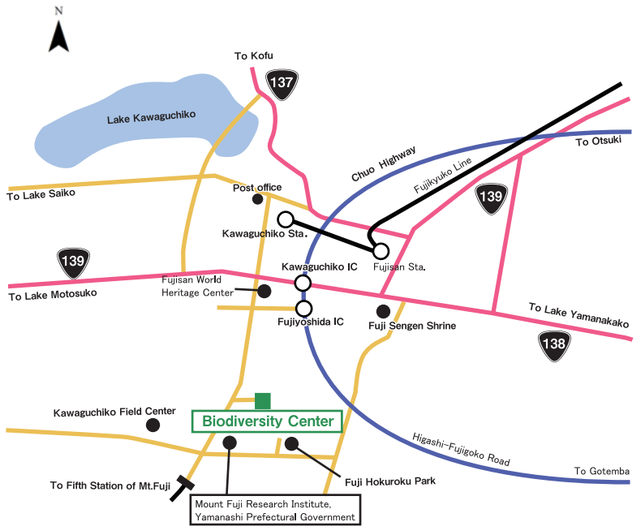

Cover illustration: "JAPAN,Treasure Islands of Wildlife" by Nobuyuki Nagata

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Biodiversity Center of Japan

Through four billion years of evolution, life on earth has expanded to almost infinite diversity, each species interacting with others and molding itself to its habitat until a global ecosystem developed. This diversity of life forms is commonly referred to as biodiversity. Biodiversity is not only crucial but also brings immeasurable benefit to human lives.

In recent years, however, human activities have caused a rapid decline in biodiversity, such as through destruction of habitats and overhunting. This is true of Japan as much as anywhere else, where changes to the natural environment threaten the biodiversity that has developed over millions of years.

Seeking to conserve biodiversity and ensure sustainable use of the natural environment on a global scale, the Convention on Biological Diversity came into effect in 1993. After becoming a signatory, Japan adopted the National Biodiversity Strategy in 1995, outlining a basic plan for reaching the goals laid out in the Convention.

Following this national strategy, the Biodiversity Center of Japan was established in 1998 to encourage the conservation of biodiversity in Japan and to contribute to international efforts toward conserving biodiversity.

■Biodiversity

Biodiversity refers to the differences between all living things that exist upon the earth, which can be viewed from three perspectives: ecosystems, species, and genetics.

Biodiversity has come about through the long history of diverse life forms, including humans, and life on the earth together with our living environment are supported by the various blessings brought from biodiversity.

Ecosystem diversity

There are various types of ecosystems, including forests, rivers, wetlands, coral reefs, tidal flats, etc.

Species diversity

It is estimated that 30 million types of life exist on the earth, including animals, plants, fungi, bacteria, etc.

Genetic diversity

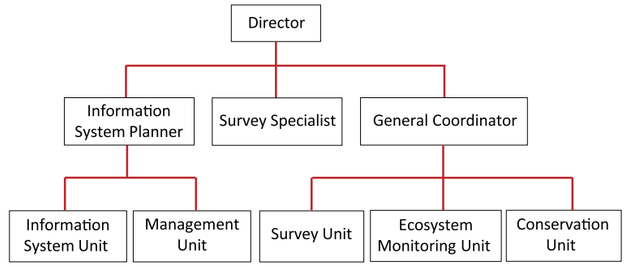
Even within the same species, there are genetic differences among individuals and populations.

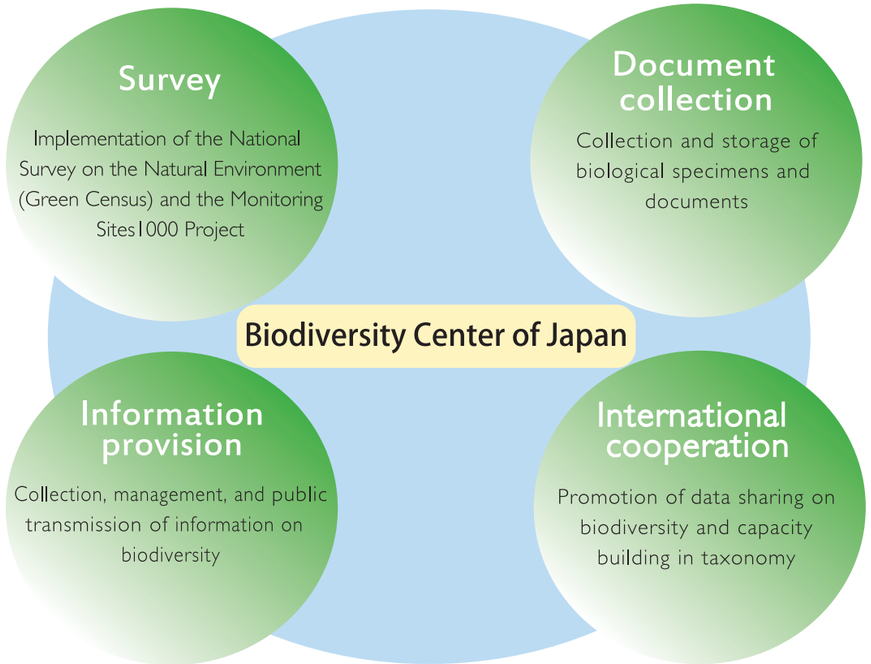
Functions

The Biodiversity Center of Japan has four functions: surveys, document collection, information provision, and international cooperation.

