

## Challenge 6 Challenge of Establishing a Future Society in Harmony with Nature

**Fundamental Approach** It is critical for humans to conserve forests and other natural environments in all regions for coexistence in harmony with nature. However, deforestation is progressing across the world, resulting in the fragmentation of habitats of diverse species, as well as the continuing loss of biodiversity. This entails a number of issues including the loss of biological resources that are essential for society, causing natural disasters, and spurring global warming, and we believe that it poses a risk to the potential for the sustainability of society as a whole including Toyota. In light of this risk, Toyota launched three “connecting” projects and is taking action to expand activities various regions of Japan and overseas in order to “enrich the lives of communities” in each region. We will expand these activities at group, regional, and organizational levels using the insights we have gathered so far, aiming for a future where people and nature live in harmony.

- **Toyota Green Wave Project**  
Connecting Communities
- **Toyota Today for Tomorrow Project**  
Connecting with the World
- **Toyota ESD Project**  
Connecting to the Future



### Promote Expansion of Nature Conservation Activities Connecting Communities — Toyota Green Wave Project

Toyota Group companies have conducted afforestation activities at their respective plants and undertaken environmental conservation activities in their surrounding areas. The Toyota Green Wave Project is an initiative to connect regions through these diverse activities promoting harmony with nature. By extending Toyota Group activities to promote harmony with nature in Japan and overseas, we aim to expand natural habitats and help create a sustainable society, benefitting biodiversity.

Specific programs include the Plant in Harmony with Nature Project, which creates environments that foster nature and living creatures, and the All-Toyota Green Wave Project, which fosters ties between local communities and the Group.

#### Evolution from “Afforestation Activities at Plants” to “Plant in Harmony with Nature”

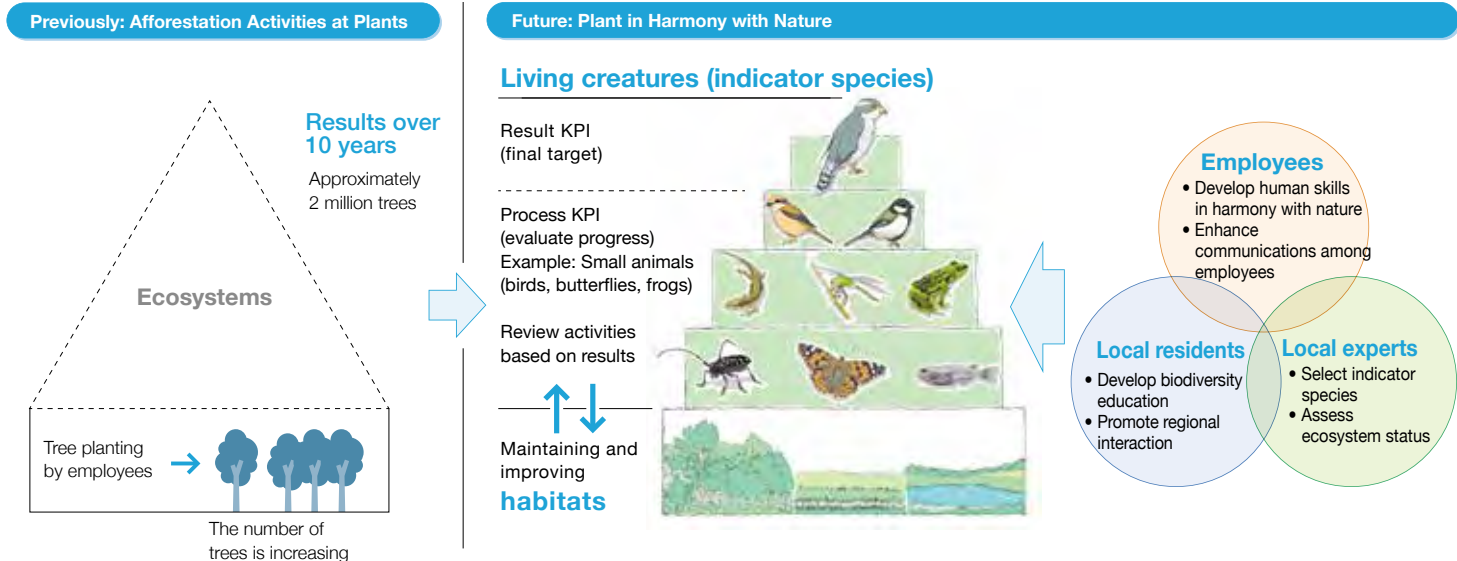
Afforestation activities have been conducted since 2007 with the theme of creation of forests at plant sites. The Tsutsumi Plant, where the Prius is produced, serves as a model plant for this project.

