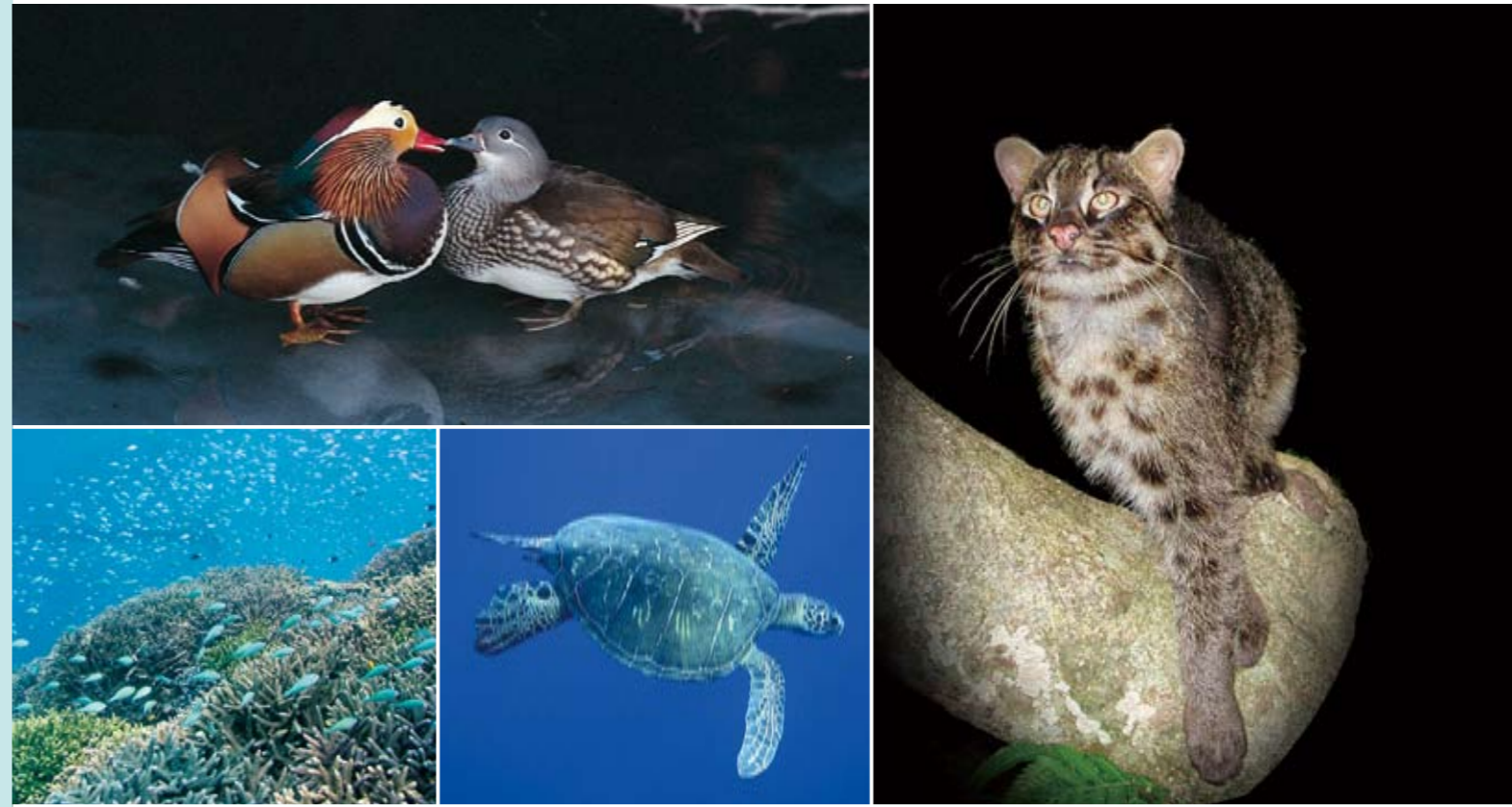




The Wildlife in Japan



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# Japan living with abundant Wildlife

Over 90,000 animal species have been confirmed in Japan. Despite the country's small size, some 38 million ha, repeated connections with and separations from the Eurasian Continent, its long, complex terrain stretching from north to south, high precipitation, four distinct seasons, disturbance caused by volcanic eruptions and river flooding, and human activities such as agriculture and forestry have created diverse habitats that support rich biodiversity. All of the species are irreplaceable having evolved over the ages, and they have formed rich ecosystems by interacting with each other. The Wildlife in Japan is classified into the following 5 groups: Wildlife in Northland, Wildlife in Mountains, Wildlife in Rural Area, Wildlife in Wetlands and Wildlife in Subtropics.

