

## Highlight — Benefitting to Customers and Society —

### Providing Cloud Services to Support Organizations Working to Conserve Biodiversity



Human beings live on blessings - water, food, wood, fiber, etc. - derived from countless other living beings. The Earth's abundant biodiversity, however, is rapidly being lost as a result of habitat destruction, ecosystem changes, and other impacts of human activities.

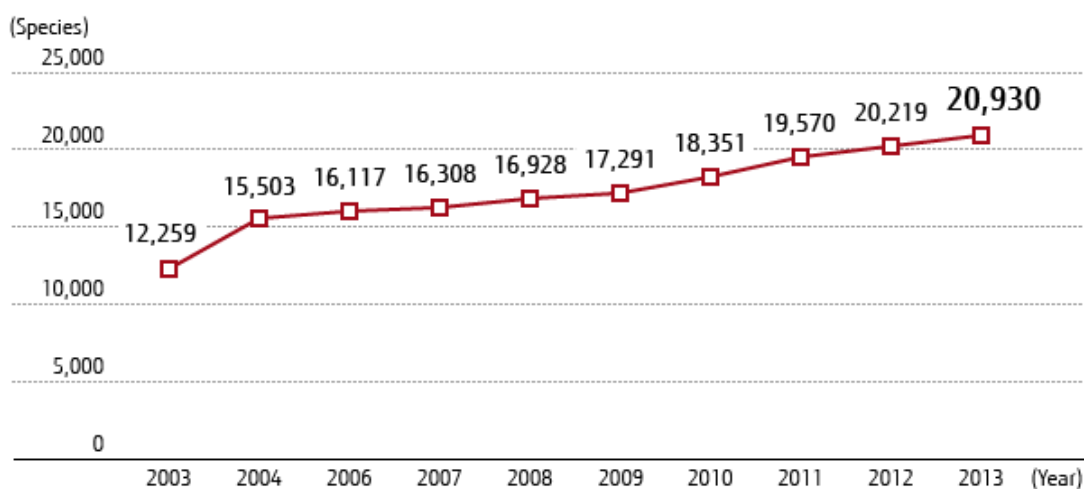
As national and local governments, NPOs, and various other actors expand their activities aimed at conserving biodiversity, Fujitsu is providing cloud services free of charge to support their work.

### Rapidly Declining Biodiversity

At present, it is estimated that there are as many as 30 million species of life on the Earth, and human life enjoys the benefits of that diversity. In 2012, however, it was determined that the number of the world's species in danger of extinction had risen to 20,930, from 12,259 ten years earlier. The speed of species extinction, in other words, is accelerating<sup>\*1</sup>.

With species extinction a growing concern, the Convention on Biological Diversity's 10th meeting of the Conference of the Parties (COP10) adopted the Aichi Targets on global biodiversity<sup>\*2</sup>. To stop the loss of biodiversity by 2020, these targets call for national and local governments, NPOs, and various other actors to take effective, immediate action.

### Global Trend of Threatened Species



Source: Prepared by Fujitsu based on the "Numbers of threatened species by major groups of organisms (1996-2013)," published by the International Union for Conservation of Nature (IUCN).

\*1 Threatened species:

Please refer to the [PDF "Numbers of threatened species by major groups of organisms \(1996-2013\)." \[108KB\]](#) published by the IUCN.

\*2 Aichi Targets:

Formerly known as the "Strategic Plan for Biodiversity 2011-2020."

### Issues on the Frontlines of Biodiversity Conservation

Employing a PDCA cycle - including stages like formulating a biodiversity conservation strategy and checking the effectiveness of biodiversity actions - requires detailed and accurate knowledge of the distribution of the conservation area's wild plants and animals.