The information about the natural environment and biodiversity that the Biodiversity Center of Japan supplies is used in a variety of fields, such as in formulating conservation measures by central and local governments and in implementing environmental impact assessments, thus contributing to the conservation of biodiversity in Japan.

■ Organization (As of March 2017)





■Conservation of Biodiversity

Designed to promote the conservation of biodiversity and sustainable use of life forms, this international treaty was adopted in May 1992 immediately before the Earth Summit in Rio de Janeiro. It came into effect in December 1993, and as of March 2016 the Party signatories consist of 196 countries as well as the EU. The treaty's provisions cover such areas as national biodiversity strategies, the designation and monitoring of key habitats and species, in-situ and ex-situ conservation, information exchange, the distribution of profits derived from genetic resources, technology transfer, financial cooperation, and the safety of biotechnology.

■The National Biodiversity Strategy

National Biodiversity Strategy has been decided on in accordance with Article 6 of the Convention on Biological Diversity. The National Strategy was formed in accordance with the Basic Act on Biodiversity after its enactment in 2008.

In Japan, the first National Biodiversity Strategy was settled on in 1995. It was subsequently revised several times, and the "National Biodiversity Strategy of Japan 2012-2020" was finalized in 2012.

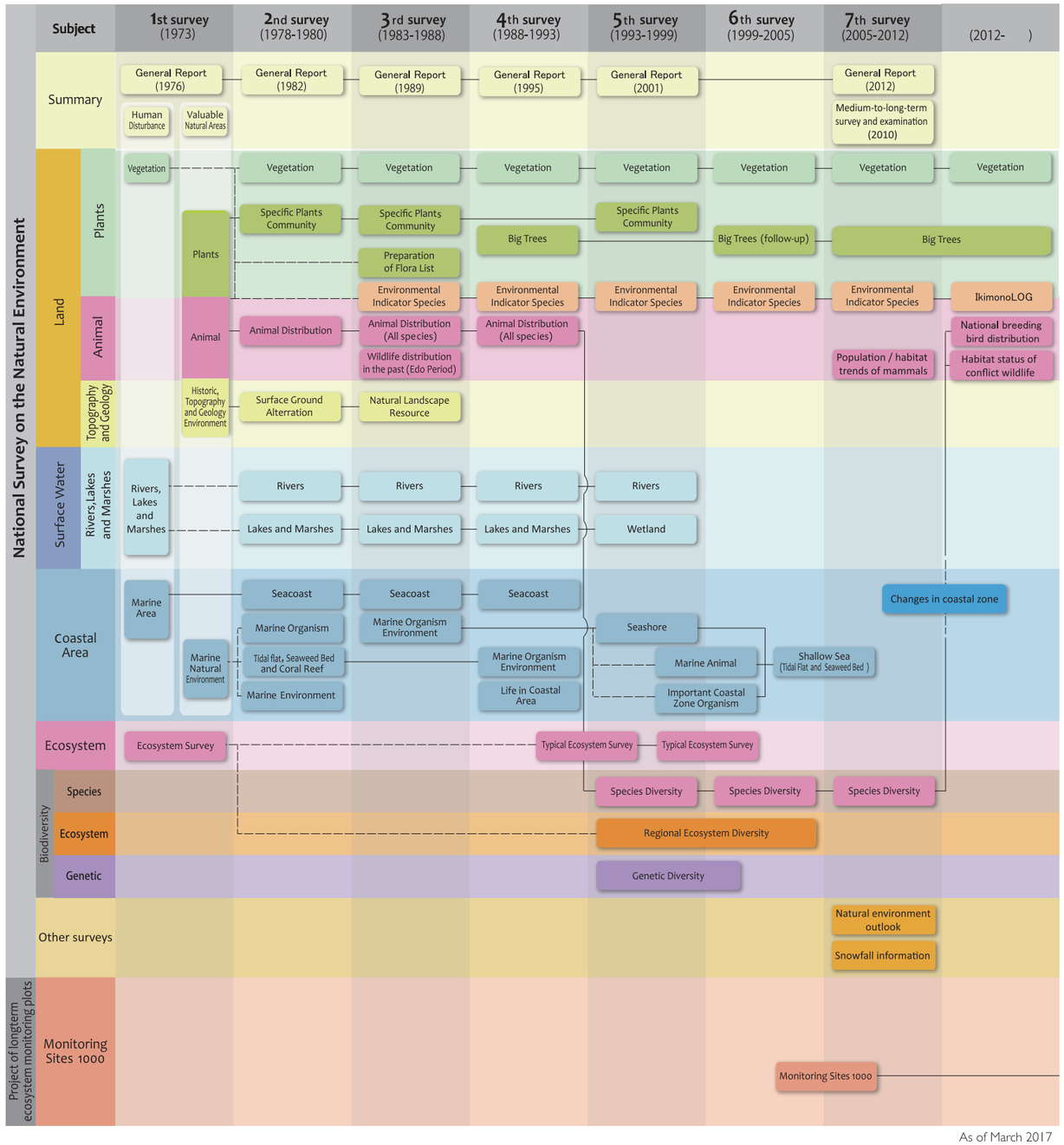
As well as establishing Japanese goals for conservation of biodiversity and sustainable use, the current National Biodiversity Strategy also sets forth a grand design as a vision of the future of Japan as an environmentally symbiotic society, and clarifies the direction of policies to be given attention up to FY 2020. Also outlined as a roadmap and concrete plan of action towards achievement of the Aichi targets adopted at the 10th Conference of the Parties to the Convention on Biological Diversity (COP10).