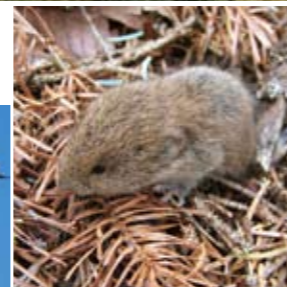
*Dicentra peregrina*



*Alsophila mertensiana*



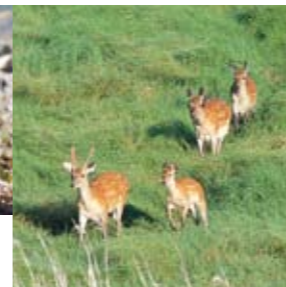
Japanese crane



Red-backed vole



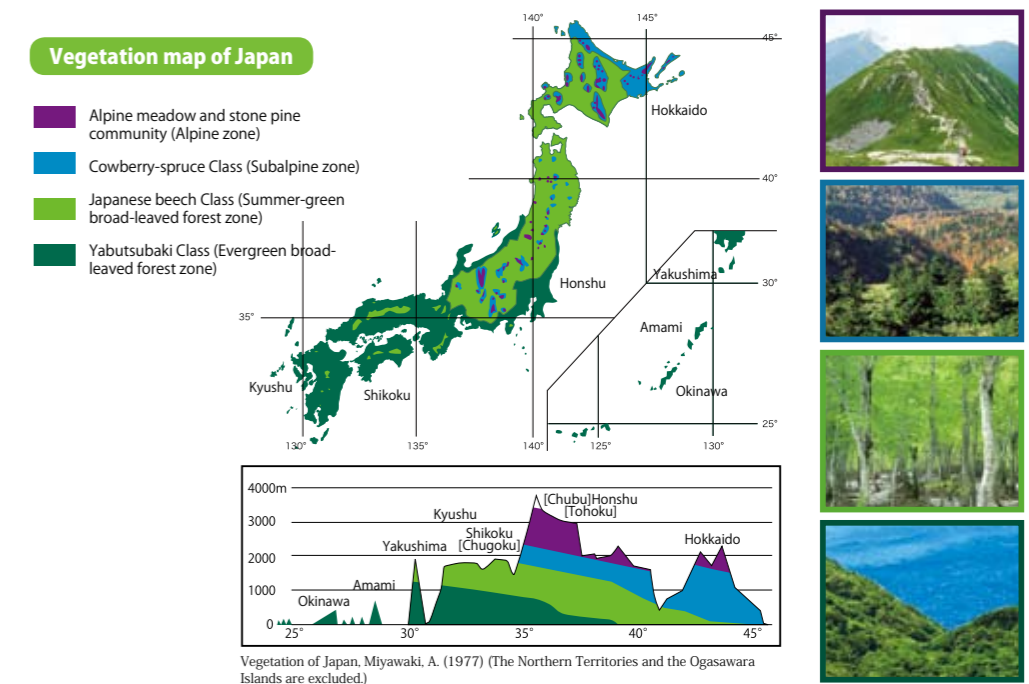
Japanese macaque



Hokkaido sika deer

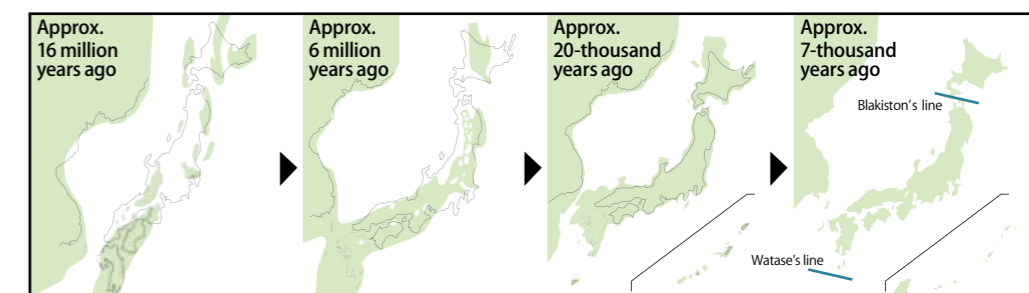
## Flora of Japan

The flora of Japan can be roughly classified into the following four categories based on the differences in temperature and precipitation: alpine zone, subalpine zone, summer-green broad-leaved forest zone and evergreen broad-leaved forest zone. The alpine zone is dominated by stone pines, the subalpine zone is dominated by spruces, and evergreen needle-leaved trees, the summer-green broad-leaved forest zone is dominated by deciduous broad-leaved trees such as Japanese beeches and Japanese oaks, and the evergreen broad-leaved forest zone is dominated by evergreen broad-leaved trees such as Yabutsubaki (*Camellia japonica*) and Shii (*Castanopsis spp.*) The Japanese archipelago is long, stretching from north to south, and has mountain ranges exceeding 3,000 m; therefore, its vegetation changes both horizontally (with latitude) and vertically (with altitude).



## Fauna of Japan

The fauna of Japan is close to that of the Eurasian Continent. This is owing to the migration of animals from the continents during the ice age when the Japanese archipelago was connected to the mainland. But, there is a significant difference in fauna between the Yakushima-Tanegashima Islands and Amamioshima Island reflecting the history of repeated connections with and separation of these Islands from the continent. The Watase's line, a biogeographic border, has been proposed between the Islands. The fauna in north of this line is similar to that of the Eurasian Continent while the fauna in south of this line is close to that of Taiwan and Southeast Asia. There is also a difference in fauna between Hokkaido and other three main islands, and the Blakiston's line, a biogeographic line situated in the Tsugaru Straits, has been proposed.



Yonekura, N., Kaizuka, S., Nogami, M. and Chinzei, K. (2001) Regional Geomorphology of the Japanese Islands, Vol. 1. Introduction to Japanese Geomorphology, University of Tokyo Press, Tokyo.

## Endemic Species of Japan

Geohistorically isolated habitats, including islands such as Okinawa, Amami and Ogasawara Islands, alpine regions such as the Daisetsu Mountains and the Japan Alps, and Lake Biwa and Ozegahara, are inhabited by many endemic species. The proportion of endemic species is also high as the entire country; approximately 40% of terrestrial mammals and vascular plants, approximately 60% of reptiles and approximately 80% of amphibians are endemic species of Japan.

The Japanese macaque, the Japanese weasel, the Japanese serow, the Japanese squirrel, the Japanese giant flying squirrel, the Japanese dwarf flying squirrel, the Japanese red-backed vole, the Okinawa spiny rat, the Japanese dormouse, the Amami rabbit and the Japanese hares are endemic mammals of Japan.



▶ **Rebun-kinbai**  
*Trollius ledebourii* var. *polysepalus*

Found only in Rebun Island, a northern-most island of Japan. This plant has pretty orange-yellow or orange-red blooms in around June. One of the plants of Ranunculaceae, and it form alpine plant communities.



Blessed with rich nature, reflecting its history of once being connected to the continent, Hokkaido is home to numerous animal species not found in Honshu and other parts of Japan, such as brown bear, hazel hen, Siberian salamander and Japanese huchen. In winter, eagles, seals and other wildlife migrate to Hokkaido from further north. Because Hokkaido is at high latitude in Japan, plants that are only found in the alpine and subalpine zones in Honshu grow at low altitudes there.

**Plants characteristic to high latitude**

▶ **Rebun-hanashinobu**

*Polemonium caeruleum* subsp. *laxiflorum* f. *insulare*  
Among *Polemonium caeruleum* ssp. *laxiflorum* that grow in Hokkaido, those found in Rebun Island are separately classified as *Polemonium caeruleum* ssp. *laxiflorum* f. *insulare* due to their short inflorescences and dense flowers. A plant of Polemoniaceae.



