

Forestry Operation Policy in Consideration of Natural Environment on Amami-Oshima Island and Tokunoshima Island

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Overview

1. Introduction

This policy provides a basic direction of forestry operations in consideration of natural environment on Amami-Oshima Island and Tokunoshima Island. Relevant organizations must work closely together to promote forestry operations that take into account the natural environment so that sustainable forestry operations in these areas will be conducted in accordance with this policy.

This policy will be revised as needed in response to changes in social conditions and the accumulation of insights such as the results of forest monitoring.

2. Forest Zoning for Use

Forests play various functions such as the functions to protect watersheds, to prevent slides and other disasters, to produce timber, and to conserve biodiversity. To effectively utilize these multiple functions, it is beneficial to categorize the forest areas based on their current status, location, and social needs placed on them, and to appropriately manage them according to their classifications.

For this purpose, we establish a zoning that reflects the functions required of each forest area and conduct forestry operations under the guidelines set for each zone.

*1&2: The Amami-Oshima Island Timber Distribution Promotion Council is a council established to promote the production and distribution of timber produced on Amami-Oshima Island. It consists of timber businesses, administrative institutions, and others on Amami-Oshima Island. The Tokunoshima Island Forestry Products Production and Distribution Promotion Council is the Tokunoshima version of this council.




*3: The Kagoshima Prefecture Oshima Branch Office is a local agency of Kagoshima Prefecture and oversees the Amami Island Group which includes Amami-Oshima Island and Tokunoshima Island.

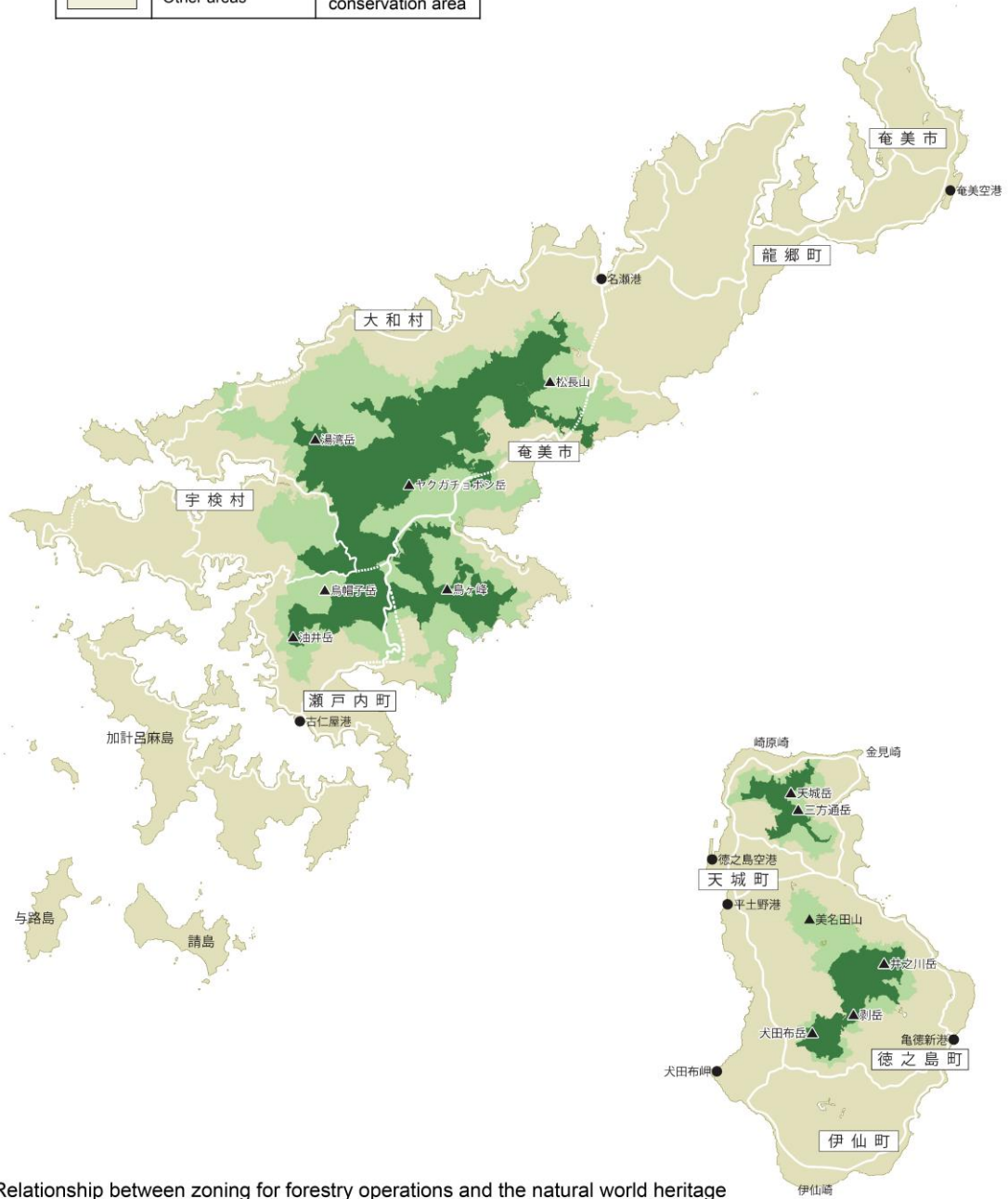
Overview of Zoning for Forestry Operations