A recalculation of results from the past 10 years indicated that approximately 2 million trees have been planted in Japan and overseas, creating sites that foster nature and living creatures.

We expanded activities in FY2018, and in the future will carry out the Plant in Harmony with Nature Project. These activities are not limited to forest environments covering forests at plants, but are being expanded to cover the habitats of various living creatures. In addition, species that serve as indicators (indicator species) are selected to quantitatively assess ecosystems and are continuously monitored. The Plant in Harmony with Nature Project is being carried out by not only employees but also employees working under the guidance of local experts and in collaboration with local residents. Specific actions include periodically surveying indicator species according to the level in the ecosystem pyramid and reviews of activities based on the survey results. Continuation of these activities contributes to the preservation of regional biodiversity.

We expect that these activities will build and develop positive relationship between the plants and local ecosystems and promote good communications among employees and interaction with local communities.

**Plant in Harmony with Nature Project Leads the Way to the Better Environment**



Plant employees conduct surveys of living creatures

**Column Toyota Facilities Win Japan Greenery Research and Development Center Chairman's Award**

The Kinuura Plant and Tajimi Service Center won the Japan Greenery Research and Development Center Chairman's Award at the 36th National Factory Greenery Promotion Conference. The award is presented to plants, organizations, and individuals that promoted afforestation at plants and made significant contributions to improving the environment in and around plants. The aim is to encourage further afforestation at plants.

The Kinuura Plant manufactures transmissions and other drive-related components. Since 2008, the plant has been conducting environment classes at an on-site biotope for all second grade elementary school student in Hekinan City, Aichi Prefecture. In addition, approximately 5,000 trees were planted since 2010 as a part of afforestation activities.

The Tajimi Service Center was established in 2013 to train dealer staff in Japan and overseas and for other purposes. When the facility was constructed, harmony with the local environment and restoration of forested areas that had been lost to former clay mining sites were raised as issues. The site was divided into six zones and activities are being carried out with the aim of restoring the forested areas with a focus on species native to Tajimi City. In line with this concept, approximately 1,100 trees were planted in 2013 as an afforestation project.

Toyota will continue to undertake plant afforestation with the aim of maintaining and improving the habitat environments of living creatures in order to create a plant that makes use of and is in harmony with nature.



The Kinuura Nature Observation Park, a biotope at the Kinuura Plant



The biodiversity zone at the Tajimi Service Center

### All-Toyota Harmony with Nature Working Group Activities: All-Toyota Green Wave Project

Toyota Green Wave Project Working Groups were established by 23 affiliated companies in May 2015 to expand activities in harmony with nature, enhance the dissemination of information, and strengthen cooperation by participating companies.

In FY2018, individual companies in Japan expanded the types of activities and steadily progressed by undertaking 217 projects, 1.8 times more than in FY2017. In addition, collaborative activities or All-Toyota unified activities were conducted. In May 2017, 30 employees from 18 companies participated in a tree planting festival held at Millennium Hope Hill in the Tohoku region. In October 2017, bamboo forest maintenance was performed at the Yahagi River with the participation of 54 employees from 18 companies. Due to these activities, river-based activities have been added to ongoing forest maintenance and estuary cleanup programs, establishing a new “connecting” activity that links living creature preservation in different river zones of forest, river, and ocean.