◀ **Ezonohakusanichige**

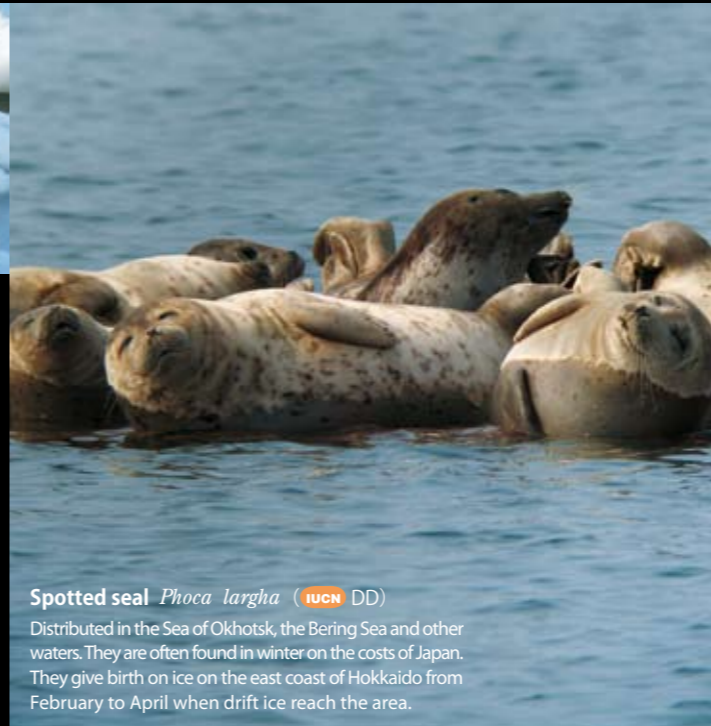
*Anemone narcissiflora* var. *sachalinensis*  
Grow in wet grassland in the alpine zone and has white blooms. Closely related to more southerly distributed *Anemone narcissiflora* var. *nipponica* and distributed in the northern parts of the Tohoku region and Hokkaido. A plant of Ranunculaceae.

**Migrating wildlife**



▲ **Steller's sea eagle**  
*Haliaeetus pelagicus pelagicus*  
(env VU IUCN VU)

Found along the Okhotsk coasts on Hokkaido. Come to Japan (mainly to Hokkaido) during winter. A recent study showed that 2,500 birds, about half of the total number of the world population, overwinter in Japan.



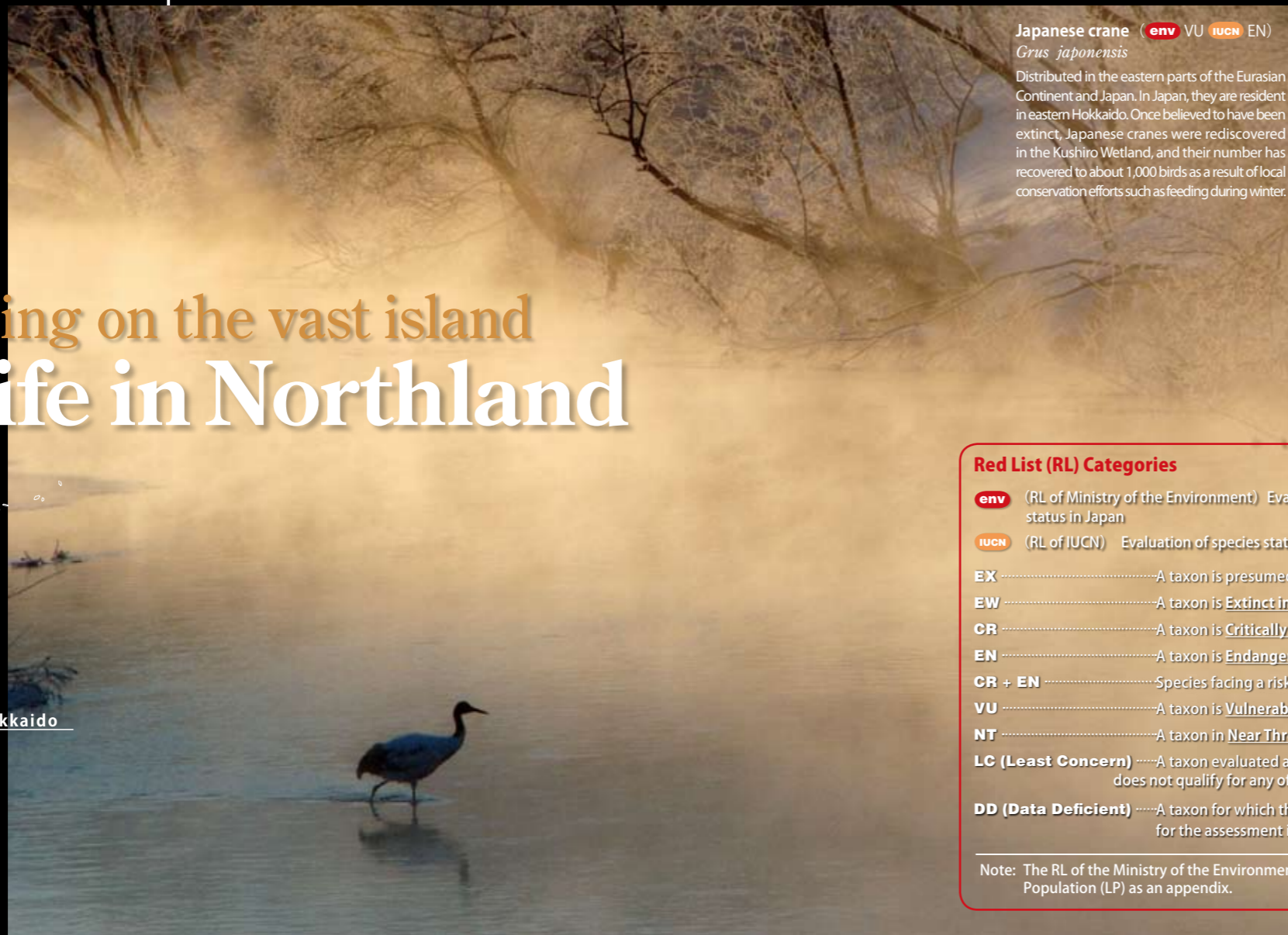
▶ **Spotted seal** *Phoca largha* (IUCN DD)

Distributed in the Sea of Okhotsk, the Bering Sea and other waters. They are often found in winter on the coasts of Japan. They give birth on ice on the east coast of Hokkaido from February to April when drift ice reach the area.