Area	Zoning concepts
Area for natural environment conservation	Areas that have a large section of primeval nature or old growth forest remaining on Amami-Oshima Island and Tokunoshima Island. The Natural Parks Act ensures the protection of the primeval nature in these areas.
Area for controlled utilization	Areas that exist on the periphery of or nearby the area for natural environment conservation. In these areas, efforts are made to achieve both forestry operations and nature conservation under the provisions of the Natural Parks Act.
Other areas	Areas that are not subject to severe restrictions on logging but where efforts are made to conduct forestry operations by paying attention to conserving the natural environment.

Zoning for Forestry Operations in Relation to the Natural World Heritage and National Park

Area	World heritage	National park	Management policy	Major laws, regulations, etc.
Area for natural environment conservation	Property	Special Protection Zone and Class I Special Zone	No forestry operation is permitted.	Managed under the Natural Parks Act
Area for controlled utilization	Buffer zone	Class II Special Zone	Forestry operations are possible under certain conditions regarding consideration to the environment	Managed under the Natural Parks Act and Forest Act
Other areas	Surrounding conservation area	Class III Special Zone, Ordinary Zone, and outside parks	Forestry operations are possible under certain conditions	Managed under the Natural Parks Act and Forest Act

Legend		
	Forestry operation	World heritage
	Area for natural environment conservation	Property
	Area for controlled utilization	Buffer zone
	Other areas	Surrounding conservation area



Relationship between zoning for forestry operations and the natural world heritage

3. Management Guidelines for Each Area

Logging operations through cutting, skidding, and regeneration in each area must comply with the following permission requirements, matters requiring consideration, notification systems, and other necessary provisions under the Natural Parks Act and Forest Act in order to maintain the diverse functions of forests that have public benefits.

Area for natural environment conservation	
Cutting and skidding	No forestry operation is permitted.
Regeneration	No regeneration operation will arise due to the absence of forestry operations.
Area for controlled utilization	
Cutting and skidding	<p>Amami-Oshima Island</p> <ul style="list-style-type: none"> ● Requirements <ol style="list-style-type: none"> (1) The age of the trees/bamboos to be harvested must be at or above the standard rotation age. (2) The logging unit must be no greater than 10 hectares. (3) The logging unit must not be adjacent to a logging unit that was cut within the past three years. (4) No cutting and skidding is carried out in the vicinity of facilities for activities, etc. ● Matters requiring consideration <ol style="list-style-type: none"> (5) No cutting is carried out in the following forests. <ul style="list-style-type: none"> - Forests within 20 meters on each side of a road (national road, prefectural road, municipal road, and forest road) - Forests within 20 meters from the Special Protection Zone or Class I Special Zone of the national park - Forests within 20 meters on each side of a major river - Forests within 20 meters on each side of a major ridge - Forests recognized as habitats on which rare animals, plants, and others depend* (6) Use the skyline logging method that has minimum impact on the ground. (7) Keep the number of cutting trees obstructing yarding to a minimum when conducting skyline logging. (8) Take appropriate measures to prevent soil erosion. (9) Use the existing forest roads wherever possible.

	<p>(10) Appropriately take care of the roads or pathways used for logging after completing logging.</p> <p>(11) Spread logging units.</p> <p style="text-align: right;">etc.</p>
	<p>Tokunoshima Island</p> <ul style="list-style-type: none"> ● Requirements <p>(1) The age of the trees/bamboos to be harvested must be at or above the standard rotation age.</p> <p>(2) The logging unit must be no greater than 2 hectares.</p> <p>(3) The logging unit must not be adjacent to a logging unit that was cut within the past five years.</p> <p>(4) No cutting and skidding is carried out in the vicinity of facilities for activities, etc.</p> <ul style="list-style-type: none"> ● Matters requiring consideration <p>(5) Leave an unlogged space between logging units approximately as wide as the height of the surrounding forest canopy.</p> <p>(6) Spread logging units.</p> <p>(7) Take appropriate measures to prevent soil erosion.</p> <p>(8) No cutting is carried out in forests recognized as habitats on which rare animals, plants, and others depend*.</p> <p style="text-align: right;">etc.</p>
Regeneration	Natural regeneration in principle.
Other areas	
Cutting and skidding	<ul style="list-style-type: none"> ● Matters requiring consideration <p>(1) The age of the trees/bamboos to be harvested must be at or above the standard rotation age.</p> <p>(2) The logging unit must be no greater than 10 hectares.</p> <p>(3) Leave an unlogged space between logging units approximately as wide as the height of the surrounding forest canopy.</p> <ul style="list-style-type: none"> - Spread logging units. - Take appropriate measures to prevent soil erosion. - No cutting is carried out in forests recognized as habitats on which rare animals, plants, and others depend*. <p style="text-align: right;">etc.</p>
Regeneration	Natural regeneration in principle.

