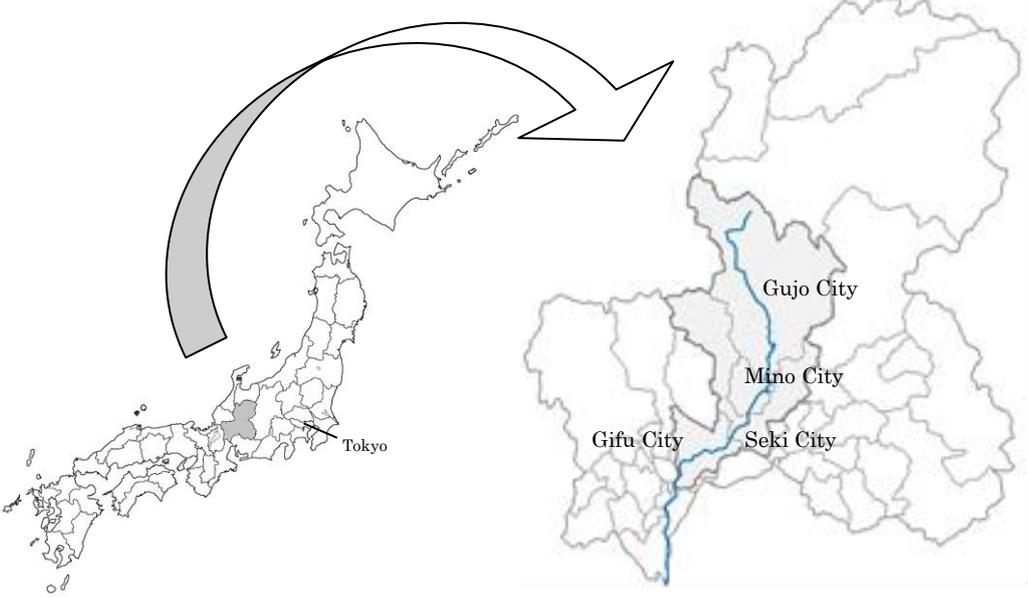


Globally Important Agricultural Heritage Systems (GIAHS) Application

Overview

<p>Agricultural System Name: The Ayu of Nagara River System (The Connection Between Ayu and the People of the <i>Satokawa</i>)</p>
<p>Applicant Organisation: Nagara River Agriculture, Forestry and Fisheries Promotion Association</p>
<p>Country/Area/Region: Japan, Gifu Prefecture, Upper and Central the Nagara River (Gifu City, Seki City, Mino City, Gujo City)</p> 
<p>Gifu Prefecture is located in the heart of Japan, with the Nagara River flowing through four cities in its central region.</p>
<p>Access to the Capital and Major Cities: To Tokyo: 2 hours 10 minutes by Japan Railway Shinkansen and Tokaido Line Approximately 4 hours 45 minutes by car To Nagoya: 20 minutes on the JR Tokaido Line Approximately 50 minutes by car</p>
<p>Area: 1,824 km²</p>
<p>Agricultural and Ecological Classification: Temperate, inland fisheries, paddy rice, upland crops</p>
<p>Topological Characteristics: Forests, rivers, and the surrounding plains</p>
<p>Climatic Classification: Temperate humid climate Population: 577,000 (March, 2013) Number working in agriculture, forestry and fisheries industries: 6,052</p>
<p>Primary Income Sources: Agriculture, forestry, fisheries, commerce and tourism</p>
<p>Ethnic Groups/Indigenous Peoples: N/A</p>

Explanation of Agricultural Heritage System

On the upper and middle courses of the Nagara River located in Gifu Prefecture exist thriving inland fisheries which revolve around a species of Japanese sweetfish called “ayu” (*Plecoglossus altivelis altivelis*). Despite flowing through urban and residential areas, the pristine Nagara River that runs through the site’s centre boasts an abundance of clear, high quality water, and is also considered one of Japan’s three clearest rivers. The people of the region receive the river’s bounty and in turn strive to conserve it for future generations.

Ayu are a migratory species that move between oceans and rivers and can only inhabit remarkably clean water. The ayu of the Nagara River in particular have long been considered a local specialty and were crucial to the development of the region’s food culture, as well as traditional fishing techniques such as cormorant fishing. Indispensable to the fisheries products, processing, and tourism industries, ayu are an integral part of many peoples’ livelihoods.