In the future, the activity areas of All-Toyota programs will be expanded and “connecting” activities will be undertaken such as preserving living creatures that is common to multiple areas.



The fourth “Connecting” Activity: The Millennium Hope Hill Tree Planting Event in Tohoku



The fifth “Connecting” Activity: Logging of Yahagi River bamboo forest

#### All-Toyota Harmony with Nature Working Group Activities

	FY2017	FY2018	Two-year total	2006–2018 total
Number of participants (persons)	41,118	47,440	88,558	
Number of trees planted	31,089	27,645	58,734	12,158,734
Conservation target forests (ha)	1,798	3,019	4,817	
Environmental education (participants)	26,486	32,302	58,788	

#### Booklet Published and Website Created

The All-Toyota Green Wave Project volume 2 was published following volume 1 published in 2016 and distributed to employees throughout the Toyota Group. As a result of this activity, it was found from an

employee questionnaire that the recognition of biodiversity reached 81 percent. Starting in June 2018, which was Toyota Environment Month, in addition to distribution of the booklet (volume 3), a dedicated website was launched to disseminate information on the activities of each company in a timely manner. From now on, we will strengthen activity sharing so as to improve the degree of recognition in each company.



Dedicated website



#### Little Tern Conservation Project in Kinuura Bay

Toyota Motor Corporation, JTEKT Corporation, and Toyota Industries Corporation, which have plants in the Kinuura region, collaborated and launched a program to protect the little tern.

The little tern is a migratory bird that spends spring and summer in Japan to breed and raise its young. In the past, they were common birds, but more recently, their breeding environment has diminished and they are at risk of extinction (the little tern is classified on the Red List of Ministry of the Environment of Japan as a Category II (Vulnerable) and as Category I B (Endangered) on the Red List Aichi 2015).

The three Toyota Group companies are collaborating with Nishimikawa Bird Club and we are carrying out conservation activities for coastal biodiversity with a focus on the nesting environments of little terns. Nesting area development and attraction activities began at the JTEKT Tadomisaki Plant in the winter of 2015. Nesting area development on idle land began at the Kinuura Plant in 2017, and Toyota Industries Corporation participated in 2018.

In FY2017 decoys were installed, CDs of the birds' cries were played, and other activities were conducted at the Kinuura Plant. It was confirmed that little terns flew into the area, but unfortunately, they did not build nests. Starting in March 2018, employees created gravel beds, drinking locations, and hiding spots for chicks and conducted other activities to improve the nesting environment and set additional decoys to attract more birds. As a result, birds built nests and laid eggs, and the chicks are now steadily growing as of July 2018.



Little terns (the two on the left) and decoys (two on the right)



Parent and chick little terns



## Boost Grant for Environmental Activities Connecting with the World —Toyota Today for Tomorrow Project

Toyota has conducted cooperative activities in Japan and overseas with environmental NGOs including the Toyota Environmental Activities Grant Program and afforestation programs in China and the Philippines. We have established Toyota Today for Tomorrow Project to bolster our long-standing grant program on a global basis. With the aim of contributing to society, we will work together with organizations engaged in nature conservation around the world by establishing projects to solve issues in the areas of living in harmony with nature and biodiversity.

### Launch a Five-year Partnership with WWF on Living Asian Forest Project

In July 2016, Toyota entered into a five-year partnership with WWF (World Wide Fund for Nature) aiming at accelerating the globe's transition to sustainability. Toyota is the first car company and the first Japanese company to sign a Global Corporate Partnership agreement with WWF.

To promote biodiversity conservation under the partnership, Toyota has made annual 1 million US dollar grants to WWF since 2016 to support the Living Asian Forest Project. The Living Asian Forest Project aims to strengthen existing WWF activities to conserve tropical forests and wildlife in Southeast Asia and launch new conservation initiatives.



