the buffer zone is to be minimized, and visitors are to be guided to the surrounding conservation area. In addition, in order to allow visitors to enjoy a quality experience in the surrounding conservation area and also provide them with sufficient information about the surrounding conservation area, human resources are to be developed and the infrastructure to receive visitors is to be strengthened, including the installation of facilities where visitors can experience the nature, biodiversity, and culture of Northern Part of Okinawa Island.

2: Minimizing the impact of tourism use on the nominated property, buffer zone, etc.

In order to control the number of visitors and strengthen the infrastructure to receive visitors to promote the greater experience of nature, rules for proper tourism use are to be developed for the nominated property, for example requiring visitors entering the fields to be accompanied by a registered and certified tourist guide. In the buffer zone, a certain level of use for nature experience-oriented tourism is to be accepted on the condition that visitors are accompanied by a registered and certified guide to provide visitors with opportunities to experience the rich nature and biodiversity of the region. In addition, by ensuring that the gateway to the nominated property function to control tourism use, utilization rules and the value of the natural environment are to be communicated to

visitors to the nominated property. Furthermore, tourism use is to be controlled as necessary by continuously monitoring whether the nature-experience-oriented tourism is carried out properly on both of the nominated property and the buffer zone.

3: Using sustainable tourism for sustainable development of local society

An increase in the number of visitors that may occur after inscription on the World Heritage List is to be taken as an opportunity for the sustainable development of Northern Part of Okinawa Island. Since Northern Part of Okinawa Island faces issues such as population decline and stagnation of economic activities, sustainable tourism will provide an opportunity to revitalize not only the tourism industry but also other local industries, including restaurants, retail shops, agriculture, forestry, and fisheries, through an increase in local consumption and employment creation.

2.3 Basic Policies

To achieve the aforementioned aim, five basic policies have been set out based on the basic ideas.

Policy 1: Fostering the local residents' understanding of sustainable tourism (Principles 5 and 3)

Efforts are to be made so that local residents can understand the value of the property and the importance of sustainable tourism in Northern Part of Okinawa Island. Particular efforts are to be made to inform the residents that promoting sustainable tourism brings economic benefits to the primary industry (e.g. agriculture) and the secondary industry (e.g. processing) and can contribute to sustainable development of local society, and that higher awareness of local residents for environmental conservation leads to the conservation and sustainable utilization of the value of local resources.

Policy 2: Building a mechanism for Natural World Heritage inscription to contribute to sustainable development of the local economy and resolution of issues of the local communities (Principle 9 and 8)

Taking the inscription on the World Heritage List as an opportunity, efforts are to be made to take advantage of the added value of local agricultural products from the area with a World Natural Heritage, increase tourists' consumption of local products and services, generate employment through tourism, and strengthen the collaboration between tourism and other industries. This will lead to curbing the decline and aging of the local population and furthering the development of the local economy and communities.

Policy 3: Realizing proper visitor management in the nominated property and buffer zone through Yambaru Forest Tourism and other measures (Principles 4, 1, 5, 8, and 9)

For nature-experience-oriented tourism that allows visitors to feel the attractiveness of the rich biodiversity of Yambaru without deteriorating the heritage value in the nominated property and buffer zone, Yambaru Forest Tourism is to be promoted by delineating and categorizing fields for visitor use in the three villages, determining the responsible persons or organizations in charge of management, establishing standards for the registration and certification of guides, training quality guides, branding guided tours that provide value-added programs, and realizing proper control of tourism use based on monitoring.

Policy 4: Promoting tourism mainly in the surrounding conservation area and circular trips around the three villages (Principles 4, 1, 2, 3, and 6)

To prevent the overuse of nature experience fields in the nominated property and buffer zone by promoting tours mainly in the surrounding conservation area in the three villages, efforts are to be made to promote tourism using local resources, such as history and culture, strengthen the infrastructure to receive visitors, secure transportation means enabling visitors to move around the three villages without depending on rental cars, strengthen the collaboration between gateway facilities to the property and tourism facilities of the individual villages, and effectively disseminate information about biodiversity.

Policy 5: Developing human resources who work for the promotion of sustainable tourism and building capabilities of organizations (tourism associations etc.) for operation and tourism management (Principles 5 and 7)

To promote local residents' understanding of and participation in sustainable tourism and increase local consumption, people who play a central role within local communities, such as tourist coordinators and community guides who interpret the value of local history and culture, are to be trained, and the capabilities for operation (e.g. personnel system and securing operation funds) and tourism management (e.g. collaboration among the three villages and monitoring) of organizations that promote sustainable tourism (e.g. tourism associations) are to be strengthened.