National Survey on the Natural Environment

Since 1973, the Ministry of the Environment of Japan has been conducting the National Survey on the Natural Environment. The Survey is held roughly every five years under the authority of Article 4 of the Nature Conservation Law. The Survey endeavors to gather information nationwide that will provide the basic data needed to promote and implement policies to protect the environment.

The Survey is also known as the "Green Census," and has been a part of significant conservation efforts. This Survey is ongoing and its targets are broad in scope, including fauna, flora, geology, geomorphology, riparian areas and lakeshores, fresh water, marshes, wetland, and coral reefs, from among Japan's variety of land and coastal environments.

The results are published using text and numerous maps, and serve as the basic resource for developing environmental management plans, designating and zoning national parks, as well as undertaking other environmental conservation measures and environmental impact assessments in various parts of the country.



As of March 2017

National Survey on the Natural Environment (Animal Distribution)

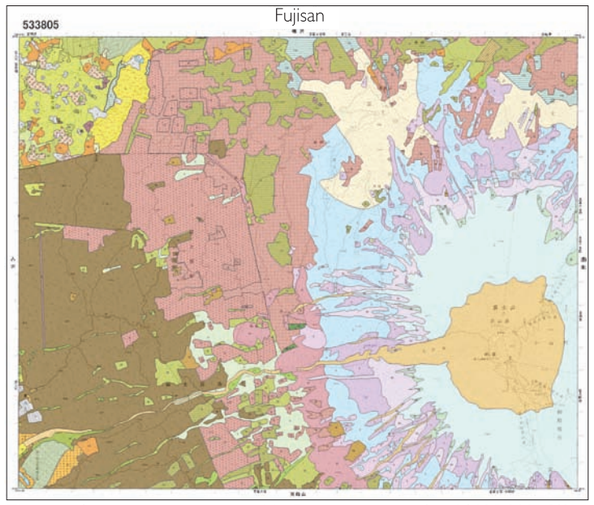
In order to comprehend the inhabitation state of wild animals in Japan, we periodically survey the distribution of animals. The results were gathered as "The Animal Distribution Atlas of Japan", a compilation of the animal distribution surveys conducted in Japan from 1978 to 2005, containing the distribution maps on 3,304 species of animals (116 species of mammals, 364 species of birds, 96 species of reptiles, 64 species of amphibians, 326 species of fresh water fish, 1,184 species of insects, 1,154 species of land and fresh water shellfish). It is used for conservation management of endangered species as well as for decisions on wildlife management, etc.

Sika deer (*Cervus nippon*)

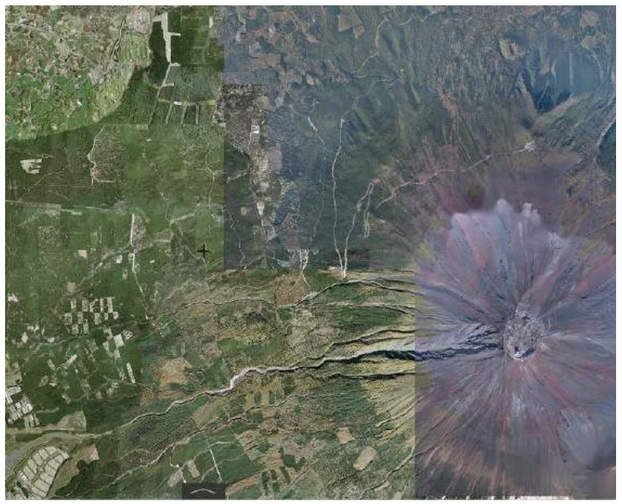
Distribution map of sika deer in 1978 and 2003. Distribution of sika deer expanded 1.7 times in 25 the years and it has led to deterioration plant communities and ecosystems in Japan. (Source: Animal Distribution Atlas of Japan (2010) (http://www.biodic.go.jp/kiso/atlas))

National Survey on the Natural Environment (Vegetation Survey)

The Biodiversity Center of Japan is surveying vegetation conditions and producing actual vegetation maps on a national level at a scale of 1/25,000. Vegetation is classified according to the plant communities and its distribution is drawn on the vegetation maps. These are the only area-wide materials showing Japan's natural environment, providing a foundational overview of biodiversity in Japan. These maps are used beneficially in versatile ways as indispensable materials for environmental assessments in national land planning and regional development, etc. and for the production of master plans for natural environment conservation.