▶ **Japanese crane** (env VU IUCN EN)  
*Grus japonensis*

Distributed in the eastern parts of the Eurasian Continent and Japan. In Japan, they are resident in eastern Hokkaido. Once believed to have been extinct, Japanese cranes were rediscovered in the Kushiro Wetland, and their number has recovered to about 1,000 birds as a result of local conservation efforts such as feeding during winter.

Life dancing on the vast island  
**Wildlife in Northland**



**Red List (RL) Categories**

- env** (RL of Ministry of the Environment) Evaluation of species status in Japan
- IUCN** (RL of IUCN) Evaluation of species status in the world
- EX** .....A taxon is presumed **Extinct**
- EW** .....A taxon is **Extinct in the wild**
- CR** .....A taxon is **Critically Endangered**
- EN** .....A taxon is **Endangered**
- CR + EN** .....Species facing a risk of extinction; only **env**
- VU** .....A taxon is **Vulnerable**
- NT** .....A taxon in **Near Threatened**
- LC (Least Concern)** .....A taxon evaluated against the criteria and does not qualify for any of the categories; only **IUCN**
- DD (Data Deficient)** .....A taxon for which the information necessary for the assessment is insufficient.

Note: The RL of the Ministry of the Environment lists Threatened Local Population (LP) as an appendix.

**Wildlife not found in Honshu and other parts of Japan**

▶ **Brown bear** (env LP IUCN LC)  
*Ursus arctos yesoensis*

A subspecies of brown bears that are widely distributed in North America and the Eurasian Continent. The largest terrestrial animal in Japan. They inhabit mountains and forests in Hokkaido, and the home range of males is as much as hundreds of square kilometers. Being at the top of the food chain, brown bears are the symbol of rich nature in Hokkaido. Populations inhabiting Teshio-Mashike area and the western part of Ishikari area are designated as Threatened Local Populations (LP).



▶ **Siberian chipmunk** (env DD IUCN LC)  
*Tamias sibiricus lineatus*

A subspecies of chipmunks that are distributed in the northern parts of the Eurasian Continent, Hokkaido and its outer islands and Sakhalin. They dig holes under the ground to store food, and hibernate in underground burrows during the cold Hokkaido winter.



▶ **Pika** (env NT IUCN LC)  
*Ochotona hyperborea yesoensis*

A relict that migrated to Hokkaido during the ice age when the island was connected to the Eurasian Continent. A herbivore that feeds on herbs, ferns, moss and mushrooms.



▶ **Hokkaido red fox** (IUCN LC)  
*Vulpes vulpes schrencki*

A subspecies of red foxes that are distributed in most parts of the Eurasian Continent. Inhabit only Hokkaido and is slightly larger than the Japanese red fox, a counterpart found in Honshu and other parts of Japan. Mainly feed on rodentsts, small birds and insects.

▶ **Hokkaido sika deer** *Cervus nippon yesoensis* (IUCN LC)

The largest among several subspecies of the Japanese sika deer and about twice as large as the Yaku deer, the smallest of them all. To prevent damages to agriculture and forestry, population management and damage control are being taken.





# Magnificent life supported by deep forest

## Wildlife in Mountains



**Golden eagle** (env EN IUCN LC)

*Aquila chrysaetos japonica*

The largest bird of prey in Japan with a wingspan of over 2 m. Feed on hares, birds and reptiles and widely inhabit mountain terrain from high to lowlands. Their distributions are fragmented and their population size is small in Japan.

Mountains run through the center of the Japanese archipelago. Depending on latitude and altitude, a variety of mountain flora occurs, such as stone pine community, alpine grassland, needle-leaved forests, broad-leaved forests, deciduous broad-leaved forests and evergreen broad-leaved forests. The mountain fauna also changes with such vegetation variation, which the animals use as nests or food sources. Rich fauna and flora in mountains support fundamentally the country's biodiversity.



### Life in alpine

**Rock ptarmigan** (env EN IUCN LC)

*Lagopus mutus japonicus*

A southernmost living subspecies of ptarmigans distributed in the circumpolar regions of the northern hemisphere. A relict of ice age only inhabiting mountainous areas in Honshu higher than 2,400 m. In the past, ptarmigans were called the "messengers of God" in mountain worship. The birds use stone pine areas and high grassland all year round and their feathers turn white during winter.



**Japanese serow** (IUCN LC)

*Capricornis crispus*

One of the representative species endemic to Japan. Use deciduous broad-leaved forests as their main habitat and move nimbly rocky slopes. Once threatened with extinction, they now maintain a stable population as a result of conservation measures.



### Life in evergreen and deciduous broad-leaved forests



**Narcissus flycatcher** (IUCN LC)

*Ficedula narcissina*

Inhabit from Hokkaido through Kyushu as a summer bird and in more southerly parts of Japan as a resident bird. Sing in beautiful, varied whistles. Males have distinctive plumage with a beautiful contrast of black and yellow, and females have brownish feathers.



**Bohemian waxwing** (IUCN LC)

*Bombycilla garrulus centralasiae*

A winter bird in Japan found throughout the country, although their number significantly varies each year. Move in a flock and mainly feed on fruits of trees. Have a distinctive crest on the back of their head.



**Japanese macaque** *Macaca fuscata* (IUCN LC)

The northernmost living monkey in the world and endemic to Japan. Inhabit deciduous broad-leaved forests and evergreen forests. They give agricultural damages in some areas, and their future conservation and management is an issue.

### Life in forest bed

**Eastern-Japanese common toad** (IUCN LC)

*Bufo japonicus formosus*

A large toad species distributed in central Honshu and eastward and some parts of Hokkaido. During the breeding season, many males congregate around a female fighting for mating. The western-Japanese common toad, a subspecies, is distributed in the Chubu region and westward.



**Five-finger fern** *Adiantum pedatum*

In Japan, grow in mountainous forests in Hokkaido and Honshu as well as in some parts of Shikoku and Kyushu. The Japanese name Kujaku-shida (peacock fern) is derived from their resemblance to a peacock with their tail feathers spread.



**Honey mushroom**

*Armillaria mellea*

A fungus found throughout Japan. There are several close species. Fungi support the material circulation in the forest ecosystem through decomposition of organic matter such as dead trees and fallen leaves and branches.

**Small Japanese field mouse** (IUCN LC)

*Apodemus argenteus*

A small rodent endemic to Japan, widely distributed from Hokkaido through Kyushu. Forest-dwelling mice, including this species, usually storing food, such as acorns, in the ground. The acorns left uneaten will grow, subsequently forming forests of the next generation.