The landscapes of the Nagara River and ayu are not just the pride and joy of the local people, but essential to their daily lives as a source of drinking and irrigation water as well. The locals seek to conserve them by nurturing forests and water sources so that the quality of the water, as well as the habitat for ayu and many other rare species of fish, can be conserved. Thus, the Nagara River can be called a *satokawa*, which through proper maintenance and sustainable use by the local people possesses economic and spiritual value, and supports the conservation of biodiversity.

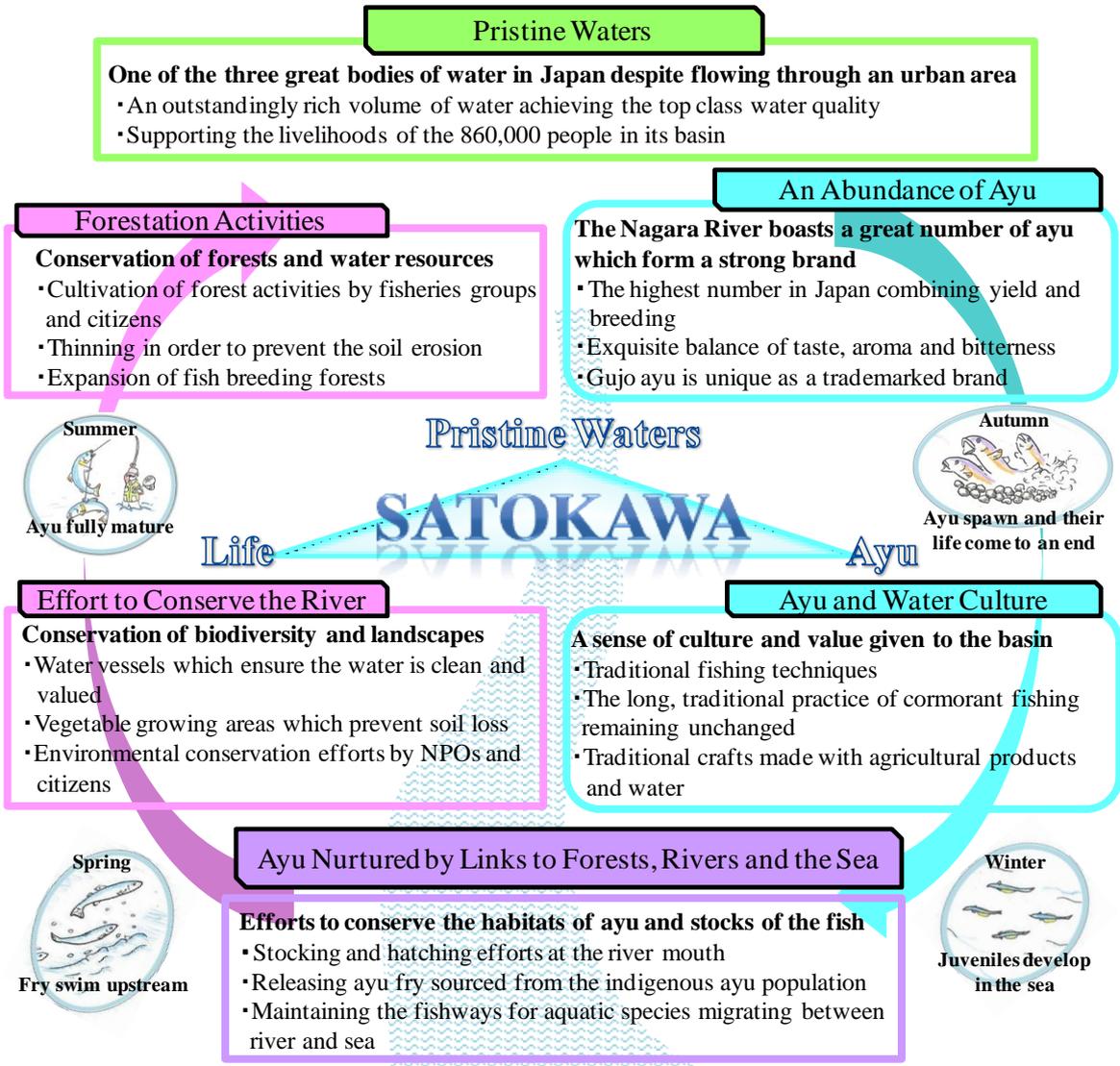
This connection between the river, ayu, and people of the region is integral to the synergy of the local lifestyle, aquatic environment and fisheries resources that makes the Nagara River system an invaluable GIAHS. The Nagara River system provides useful insights for addressing the global problems of pollution, water shortages due to population growth, and rapid industrialisation, as well as how to maintain sustainable fisheries.