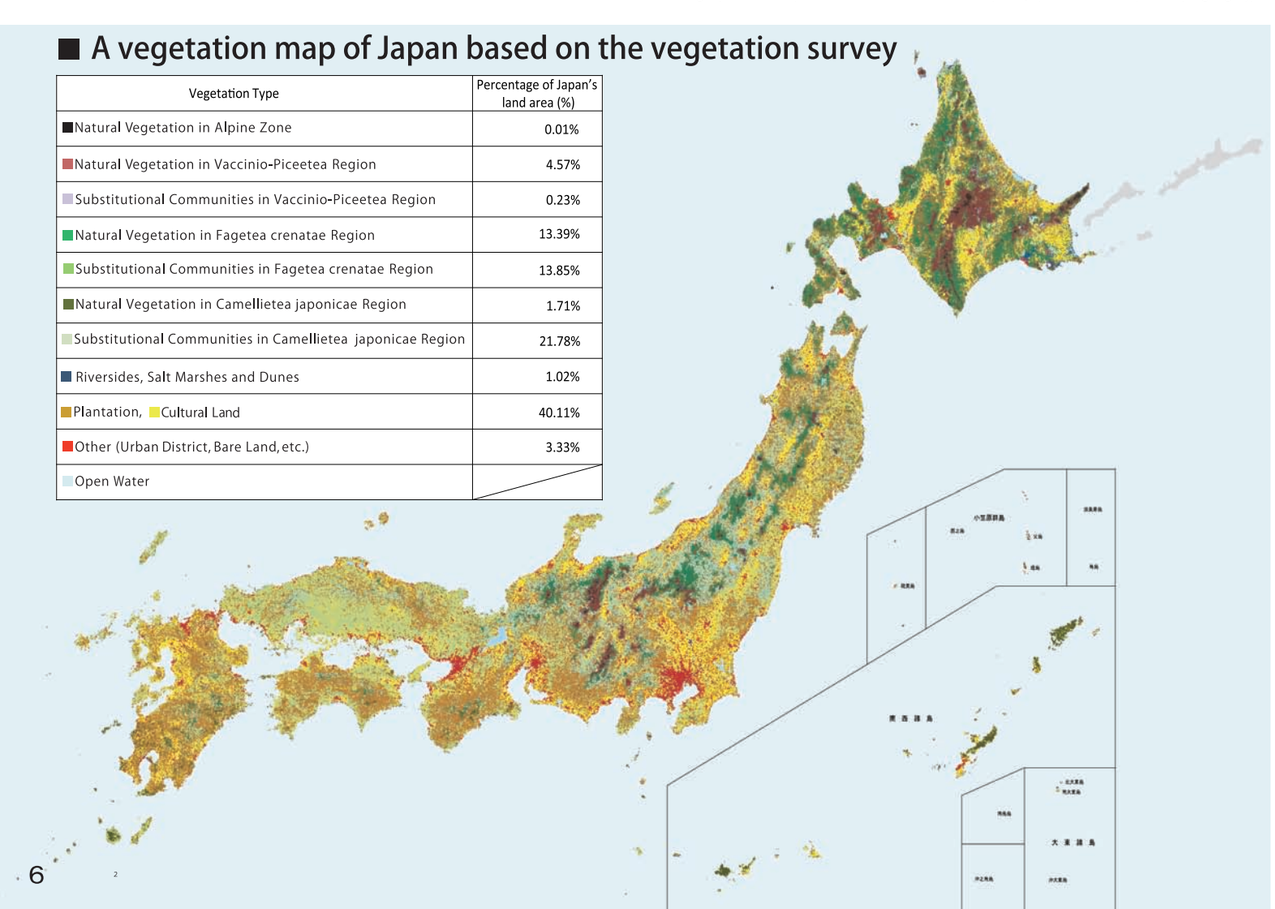
The actual vegetation map in the Mt. Fuji area on a scale of 1:25,000. GIS data is also available on the Internet. (http://gis.biodic.go.jp/webgis/)



Source: Aerial photograph in the Mt. Fuji area created by editing "Seamless Aerial Photograph" (Geospatial Information Authority of Japan(GSI))(http://maps.gsi.go.jp)

■ A vegetation map of Japan based on the vegetation survey

Vegetation Type	Percentage of Japan's land area (%)
■Natural Vegetation in Alpine Zone	0.01%
■Natural Vegetation in Vaccinio-Piceetea Region	4.57%
■Substitutional Communities in Vaccinio-Piceetea Region	0.23%
■Natural Vegetation in Fagetea crenatae Region	13.39%
■Substitutional Communities in Fagetea crenatae Region	13.85%
■Natural Vegetation in Camellietea japonicae Region	1.71%
■Substitutional Communities in Camellietea japonicae Region	21.78%
■Riversides, Salt Marshes and Dunes	1.02%
■Plantation, ■Cultural Land	40.11%
■Other (Urban District, Bare Land, etc.)	3.33%
■Open Water	