## Life in paddy fields

### ▼ White-fronted goose *Anser albifrons frontalis* (env) NT (IUCN) LC

A winter bird locally found in northern parts of Japan. They rest in large lakes and feed on rice remains in fields and the leaves and stems of aquatic plants. A large bird adapts to the rural environment in Japan.



### ▲ Giant water bug (env) VU *Lethocerus deyrollei*

The largest aquatic insect in Japan. Prey on small fish and frogs using their large sickle-shaped forelegs. Once threatened with extinction owing to the use of agrochemicals, there are recently signs of recovery in their number in some areas.



### ▲ Heike firefly *Luciola lateralis*

A luminous insect popular along with Genji fireflies. At night, they emit light from their lower abdomen and use light signals to communicate with each other. Inhabit still-water bodies such as paddy fields and marshes.



### ▲ Kanto dandelion

*Taraxacum platycarpum*  
Native to Japan, found from the Kanto region through the eastern part of the Chubu region. There are 20 dandelion species in Japan, which intercross with introduced species such as the European dandelion.

Visitors to villages in Japan will see rice paddies, irrigation canals and ponds, and woodlands for collecting fallen leaves and fuel wood; together they form unique landscapes called "Satoyama." Through human interventions into each of the habitat components, complex ecosystems are maintained, providing unique habitats for diverse organisms. However, a significant decline in the interactions of people's activities in Satoyama due to changes in their lifestyles has broken down the balance of the ecosystems and has brought many species to verge of extinction.

## Life in woodlands

### ▼ Grey-faced buzzard

*Butastur indicus*

(env) VU (IUCN) LC

Range from Honshu through Kyushu as a summer bird and overwinter in the Nansei Islands. This medium-sized falcon forms flocks during migration seasons in spring and fall. In fall, they congregate near Cape Irago, and large migrating flocks are seen at Cape Sata in Kyushu.



### ▶ Raccoon dog (IUCN) LC

*Nyctereutes procyonoides*

Nocturnal, wander in family groups and feed on small animals, such as rodents, insects, and fruits. This medium-sized mammal has adapted to the rural environment. The raccoon dog is one of the most familiar wildlife to Japanese people through folklores and traditions.



### ▲ Great purple emperor (env) NT

*Sasakia charonda charonda*

Distributed in East Asia. In Japan, this large emperor butterfly ranges southern Hokkaido and southward. Males have beautiful purple wings. They suck tree sap, not nectar, and form territories. National butterfly of Japan.



### ▲ Giant stag beetle *Lucanus maculifemoratus*

*Dryad Minois dryas bipunctata*

**Japanese rhinoceros beetle *Trypoxylus dichotomus***

Rhinoceros and stag beetles have large horns or jaws and are popular among children as well as enthusiasts. These insects are often found in woodlands seeking tree sap. Recently, a large number of close-related Coleoptera are imported every year, and their intercrossing with native species in the wild has been concerned.

# Wildlife living with local people Wildlife in Rural Area



### ▲ Minamimedaka (env) VU

*Oryzias latipes*

A small freshwater fish, 4 cm in body length, representing the rural environment of Japan. A part of its Japanese name, medaka (high eyes), is derived from their large eyes positioned high in the head. The generic name, *Oryzias*, means "rice."

### Japanese tree frog *Hyla japonica* (IUCN) LC

Distributed throughout Japan and one of the most familiar wild animal to Japanese people. Inhabit flat and hilly rural areas and found on low trees and grass. They actively croak before rain.



### ▲ Water clover (env) VU (IUCN) LC

*Marsilea quadrifolia*

An aquatic fern. Once known as a very common lowland weed. They are disappearing from paddy fields owing to the use of herbicides.



### ▲ Dogtooth violet *Erythronium japonicum*

**Japanese Luehdofia *Luehdorfia japonica* (env) VU (IUCN) NT**

The dogtooth violet is a well-known flower also appearing in Manyoshu, a collection of poetry compiled in the Nara period. This luehdofia species is endemic to Japan and phylogenetically one of the old swallowtail butterflies. Both only appear in spring.

## Column

### Endangered species in paddy fields

The biodiversity in paddy fields has been significantly reduced owing to the past use of a large amount of chemicals and farmland consolidation. Once familiar paddy fields, such as the giant water bug, diving beetle, killifish and water clover, are decreasing in their numbers.

Japanese oriental white storks and Japanese crested ibises, widespread in rural areas throughout the country in the past, have been extinct in the wild. Following their successful captive breeding, reintroduction projects of the stork in Toyooka City in Hyogo Prefecture and of the ibise in Sado City in Niigata Prefecture have been ongoing in an attempt to restore the paddy field ecosystems with the birds at the top of the food chain. These attempts to reintroduce large birds to populated areas are among the first in the world.