3. Major Actions

Basic policy	Actions / projects	Implementing agency	Description	Area	Fiscal year of implementation
					2019 2020 2021
Policy 1: Fostering the local residents' understanding of sustainable tourism	Raising local residents' awareness of Yambaru Discovery	• Kunigami Village (Planning, Commerce, and Tourism Division)	Awareness-raising activities related to the nature, life, and culture of the village are to be carried out so that local residents can learn about local values and be proud of and interested in their village.	Kunigami Village	Implementation → Continuation
Policy 2: Building a mechanism for Natural World Heritage inscription to contribute to sustainable development of the local economy and resolution of issues of the local communities	Model project for local society promotion, taking advantage of Natural World Heritage	• Okinawa Prefecture (Nature Conservation Division)	Modalities for the branding of local specialties of the three villages in Northern Part of Okinawa Island taking advantage of Natural World Heritage are to be discussed.	Three villages of Northern Part of Okinawa Island	Planning → Implementation
	Examination of activities and strategies for local brands of Higashi Village and examination of the possibility of using intellectual property	• Higashi Village (Agriculture, Forestry, and Fisheries Division)	A trademark of Gold Barrel pineapple, a local specialty of Higashi Village, is to be registered, and the possibility of branding on the strength of added value as products from around of a World Heritage property is to be examined.	Higashi Village	Implementation
Policy 3: Realizing proper visitor management in the nominated property and buffer zone through Yambaru Forest Tourism and other measures	Operation of the guide certification system	• Yambaru Three Villages Council for World Heritage Promotion (Kunigami Village, Ogimi Village, Higashi Village)	Based on the Grand Design for Promoting Yambaru Forest Tourism, proper operation of the guide certification system and determination of the experience fields in the three villages are to be carried out.	Three villages of Northern Part of Okinawa Island	Implementation
Policy 4: Promoting tourism mainly in the surrounding conservation area and circular trips around the three villages	Installation of Yambaru Forest Visitor Center	• Ogimi Village (Planning and Tourism Division) • Ogimi Village Tourism Association	Function to provide information to visitors of Northern Part of Okinawa Island (about the value of the natural environment, the rules of use, etc.) is to be enhanced.	Ogimi Village	Implementation
	Model project for tourism promotion in the surrounding conservation area	• Okinawa Prefecture (Nature Conservation Division) • Kunigami Village (Planning, Commerce, and Tourism Division) • Kunigami Village Tourism Association	Tourism options taking advantage of local resources, such as culture, history, and primary industry, etc., are to be examined and implemented in the surrounding conservation area.	Three villages of Northern Part of Okinawa Island	Planning → Implementation
		• Okinawa Prefecture (Nature Conservation Division) • Ogimi Village Tourism Association	○Methods for providing information at the gateway facilities of the property and for systematically guiding tourists at these facilities are to be examined and implemented. ○Human resources are to be developed to promote the use of the surrounding conservation area, such as organizing activities to walk around local communities. ○Information about the village's tourism resources is to be organized.	Ogimi Village	Planning → Implementation
		• Okinawa Prefecture (Nature Conservation Division) • Higashi Village Tourism Promotion Council	○Tour programs are to be developed to prevent concentrated use and disperse the use of specific natural tourism resources. ○Information on the village's tourism resources is to be organized.	Higashi Village	Planning → Implementation

Basic policy	Actions / projects	Implementing agency	Description	Area	Fiscal year of implementation		
					2019	2020	2021
Policy 5: Developing human resources who work for the promotion of sustainable tourism and building capabilities of organizations (tourism associations etc.) for operation and tourism management		• Okinawa Prefecture (Nature Conservation Division) • Kunigami Village (Planning, Commerce, and Tourism Division) • Kunigami Village Tourism Association • Ogimi Village Tourism Association • Higashi Village Tourism Promotion Council	Efforts are to be made to develop human resources to promote tourism in the surrounding conservation area and control visitors within the nominated property, strengthen the capability of operating self-sustainable organizations, and enhance collaboration among the three villages.	Three villages of Northern Part of Okinawa Island			

Measures against roadkills on the four islands				
	No.	Measures	Target area	Contents/progress
Ongoing	1)	Installation of road signs to prevent roadkills	Four islands	Road signs, including movable signs and road markings, have been installed at the locations where roadkills occur frequently, traffic becomes heavy, or many tourists enter. The signs increased in 2019 but more signs will be installed as necessary. On Iriomote Island, the movable signs will be improved to show in multiple languages in this coming spring. The locations of signs are decided based on the roadkill risk analysis, which is conducted with experts.
	2)	Improvement of road structures by installation of underpasses and rumble strips etc. on main roads	Four islands	Various efforts are being made to reduce roadkills in accordance with the advice from experts. Those efforts include: installing underpasses (crossroad that is built under a road to allow safe passage for animals), installing rumble strips (gentle surface bumps on roads to limit vehicle speed), coloring shoulders to spot animals easily, and installing or improving ditches that small animals can crawl out. Ten and 123 underpasses have been installed in Northern Part of Okinawa Island and Iriomote Island, respectively, in which two were newly installed in 2019 in Northern Part of Okinawa Island.
	3)	Installation of fences to prevent animals from entering roads	Northern Part of Okinawa Is. and Iriomote Is., etc.	The fences are installed in Northern Part of Okinawa Island and Iriomote Island. Considering the risk that the fences may block animals from getting out of the roads, one-way gates (exit way for animals) are placed on the fences, and where appropriate, the fences are connected to the underpasses so as not to disturb movements of animals. The monitoring is conducted using camera traps to verify the effectiveness of those fences. Based on experts' advice, the installation of fences will be expanded (see 6) below for more details).

	4)	Awareness raising for tourists and local communities	Four islands	Awareness raising is promoted for local communities, tourists, and transportation business operators to prevent roadkills, by disseminating information on precautions to take when driving at night and on the number of monthly accidents. In the months when accidents frequently occur and high seasons, intensive campaigns are conducted through community announcement, radio, and dissemination of awareness-raising materials. As a concrete example of awareness raising activities for local communities, local constructors' association and traffic safety association actively cooperate in organizing an annual children's painting contest on the theme of rare species protection on Iriomote Island. The selected paintings are used as flyers and posters for that year to reduce roadkills. This kind of activities contributes to maintain a high level of willingness of local people and tourists to cooperate. In addition, the awareness-raising materials and exhibits of the Wildlife Conservation Center will be converted to multilingual in this coming spring.
Planned	5)	Installation of a speed warning device in all vehicles to warn when vehicles reach speeds that cannot avoid roadkills	Iriomote Is., etc.	A speed warning device equipped with a GPS logger has been used experimentally in rental cars since 2019. This device notifies the driver of speeding and, at the same time, clarifies the area where speeding occurs frequently based on the records of the GPS logger. In the future, improvements will be made in accordance with opinions from users. In addition, with the cooperation of rental car and guide business operators, the device installation will be expanded to more rental cars and vehicles used for ecotours. These will be implemented on Iriomote Island and then expanded to other islands as needed.
	6)	Development of a new animal entry prevention fence that can be easily installed/uninstalled at the necessary locations and a	Iriomote Is., etc.	Based on the structures, effectiveness, and risks of the existing fences, a new fence is being developed. It will be installed promptly (including connection to underpasses) at the locations where roadkills