In order to conserve the ayu of the Nagara River, we seek GIAHS designation so that we may share this agricultural model with the world, contributing to issues such as the conservation of aquatic environments, biodiversity, and resources vital to fisheries industries.

The Ayu of Nagara River System

-The Connection Between Ayu and the People of the *Satokawa*-

Despite flowing through urban areas, the river boasts various fish population centred around ayu, as well as clear waters
A sustainable system intrinsically linking the lives of the people, the water environment and the fisheries resources



The environment is conserved through the appropriate use of the Nagara River. It flows the *satoyama*¹ and the *satochi*² and can thus be called a “*satokawa*”³. The system of intrinsic links between the lives of the people, the water environment and the fish resources on the *satokawa* is known as the “Nagara River System” which will be shared with the world.

Domestically: Improving the brand power of ayu and agricultural goods, strengthening the environment around the river and continuing with the construction of the Ayu Park.
Abroad: Dealing with water shortages, the conservation of ayu, a fish found only in East Asia, and promoting the culture and sustainable export of the fish.

1 Woodland areas in the mountains near human settlements; important as habitation zones and for natural resources.
 2 Regions consisting of farmlands and ponds in mountains and forests surrounding the settlements that manage them.
 3 Rivers flowing through human settlements that are maintained through the appropriate use and conservation of the environment surrounding them.

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Explanation of Agricultural System

I. Characteristics of the Proposed GIAHS

Global (National) Importance

At this site, where inland fisheries revolving around the ayu (*Plecoglossus altivelis altivelis*, commonly known as sweetfish) and other fishes flourish, the Nagara River (image 1) and its pristine waters are conserved as part of the lifestyles of the people (see Appendix 1). Both the river and the ayu are deeply connected to the region economically, historically and culturally.



Image 1: The Nagara River, Mt. Kinka and Castle Town Area (Important National Cultural Landscape)



Ayu is placed in the monotypic family (Plecoglossidae) in the order *Salmoniformes* in taxonomy. The unique morphological characteristics of ayu are its comb-like teeth and its sail-like dorsal fin. It is basically an amphidromous fish that moves between rivers and sea and grows to a maximum length of 30cm over its one year life span. Its rapid growth is related to its habitat and it has a feeding territory based on the algae attached to stones. The dominant individuals that claim the territory can control food supplies in the area, and the territorial holders attack intruders intensely. Their comb-like teeth are useful for feeding and their sail-like dorsal fin grows gradually.

This cycle that occurs on the Nagara River combines the peoples' lifestyles, the aquatic environment and fisheries resources to constitute a “*satokawa*” system that is worth introducing to the world.

The existence of this “Nagara River System” depends largely on three very important factors that make the cycle possible.

- a) Initiatives to conserve the water and aquatic resources occur as part of people's daily lives and economic activities. As a result, even rivers that flow directly through urban cities and towns maintain a high level of water quality and biodiversity.

- b) Through the conservation of the aquatic environment and the area's traditional fishing methods, inland artisan fishing that relies on ayu and other migratory fish is able to thrive, maintaining the productivity of the agriculture, forestry and fisheries industries.
- c) Flourishing historical culture and related production industries developed as a result of conserving the region's pristine waters, agriculture, forestry and fisheries.

i) What is a *Satokawa*?

Literally, the word *satokawa* means *sato*, referring to a settlement of human activity, and *kawa*, meaning river. Thus the *satokawa* is not a river that is preserved in an untouched natural environment, but conserved through the proper management of forests, the implementation of flood protection measures and regular cleaning, existing as an important part of the local lifestyle. Economically valuable as a source of water for everyday use, irrigation and for its indispensability to fisheries, the Nagara River also possesses sentimental and spiritual value as a source of leisure, a crucial element of the area's many beautiful landscapes, and for its historical and cultural significance. The *satokawa* also conserves biodiversity, flowing from the *satoyama* above to the *satochi* that lie below.