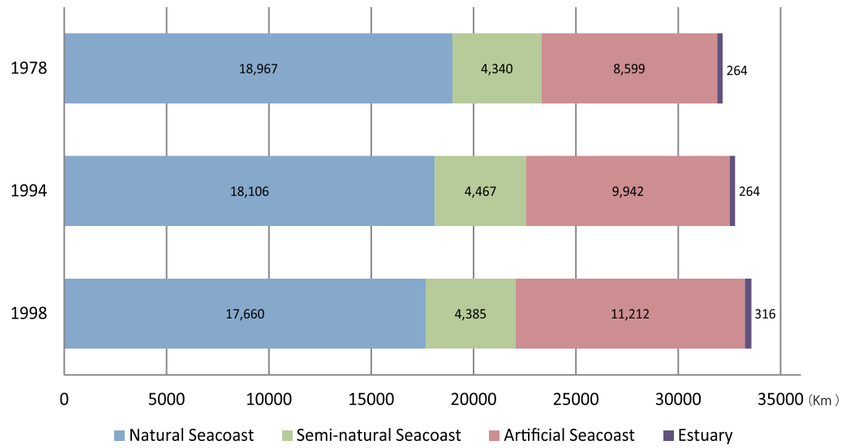


National Survey on the Natural Environment (Coastal Survey)

The seacoasts of Japan, a country surrounded by the sea, are winding with many indentations, consisting of beaches, rocky shores, tidal flats, and islands of various sizes. However, along with urbanization and industrial development, the seacoasts have become increasingly artificial. While some modification of the seacoasts is unavoidable, sensitive handling is required because it involves large-scale engineering work.

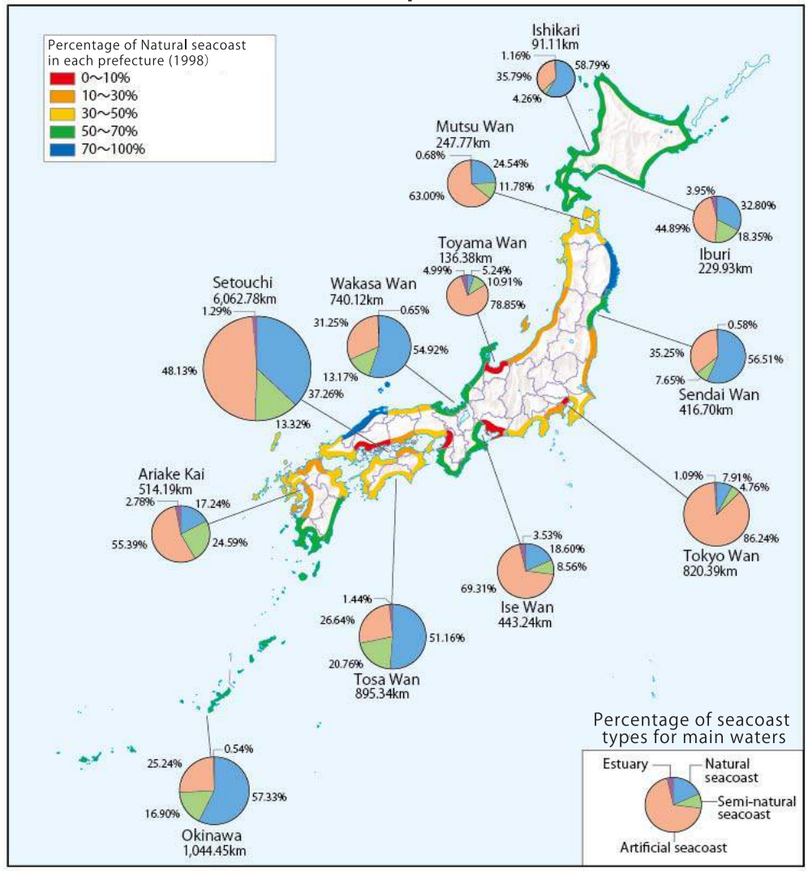
The Biodiversity Center of Japan monitors significant changes of the natural environment by conducting surveys on the state of nature along the seacoasts.

■ Changes in the composition of Japan's seacoast



Natural Seacoast : A coastline in its natural state, unchanged by human activities. No artificial structures.
Semi-natural Seacoast : Roads, dikes, tetra pods, etc. exist but the intertidal zone is in a natural state.
Artificial Seacoast : Coasts with harbors, filled land, dredged bottoms, drained land etc. Intertidal zone also have artificial objects.
Estuary : The boundary between sea and land is the river's lowest flow point of "River Areas", which is designated by The River Law. This includes rivers to which the River Law does not apply.

■ Situation of seacoasts in Japan (1998)



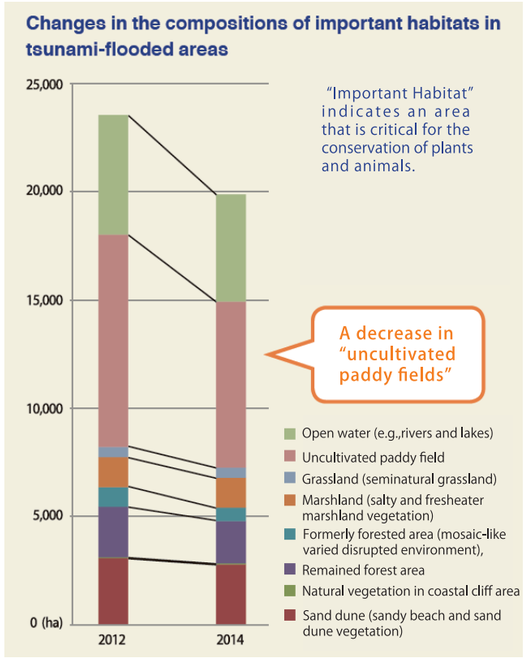
Monitoring after the Great East Japan Earthquake

On March 11, 2011, the Great East Japan Earthquake (GEJE) disaster occurred off the shore of Sanriku, Tohoku Region, Japan. The GEJE seismic motion and tsunami had significant impact on the natural environment in the coastal area. In response to this catastrophic disaster, the Biodiversity Center of Japan has been monitoring the changes that have affected the natural environment in the flooded areas.