		flashing warning light for animals entering roads		frequently occur. It is planned to install the fence in the western part of Iriomote Island as the traffic accidents involving the Iriomote cat are relatively concentrated in this area. Also, development of a warning light is being considered for the locations where installation of underpasses is difficult. It is designed to flash on road shoulders when animals enter the roads and inform the driver of the existence of animals. These will be implemented on Iriomote Island and then expanded to other islands as needed.
	7)	Establishment of a permanent maintenance system to keep underpass entrances favorable for wildlife use	Iriomote Is., etc.	A community-based maintenance system will be established so that all 123 underpasses installed on Iriomote Island will always function effectively. In particular, it aims to prevent vegetation from growing too much and blocking the entrance of the underpasses. At the same time, a system for shoulder mowing operations will be created to maintain clear visibility for drivers. These will be implemented on Iriomote Island and then expanded to other islands as needed.

List of monitoring indicators (Excerpts from the Monitoring Plan related to the OUV status, road kills, and tourism management)

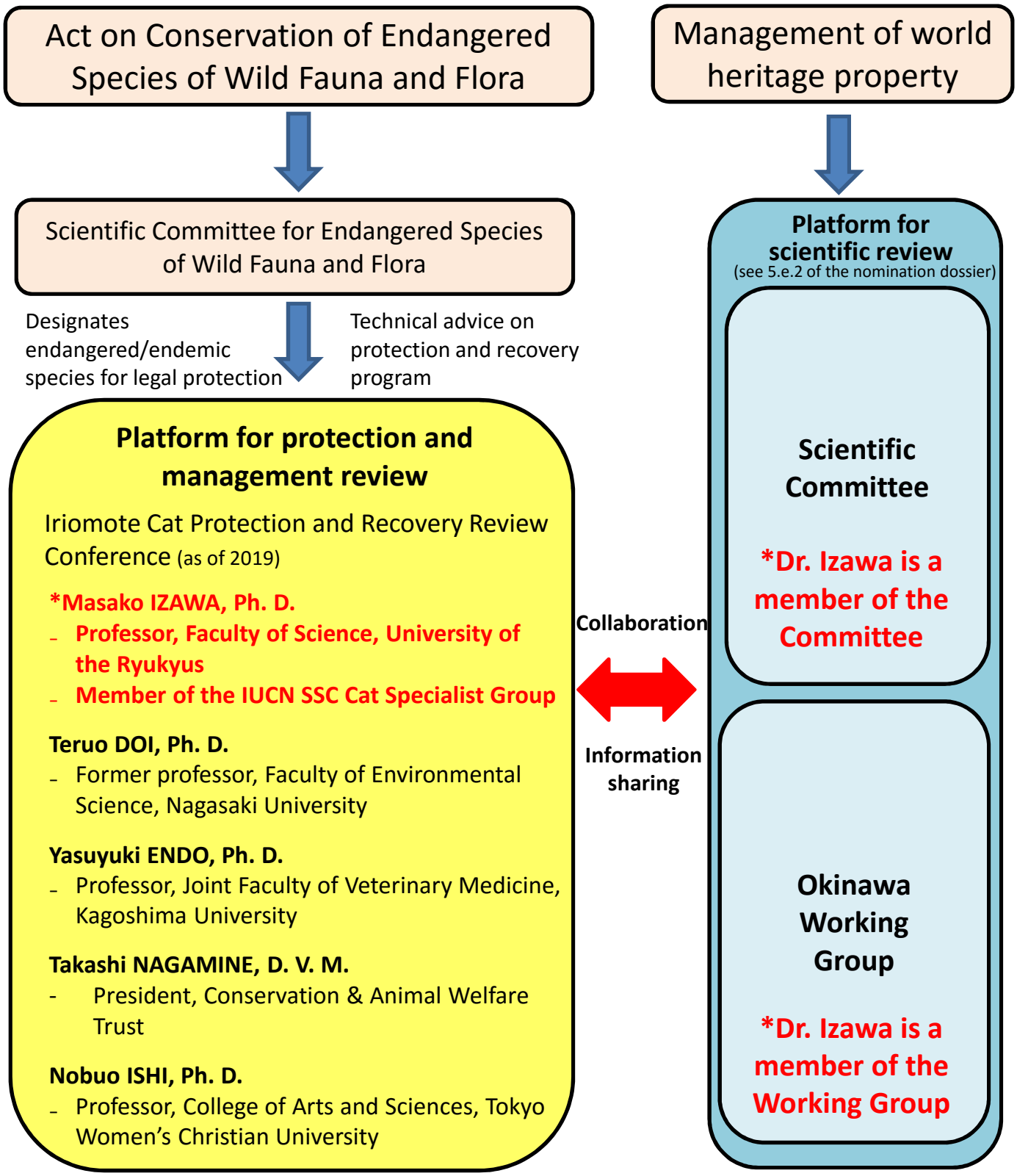
I. Maintenance of endemic and/or threatened species of the OUV