■ FY2018 Activities (1): In July 2017, a WWF seminar on sustainable natural rubber production and procurement was held in Japan as an educational event. With the expectation that providing information on conditions at natural rubber production sites and conveying local opinions to involved people will expand the movement for sustainable natural rubber, relevant people were urged to participate in. Numerous participants from Japanese tire makers as well as locals from Thailand, Indonesia, and Myanmar discussed the current conditions of natural rubber production. Also, a tire maker from Europe, whose procurement guidelines on natural rubber were issued at an early stage, presented information on examples of applications that improve traceability in the natural rubber supply chain.

### Comment from WWF Thailand

- There is a correlation between the loss of forests in Thailand and the increase in land area used for natural rubber plantations
- Ninety percent of natural rubber farmers (1.4 million households) are small-scale farmers with an average land area of 4 ha

### Comment from WWF Myanmar

- There are many issues including low quality, low productivity, and low added value
- There has been some movement by the government including the announcement of zero deforestation, but the instability of the government is proving to be a bottleneck

### Comment from WWF Indonesia

- Most deforestation is illegal, and much of it is for production of palm oil and other products



Rubber is produced by making a cut near the surface of a rubber tree using a knife or other tool, collecting the white sap that seeps out, and solidifying and processing it



Orangutans are endangered due to the rapid loss of forests

■ FY2018 Activities (2): A website for the Living Asian Forest Project in both Japanese and English was launched in November 2017. The site introduces a summary of the project as well as information on recent activities, plants and animals inhabiting the living Asian forests.



It is believed that there are no more than 100 Sumatran rhinoceroses



A veterinarian cares for eight elephants that are part of a patrol team

## Toyota Collaborates with IUCN to Enhance Data on Biodiversity Preservation Status

Toyota began a five-year partnership with International Union for Conservation of Nature (IUCN)<sup>1</sup> in May 2016 to raise awareness of the biodiversity crisis. Under the partnership, we provide annual grants of approximately 1.2 million dollars and began supporting the IUCN to enrich the IUCN Red List of Threatened Species™ (the IUCN Red List)<sup>2</sup>. With this support, the IUCN will conduct assessments of more than 28,000 species at risk of extinction, accounting for 35 percent of species requiring assessment. This represents a major step forward in the IUCN's goal of gaining a comprehensive view of the conservation status of biodiversity on the Earth.



<sup>1</sup> IUCN: Founded in 1948 through an international initiative, International Union for Conservation of Nature is a global nature conservation network comprising nations, government agencies, and non-governmental organizations

<sup>2</sup> IUCN Red List: The IUCN Red List of Threatened Species™ (IUCN Red List) is a list of threatened species in the world managed by the international organization IUCN

■ FY2018 Activities (1): We jointly organized an event held in Bangkok, Thailand in May 2017 with IUCN to raise awareness of biodiversity and the IUCN Red List in Thailand. Various stakeholders including officials from the Thai government, university academics, students, and NGOs participated. Representatives from each sector gave speeches in which they expressed hope that activities will be expanded through collaboration between the public and private sectors, welcomed the participation of persons of like mind, and conveyed their wishes for increasing such persons in the future. The participants emphasized the importance of cooperation in undertaking conservation activities.

■ FY2018 Activities (2): The IUCN released the latest version of its IUCN Red List at an event held in December 2017. Forty-six species of snakes and lizards endemic to Japan were newly assessed, and it was indicated that 15 species of reptile including snakes and lizards that inhabit the Nansei Islands are endangered. During a panel discussion at the event, Toyota highlighted that the IUCN Red List is an important pillar of Challenge 6.

■ FY2018 Activities (3): Environmental NGOs BirdLife International (BLI) and Conservation International (CI) conduct IUCN Red List surveys and preservation activities. Toyota has been supporting activities for the Red List and has provided vehicles to the two organizations since 2016. Based on local needs, in FY2017, Toyota made donations to BLI in Vietnam and Brazil and to CI in Indonesia and Brazil, supporting local surveys.