This series of surveys was conducted on the tsunami-flooded areas and their surroundings, covering a wide range of approx. 670 km in length and 578 km² in area, extending from Aomori Prefecture to Chiba Prefecture. The surveys started in 2012, including the vegetation survey, coast change status survey, distribution survey of seaweed and seagrass beds, and fauna and flora survey in terrestrial key sites, as well as the ecosystem monitoring surveys on tidal flats, seagrass beds, seaweed beds and seabird breeding sites, which were conducted mainly on the ecosystems in shallow sea areas.

Based on the results of the surveys that were conducted, the "Nature and Earthquake" pamphlet, "Important Habitat Maps 2013" and "Important Habitat Maps 2015" were published to show the statuses of the natural environment after the GEJE with a focus on habitats – the environments in which living organisms inhabit and grow. The reports, brochure, survey data and GIS data of the series of surveys are disclosed in the "Shiokaze Natural Environment Log" <http://www.shiokaze.biodic.go.jp/27sokuhou.html>.

Important Habitat Map 2015, "Southern Sanriku".
The map consists of four area, Northern Sanriku, Southern Sanriku, Sendai Bay Coast and Fukushima Coast.



■ Remaining important habitats

This disaster may be just one of many disturbances that the wildlife inhabiting the coastal environments have experienced and survived throughout history.
As long as their habitats are not lost entirely, these organisms will not easily go extinct because of such disasters. However, coastal environments and habitats were disrupted and fragmented by the reconstruction projects needed for our daily lives. We must be careful that these projects do not cause irreversible damage to our natural environments.

The Biodiversity center of Japan has conducted research to identify critical habitat sites for conservation efforts. When the survey results from 2012 and 2014 were compared, there was a noticeable decrease in important habitats in flooded areas. For example, areas of "uncultivated paddy fields" had been reduced through conversion to paddy fields or land development processes.

Ikimono Log (Biological Information Collection and Provision System)

The Biodiversity Center of Japan operates the "Ikimono Log" (http://ikilog.biodic.go.jp) as a system for collecting/providing biodiversity information using the Internet. Ikimono Log can be used by anyone who is looking for information regarding living things. By searching for the name of a living thing, it is possible to research the places where the living thing was previously found. Search results can be displayed on a distribution map and viewed in individual data with detailed information or downloaded as data in a format that can be displayed with GIS. Also, original surveys can be launched by completing the user registration process. The Ikimono Log app also makes it easy to report information from smartphones or tablets.

Using Ikimono Log, the aim is to share high-quality extensive biodiversity information managed by each main party and accumulate and use Japan's biodiversity information, together making international contributions by providing information to international data base projects, etc.

Monitoring Sites 1000

The Monitoring Sites 1000 is a project to continuously conduct surveys on various types of nationwide ecosystems at approximately 1000 sites and to collect data on,for example, changes in the number of the individuals as the indicators of each ecosystem.

The ecosystems surveyed are alpine zones, forests/grasslands, Satoyama, lakes/marshes/wetlands, coastal areas (sandy beaches, rocky shores, tidal flats, seagrass beds, and algal beds), coral reefs, and small islets. We conduct surveys that collect quantitative data on the composition of species and populations of indicator species, which play important roles in each ecosystem. These surveys are performed in cooperation with various parties including scientists, local experts, NPO/NGOs, and volunteers.

■ Location Map of the Monitoring Sites


Alpine Zones


Forests


Satoyama

Monitoring Sites 1000
Since 2003

Anatidae


Lakes/marshes


Lakes/marshes

■ Outline of the Monitoring Sites 1000

Current as of Feb. 1, 2016 / No. of sites are round numbers

Ecosystem			Survey site classification	Main survey items	Survey organizer(s)	No. of sites
Land environments	Alpine zones			Air temperature Earth temperature Vegetation Creeping pine growth Flowering phenology (interval camera) Flowering phenology (visual) Butterflies Ground beetles Bumblebees	Researchers	5
	Forests/grasslands		Core sites	Trees Litter seeds Ground beetles Terrestrial birds	Researchers	20
			Standard core sites	Trees Litter seeds Ground beetles Terrestrial birds	Researchers	28
			General sites	Terrestrial birds	Citizen examiners	422
	Satoyama (Sustainable human-iufluenced natural environment)		Core sites	Flora Mammals Birds Butterflies Water environment Harvest mouse Frogs Fireflies Human impact (vegetation chart production)	Citizen examiners	18
			General sites	At least 1 survey from among 9 core site surveys	Citizen examiners	171
Inland water regions	Lakes/marshes/wetlands		Lake/marsh sites	Plankton (conducted until FY2013) Lake vegetation (conducted until FY2013) Benthic fauna Freshwater fishes (commenced from FY2015) Aquatic plants (commenced from FY2015)	Researchers	10
			Wetland sites	Wetland vegetation Natural environment	Researchers	7
			Anatidae sites	Anatidae population Swan adult-young bird ratio Climate/environment	Citizen examiners	80
Coastal areas	Sandy beaches			Sea turtle landing/egg planting frequency Sand temperature measurement	Citizen examiners	41
	Tideland	Rocky shores		Benthic fauna Reef temperature measurement	Researchers	6
		Tidal flats		Benthic fauna Subsoil particle size analysis Reduction of particle size/temperature	Researchers	8
			Shorebird sites	Shorebird population	Citizen examiners	142
		Seagrass beds		Seagrass coverage Benthic fauna	Researchers	6
		Algal beds		Algal bed coverage	Researchers	6
	Coral reefs			Coral reef coverage Natural environment Crown-of-thorns starfish population	Researchers	24
	Small islets			Seabird population Seabird breeding conditions	Researchers	30
Total						1,024