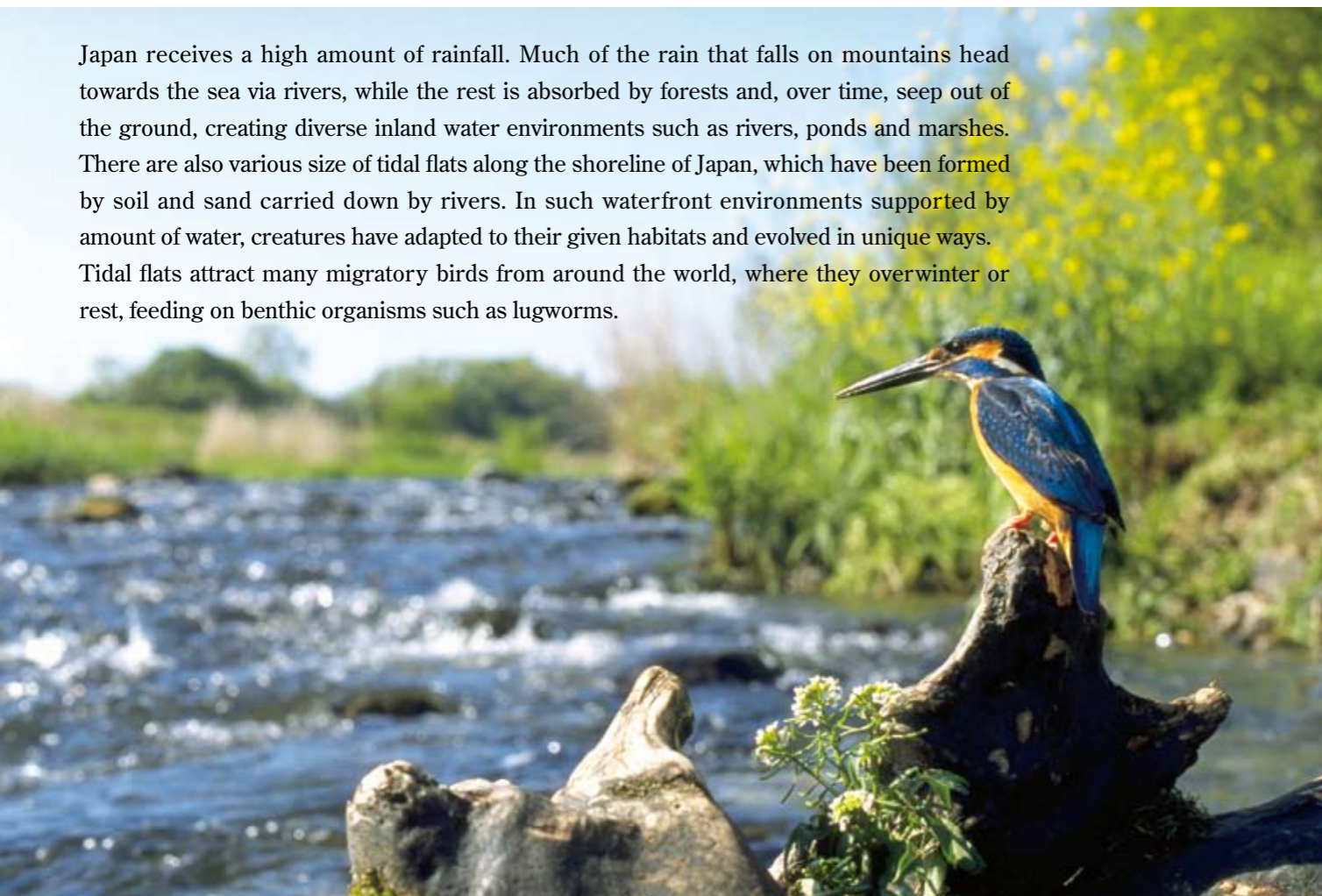


### Japanese oriental white stork

*Ciconia boyciana* (env) CR (IUCN) EN



Japan receives a high amount of rainfall. Much of the rain that falls on mountains head towards the sea via rivers, while the rest is absorbed by forests and, over time, seep out of the ground, creating diverse inland water environments such as rivers, ponds and marshes. There are also various size of tidal flats along the shoreline of Japan, which have been formed by soil and sand carried down by rivers. In such waterfront environments supported by amount of water, creatures have adapted to their given habitats and evolved in unique ways. Tidal flats attract many migratory birds from around the world, where they overwinter or rest, feeding on benthic organisms such as lugworms.



# Life fostered in waterfront Wildlife in Wetlands

▲ **Kingfisher** *Alcedo atthis bengalensis* (IUCN LC)  
A small bird widely distributed from Hokkaido through Kyushu. Well adapted to populated environments, as shown by their breeding in ponds of city parks and canals. With their beautiful plumage, metallic turquoise and orange, they are called the "flying jewel."



◀ **Japanese giant salamander** *Andrias japonicus* (env VU IUCN NT)  
The world's largest amphibian species endemic to Japan, sized over 1 m in length, and mainly distributed in western Japan. Due to their long lifespan and because they spend much of their life in water, stable water quality and quantity are required.

## Life in rivers

▼ **Ayu** (IUCN DD) *Plecoglossus altivelis*  
An diadromous, annual fish that uses both rivers and the sea during their lifecycle. After descending to and growing in the river mouth or the coastal area after hatching in the lower reaches of a river in fall, Ayu ascends to the upper to middle reaches of the river in summer, where they establish territories, and further grow by feeding on adhesive algae on rocks.



▼ **Japanese huchen** (env EN IUCN CR) *Hucho perryi*  
Distributed in Primorsky Krai, Sakhalin and, within Japan, from northern to eastern Hokkaido. A large salmonid species (a fish sized over 2 m has been recorded). The larvae feed on insects until they grow to around 30 cm, at which point they start eating other fish.



## Life in marsh

▼ **Asian skunk cabbage** *Lysichiton camtschatcense*  
Grow in cool wetlands in central Honshu and northward, and have large flowers contained within a white spathe from May through July. Belong to the Araceae family and spread large leaves in summer.



▲ **Common sundew** *Drosera rotundifolia*  
An insectivorous plant that grows in sunny, acidic wetlands. The plants catch small insects using the long glandular tentacles extended from the leaves, and dissolves and extracts nutrients from them. Has white flowers from June through August.



▲ **Tokisou** (env NT) *Pogonia japonica*  
An orchid once common in sunny wetlands throughout the country. Its number has been decreasing nationwide. Has reddish-purple flowers from May through July.



► **Bog rosemary** *Andromeda polifolia*  
An evergreen, undershrub that grows in cool wetlands in central Honshu and northward. Bear small pink flowers from June through July. The Japanese name, Hime-shakunaga (small rhododendron), is derived from its overall resemblance to rhododendrons and small size.



► **Water lily** (IUCN LC) *Nymphaea tetragona* var. *angusta*  
A perennial floating-leaved plant commonly found in old ponds and bogs from Hokkaido through Kyushu. The flowers, around 5 cm in diameter, are seen around noon and close at night. The Japanese name, hitsujigusa (sheep plant), was given, because its flowers open during the "hour of the sheep" (1 - 3 p.m.)."



▲ **Musuji-damselfly** *Cercion sexlineatum*  
Widely distributed from Miyagi Prefecture in the Tohoku region and southward through the Nansai Islands. Commonly found in ponds, bogs and wetlands on flatland, where aquatic plants thrive, as well as in paddy fields, but also sometimes in coastal blackish-water bogs. Females lay eggs inside plants tissues.

► **Mudskipper** (env EN) *Boleophthalmus pectinirostris*  
In Japan, the mudskipper distributes only some muddy tidal flats along the Ariake and Yatsushiro Seas. Hide in burrows during the high tide. During the low tide, they come out to the mud surface and males fight each other defending their territories.