Local use of Toyota vehicles

## Toyota Environmental Activities Grant Program

In 1999, Toyota was honored with the Global 500 Award from the United Nations Environment Programme (UNEP). To commemorate receipt of this award, in FY2001, we launched the Toyota Environmental Activities Grant Program to support the environmental activities of NPOs and other groups. The main themes of the grant program are biodiversity and climate change. Grants are offered to support overseas projects (up to seven million yen per project) and projects in Japan (up to three million yen or one million yen per project).

Over the 18 years since the program was established, we have supported 360 projects in 53 countries and regions worldwide.

[Environmental Data p. 131-0](#)

■ FY2018 Activities (Domestic project): One domestic project supported a nature club that seeks to foster the specialists of the future and utilize local capabilities to protect wildlife. The event, conducted by the Wildlife Partnership Office, includes nature courses for children, small groups, and lifelong learning and target elementary school children. Its objectives are to promote education on living creatures management that takes into consideration preservation of biodiversity and to foster local leaders.

The event specializes in wildlife management training and enables participants to learn local, environment, experiencing techniques on the university level.

Inquiries from non-local administrative officials, NPOs, and companies, with which there were no prior ties have increased and networks are expanding, leading to new activities.



Children participating in the program and university students participating as interns

■ FY2018 Activities (Overseas project): For one overseas project, the Organization for Industrial Spiritual and Cultural Advancement International (OISCA) is carrying out the Children's Forest Program in Sri Lanka to create plant nurseries and conduct environmental education. It aims to protect and nurture areas in an attempt to revitalize the local original biodiversity and to rebuild affluent lives in harmony with nature.

The program provides practical training on tree planting starting with growing saplings mostly by younger generation, and environmental education. Before trees are planted, local residents cooperate with ground preparation and hole digging, and the wholehearted efforts of the children inspire the adults, leading to the development of activities that involve entire regions, and there have been reports of the expansion of voluntary activities as well.



Trees are planted with a focus on native species

## Boost Contributions to Environmental Education Connecting to the Future – Toyota ESD Project

Human resources development is crucial for expanding environmental conservation activities to the future. Consequently, the Toyota Education for Sustainable Development Project promotes sustainable human resource development suited to local communities. Our corporate training approach is to nurture environmentally conscious employees and leverage their awareness to make it better for business. Additionally, we are connecting our training activities to the future by making the best use of the features of business sites and company-owned fields to provide environmental education for children, who will be responsible for sustainable societies in the future.

### Toyota Shirakawa-Go Eco-Institute

Toyota Shirakawa-Go Eco-Institute, located at the Shirakawa-Go world heritage site, opened in 2005 with the goal of widely promoting locally rooted environmental education valuing nature's inherent wisdom. The concept of "living in harmony" is central to the Institute, which is located in rich nature at the foot of Hakusan (Mt. Haku), and which provides many adults and children visiting Shirakawa-Go with hands-on nature programs as well as working on ecosystem surveys of wildlife, along with forest conservation activities. In 2015, to commemorate the institute's 10th anniversary, we enhanced the hands-on nature programs under the slogan, "Trail walking for adults. Forest play helps kids grow stronger." The Institute aims to provide opportunities and education to enable individuals to understand and take action on their own initiative through shared education that enhances growing and learning together toward living in harmony with nature. There is a special emphasis on "children's camp" that nurtures children's environmental awareness, self-reliance, and ability to take action.

In FY2017, the Old-Growth Forest Insect Survey Camp and Hakusan Outdoor Journey camp programs for junior high school students were added. A total of eight camp programs were conducted, drawing 353 participants. The total number of people staying overnight at Shirakawa-Go in FY2018 was 16,718, and 13,046 people participated in institute programs during the year. Since opening in 2005, the institute has welcomed more than 209,000 visitors.