Rocky Shores

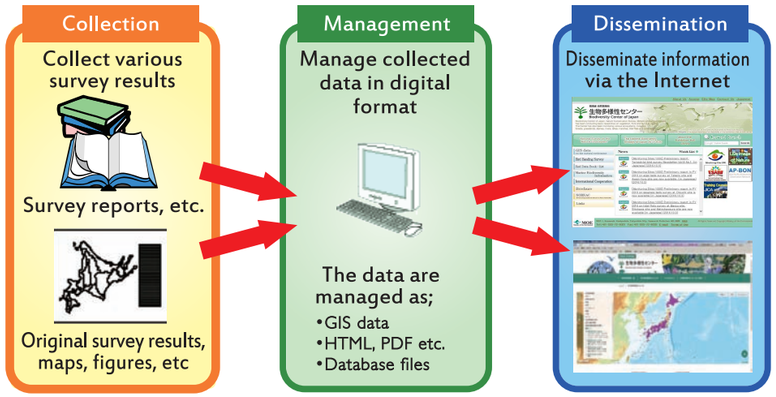

Tidal Flats


Algal Beds

Seabirds

Information provision

The Biodiversity Center of Japan constructed the Japan Integrated Biodiversity Information System (J-IBIS) to computerize and manage information about the natural environment and biodiversity, including the results of our National Survey on the Natural Environment, and makes the information widely available to the public via the Internet.



■ Public service of survey results

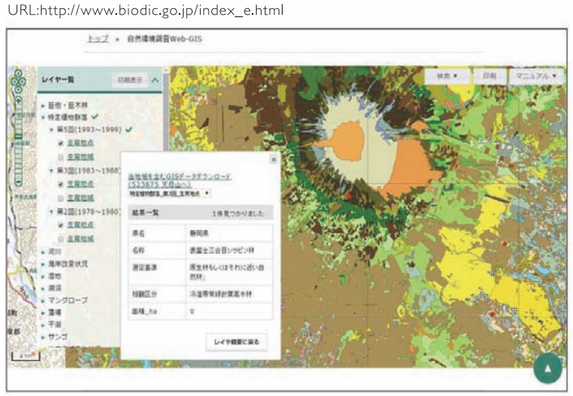
Written reports and diagrams, etc. based on survey results can be browsed from the Biodiversity Center website. In particular, together with using Web-GIS technology to enable web-based browsing of vegetation maps, etc., we also provide KML and Shapefile data that can be viewed as a superimposition on top of maps.

The website of "Biodiversity Center of Japan"
URL:http://www.biodic.go.jp/index_e.html

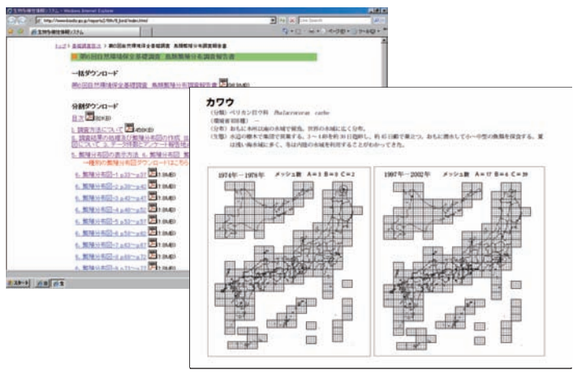
■ Main information items provided online

National Survey on the Natural Environment	Vegetation	Annual reports, Vegetation map (GIS data, image data)
	Specific Plant Community	Annual reports, Distribution information (GIS data)
	Big Trees	Annual reports, Distribution information (GIS data)
	Animal	Annual reports, Distribution information (mesh data), Compilation of distribution maps
	Rivers, Lakes and Marshes	Annual reports, Distribution/form information(GIS data)
	Tidal flat Seaweed Bed and Coral Reef	Annual reports, Distribution/form information(GIS data)
	Coastal Zone	Annual reports, Position/form information(GIS data)
Monitoring Sites 1000	Alpine Zones	Annual reports, Analysis report (every 5 years), Data file, Quick survey reports
	Forest/grasslands	Annual reports, Analysis report (every 5 years), Data file, Quick survey reports
	Satochi (secondary nature)	Annual reports, Analysis report (every 5 years), Data file, Newsletter
	Landwater (wetlands and lakes)	Annual reports, Analysis report (every 5 years), Data file, Quick survey reports
	Anatidae	Annual reports, Analysis report (every 5 years), Data file
	Coast (rocky shores, tidal flats, Seagrass beds, Serweeds beds)	Annual reports, Analysis report (every 5 years), Data file, Quick survey reports
	Plover and Snipes	Annual reports, Seasonal reports, Analysis report (every 5 years), Data file, Newsletter
	Coral reefs	Annual reports, Analysis report (every 5 years), Quick survey reports (*Data attached to reports)
	Sandy beaches (Sea turtles)	Annual reports, Analysis report (every 5 years)
	Small islets (Seabirds)	Annual reports, Analysis report (every 5 years)

etc…



Using Web-GIS skills, National Survey on the Natural Environment product data can be displayed on the Internet.