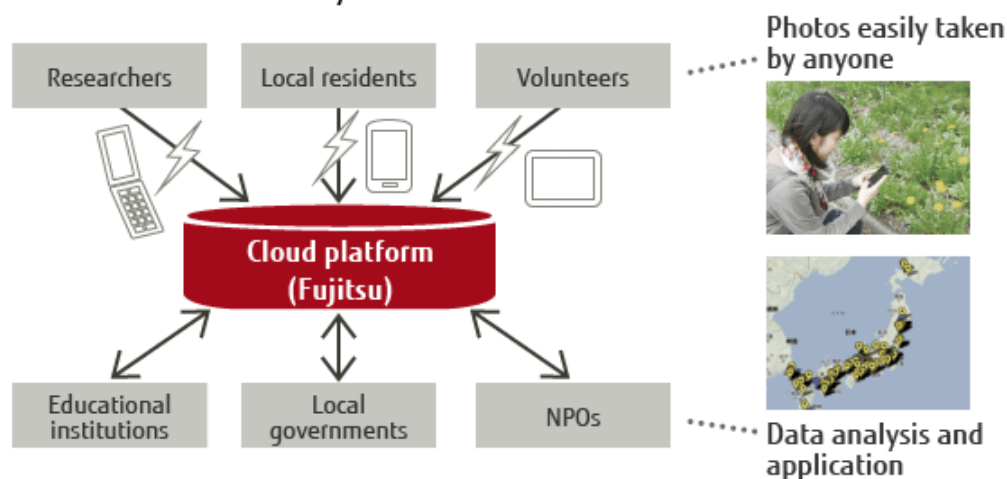
For example, investigating the invasive and native distributions of a certain plant traditionally required that experts physically go to the study location and record data, such as the names of species, locations, and times. That approach, however, faces limitations in terms of the people who can carry out the study and the geographic area that can be covered. It also involves the tedium of numerous procedures that must be followed for collecting and sorting information.

### Building a Scheme for Broad-Based Public Participation in the Cloud

Fujitsu, therefore, wanted to have conservation workers apply ICT to reduce the tedium and number of procedures involved in biodiversity surveys, and increase the efficiency and effectiveness of conservation activities.

We created the Mobile Photo System cloud service, which allows anyone to easily conduct surveys using Fujitsu's cloud platform, and a mobile phone or smartphone, from anywhere. With this service, a person conducting a survey photographs an animal or plant and sends it by email to an address where the photograph is added to a database. Experts can then examine the data and identify species, and the data can be viewed and analyzed on a map. This service enables broad-based public participation in the provision of data.

#### Overview of a Mobile Photo System and Cloud Services



### Cloud Services are being Used by Various Organizations Working to Conserve Biodiversity

Fujitsu began providing these services, in 2011, to the Aichi University of Education for a nationwide survey of dandelions and to Kawasaki City for a survey of vegetation along the Tama River, and, in 2012, to Kawasaki City for conservation activities in the Kuriki Greenery Conservation Area.

In addition, to promote biodiversity conservation initiatives, we began in April 2013 to expand provision of these services by making them available to local governments, universities and other educational institutions, NPOs, and other organizations through a public application process. Large amounts of data have already been collected and posted on the following web sites.

- [Biological Information Collection System \(in Japanese\)](#)

## VOICE

### **Use of Fujitsu Systems for a Citizen-Participation Natural Environment Baseline Survey for Formulation of a Biodiversity Regional Strategy in Kurashiki City**

**Yasuhiro Miyake, Environmental Affairs Policy Section, Kurashiki City**

Kurashiki City is in the midst of formulating a regional biodiversity strategy, and we believe this system will make it easy to gather from the citizenry-at-large the biodiversity information needed to formulate our strategy. We have only just begun, so we have no concrete results yet, but we have been covered by the media several times and have seen signs that the system, as one that involves citizens, is generating a great deal of interest. There are expectations that using the new system will lead to some kind of new discovery.



## VOICE

### **National Census of Bumblebees**

**Masakado Kawata, Graduate School of Life Sciences, Tohoku University**

We are conducting a survey to determine the current distribution of bumblebees, which play a very important as pollinators. We have received media coverage from not only local but also national newspapers and many people have taken an interest in our survey. In less than a month, we have already received 300 data submissions and are anxious to see just how the total will rise. The request to send images with GPS data, however, has proven to be a hurdle for many people. The percent of people sending photos without GPS data to a different address is high, so it would be nice to have a special app for those cases.



## VOICE

### **Animal and Plant Distribution Survey and Species Monitoring by the Tokyo College of Environment at its Fieldwork Location**

**Masaaki Kohmaru, President, Tokyo College of Environment**

Information on when, where, and the kind of species identified is indispensable for understanding nature, and obtaining this information constitutes the valuable work of the naturalist. Our aim - to gather biological information on all species in Japan - is ambitious, and, as an initial step, we have chosen 30 animal and plant species and begun to conduct a survey at our fieldwork location in the town of Masuho in Yamanashi Prefecture. We are looking forward with great anticipation to the results of our combination of state-of-the-art technology with the primitive survey approach of applying all five senses to physically find species.



## Survey with Participation Open to All

The Mobile Photo System cloud services allow anyone to participate in our survey by using a smartphone or mobile phone. The accuracy of the survey will rise with the amount of data collected, and we welcome participation from as many people as possible, so that we can ultimately implement conservation activities that are best-suited for their purposes. We also believe that going out into the field to look for species will encourage participants to feel closer to them and think about the decline in biodiversity.