Toyota Shirakawa-Go Eco-Institute will continue to develop new hands-on nature programs to nurture an awareness of living in harmony with nature among a growing number of adults and children.



Children participating in the Hakusan Outdoor Journey program

### Forest of Toyota

Forest of Toyota in Toyota City is a company-owned forest near the urban areas. It has been maintained based on the environment of satoyama, which was once part of our lives, creating a forest where living creatures can naturally inhabit.

Since 1997, the forest has been open to the public. Anyone can walk freely through the forest and take part in various events to experience the satoyama environment and learn about nature through their five senses. In 2017, we celebrated 20 years since the forest opened to the public. Since 2001, we have also provided hands-on learning events for regional elementary schoolchildren. In 2017, these events were attended by 5,538 children.

#### ■ FY2018 Activities: Nationwide Dragonfly Park Project

In June 2017, we held the "Future of Harmony between People and Nature as Learned from Dragonflies" event, the second in a series held to learn about the ecology of living creatures of satoyama. Dragonflies are familiar creatures that make use of the waterside environments that people create in their lives. By learning about dragonfly ecology and habitats, we considered the importance of biodiversity and human living in harmony with nature. An expert discussed the causes of decreases in dragonfly populations.

They presented research results such as new findings on the ecology of dragonflies and efforts to expand paddies using reduced agricultural chemicals to preserve dragonflies.

During a field tour to the Forest of Toyota, participants observed dragonfly nymphs living in the soil, the smallest dragonfly in Japan. Information was also presented on methods of developing water environments that are employed on a daily basis in the Forest of Toyota.

Finally, the participants discussed methods of environmental preservation that they can undertake. One participant commented, "I hope to create biotopes that take living creatures into consideration and conduct environmental education for children that conveys the interesting ecology of dragonflies."

We will continue to conduct environmental education programs that use dragonflies as inspiration to learn about nature in our immediate surroundings and lead to action.



An observation tour



The scarlet dwarf is about 2 centimeters long



## Promoting Environmental Contributions Through Biotechnology and Afforestation Business, Automotive Peripheral Technologies, and Forest Conservation Activities

### Cooperation with Preservation of Peat Swamp Forests in Indonesia

Indonesia is the third largest emitter of CO<sub>2</sub> in the world when forest fires, peat fires, and other factors are included. Emissions from peat as a result of peat fires and other causes account for 37 percent of the total, equal to more than half of the total CO<sub>2</sub> emissions in Japan. On the other hand, preserved peat swamp forests are not only carbon sinks, but are an important habitat for species at risk of extinction including the orangutan and proboscis monkey. In order to preserve swamp forests and prevent CO<sub>2</sub> release, in addition to fire prevention and monitoring activities, we are carrying out activities to prevent the depletion of forest resources by supporting the economic independence of local residents in the Katingan region of central Kalimantan.

As part of the support activities, Toyota has brought in an improved fast-growing Napier grass in rural villages where beef cattle are raised and began on-site cultivation tests in 2016. The tests verified that the Napier grass produces yields that are more than double those of the varieties grown locally. We also confirmed that not only can the tips of the Napier grass be used as forage grass, but the lower portion of the stems can be used as a source of fuel as an alternative fuel and as biogas. Utilization of this developed variety of Napier grass is expected to support economic independence by local residents and lead to preservation of peat swamp forests.

In the future, we will confirm the effectiveness of selected developed varieties and cooperate with local companies to verify effectiveness on a practical scale such as expanding self-sustaining models to other rural villages.



Program participants with Napier grass three months after cultivation



A Napier grass cultivation test

### TOYOTA Mie Miyagawa Mountain Forest

To its own forest site in Odai Town, Taki District of Mie Prefecture, Toyota has introduced automobile manufacturing expertise for management, such as soil and water conservation\* and providing other functions which benefit the public. We are also conducting programs to learn about forestry and the deep relationship between the forest and human beings fully using the nature properties of Miyagawa region which has the history of timber industry.