Category	No.	Indicators	Survey items	Survey objectives	Survey/evaluation cycle	Implementing entities	Areas			
							Amami-Oshima Is.	Tokunoshima Is. (a) (b)	Northern Part of Okinawa Is.	Iriomote Is.
A. Species conservation state	1	Status of the Amami rabbit	Number of pellets counted based on line transect surveys	Pellet count surveys shall be conducted in around 20 transect lines set on Amami-Oshima Island and around 10 transect lines set on Tokunoshima Island, for the purpose of understanding the population trend.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓		
	2	Status of the Amami thrush	Number of birds based on a simultaneous census	The simultaneous census based on visual observation and birdcalls shall be conducted by MOE officers, staff members of Amami ornithologists' club, and volunteering students, for the purpose of understanding the population trends.	Annually	Okinawa Amami Nature Conservation Office, MOE Amami ornithologists' club	✓			
	3	Status of the Okinawa rail	Distribution and population estimates based on play-back surveys	Play-back surveys shall be conducted at around 250 sites in Northern part of Okinawa Island, for the purpose of estimating the population and distribution.	Annually	Okinawa Amami Nature Conservation Office, MOE Nature Conservation Division, Okinawa Prefecture			✓	
	4	Status of the Okinawa woodpecker	Distribution based on play-back surveys	Play-back surveys shall be conducted at around 50 sites in Northern part of Okinawa Island, for the purpose of understanding the distribution.	Annually	Okinawa Amami Nature Conservation Office, MOE			✓	
	5	Status of frogs	Frequency of occurrence based on line transect surveys	Line transect surveys at night shall be conducted in Okuni forestry road (Okuni-rindo), for the purpose of understanding the population trend of each frog species.	Annually	Okinawa Amami Nature Conservation Office, MOE Nature Conservation Division, Okinawa Prefecture			✓	
	6	Status of the Iriomote cat	Use of territories based on camera surveys at multiple fixed sites	Camera surveys shall be conducted at around 20 sites on Iriomote Island, for the purpose of confirming the health conditions and reproductive status of individual cats.	Annually	Okinawa Amami Nature Conservation Office, MOE Kyushu Regional Forest Office, Forestry Agency				✓
	7	Status of the crested serpent eagle	Number of birds based on line transect surveys	Line transect surveys shall be conducted based on visual observation and birdcalls in four transect lines set on Iriomote Island, for the purpose of understanding the population trend.	Annually	Okinawa Amami Nature Conservation Office, MOE Okinawa Regional Research Center, Tokai University				✓
	8	Overall status of the species of the OUV	Locations of rare animal occurrences recorded in camera surveys, patrols, and distribution surveys, etc.	Data of animal and plant species indicating the OUV shall be accumulated based on information including visual observation of individual animals, hearing of animals, and public information from local residents. With regard to some species, such as ground geckoes and Ryukyu black-breasted leaf turtles, the distributions shall be investigated, as necessary.	Annually	Okinawa Amami Nature Conservation Office, MOE Kyushu Regional Forest Office, Forestry Agency	✓	✓	✓	✓
			Location of rare plant occurrences recorded in inspections, patrols, and distribution surveys, etc.	Data of plant species indicating the OUV shall be accumulated based on information including findings of individual plants and public information from local residents. With regard to some plant species, such as *Dendrobium okinawense* and *Platanthera sonoharae*, the distributions shall be investigated, as necessary.	Annually	Okinawa Amami Nature Conservation Office, MOE Kyushu Regional Forest Office, Forestry Agency	✓	✓	✓	✓
			Changes in RL categories of major species that are selected from the species of the OUV, based on experts advice	Quantitative analyses shall be conducted every five years regarding changes in the RL categories, for the purposes of regularly overviewing changes in the state of conservation regarding the entire species indicating the OUV and utilizing the information to undertake necessary measures.	Every 5 years	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
B. Habitat conservation status	9	Changes in the total area of forests	Satellite images	Forest status shall be assessed based on satellite landscape images, together with analyses of meteorological data including temperatures, precipitations, and typhoons, etc., for the purpose of detecting the vegetation changes and gap formations.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
			Unmanned aerial vehicle (UAV) images	Aerial high-resolution movies shall be taken using Unmanned Aerial Vehicle (UAV), for the purpose of understanding the changes in the forest conservation status.	Every 5 years	Kyushu Regional Forest Office, Forestry Agency			✓	✓
	10	Environmental changes in major habitats	Landscape photos at fixed sites	Landscape assessments shall be conducted based on camera surveys at several fixed sites in old-growth forests, mountain streams, and cloud belts, together with analyses of meteorological data including temperatures, precipitations, typhoons, etc., for the purpose of understanding environmental changes.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓

II. Mitigation of anthropogenic impacts and improvement on past impacts on endemic species and/or threatened species of the OUV										
A. Animal deaths from unnatural causes	11	Occurrences of road accidents	Number of road accidents involving the Amami rabbit, Okinawa rail, long-haired rat, and Iriomote cat	Necropsies shall be conducted when dead or injured individuals are found by inspections, patrols, and reports from municipalities and local residents, for the purpose of understanding the trend in traffic accident damages.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
	12	Predation by alien species	Number of predation damages by dogs and cats on the Amami rabbit, Okinawa rail, long-haired rat, and Okinawa woodpecker	Necropsies and DNA analyses shall be conducted when dead or injured individuals are found by inspections, patrols, and reports from municipalities and local residents, for the purpose of understanding the trend in predation damages by dogs and cats.	Annually	Okinawa Amami Nature Conservation Office, MOE Conservation & Animal Welfare Trust	✓	✓	✓	
B. Capture and collection of animals and plants	13	Information on poaching and smuggling of animals and plants	Number of cases/suspected cases of poaching and smuggling (illegal capture/collection and taking out)	The number of poaching and smuggling of rare animals and plants shall be investigated by inspections, patrols, and reports from related agencies, municipalities, and local residents, for the purpose of understand the trend in damages and discussing measures at the liaison committee meetings comprised of administrative organs and private companies.	Annually	Liaison meeting on measures against poaching and smuggling of rare wildlife species in the Amami Island Group region Liaison meeting on measures against poaching and smuggling of rare wildlife species in Okinawa region	✓	✓	✓	✓
			Number of traps to catch animals	The number of traps (insect collection traps) shall be investigated by inspections, patrols, and reports from municipalities and local residents, for the purpose of understanding the trend in the capture pressure.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
Ⅳ. Sustainable tourism use in the nominated property and its surrounding areas										
tatus of tourisı	17	Status of tourism use, including ecotourism	Number of entries and visitors for each island (tourism statistics)	The trend in the number of entries and visitors shall be investigated.	Annually	Planning Division, Oshima Branch Office, Kagoshima Prefecture Department of Culture, Tourism, and Sport, Tourism Policy Division, Okinawa Prefecture	✓	✓		✓
			Total capacity of accommodations	The trend in the number of entries and visitors shall be investigated.	Annually	Department of Culture, Tourism, and Sport, Tourism Policy Division, Okinawa Prefecture			✓	✓
			Number of visitors to Northern part of Okinawa Island (National Transportation Census)	The trend in the number of passing vehicles that enter into Northern part of Okinawa Island shall be investigated.	Every 5 years	Okinawa General Bureau, Cabinet Office			✓	
			Users of facilities related to natural environments	The trend in the number of facility users whose main purpose of tourism is related to natural environment among all entries shall be investigated.	Annually	Okinawa Amami Nature Conservation Office, MOE Kagoshima Prefecture, Amami City, Tatsugo Town, Kunigami Village	✓		✓	✓
			Number of registered ecotour guides and entities that have signed a conservation use agreement	The trend in the number of registered ecotour guides (or entities) and the entities that have signed a conservation use agreement (Northern part of Okinawa Island and Iriomote Island) shall be investigated.	Annually	Liaison meeting of ecotour guides on Amami-Oshima Island, Liaison meeting of ecotour guides on Tokunoshima Island, Wide Area Administration Association of Amami Islands, Yambaru three villages forest tourism meeting, and Taketomi Town	✓	✓	✓	✓
			Number of visitors at the major ecotour sites	The trend in the number of visitors shall be investigated by user counters, etc. at major ecotour sites.	Annually	Okinawa Amami Nature Conservation Office, MOE Kyushu Regional Forest Office, Forestry Agency Tropical Biosphere Research Center, University of the Ryukyus Kagoshima Prefecture, Yamato Village, Uken Village, and Kunigami Village	✓	✓	✓	✓
			Status of ecoutour use at the major locations on each island	The trend in use status and tourism types shall be investigated by identifying the ecotour sites inside the Island and visualizing them on a map.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
B. Environmental impact of tourism	18	Environmental changes in ecotour sites	Landscape photos at fixed ecotour sites	Landscape assessment shall be conducted.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
			Monitoring at fixed major ecotour sites	Monitoring shall be conducted at major ecotour sites and along footpaths, for the purpose of understanding the changes in natural environment, such as changes in vegetation due to tourism use.	Annually	Okinawa Amami Nature Conservation Office, MOE Tropical Biosphere Research Center, University of the Ryukyus				✓

Other					
Regardless of the abovementioned matters, a system (contact point) which enables monitoring (reporting, etc.) through participation of many local residents shall be established.	Okinawa Amami Nature Conservation Office, MOE and local residents	✓	✓	✓	✓

System for scientific review of Iriomote cat protection



An overall management system is established to implement various measures for protecting the nominated property in an integrated and efficient way.

In addition to the above system, we are also in contact with Dr. Krzysztof Schmidt at Mammal Research Institute of the Polish Academy of Sciences and other members of the IUCN Cat Specialist Group to take necessary advice.

5. Measures against the negative effects of climate change

It is predicted that impacts of climate change on the nominated property include warming temperatures, rainfall shortages, increase in frequency and intensity of typhoons, torrential rains and sea level rise. In Japan, based on the Climate Change Adaptation Act, the National Institute for Environmental Studies plays a central role in conducting research, and collecting and analyzing scientific knowledge on the impacts of climate change and adaptation to them. In addition, studies on scenarios which predict future risks due to climate change in natural environment in Japan are being carried out. In terms of management of the nominated property, we will surely implement the following approaches based on the latest knowledge provided by the above-mentioned studies.

The key approach is to continue a long-term monitoring of changes in flora and fauna due to climate change, and the conservation status of endemic and/or threatened species representing the Outstanding Universal Value and their habitats. This is specified in the "Monitoring Plan for Amami-Oshima Island, Tokunoshima Island, Northern Part of Okinawa Island, and Iriomote Island, nominated for Inscription on the World Heritage List (developed in August 2019, and submitted in the supplementary information in November 2019)," and monitoring will be implemented on the basis of this plan.

Taking into account the importance of responding to climate change, this monitoring plan selects and identifies monitoring indicators and items in order to monitor the conservation status of endemic and/or threatened species representing the Outstanding Universal Value and stress factors affecting those species. Regarding stress factors, it identifies factors that are currently affecting as well as factors that may affect in the future. Monitoring is carried out jointly by administrative organizations, and the results of monitoring are evaluated by the Scientific Committee and its Working Groups (see pages 256-257 of the nomination document). On the basis of the outcome of the evaluation, the administrative organizations consider measures to be taken and promote adaptive management. (An overview of the part of the monitoring plan related to climate change is shown in the Appendix 5-1).

The basic idea to reduce the impact of climate change is to enhance the site's resilience in the face of climate change by continuous or intensified (when necessary) conservation of rare and/or endemic species and their healthy habitats. For that purpose, it is necessary to reduce stress factors other than climate change, such as human-induced stress and alien species. Specifically, for example, the following measures will be implemented:

- Strict management of protected areas

  Prohibiting various actions that may affect existence of the rare and/or endemic species and their habitat, such as the development activities and capture of those species, through the designation of their important habitats as protected areas or

designation of those species as protected species based on the relevant laws and regulations.

