

Wildlife, landscape use and society: regional case studies in Japan

Introduction: aims and scopes

This book describes the uniqueness of terrestrial vertebrates and the utilization of ecosystems by local people in Japan, emphasizing the great regional variety. It evaluates the originality of vertebrate species diversity in terms of the number of species endemic to Japan and species listed in the national Red List. The main focus is forest landscapes, which cover about 70 per cent of the Japanese landmass and have changed over the years under the influence of economic background and conservation pressures. Relationships between humans and nature vary significantly among regions and have changed considerably over time. Another focus is the distinction between satoyama (rural landscapes) and okuyama (remote mountains), with particular attention to biodiversity-based services, on which there are few studies in Japan. The following chapters deal with (a) three distinctive regions representing the richness and values of Japanese biodiversity, (b) effects of the economy and local awareness on biodiversity conservation and (c) inappropriate evaluation of satoyama as the cornerstone of biodiversity conservation.

1. Terrestrial biodiversity and landscape use across the country: a brief overview

Japan has a wide variety of terrestrial ecosystems due to a wide range of latitudes and altitudes, land bridges, and a mixture of natural and moderate human disturbances, from Hokkaido in the north to the Nansei Archipelago in the southwest. Many of the terrestrial endemic species have fragmented distributions, and nationally are appointed endangered species, due to the presence of land bridges. This chapter addresses national biodiversity in terms of species uniqueness and richness, represented with notable examples are the biodiversity of Amani Oshima and rural landscapes (known as satoyama), respectively. Biodiversity-based ecosystem services, as well as conservation, are priceless but often contentious topics within modern society. I have divided this country into four regions based on differences in characteristics of man's relationship with nature. These include the changes in regional focus by the Forestry Administration, from commerce through timber production to a broad spectrum of public-benefit functions in response to changes in economic conditions. Older protected areas under the jurisdiction of the Ministry of the Environment focuses on scenic beauty and local economies, conversely, newly established protected areas focus on biodiversity in response to increasing global interest.

2. Amami Oshima: a treasure island of unique species impacted by logging during the 20th century

The island Amami Oshima has many species that are endemic to the Nansei Archipelago. Government economic subsidies indirectly caused the populations of some species to decline through habitat destruction. Self-supporting industries make up only a small portion of the island's economy, so financial support from governments has been necessary to create a substantial number of jobs for local people. As a result of the subsidised logging, young secondary forests and clearfelled sites replaced most original forests in the central mountains, where all the wildlife species considered here live. The governments planned to manage these young forests on a 35-40 year rotation-cycle for pulpwood. The Amami thrush, the Owston white-backed woodpecker and the long-haired rat are so dependent on mature forests that it appeared they would probably not maintain their populations if all the old forests were cut down. The impacts of clearcutting on the Amami rabbit, the purple jay and the spiny rat were less evident than these species. This chapter proposes an increase in the length of rotation-cycles and changes in the use of subsidies to improve both the wildlife habitat and the economic efficiency of local forestry.

3. Amami Oshima (2): controlling mongoose populations and a new period of nature conservation

During the last decade of the 20th century, clearcut logging practices could not be sustained economically and there was a precipitous decline in wood production on Amami. This unexpected change saved populations of Amami thrush, Owston white-backed woodpecker, long-haired rat and other species that were dependent on the island's mature forests. On the other hand, populations of Amami rabbit, purple jay, Amami woodcock, Ryukyu robin and spiny rat declined in the central part of the island, where mongoose numbers skyrocketed. Mongoose control encountered critical financial problems, but many people participated voluntarily and succeeded in reducing the mongoose population to very low levels. Human attitudes toward nature are now nearly the opposite of those held 30 years or more ago. Efforts for conservation on Amami should be directed to achieving a reasonable balance between forestry and tourism, and figure out appropriate strategies to achieve such a balance. Forest logging has been conducted mostly in Uken and Yamato Village, while many tourists visit an intact forest and Amami rabbit habitat in Amami City. In any future scenario, forest cutting should be limited to small areas, but the newly established national park failed to set aside substantial areas that strictly regulate logging operations.

4. Forest utilization in Fukushima before and after the 2011 power plant accident

This chapter focusses on wildlife species endemic to Japan and on local people harvesting edible wild plants and mushrooms in Tadami town, southwestern Fukushima prefecture. The town is located in a remote mountainous region characterized by heavy snowfall, where loggers cut large areas of deciduous broadleaf trees for chip wood. Coniferous plantations occupy relatively small areas due to heavy snow, steep slopes and remoteness from human settlements and main roads. Many local people are engaged in gathering a variety of wild vegetables in spring and mushrooms in fall. A study revealed that the amount of these non-timber forest products (NTFP) have a large economic value. Visitors from outside the region enjoy outdoor recreation, such as angling and hiking. The nuclear power plant accident in 2011 had significant impacts on such forest ecosystem services for local people and visitors, particularly on the Pacific Coast side of the prefecture. Tadami seems to have recovered from those impacts, but population decline continue to impose considerable challenges. Thanks to unique natural environmental conditions, Tadami is rich in biodiversity and NTFP. Still, ecosystem services and traditional knowledge of NTFP use would gradually decline as small local communities disappear.

5. Forests and satoyama landscapes in the suburb of metropolitan area

Rice paddies, dry fields, woodlands, small streams, and residential settlements comprise satoyama landscapes. Locals abandoned the traditional land management practices and these landscapes underwent drastic changes several decades ago. Satoyama activities in Kanagawa Prefecture do not suggest that the restoration of traditional landscapes is the primary objective. I set up census routes in satochi landscapes around Tsukuba Science City to monitor leisure activities of nearby residents visiting satochi landscapes and to record bird species from 1999 to 2005. Dividing the census routes into 150 sections, the average number of visits per section indicated that the use frequency was high on sections that ran between woodland and rice paddies near residential districts. Regression analyses indicated that the frequency was significantly correlated with population size, distance from a residential settlement, and certain land-use types. A mountain area north of the city has different avifauna from satochi, having some components of okuyama and suggesting the importance of large trees. Based on these studies, I conclude that it is not reasonable to argue that traditional management of satoyama is essential to preserve representative and richness of Japanese biodiversity.

6. Regional comparison and summary discussion

In the wooded areas of northwestern Kyushu, plantations predominate. Satoyama activities are more inclined to forestry than in the Kanto region. There are not many endangered terrestrial vertebrate species and active conservation groups, and nature-based tourism is relatively unpopular. A study in West Java suggests that areas near the national park boundaries, where people frequently harvest non-timber forest products (NTFPs), are used as habitats in different ways by three indicator wildlife species. Advantages of Indonesia's national park include pertinent land ownership and division of roles between government agencies. A nation-wide assessment of Japan's avian species richness generally corresponded to the regional comparisons shown in the previous chapters; species-rich in the north and more threatened in the south. The Japanese park and reserve systems does not play a critical role in biodiversity conservation, but the economy and the natural environment have substantial influence. Species richness and biodiversity-based landscape use seem to be positively correlated and to have significant influence on key policy directions of government. Biodiversity conservation improved on Amami and in Tadami, the situation improved for biodiversity conservation but not significantly changed in satochi and northwestern Kyushu.