In FY2018, we started a new project, the Forest Challenge and Development, aiming for connecting forests with future generations. Taking on a challenge for utilization of trees and spaces as well as lumber production, business plans were collected widely from the public. Also, three participants selected through a screening implemented forest-based programs starting in April 2018. To raise awareness of some wisdom from forests and trees as well as promote the use of wood, we planned workshops to produce sculpted furniture and day-to-day goods made of wood with good designs.

We are also planning events that will enable more people to enjoy maintained mountain forests.

We will continue to invigorate local communities and forests by increasing the number of people involved with forests.

\* Water conservation: The ground penetration and storage of rainwater that slowly flows as underground water and rivers



The Forest Challenge



A hands-on forest program (a walk-through a 100-year forest)

## Initiatives at the New Toyota R&D Center Promoting Harmony with Nature and Local Communities

Toyota is constructing a new research and development facility in the overlapping area of Toyota City and Okazaki City. This new facility will be a hub for development of sustainable next-generation mobility. The main design concept is a technical center in harmony with nature and local communities. About 60 percent of the total project site will be preserved as areas for the regeneration of forests and management of yatsuda rice paddies (paddies in low-lying areas) in collaboration with the local community. Toyota is also actively sharing information including the status of these activities and findings gained from them.



Overall diagram of the new Toyota R&D Center



The Japanese pond frog is an important species for the regeneration of yatsuda paddies

### ■ FY2018 Activities (1): Acorn tree planting activity at business site

In June 2017, Toyota held a tree planting activity with the participation of 90 prefectural and municipal personnel and others local concerned persons including fifth and sixth grade students and teachers from the Hanayama, Tomoegaoka, and Onuma Elementary Schools in Toyota City and the Shimoyama Elementary School in Okazaki City. The saplings, grown at elementary schools in milk packs, were raised from konara oak and Japanese blue oak acorns collected on the business site. On the day of the event, a total of 600 saplings were planted. By growing saplings from collected acorns and returning them to the mountain, we are preserving acorn mountain. The Karen Forest Development Promotion Association, a member organization of the Shimoyama Satoyama Conference, plays a central role in this program, and Toyota employees participate as volunteers each year. We will continue to support local proactive activities that lead to the preservation of Satoyama and will take measures to make the new R&D facility a sustainable technical center in harmony with nature and local communities.



Children planting saplings grown from acorns



Personnel from schools, local government, and the local community at the tree-planting event

### ■ FY2018 Activities (2):

#### Rice paddy living creatures survey team

In July 2017, we conducted a survey of the living creatures in rice paddies. We used landing nets and plastic bottle traps to capture living creatures in three kinds of waterside areas with different environmental conditions: rice paddies (with agricultural chemical use), biotope (without agricultural chemical use), and waterways. We examined the species and numbers living in each environment and compared the differences. Participants learned from explanation by an expert that there is a relationship between the living creatures living in rice paddies and surrounding forests, and when living creatures decrease due to changes in the environment, food chains collapse, and ultimately there is an impact on human food supplies.



Observation of captured living creatures



Explanation by an expert

#### Bamboo charcoal making and searching for spring living creatures in satoyama

In March 2018, we conducted a program on making charcoal from bamboo and searching for spring living creatures in satoyama. The objective was to inform participants about earlier lifestyles in satoyama, which used natural resources cyclically, and raise awareness about current satoyama issues. Members of the Nukata Charcoal Making Group, a member organization of the Shimoyama Satoyama Conference, demonstrated bamboo charcoal making techniques using pail cans and discussed uses for charcoal in daily life. Participants learned about damage caused by animals and one of the solutions is to hunt and eat. They tasted a lunch of wild boar stew prepared by local mothers. During the search for living creatures, participants learned about the various environments of satoyama and the many creatures inhabiting them by finding signs of living creatures in forests and grasslands, and observing egg masses of montane brown frogs in rice paddies.



Bamboo charcoal making using pail cans



Observing montane brown frog egg masses