ii) Nagara River Overview

The Nagara River region supports a population of 860,000 people (1), and the river itself is designated one of the "Selected 100 Exquisite and Well Conserved Waters" by the Ministry of the Environment despite flowing through urban centres. It is also the only river in the country to be counted among Japan's "88 Best Bathing Spots" (2) and is also known as one of the nation's three most pristine streams of water. The Nagara River and the ayu it nurtures are the centre of a thriving inland fishery that led to the development of traditional artisan fishing methods such as cormorant fishing, Gujo fishing, shoal net fishing and night net fishing, which have been passed down from generation to generation. Amongst them, there are records of cormorant fisheries dating back as far as the Nara (710 - 784) and Heian (794 - 1185) periods, and the cormorant fishing that is practiced on the Nagara River now is said to have remained virtually unchanged since the Muromachi period (1392 - 1573).

Furthermore, the culture surrounding the agriculture, forestry and artisan fishing has manifested in the form of traditional arts that continue to be passed down, such as Gujo *honzome* dyeing, Mino *Washi* Japanese paper, Gifu *wagasa* Japanese umbrellas and Gifu *chouchin* paper lanterns (see Historical Relevance chapter). Their development is made possible by the limpid waters and the agricultural and forestry products that are bountiful in the region.

The water that flows through the Nagara River has supported both the local culture and the agriculture, forestry and fisheries industries, but its high quality has not only been maintained due to natural conditions such as precipitation or the steep topography. Spiritual beliefs such as the worship of Mt. Hakusan in the Nagara River region, from which the river water originating surrounding Mt. Hakusan has supported the people's daily lives, agricultural activities and traditional culture of the local people since ancient times, and the desire to deliver pure water downstream has been passed down to this day. One such practice devised by the people along the upper course of the Nagara River to keep the water clean was the creation of the *mizubune* (see The Management of Land and Water chapter), a communal watering spot that is divided into multiple levels. The top level is for drinking water, which flows to the middle level meant for rinsing vegetables or fruits, and then to the bottom level where the water is used for washing dishes or linens. Before the water flows downstream, the food scraps are eaten by carps which are kept in the nearby waters. This is one example of how routine practices help to maintain the water's purity. Moreover, there are also ongoing initiatives by the fisheries and local government bodies in the central region of the river to care for the forests and protect the water's source, as well as activities along the upper Nagara River to conserve the forests. Citizen groups spearhead cleanup and nature conservation movements.

This process of circulation on the Nagara River intertwines the lifestyles of the people, aquatic ecosystems and the resources of the artisan fishing industry and is a system worthy of introduction to the world.

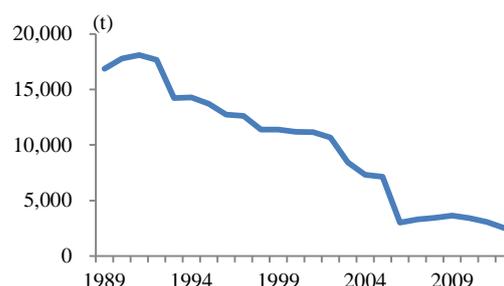
iii) Ayu Resources

Ayu, the symbol of the Nagara River, is a migratory fish that moves between rivers and seas. The juveniles raised in the sea make their way upriver in the spring, live their

lives and grow up in the bountiful and clear river waters. They once again travel downriver in the autumn to spawn, where they lay eggs and end their short life span of only one year. The juveniles that hatch from those eggs then move to the sea in late autumn and live in coastal areas until spring. The ayu is designated Gifu's prefectural fish and is not just a means by which many in the artisan fishing industry make their living or a target for recreational fishing in the areas it swims, but is also culturally connected to the lives of the people in the prefecture.

Ayu also inhabit places other than Japan such as China, South Korea, Taiwan and various regions across Southeast Asia (3). However, because they are a migratory fish that live for only one year, they are highly vulnerable to changes in their environment. During the rapid economic expansion and accompanying pollution and overfishing in Taiwan in the 1960s, ayu had completely disappeared from there for a time.

While ayu may account for the second largest yield of river fish in Japan (4), the subspecies of ayu that inhabited Okinawa's main island (*Plecoglossus altivelis ryukyuensis*) is now extinct (5) and the number of habitable rivers for ayu have decreased due to environmental changes and diseases, causing a sharp drop in the total yield of ayu (graph 1).



