Conservation Program for the Bonin flying fox (*Pteropus pselaphon*)

Ministry of Education, Culture, Sports, Science and Technology
Ministry of Agriculture, Forestry and Fisheries
Ministry of Land, Infrastructure, Transport and Tourism
Ministry of the Environment

I. Purpose of the program

The Bonin flying fox (*Pteropus pselaphon*), which belongs to the family Pteropodidae, is the only mammal endemic to the Ogasawara Islands. It is a herbivore that mainly forages on fruits. As a large seed disperser and pollinator, the Bonin flying fox is a crucial member of the ecosystems of the oceanic islands that make up Ogasawara. At present, its occurrence has been confirmed only on Chichijima, Hahajima and the Kazan Island Group. Its population in all of the Ogasawara Islands is estimated to be about 300 individuals at most. In the past, several hundred individuals were confirmed on Hahajima, which is part of the Ogasawara Archipelago, but the population had rapidly plummeted to a very small number by the 1970s. At present the total abundance is expected to be about 130, most of which occur on Chichijima. Hence, they are deemed in serious danger of extinction in the near future.

In winter on Chichijima, Bonin flying foxes exhibit behavior not seen in other flying foxes, such as forming clusters in a colonial roost during the day in which individuals rest huddled together, and this is likely to be related to the development of a distinctive society. Currently, the Ogiura area on Chichiijma is the only confirmed winter roosting site. In winter, this roost is used by almost all individuals on Chichijima and is thought to be closely linked to breeding behavior.

Pressures thought to affect this species include: development around the colonial roost in winter; decrease of native forest vegetation; competition for food resources with rats; entanglement in bird netting and other netting used to prevent damage to crops; predation by housecats that have adapted to the wild (hereinafter “feral cats”); and anthropogenic disturbance of the roost.

The objective of the program is to create a society in which the Bonin flying fox can coexist harmoniously with people and to make the stable survival of this species in its natural state possible. This is to be achieved by: continuing to collect population, distribution and other data on this species; continuing to monitor it; mitigating or eliminating factors that place pressure on this species; maintaining or improving environments necessary for this species’ survival; striking a balance with human activities such as agriculture; raising public awareness of the need to protect this species; and facilitating the proper use of this species as a resource for tourism.

II. Program area

Ogasawara Islands, Tokyo

III. Program details

1. Ascertaining population and other data

In order to carry out the program properly and effectively, the following studies will be conducted as necessary. If changes are seen that merit concern, steps contributing to the preservation of the Bonin flying fox such as additional studies to identify the causes will then be taken.

(1) Understanding the biological characteristics of the species

In order to take the proper steps to conserve this species, it is necessary to ascertain basic ecological and biological information. Steps to obtain such biological information shall be taken, including studies of life history, feeding habits, migration and dispersal, home range, reproductive ecology, and population dynamics of the species in its natural state.

Individuals captured for injuries or diseases, and for studies will, whenever possible, undergo pathological and parasite tests to monitor the introduction or spread of contagious diseases. In addition, genetic information will be analyzed and compared to elucidate the genetic exchange among populations on the Ogasawara Archipelago and the Kazan Island Group and to study genetic diversity within individual populations, thereby gathering basic data necessary for the conservation of the species.

(2) Population/distribution surveys and monitoring

Surveys and research will be conducted to study population and distribution of the Bonin flying fox on Chichijima and Hahajima, and thereby determine important habitats. Habitats there will be monitored regularly. For islands in the Ogasawara Archipelago other than Chichijima and Hahajima, although the species' occurrence has not been reported, efforts will be made to search for foraging or other signs, and to gather sighting or other information. In the Kazan Island Group, efforts will be made to gain a better understanding of populations and distribution through the relevant studies.

(3) Habitat surveys and monitoring

Studies will be conducted of the vegetation, topography, and climate in and around habitat areas to understand the conditions crucial for the species' survival, and changes to those factors will be monitored regularly.

(4) Identifying factors affecting the maintenance of populations

Results from (1), (2), and (3) above will be analyzed with care taken to maintain populations, and factors affecting the maintenance of populations will be identified.