Conservation of the rare and/or endemic species will be implemented mainly as in-situ conservation, including maintenance and improvement of habitats through the above-mentioned protected areas management, control of capture, and elimination of invasive alien species that are threatening those species. Ex-situ conservation will also be implemented as a complement to in-situ conservation when emergency evacuation of species or preservation of species as insurance against extinction is required.

- Measures against invasive alien species

Implementing immediate actions when invasion of new invasive alien species is confirmed (For details of these measures, refer to "5. A list of prevention measures against unintentional invasion by invasive alien species" in the supplementary information of November 2019.) and strengthening the regulation of the commercial trade of invasive alien species by newly designating them as regulated species based on the relevant laws or ordinances.

In addition, in case of the potential erosion or landslips caused by future climate change, in principle, affected areas will be left to natural transition, and changes and recovering status of habitats and distribution of rare and/or endemic species will be monitored. As a result of monitoring, if there is a significant adverse effect on the Outstanding Universal Value, such as a rapid habitat deterioration, and if it is not easy to recover naturally, necessary measures such as in-situ conservation (maintenance and improvement of the habitat, including restoration of the natural environment), and ex-situ conservation (including subsequent release into the wild) will be taken.

Appendix 5-1

List of monitoring indicators（Excerpts related to the OUV status and climate change）

Category	No.	Indicators	Survey items	Survey objectives	Survey/evaluation cycle	Implementing entities	Areas			
							Amami-Oshima Is.	Tokunoshima Is. (a) (b)	Northern Part of Okinawa Is.	Iriomote Is.
I. Maintenance of endemic and/or threatened species of the OUV										
A. Species conservation state	1	Status of the Amami rabbit	Number of pellets counted based on line transect surveys	Pellet count surveys shall be conducted in around 20 transect lines set on Amami-Oshima Island and around 10 transect lines set on Tokunoshima Island, for the purpose of understanding the population trend.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓		
	2	Status of the Amami thrush	Number of birds based on a simultaneous census	The simultaneous census based on visual observation and birdcalls shall be conducted by MOE officers, staff members of Amami ornithologists' club, and volunteering students, for the purpose of understanding the population trends.	Annually	Okinawa Amami Nature Conservation Office, MOE Amami ornithologists' club	✓			
	3	Status of the Okinawa rail	Distribution and population estimates based on play-back surveys	Play-back surveys shall be conducted at around 250 sites in Northern part of Okinawa Island, for the purpose of estimating the population and distribution.	Annually	Okinawa Amami Nature Conservation Office, MOE Nature Conservation Division, Okinawa Prefecture			✓	
	4	Status of the Okinawa woodpecker	Distribution based on play-back surveys	Play-back surveys shall be conducted at around 50 sites in Northern part of Okinawa Island, for the purpose of understanding the distribution.	Annually	Okinawa Amami Nature Conservation Office, MOE			✓	
	5	Status of frogs	Frequency of occurrence based on line transect surveys	Line transect surveys at night shall be conducted in Okuni forestry road (Okuni-rindo), for the purpose of understanding the population trend of each frog species.	Annually	Okinawa Amami Nature Conservation Office, MOE Nature Conservation Division, Okinawa Prefecture			✓	
	6	Status of the Iriomote cat	Use of territories based on camera surveys at multiple fixed sites	Camera surveys shall be conducted at around 20 sites on Iriomote Island, for the purpose of confirming the health conditions and reproductive status of individual cats.	Annually	Okinawa Amami Nature Conservation Office, MOE Kyushu Regional Forest Office, Forestry Agency				✓
	7	Status of the crested serpent eagle	Number of birds based on line transect surveys	Line transect surveys shall be conducted based on visual observation and birdcalls in four transect lines set on Iriomote Island, for the purpose of understanding the population trend.	Annually	Okinawa Amami Nature Conservation Office, MOE Okinawa Regional Research Center, Tokai University				✓
	8	Overall status of the species of the OUV	Locations of rare animal occurrences recorded in camera surveys, patrols, and distribution surveys, etc.	Data of animal and plant species indicating the OUV shall be accumulated based on information including visual observation of individual animals, hearing of animals, and public information from local residents. With regard to some species, such as ground geckoes and Ryukyu black-breasted leaf turtles, the distributions shall be investigated, as necessary.	Annually	Okinawa Amami Nature Conservation Office, MOE Kyushu Regional Forest Office, Forestry Agency	✓	✓	✓	✓
			Location of rare plant occurrences recorded in inspections, patrols, and distribution surveys, etc.	Data of plant species indicating the OUV shall be accumulated based on information including findings of individual plants and public information from local residents. With regard to some plant species, such as *Dendrobium okinawense* and *Platanthera sonoharae*, the distributions shall be investigated, as necessary.	Annually	Okinawa Amami Nature Conservation Office, MOE Kyushu Regional Forest Office, Forestry Agency	✓	✓	✓	✓
			Changes in RL categories of major species that are selected from the species of the OUV, based on experts advice	Quantitative analyses shall be conducted every five years regarding changes in the RL categories, for the purposes of regularly overviewing changes in the state of conservation regarding the entire species indicating the OUV and utilizing the information to undertake necessary measures.	Every 5 years	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
B. Habitat conservation status	9	Changes in the total area of forests	Satellite images	Forest status shall be assessed based on satellite landscape images, together with analyses of meteorological data including temperatures, precipitations, and typhoons, etc., for the purpose of detecting the vegetation changes and gap formations.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
			Unmanned aerial vehicle (UAV) images	Aerial high-resolution movies shall be taken using Unmanned Aerial Vehicle (UAV), for the purpose of understanding the changes in the forest conservation status.	Every 5 years	Kyushu Regional Forest Office, Forestry Agency			✓	✓
	10	Environmental changes in major habitats	Landscape photos at fixed sites	Landscape assessments shall be conducted based on camera surveys at several fixed sites in old-growth forests, mountain streams, and cloud belts, together with analyses of meteorological data including temperatures, precipitations, typhoons, etc., for the purpose of understanding environmental changes.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓

III. Decrease of alien species that pose threats

Category	No.	Indicators	Survey items	Survey objectives	Survey/evaluation cycle	Implementing entities	Areas			
							Amami-Oshima Is.	Tokunoshima Is. (a) (b)	Northern Part of Okinawa Is.	Iriomote Is.
A. Status of invasive alien species	14	Status of the small Indian mongoose	CPUE (relative abundance) and distribution of the mongoose	The trend and range of CPUE (Catch Per Unit Effort) of mongoose control projects shall be understood.	Annually	Okinawa Amami Nature Conservation Office, MOE Nature Conservation Division, Okinawa Prefecture	✓		✓	
	15	Distribution status of cats and cat keeping	Distribution status of cats in the nominated property and buffer zones	Information shall be collected on camera shooting, capture status, and abandonment of cats, for the purpose of understanding the trend in invasions of cats into the nominated property and the buffer zones.	Annually	Okinawa Amami Nature Conservation Office, Nature Conservation Division, Okinawa Prefecture	✓	✓	✓	
			Number of pet cats	The number of new registrations of pet cats and microchipped cats shall be investigated, for the purpose of understanding the trend in numbers of pet cats as the source of feral and stray cats.	Annually	Amami City, Yamato Village, Uken Village, Setouchi Town, Tatsugo Town Tokunoshima own, Amagi Town, Isen Town, Kunigami Village, Ogimi Village, hibachi Village, Taketomi Town, and of Veterinary Medical Association of the Oshima region	✓	✓	✓	✓
	16	Invasion status of alien species	Number and locations of alien species found in the nominated property and buffer zones	Information shall be gathered from patrols conducted by officers of MOE and Forestry Agency as well as reports from municipalities and local residents, for the purpose of understanding distributions and invasions of alien species.	Annually	Okinawa Amami Nature Conservation Office, MOE Kyushu Regional Forest Office, Forestry Agency Okinawa Prefecture, Kagoshima Prefecture, municipalities, and local residents	✓	✓	✓	✓
			Number and locations of alien species found in the surrounding conservation area	Line transect surveys extending to several kilometers per site at around 100-200 sites in total shall be conducted in places within the vicinity of the nominated property, where unintentional invasions are expected from outside and inside the country. The surveys are for the purpose of understanding the invasion status of alien species listed in the List of Invasive Alien Species, which has been created according to the degrees of priorities.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓

V. Early detection of the impacts or signs of climate change and disasters

Category	No.	Indicators	Survey items	Survey objectives	Survey/evaluation cycle	Implementing entities	Areas			
							Amami-Oshima Is.	Tokunoshima Is. (a) (b)	Northern Part of Okinawa Is.	Iriomote Is.
A. Climate change and forest areas	9	Changes in the total area of forests	Satellite images	Forest status shall be assessed based on satellite landscape images, together with analyses of meteorological data including temperatures, precipitations, and typhoons, etc., for the purpose of detecting the vegetation changes and gap formations.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓
			Unmanned aerial vehicle (UAV) images	Aerial high-resolution movies shall be taken using Unmanned Aerial Vehicle (UAV), for the purpose of understanding the changes in the forest conservation status.	Every 5 years	Kyushu Regional Forest Office, Forestry Agency			✓	✓
	19	Changes of forests in model areas	Number of woody plant species, species composition, above-ground carbon stocks, coverage of forest floor and shrubs, at a fixed site in nominated property on each island	The secular changes with the trends at the fixed sites across the country shall be compared, for the purpose of detecting responses to climate change and impacts of typhoons in the nominated property.	Annually to every 5 years	Biodiversity Center of Japan, MOE	✓		✓	✓
			Monitoring on terrestrial plants	Monitoring of the specified plant communities in the nominated property shall be conducted based on climate change adaption plan.	Every 5 years	National Institute for Environmental Studies, Kagoshima University, and Ryukyu University	✓	✓	✓	✓
B. Climate change and fauna	20	Fauna and changes in main habitats	Number of bird species, species composition, and biomass at a fixed site in the nominated property on each island	The trend at the fixed sites across the country and their secular changes shall be compared, for the purpose of detecting the impacts of climate change in the nominated property.	Annually to every 5 years	Biodiversity Center of Japan, MOE	✓		✓	✓
	10	Environmental changes in major habitats	Landscape photos at fixed sites	Landscape assessments shall be conducted based on camera surveys at several fixed sites in old-growth forests, mountain streams, and cloud belts, together with analyses of meteorological data including temperatures, precipitations, typhoons, etc., for the purpose of understanding environmental changes.	Annually	Okinawa Amami Nature Conservation Office, MOE	✓	✓	✓	✓

* In addition to the above three types of indicators, “II. Mitigation of anthropogenic impacts and improvement on past impacts on endemic species and/or threatened species of the OUV” and “IV. Sustainable tourism use in the nominated property and its surrounding areas” are also set as monitoring indicators. Comprehensive monitoring, including monitoring of stress factors on OUV other than climate change, will be implemented through studies on those indicators.