Graph 1 : Changes in the Total Yield of Ayu in Japan

However, due to ongoing efforts to conserve the Nagara River's ecosystem, such as the continued release of genetically consistent fry into the waters and taking steps to conserve fisheries resources through disease prevention initiatives, the yield of fish from the Nagara River has remained constant. Environmental integrity is necessary in order to secure the conservation of the ayu life cycle, which requires an abundance of pure and high quality water, proper structure of shoals and deep waters, varied types of riverbed gravel and uninterrupted connection between river and sea. This environment is also linked to the conservation of other migratory species such as red spotted masu trout (*Oncorhynchus masou ishikawae*) or the Japanese mitten crab (*Eriocheir japonica*), which are also caught using the distinct fishing methods found on the Nagara River, which despite flowing through crowded cities maintains its bountiful fisheries resources

and biodiversity. Moreover, the Nagara River environment which ayu inhabit also supports the continued inhabitation of several other freshwater species, making the area not just a valuable fisheries resource but a globally significant site for learning how to maintain and conserve biodiversity.

iv) Issues Surrounding the Aquatic Environment and the Nagara River System

Aquatic environments the world over are changing due to climate change pressures from global warming, population growth and the increased demand for water in developing nations seeking economic growth. It is said that more than 700 million people currently suffer from water shortages worldwide (6), and it is anticipated that the problem will only continue to worsen. Moreover, due to the improper treatment and disposal of waste water generated by citizens, factories and industries, some areas of the world are facing grave issues with water pollution.

In a world where people are confronted with serious problems surrounding the quality of drinking water, water shortages, fewer resources available to fisheries and the development of forests, the cyclical system on the Nagara River could possibly serve as a model for how to conserve the water, ecosystems and provisions surrounding rivers through sustainable use. We expect that the cyclical system of this site could be used as a possible solution to the ongoing problems concerning water and natural resources around the world.

1. Food and Livelihood Security

i) Food Security

Inland fishing is an important source of animal protein worldwide. Rivers and lakes in Japan are narrow, and the resources available to inland fisheries are limited. Nevertheless, inland waters play an important role as a source of various freshwater fish, as well as a means by which people engaged in commercial or recreational fishing can commune with nature and conserve the natural environment.

The Nagara River is home to a thriving inland fishery industry that centres around the ayu, accounting for the second greatest yield amongst all river fish in Japan. 216 tonnes of ayu are caught annually with an additional 871 tonnes produced through aquaculture (4), making Gifu Prefecture the top production centre for ayu in the country.

In particular, *tomozuri* live decoy fishing is popular upriver in Gujo City, and the Gujo Fisheries Cooperative¹ that holds jurisdiction over fishing in the area is unique in that it has established its own cooperative shipping system. Blessed by a steep current and clear water, “Gujo Ayu” (image 2, left) boast not only perfect shape, but they are also renowned for their firmness, aroma and taste. In 2007, it became the very first river fish to be registered as a Regional Collective Trademark by the Japan Patent Office (image 2, right). The Gujo Ayu brand has continued to grow and was awarded the grand prize at the “Clear Water Ayu Tasting Festival” in 2008 to determine the most delicious ayu in all of Japan.



Image 2: Gujo Ayu (Registered as a Regional Collective Trademark)

1 While inland fisheries cooperatives receive licenses from the governor that permit members to engage in fishing business, the Gujo Fisheries Cooperative determines the usage of natural resources managed through regulations concerning fishing methods, what times of year fishing is allowed, and what size of fish are acceptable to catch. They also bear the responsibility of increasing the natural resources through the release of fry that are targets of the artisan fishing.

Furthermore, the abundant and clear waters of the Nagara River and its branches irrigate rice paddies located throughout the site’s 11,000 hectare area, making it essential to the production of rice. The lands along the river have also seen a great accumulation of sand and soil, making the land perfectly suited to growing fruit trees and vegetables. This area in particular produces the third largest yield of *fuyu* persimmons (*Diospyros kaki* ‘Fuyu’) and is the most commonly harvested variety of persimmon in the country (7).

ii) Securing Income

Ayu are significant not just to the local artisan fishing sector, but are also an important tourism resource as part of cormorant fishing and are deeply connected to the local food culture, thus making the scope of their industrial importance quite wide. The total revenue of ayu across the entire prefecture comes to 2.2 billion yen (\$18.3 million USD) per year. The fisheries cooperatives receive 300 million yen (\$2.5 million USD) per year from 220,000 people in fishing license fees, with fishing on the Nagara River accounting for roughly half of the total (8).