2. Maintaining and improving environments in the species' habitats

To ensure the stable survival of the Bonin flying fox in a natural state, it is important to keep the colonial roost, feeding grounds, and other areas crucial to this species in good condition.

Steps will be reviewed based the findings of the studies described in III.1 above. The following measures will then be taken as necessary to maintain and improve environments ideal for its survival.

In addition, efforts will be made to ensure the conditions necessary for the survival of this species whenever utilizing or developing land in its habitats.

(1) Ensuring supplies of food resources by restoring native forest vegetation

The Bonin flying fox feeds on the fruits of native plants such as *Pandanus boninensis* and *Machilus kobu*, but these plants are declining in number due to invasions by bishop wood (*Bischofia javanica*) and other alien plant species. At present, this species is largely dependent on agricultural crops for food, and is therefore causing damage to farm crops. For this reason, efforts will be made to ensure supplies of this species' natural food sources by restoring native vegetation through the eradication of alien plant species. If necessary, the possibility of planting native plants will also be studied.

Furthermore, the possibility of building feeding grounds will be studied as necessary to prevent food shortages due to environmental changes resulting from steps taken to prevent damage to crops or to eradicate alien plant species.

(2) Conserving the colonial roost

Because this species forms a colonial roost in winter, efforts will be made to conserve the roost as well as areas adjacent to it.

(3) Mitigating the impact of alien species

The impact of feral cats, rats, and other alien species that affect this species through predation or competition for food resources will be studied, and methods to control or eradicate the former will be studied and carried out. Special attention will be given to finding out the extent to which feral cats encroach upon the colonial roost and surrounding areas.

(4) Patrolling important habitats

Patrols and signage will be instituted to help conserve environments important to this species, such as forests rich in trees that the species feeds at, the colonial roost, and their environs.

3. Striking a balance with human activities such as agriculture

The survival of the Bonin flying fox is currently inextricably tied to human activity, as attested by

the fact that it is causing damage to crops (including damage to plants grown in home gardens) but there are also instances of this species becoming entangled in bird nets set up to prevent damage to crops, as well as concerns over disturbances caused by people encroaching on its habitats.

For these reasons, efforts will be made to determine the degree of damage to crops caused by this species. Further, safe and effective damage prevention methods will be researched, developed, and spread, and early detection systems will be put in place to find individuals that have been caught up in nets as quickly as possible. Attempts shall also be made to set up nets in such a manner that prevents this species from entanglement, whether they are for crop protection or other.

In addition, efforts shall be made to study forms of tourism as it relates to this species, such as the encroachment upon important habitats by tourists there for the purpose of watching, spotting, photography, etc. Modes of utilization of this resource in ways that contribute to sustainable local development and the stimulation of the local economy will be studied, and steps will be taken to promote the appropriate utilization of this species in tourism.

4. Rescuing sick and injured individuals

Systems shall be created among the concerned parties for rescuing or collecting Bonin flying foxes whenever, for example, there are sick or injured individuals caught in bird nets, etc. Rescued individuals will be returned to the wild when possible. If returning an individual to the wild is not a viable possibility, it will be studied to gain a better understanding of biological characteristics, to establish rearing methods, to raise awareness, or otherwise be used to contribute to the conservation of the species.

Individuals that have died will be examined to determine the cause of death to whatever extent possible. Mechanisms for preserving individuals and utilizing them later will be studied and the outcomes of those efforts will be used to further contribute to conservation measures.

5. Promoting awareness

In view of the actual conflict between the Bonin flying fox and people, in order to make the program effective, understanding on the part of local governments, the parties carrying out the different aspects of the program, local residents, tourists, and other members of the public, is crucial. For this reason, activities to raise awareness among the public of the need to protect this species and to inform them of the results of population/distribution studies and other aspects of the program's progress will be undertaken. The activities are expected to promote consideration and cooperation in conserving the species and to facilitate the development of voluntary conservation activities by the community.

The program will also seek to train specialists who will further research into this species, conduct related studies, and advance the cause of properly conserving this species.

6. Gaining cooperation in order to promote the program effectively

In implementing the program, steps will be taken to facilitate partnerships among the national government, local governments, persons with expertise in the biology, ecology and other aspects of this species, as well as groups and community residents participating in activities to protect this species, so that the program may proceed effectively.