▼ **Snipes and plovers**  
Some bird species travel a long distance, even between northern and southern hemispheres, for wintering and breeding. To conserve such migratory birds and their habitats in their flyway through international cooperation, Partnership for the East Asian Australasian Flyway.



◀ **Horseshoe crab** (env CR+EN IUCN DD) *Tachypleus tridentatus*  
Found in the muddy sea bottom on some tidal flats in the Setonaikai Sea and Kyushu. Also called a living fossil. Once common enough to be used to make fertilizers, they are now considered an endangered species.

▼ **Loggerhead sea turtle** (env EN IUCN EN) *Caretta caretta*  
Spend much of their life in the sea and only come on shore to lay eggs on the beach. The hatchlings spend 20 - 30 years in the Pacific Ocean until they mature. The Nagatahama Beach in Yaku Island is one of the most important breeding sites in the world of the loggerhead sea turtle.





# Unique life embraced by southern wind

## Wildlife in Subtropics

In subtropical islands (Nansei Island) situated southwest to Japan, including Okinawa and the Amami Islands, coral reefs and mangrove forests are developed on some parts of coast areas. On mountains, evergreen forests are sustained with Sudajii (*Castanopsis cuspidata* var. *sieboldi*) as a dominant species, and giant ferns characteristic to the subtropics, such as the Hikagehego (*Cyathea lepifera*), are found. In these islands, the fauna and flora have taken distinctive evolutionary history due to their unique environments characterized by the subtropical climate, and because the islands have been isolated from the continent much longer than Honshu and other parts of Japan have. The Ogasawara Islands, at 1,000 km south of Tokyo, have been isolated since their formation, and therefore are home to many endemic species to the islands.

► **Humpback whale** (IUCN LC)  
*Megaptera novaeangliae*

A baleen whale reaching as much as 12–13 m in body length and weighing 30 t. They have long pectoral fins, and individuals can be identified by the variation of patterns on their tail flukes. A popular subject of whale watching with their unique singing and dynamic jumping.



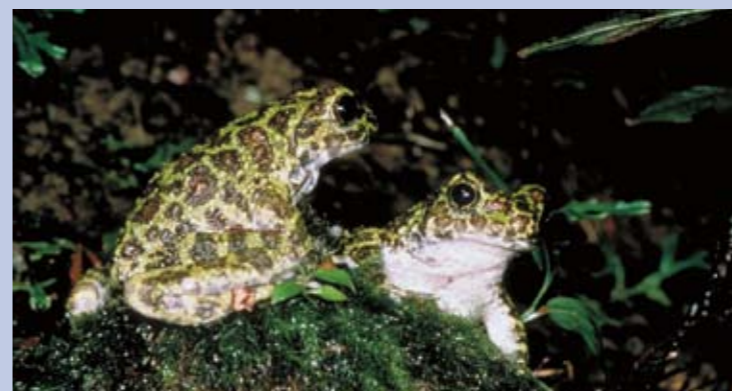
► **Dugong** (env CR IUCN VU)  
*Dugong dugon*

The sea around the main island of Okinawa is a habitats of the northernmost living populations of dugong, which are mainly distributed in tropical waters. This marine mammal—after which the mermaid was modeled, some suggest—mainly feeds on seaweeds growing in shallow waters.



▲ **Okinawa Ishikawa's frog** (env EN IUCN EN)  
*Odorrana ishikawae*

Sized around 10 cm in length and have a patchy pattern of green and dark brown on body. People say they are the most beautiful frog in Japan. Distributed on the main island of Okinawa, they mainly inhabit mountain streams.



▲ **Yambaru long-armed scarab beetle**  
*Cheirotonus jambar* (env EN)

The largest beetle in Japan discovered in 1983 in the Forest of Yambaru in the northern part of the main island of Okinawa. Found mainly in holes of old trees.

◀ **Amami rabbit** (env EN IUCN EN)  
*Pentalagus furnessi*

A primitive rabbit only found in the Amamioshima Island in the world. This forest-dwelling rabbit has a unique figure with short hind legs and ears. Supposed a living remnant of ancient rabbits of the Eurasian Continent, having migrated to the islands when the continent and the islands were connected. The rabbit is currently endangered owing to predation by the mongooses introduced by humans and other factors. Mongoose control program has been implemented.



▲ **Crested serpent eagle** (env CR IUCN LC)  
*Spilornis cheela perplexus*

Distributed from South Asia through Southeast Asia, and within Japan, in Ishigaki and Iriomote Islands as a resident bird. Prey on small animals in paddy fields and wetlands, such as snakes, frogs and crabs.



▲ **Okinawa habu**  
*Protobothrops flavoviridis*

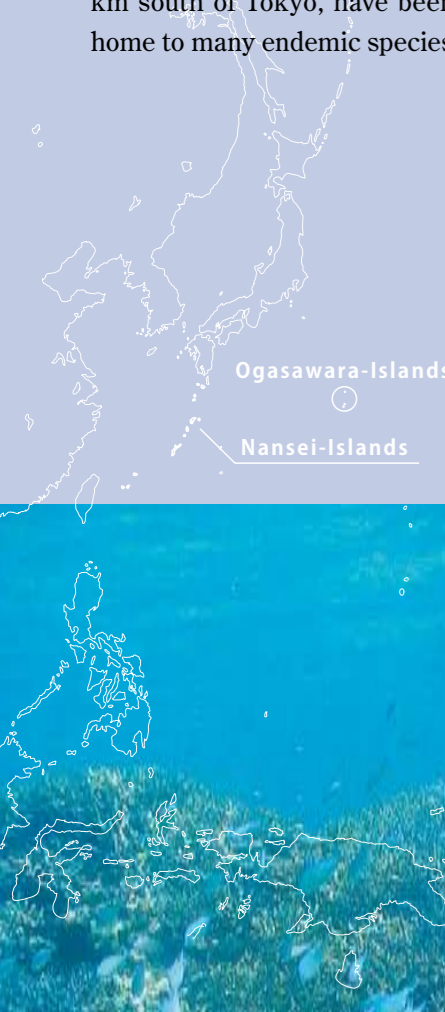
Distributed from the Amami Islands through the Okinawa Islands and found in mountains as well as near residences. This highly venomous snake mainly preys upon rodents.