Reports are also available in Japanese.

International cooperation

■ AP-BON: Asia-Pacific Biodiversity Observation Network

AP-BON has been established in 2009 as a regional network with a specific interest in collaborating with the Global Earth Observation:Biodiversity Observation Network (GEO BON). AP-BON covers all levels of biodiversity and ecosystems in the Asia-Pacific region and tries to promote data sharing to link the outcomes of each observation, with the aim of contributing to policy-making for the conservation of biodiversity.

GEOSS Asia-Pacific Symposium

AP-BON Workshop

AP-BON books

AP-BON books are published almost every two years to introduce various biodiversity observations in the Asia-Pacific region, as well as achievements and challenges of AP-BON.

Publications
2012: The Biodiversity Observation Network in the Asia-Pacific Region
2014: Integrative Observations and Assessments
2016: Aquatic Biodiversity Conservation and Ecosystem Services

Website: http://www.esabii.biodic.go.jp/ap-bon/index.html

■ ESABII: East and Southeast Asia Biodiversity Information Initiative

ESABII was launched in 2009 to pursue capacity-building in taxonomy and development of an information system on biodiversity in East and Southeast Asia, in order to contribute to the promotion of biodiversity conservation and the implementation of the CBD Strategic plan. ESABII organizes training workshops on taxonomy for young officials and researchers, as well as training workshops on CITES policies and identification of threatened species for officials and relevant agencies.

Training of Trainers on CITES

Identification Sheets of Threatened Species

Identification Sheets are developed to provide the information required to identify threatened 95 species listed in the CITES Appendices.

They have been translated into ASEAN local languages, Chinese, Mongolian and Japanese, and then distributed to customs and other relevant agencies in these countries.

Website: http://www.esabii.biodic.go.jp/index.html

Training Workshop on the Taxonomy of Plants

■ JICA training courses

The JICA provides a course called the "GIS and Remote Sensing utilized for Biodiversity Information System and Participatory Approach", covering technology and views on information collection relating to biodiversity, and accepts on this course administrative officials, etc. from each nation connected to biodiversity conservation measures and their implementation. Together with its predecessor, the "Biodiversity Information System Training Course" (1998-2013), more than 160 trainees from more than 50 countries have received training.

Aside from this course, many other JICA training courses are also run so as to dispatch Japanese expertise and experience to other countries.

A lecture being given

Tour of specimen storage room

Tour of exhibition facilities

Specimen collection

The Biodiversity Center of Japan is collecting biological specimens with an emphasis on the following three policies.

1 . Handing down biodiversity to the future

We collect important specimens of the organisms including endemic species of Japan, the species that show regional differences, and those that are good materials to think about the conservation for the endangered and the rare species.

Stuffed Japanese Crested Ibis
Nipponia Nippon
(Extinct in the Wild in Japan)

Okinawa Rail
Gallirallus okinawae

Amami rabbit
Pentalagus furnessi

Dugong
Dugong dugon
(Skeletal preparations)

2 . Representing fauna and flora of protected areas in Japan

We collect specimens of living things including endemic species in order to characterize naturally important regions such as National Parks and nature conservation areas.

Giant purple butterfly
(species of nymphalid butterfly)
Sasakia charonda

Scarabaeid beetles of Japan

Scutellaria longituba
(Endemic plant in the Bonin Islands)

3 . Promoting public awareness for biodiversity conservation

We collect specimens that you can touch, skeletal specimens for learning about their body structure and invasive alien species in order to promote public awareness on the conservation of Japan's biodiversity.

Exhibition of touchable specimens

Specimens of alien species

Common raccoon
Procyon lotor
(Invasive alien species in Japan)

Exhibition

In order to promote conservation of biodiversity, it is important that as many people as possible understand the value of biodiversity and start to take action that is possible on a personal level. As a means of motivating such action, we have established and opened to the public an exhibition room based on themes of the significance of biodiversity and its value.

■ Permanent exhibition booth

Following guides in the forms of an Asian black bear and a collared scops owl, a drama is developed by interweaving diverse forms of life as small doors concealed in Japanese nature panels are opened.

Biodiversity is introduced in such a way that learning is fun, through games and commentary panels.

■ Video theater

Together with conveying the abundance and value of Japan's natural environment and biodiversity using three screens, the video theater looks at what kind of relationships should be built between ourselves and nature.

■ Hands-on Exhibisions booth

Some biological specimens are displayed in the entrance hall as specimens that can be touched.

■ Library

We collect and own books and literature about biodiversity. There are more than about 26,000 books and pieces of literature in the library.