Cormorant fishing, a tourist attraction that revolves around the observation of ayu fishing, attracts 110,000 people a year who spend a total of 300 million yen (\$2.5 million USD) boarding the viewing boats. 90,000 people visit *yana* fishing spots a year to enjoy ayu cuisine (9, 10), which when all combined with the 1.1 billion yen (\$9.1 million USD) made from the leveraging of artificially spawned ayu makes for an “ayu industry” that comes in at approximately 4 billion yen (\$33.3 million USD) per year.

There are 15,399 members in the fisheries cooperatives for the four cities located along the middle and upper courses of the Nagara River (Gujo City, Mino City, Seki City, Gifu City), totaling 2.7% of the total population, which is much higher than the prefectural average of 0.6% across the nation. These statistics show that there are a particularly large number of people that rely on fishing on the Nagara River as a source of income (11, 12, 13).

2. Biodiversity and Ecosystem Functions

i) Biodiversity of the Agriculture, Forestry and Fisheries Industries

a) Aquatic Life

The biodiversity of the inland fisheries area on the Nagara River is connected with the sea. Ayu are a migratory fish that are raised in the sea, after which the fry swim upriver to mature in the abundant water provided by the forests, where they lay eggs and end their one-year life span. Moreover, a sea-run variety of salmon called the red

spotted masu trout (image 3) spends half the year in Ise Bay, which connects to the southernmost point of Nagara River, before climbing upriver in the spring, whereas the fourspine sculpin (*Cottus kajika*) (image 4) and the Japanese mitten crab (image 5) travels downriver to the sea for breeding in autumn. Both of them, as well as other freshwater creatures, are valuable targets of the local fisheries.



Image 3: Red Spotted Masu Trout
(*Oncorhynchus masou ishikawae*)
[Courtesy of: Aqua Totto Gifu]



Image 4: Fourspine Sculpin
(*Cottus kajika*)
[Courtesy of: Aqua Totto Gifu]



Image 5: Japanese Mitten Crab
(*Eriocheir japonica*)

Along the upper course of the Nagara River, the water temperature is low and the current is swift with connecting rapids and trenches, making it a habitat for salmonid species that prefer cold water like red spotted masu trout (landlocked form) or whitespotted char (*Salvelinus leucomaenis*). This same habitat is also home to many other popular targets of mountain stream fishing. Furthermore, in the central area where the water level is higher and the shape of the river constitutes of a combination of rapids, shallows, deep trenches and pools, the water is of a slightly higher temperature and supports a variety of species focusing mainly on ayu, but also including Japanese dace (*Tribolodon hakonensis*), pale chub (*Zacco platypus*), the delicate loach (*Niwaella delicata*) and more (9).

Many species of fish make their home in the Nagara River (see Appendix 2), with the following 17 species complex being targets for fishing: Ayu, whitespotted char, red spotted masu trout, Japanese eel (*Anguilla japonica*), Japanese dace, pale chub, common carp (*Cyprinus carpio*), Japanese barbell (*Hemibarbus barbus*), crucian carp (*Carassius* spp.), weather loach (*Misgurnus anguillicaudatus*), delicate loach, Japanese minnow (species complex of genus *gnathopogon* or *squalidus*), Japanese catfish (*Silurus asotus*), freshwater goby (*Rhinogobius* spp.), Japanese sculpin (*Cottes* spp.), freshwater prawn (*Macrobrachium nipponense*) and Japanese mitten crab (11).

b) Agricultural Products

The abundant and pristine waters of the Nagara River (and its branches) irrigate rice paddies throughout the site's 11,000 hectare area, contributing to the sustainable production of rice, which is a major commodity of the region. One of the varieties of rice called *Hatsushimo* (*Oryza sativa*) is noteworthy for being a traditional variety of rice that has been cultivated in Gifu Prefecture for over 60 years. It is grown exclusively in Gifu and Aichi prefectures, with Gifu dominating 99% of the total yield.