### Activities of Organizations Using the Mobile Photo Cloud Service (No particular order)

No.	Activity and Organization Name	Activity Summary
1	<b>Search for dandelions!</b>	This project is gathering data on and creating a map showing the extent of dandelion distribution in Japan. In addition, by having participants come into contact with the natural environment and learn about dandelions, the dandelion survey is also an opportunity for participants to develop their understanding of the importance of biodiversity conservation.
	Aichi University of Education, Mikio Watanabe's laboratory	
2	<b>Tama River Vegetation</b>	Through citizen, government, and business cooperation, vegetation found along the Tama River is being recorded and information is being shared to investigate the characteristics of vegetation in this riverine environment.
	Kawasaki City	
3	<b>Kawasaki City Kuriki Greenery Conservation</b>	A woodland is being rehabilitated based on the Kuriki San'noyama Special Greenery Conservation Area Management Plan created by Kawasaki City and Fujitsu's Kawasaki Plant. The change brought about to the ecosystem through rehabilitation work is being studied.
	Kawasaki City and Fujitsu's Corporate Environmental Affairs Unit	
4	<b>Hakusan Non-native Plant Species Initiative</b>	With the help of volunteers, this activity is identifying and eliminating distributions of plantain and other invasive plant species in Hakusan National Park. National and prefectural governments, and the management association are working together to deal with the difficult problem of eliminating invasive species.
	Chubu Regional Environment Office of the Ministry of the Environment, Hakusan Ranger Office for Nature Conservation	
5	<b>Survey of Living Things in the Chita Peninsula Green Belt</b>	On the Chita Peninsula of Aichi Prefecture, businesses, students, and local residents are working to protect the area's plants and animals by conducting a survey and creating a map of Chita Peninsula plants and animals. Businesses are aiming to work together to build an ecosystem network for the entire Chita Peninsula.
	Intertwined Life Project Office	
6	<b>Search for Kurashiki Plants and Animals</b>	In this activity, any citizen-participation survey will be conducted to gather information on plants and animals in the Okayama Prefecture city of Kurashiki. The activity is intended to determine the status of the natural environment within the city and enlighten citizens. A Regional Biodiversity Strategy will be developed.
	Kurashiki City	
7	<b>National Census of Bumblebees</b>	Focusing on the important role played by flower-visiting insects in ecosystems, this activity is enlisting the cooperation of people throughout Japan in recording data on the activities of bumblebees found in the field. It will not only clarify the movements of bumblebees but also enlighten citizens.
	Graduate School of Life Sciences, Tohoku University	
8	<b>Woodland Plants and Animals in Tsushima</b>	To conserve the unique ecosystem of Tsushima, this activity is conducting a citizen-participation survey of plants and animals in areas hosting the Tsushima leopard cat and other endangered species. It will investigate human activities and the woodland environment.
	MIT	
9	<b>General Survey of the Natural Environment of the Tokachi Coastal Wetlands</b>	This activity is undertaking a general survey (employing the Flowerthon method) of the natural environment of the Tokachi coastal wetlands, which are registered under the Ramsar Convention on Wetlands of International Importance. The survey is being conducted from multiple perspectives, including human activities and cloud observations.
	The Wetlands Institute of Northeastern Asia	

No.	Activity and Organization Name	Activity Summary
10	<b>TCE Animal and Plant Species Habitat Distribution Survey</b>	Using a plant and animal survey tool as a field work curriculum, this activity seeks to enlighten students and test the practicality and extensibility of the tool. The activity will foster human resources who will engage in natural environment conservation in the future.
	Tokyo College of Environment	
11	<b>Honeybees were here! Great Survey</b>	This activity is investigating how people relate to nature via honeybees. It is enlisting the cooperation of citizens, schools, beekeepers, and others in conducting a survey of the flower-visiting activity of honeybees in areas including the Tokyo cities of Kunitachi and Machida, and the town of Fujimi in Nagano Prefecture. It is also using the familiar honeybee as a vehicle for contributing to environmental education.
	A Thousand Flowers for Bees, an NPO registered in Japan	
12	<b>Woodland Living and Biodiversity</b>	In this activity, a citizen-participation survey is being conducted of insects, amphibians, birds, and other forms of life in Uonuma City, Niigata Prefecture. By also covering medicinal plants, the survey is investigating the relationship between people and woodlands, as well.
	ECOPLUS, an NPO registered in Japan	