6. Others

The supplementary information submitted to the UNESCO World Heritage Centre in November 2019 contained minor errors. The amendments are as follows;

Page	Title	Paragraph No. /line No.	Error	Correction	Notes
26	5. A list of prevention measures against unintentional invasion by invasive alien species	2nd paragraph/ 7th - 8th line	approximately USD 0.1 million	approximately USD 0.9 million	The error is a miscalculation when converting currency.
27		1st paragraph/ 7th line	approximately USD 0.1 million	approximately USD 0.9 million	
27		6th paragraph/ 7th line	approximately USD 0.1 million	approximately USD 0.9 million	

鳥居敏男

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Government of Japan
February, 2020

6-1. AMA_3. Yuwan (Amami-Oshima Island)

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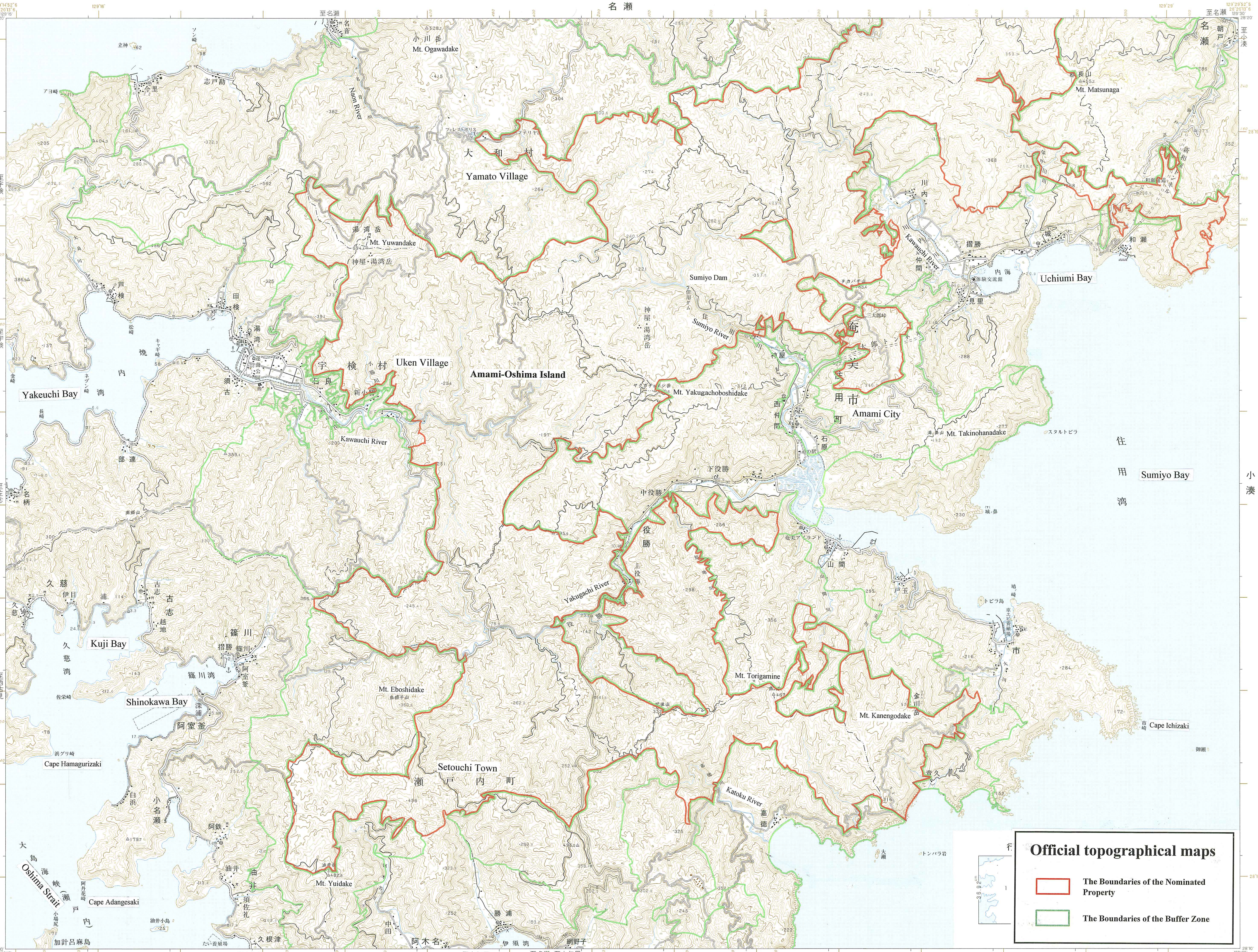

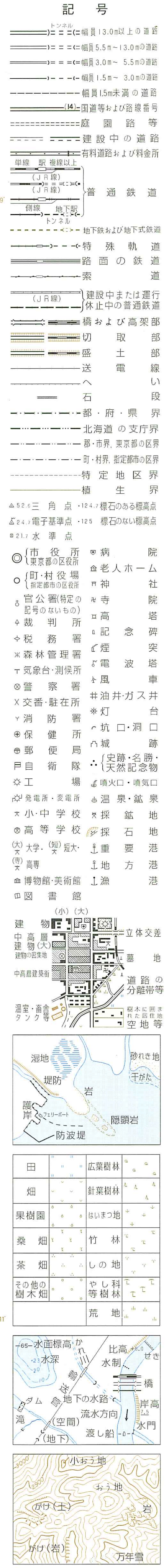

大正 8 年測量
昭和62年第2回編集
平成19年修正

資料：平成18年更新1:25,000地形図

Datum : The Japanese Geodetic Datum 2000
Projection : Universal Transverse Mercator zone 52N

1. 投影はユニバーサル横メルカトル図法、座標帯は第52帯、中央子午線は東経129°
2. 図郭に付した短線は経緯度差1分ごとの目盛
3. 高さの基準は名瀬港の平均海面
4. 等高線の間隔は20メートル
5. 磁針方位は西偏約 4°50′
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著作権所有兼発行者 国土地理院

茶色の経緯度数値は世界測地系(平成14年4月1日から適用)による

Brown lined longitude and latitude values based on the Japanese Geodetic Datum 2000 (applied from April 1, 2002)