◀ **Ogasawara flying fox** (env EN IUCN CR)  
*Pteropus pselaphon*

A large flying fox that mainly feed on fruit. They took a unique evolutionary history in the Ogasawara Islands—oceanic islands—and is a distinguish species from flying foxes in the Nansei Islands.



Mangrove forest







# Coexistence with other irreplaceable life

## Conservation of endangered species

The extinction of a species directly results in the loss of biodiversity. To protect irreplaceable wildlife that has been described here, the Ministry of the Environment, based on the Law for the Conservation of Endangered Species of Wild Fauna and Flora, has implemented various conservation and breeding programs, including the restriction on the hunting and collection of designated wildlife species, control of development

activities through the designation of habitat protection areas, conservation and restoration of habitats, control of introduced alien species and promotion of captive breeding, targeting rare wild animals and plants endangered caused by loss of habitats, development, hunting and harvesting, introduced species and other factors. Joint efforts by local people, governments and other stakeholders are described below:

An orchid belonging to the Genus *Cypripedium*. *Cypripedium* plants are very popular among enthusiasts for their beautiful flowers, and strict measures to protect the habitats have been taken to stop illegal collection. Tissue culture program has also been tried.



Rebun-atsumorisou  
*Cypripedium macranthos* var. *rebunense*



Blakiston's fish owl  
*Ketupa blakistoni blakistoni*

The world's largest owl with a wingspan of 180 cm, distributed from eastern through central Hokkaido. Conservation measures have been taken, such as the installation of artificial nest boxes and feeding during winter. The estimated current population in Japan is approximately 140.

(env CR IUCN EN)



Itasenpara bitterling  
*Acheilognathus longipinnis*

A bitterling fish with unique characteristics; they spawn inside bivalves of Unionidae and the hatchlings grow there. Currently, habitat improvement measures, such as the restoration of coves (wando) and the control of introduced fishes, and captive breeding programs at aquariums have been ongoing.

(env CR IUCN VU)



Abe's salamander  
*Hynobius abei*

Small salamanders in Japan have locally taken unique evolutionary process. Among them, the distribution range of the Abe's salamander is the smallest, and they can be found in very limited environments such as under fallen leaves in secondary forests where spring water occur. Protected areas have been designated and conservation activities have been carried out by local people.

(env CR IUCN CR)



Japanese crested ibis  
*Nipponia nippon*

Once widespread throughout Japan until around the 18th century, the number has significantly lowered in the Meiji period because of overhunting and other factors. Birds provided by China successfully bred in 1999, and the release started on Sado Island in 2008. Today, there are more than 300 individuals in Japan, consisting of those in captivity in five areas and those in the wild.

(env EW IUCN EN)



Tsushima leopard cat  
*Prionailurus bengalensis euptilurus*

Inhabit Tsushima Island. The population size is estimated to be around 100. Captive breeding programs in conjunction with zoos as well as habitat restoration efforts, decreasing of road kills and promotion of appropriate management of pet cats have been ongoing.

(env CR IUCN LC)



Okinawa rail  
*Gallirallus okinawae*

The only flightless bird in Japan, discovered in 1981 in the forest of Yambaru in the northern part of the main island of Okinawa. Captive breeding has been ongoing in addition to the control of the main predator, mongooses, promotion of appropriate management of pet cats, protection of injured birds and decreasing of road kills.

(env CR IUCN EN)



Albatross  
*Diomedea albatrus*

The largest bird in the Pacific area with a wing span of over 2 m. The population size once reached several millions, but overhunting since around 1890 for feather collection has significantly reduced the number of bird. In Japan, they only inhabit two areas: Torishima Island of the Izu Islands and the Senkaku Islands. In Torishima Island, the number has been recovered to approximately 3,000 as a result of the conservation of their breeding sites and the creation of new breeding sites through the use of real-size decoys. Joint efforts with the United States to create new breeding sites in Mukojima Island of the Ogasawara Islands are in progress.

(env VU IUCN VU)



Japanese wood pigeon  
*Columba janthina nitens*

A forest-dwelling bird whose estimated population size in the Ogasawara Islands is only dozens. Predation by feral cats, competition with black rats for food and introduced species give negative impacts on the birds. In addition to efforts such as the control of introduced species and the promotion of appropriate management of pet cats, captive breeding programs at zoos have been implemented.

(env CR IUCN NT)

## Strengthening the management of wildlife overabundance

Recently, the numbers and distribution areas of some medium and large mammals, such as the sika deer and boar, have greatly increased, causing serious damages to agriculture, forestry and ecosystems. Efforts therefore have been made to separate human use areas from the wildlife habitats by population control of the wildlife in optimal size, installing animal defense fences, creating buffer zones, so on.



Boar (*Sus scrofa*) family

Increasing range of sika deer

Increasing range of wild boars

National Survey on the Natural Environment (Green Census) Distribution Survey of Mammals



Tree damage by the sika deer



Flock of sika deers (*Cervus nippon*)

## Measures against introduced alien species

Not native species, such as largemouth basses, raccoons, and small Indian mongooses in the Nansei Islands, have caused adverse effects on unique local ecosystems nationwide in various ways. The Ministry of the Environment has designated

the introduced species which cause serious damage to ecosystems, as invasive alien species. Feeding, cultivation, storage, transport and import of these invasive alien species, are controlled.



Largemouth bass  
*Micropterus salmoides*



Raccoon  
*Procyon lotor*



Small Indian mongoose  
*Herpestes auro-punctatus*

## Effects of global warming on wildlife

Global warming will cause serious damages to biodiversity, ecosystems and various species. It is predicted that a 1-3 C° increase in sea-surface temperature will result in the bleaching and extensive death of coral.

It has also been predicted that a 3 C° increase in the average annual temperature is likely to exterminate alpine-dwelling

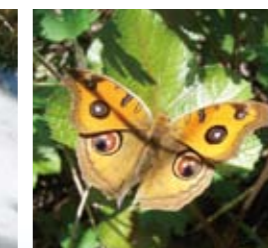
ptarmigans through the decrease of alpine zones. At the same time, global warming also changes the distribution of some species; for example, several reports suggest that the wintering sites of bean geese and the distribution of peacock pansies, a tropical butterfly, will move northward.



Coral reef



Rock ptarmigan  
*Lagopus mutus japonicus*



Peacock pansy  
*Junonia almana almana*



Bean geese  
*Anser fabalis serrirostris*