

Kaisho Forest, an excellent SATOYAMA located close to an urban area.

There was concern about the sustainability of Kaisho Forest once it was selected as a site for the 2005 World Exposition, Aichi, Japan. However, the natural environment was carefully studied, including confirmation of nest building for the endangered northern goshawk (*Accipiter gentilis*), and most of the area was preserved through extensive consultations and cooperations involving many people.

Now Kaisho Forest is a popular destination for many people who are drawn to this rich forest environment located so close to the city.



Northern Goshawk

Factors Affecting Biodiversity in Kaisho Forest

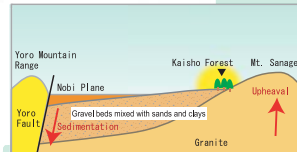
● Unique Geological Features ~Formation of Gravel Beds~

Approximately six million years ago, the area surrounding present Ise Bay was a shallow lake basin known as Lake Tokai, where there was a thick accumulation of gravel, sand and clay. The area is composed of gravel bed, granite and others.

This gravel bed is permeable and infertile. Both arid areas and marshes are formed, which had a major influence on the development of plants that are unique to this region known as "the Tokai hilly land element flora".



Graph 1 Position of Lake Tokai



Graph 2 Cross Section

● Change of Natural Environment due to Man's Activities

Since the Heian Period (794 to 1185) trees in Kaisho Forest were excessively cut in order to provide firewood, fuel of pottery making and leaves for manure. Around 1900, much of the forest had been devastated.

However, efforts were made that year to begin restoring such devastated lands across the country. Japanese black pines (*Pinus thunbergii*) and *Alnus pendula* were planted to stabilize mountain regions. Gradually *Quercus serrata* and other species began to grow there. Also many cedar and cypress trees were planted at other bare land. By 1970, almost all land that was bare had been covered by forests.



● Environment Maintained through Continuous Regular Usage

In the past, SATOYAMA environments such as paddy fields, farms, forested areas and reservoirs were used daily and were habitats where many animals and plants can be adapted.

However, lifestyle began to change from the 1960s as the use of gasoline became more common. People stopped taking care of the SATOYAMA environments and gradually the plants and animals that inhabited there started to disappear.

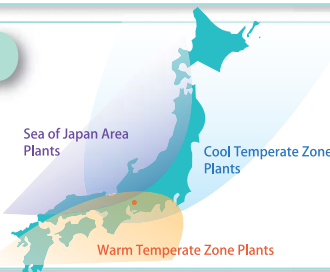
Presently, the SATOYAMA environments are again maintained by new activities such as forest and farming activities.



● Climatic and Geographical Location ~Central Japan~

The north-central part of Aichi Prefecture where the Kaisho Forest is located belongs to a warm temperate zone with an annual average temperature of 15°C and annual average rainfall of about 1,500 mm.

In some areas, however, cool temperate zone plants, such as the bog club-moss (*Lycopodium inundatum*), as well as *Viola vaginata* and other plants more common along the Sea of Japan's chilly coast, are seen. This is due to the fact that the area is a continuation of the mountain regions stretching from Gifu and Nagano prefectures and some areas have climates similar to those near the Sea of Japan coast.



Kaisho Forest

Biodiversity of Kaisho Forest
Various factors have made this environment a mosaic of habitats for a diverse array of plants and animals.

Understanding Biodiversity

Biodiversity refers to having a variety of different plants and animals living together in the same habitat. Biodiversity can be seen in Kaisho Forest on the ecosystem, species and genetic levels.

Ecosystem Diversity

There is a mosaic of various environments around the forest. Specifically, there are eight rivers and the connecting streams, small wetland formed by underground water springs, reservoirs and fields. Here various plants and animals specific to each environment can be seen.

Forest

Pond

Small Wetland

Field

River & Stream

Species Diversity

Roughly 3,400 different species have been identified in Kaisho Forest (Table 1). This is equivalent to 39% of all species identified in Aichi Prefecture.

These various species are living in different types of environment in accordance with their own unique life patterns.

Table 1 Number of Species Confirmed in Kaisho Forest

Classification	Family	Species	Percentage of all species in Aichi Prefecture
Vascular plants	134	893	41%
Mammals	13	23	37%
Birds	41	132	34%
Amphibians	6	13	81%
Reptiles	6	12	60%
Freshwater fishes	5	13	26%
Insects	306	2,308	38%
Total	511	3,394	39%

Source : Number of species identified in Kaisho Forest : 2005 Assessment of Environmental Impact from the Aichi Environment Agency
Number of species identified in Aichi Prefecture : Plants [Red Data Book Aichi 2002]
Animals [Red Data Book Aichi 2001]

Genetic Diversity

The star magnolia (*Magnolia tomentosa*) is a small tree endemic to the Tokai area and is in danger of becoming extinct.

Its small populations are isolated and dispersed and so genetic diversity within the group was supposed to be low. However, genetic analysis has concluded that the genetic diversity is actually high.

New populations of the star magnolia are formed by birds bringing these seeds to newly created small wetland. After a certain period of time these populations declined as other plants around them grew taller. Then after a relatively short time, different populations were formed through seed dispersal into newly formed small wetland by birds. This pattern was repeated over and over. This is why so many different genes can be seen dispersed in a rather narrow area.