- For controlled utilization of Amami-Oshima Island, (1) and (4) in the area are based on the Enforcement Regulations of the Natural Parks Act; (2) and (3) are based on a special exception to the criteria based on the Natural Parks Act; (5) to (10) are based on Management and Operation Plan for the Amami Gunto National Park Amami-Oshima and Tokunoshima; and (11) is a voluntary code.
- For controlled utilization of Tokunoshima Island, (1) to (4) in the area are based on the Enforcement Regulations of the Natural Parks Act; (5) to (8) are voluntary codes.
- For other areas, (1) to (6) are voluntary codes.

*Referring to the habitats that are especially important for the survival of rare species including animals and plants or their local populations, old growth forests that are important for conservation and could become such habitats, and forests in the periphery of unique environments (e.g., rocky terrains and hollows), among others.

4. Sustainable Forestry That Co-exist with Nature

— Forestry operations in the area for controlled utilization —

To conduct forestry operations in consideration of natural environment, it is important to comply with the provisions of the Natural Parks Act and Forest Act as stated in the previous chapter. In addition, it is important that the forestry operators, relevant administrative institutions, and others share plans on logging operations and make adjustments as needed.

To this end, forestry operations in the area for controlled utilization will be carried out in compliance with the following items in addition to the requirements and matters requiring consideration described in the previous chapter.

●Rotation age

The standard rotation age of an evergreen broadleaved forests in Amami-Oshima Island and Tokunoshima Island is set at 30 years by Kagoshima Prefecture and local municipalities. This is based on the age of the forests that could maximize the average rate of growth volume and focuses on forests' function to produce timber. Meanwhile, it is pointed out that the forests' functions to maintain the environment including its biodiversity and water resources rely on the biomass volume of the forests and that these functions improve as the age of the forests increases (Fujimori, 2001). From this viewpoint, it is important to further raise the rotation age in Amami-Oshima Island and Tokunoshima Island, taking into consideration forests' economic function and environment conservation function, in order to maintain forests' biomass volume at a high level. Yoneda (2017) clarified that, if a forests' functions were evaluated as the product of their economic functions and environmental conservation functions, the rotation age that maximizes the functions would be approximately 1.5 times of the standard rotation age. He also points out that, in this case, while the economic functions (average ratio of growth) will decline by 22% compared with the standard

rotation age, the environmental conservation function will increase by 76%. Based on these, as a forestry policy in the buffer zone which is required to achieve both economic outcome and nature protection, the rotation age in the area for controlled utilization in Amami-Oshima Island and Tokunoshima Island is set at approximately 45 years or longer (30 years x 1.5).

- Maximum logging timber volume

The maximum logging timber volume in the area for controlled utilization in Amami-Oshima Island and Tokunoshima Island is set within the scope of the rate of growth while maintaining the necessary volume to constantly exercise the forests' functions to conserve biodiversity and to produce timber.

The maximum logging timber volume is calculated for each municipality. The rotation age used for its calculation here, is 1.5 times the standard rotation age normally used.

The maximum annual logging timber volume (E_w) is as shown below.

$$E_w = \left[Z + \frac{V_w - V_n}{T_a} \right]$$

Z: Annual rate of forest growth in the area for controlled utilization

V_w : Standing timber volume in the area for controlled utilization

V_n : Standing timber volume equivalent to 50% of the total standing timber volume calculated when all the trees in the area for controlled utilization reach 1.5 times of the standard rotation age (45 years old)

T_a : 1.5 times the standard rotation age stipulated for the area for controlled utilization (45 years old)

The maximum logging timber volume calculated here is not a target encouraged to be achieved; it is instead designed to regulate any logging exceeding the said ceiling.

- Sharing information on planned logging units

Logging operators prepare a list of planned logging units and maps showing the locations and so on at the end of each fiscal year (or the beginning of each fiscal year) for the forests to be harvested in the following (or current) fiscal year, and share them with administrative organs (e.g., the Ministry of the Environment, prefectures, municipalities).

The relevant organizations that have received such information should check the information

against the existing data on forests, habitats of rare wild animals and plants, the local populations and so on, that they each own, and if necessary, notify the logging operators the need to obtain a permission or approval. In addition, they ask the logging operators to consider the natural environment and make adjustments to their plan if any such consideration is necessary; for instance, when they have confirmed a habitat that is especially important for the survival of rare plant and animal species or their local population, or if the logging plan includes an old growth forest or a forest near the special environment (e.g., rocky terrain, hollow) that is important for conservation and could become such habitat.

References:

- Forestry and Fisheries Department, Kagoshima prefectural government (2007) *Decision Criteria for Natural Regeneration in Kagoshima Prefecture*. (in Japanese)
- Fujimori, T. (2001). *Ecological and Silvicultural Strategies for Sustainable Forest Management*. Elsevier, Inc. Amsterdam. 398pp.
- Yoneda, T. (2017). Diagnosis of a tropical rain forest and its forestry basing on net ecosystem productivity. *Jap. J. International Forest and Forestry* 100: 14-24. (in Japanese)