Moreover, due to the fact that the lands along the Nagara River have seen a great accumulation of sand and soil due to many floods, the land is also perfectly suited to growing fruit trees and vegetables. Persimmons (*Diospyros kaki* Thunb.) are one of Gifu Prefecture's most important agricultural products and have been harvested as far back as the Heian period (794 - 1185), with written record stating the governor of the prefecture's southern region would make offerings of dried persimmons to the imperial court (14).

The tannin in persimmon juice that is made from astringent persimmons is the main ingredient necessary for the creation of a material important to dyeing and has long been known as a specialty product of Gifu Prefecture, being used to increase the durability of Japanese *washi* paper and to prevent fishing nets from corroding. Due to this connection with the traditional craft of Mino *Washi*, a Japanese handmade paper produced in this area, as well as the artisan fishing, persimmon cultivation has continued since long ago.

In the Meiji period (1868 - 1912), the locale was considered suitable to the production of persimmons and their cultivation was therefore encouraged, leading to the discovery of a variety of sweet persimmon known as the *fuyu* persimmon (image 6), which is native to the Nagara River area.



Image 6: *Fuyu* Persimmon
(*Diospyros kaki* 'Fuyu')



Image 7: Moriguchi Radish
(*Raphanus sativus* var. *longipinnatus*)



Image 8: Pickled Moriguchi Radish

The cultivation of traditional vegetables also thrives in the Nagara River region, and the *moriguchi* radish (*Raphanus sativus* L.) (image 7) that can reach almost 1.5 meters in length saw an increase in cultivation moving into the Meiji period (15), being used primarily for pickling (image 8). Producers cooperate with nursery companies, securing seeds in order to maintain the *moriguchi* radish's particular shape. In addition, initiatives are also in place to maintain continued cultivation through making it a brand and certifying it as a "Hida and Mino Traditional Vegetable" of the prefecture.

Other items that have also been certified in this way include *shima* burdock (*Arctium lappa* L.), *sengoku* beans (*Lablab purpurea* [L.] Sweet), and the *goboumeshi* dish made using *shima* burdock is a traditional form of cooking that has been passed down, preserving the area's local food culture (16).

Further items suited to the region's soil include spinach (*Spinacia oleracea* L.), radishes (*Raphanus sativus* L.), green soybeans (*Glycine max* L.), strawberries (*Fragaria × ananassa* Duch.), taro (*Colocasia seculenta* [L.] Schott) and more, with the number of items cultivated totalling 10 different vegetables in addition to various flowers. These items are shipped year round, making the area an intensive production centre.

c) Biodiversity

The geography of the Nagara River region has plains as low as 10 meters above sea level to plateaus over 1,700 meters in height. Climates include warm temperate zones, moderate temperate zones, cool temperate zones and subalpine zones, with the combinations of geography and climates making it possible for a wide variety of species to inhabit the area.

Having long engaged in inland artisan fishing focusing mainly on the ayu, the local people have benefitted from the bountiful resources of the Nagara River and its surrounding nature for many years. Feeling gratitude towards the mountains and the water, the people strive to conserve the environment that has blessed them so. Citizen groups and fisheries cooperatives engage in initiatives to maintain water sources by planting forests, living lifestyles that conserve the clear water of the river's upper course and sustain the genetic diversity of the ayu.

Such a wide variety of living creatures are able to inhabit the Nagara River region because of the ongoing efforts of the people who, while using the environment to its fullest, also seek to conserve and maintain it.

d) Plants

One of Gifu Prefecture's distinct characteristics is its extremely high proportion of forested land, with 80% of the upper and central the Nagara River regions covered in forests (17). Forests are composed of evergreen like Japanese chinquapin (*Castanopsis cuspidata* [Thunb.] Schottky) and Japanese blue oak (*Quercus glauca* Thunb.), Siebold's Beech (*Fagus crenata* Blume) and Japanese oak (*Quercus crispula* Blume, *Q. serrate* Thunb. ex Murray), and evergreen conifers such as Japanese red pine (*Pinus densiflora* Sieb. et Zucc.), Japanese cedar (*Cryptomeria japonica* [L. f.] D. Don) and hinoki Cypress (*Chamaecyparis obtusa* [Sieb. et Zucc.] Endl.). A wide variety of trees can be seen all the way from the warm temperate zones up to the subalpine zone (see Appendix 3).

The region's heavily wooded zones store ample rainfall, with the water that flows from mountainous areas down into the plains creating an abundant river ecosystem.

At a natural woodland area (*satoyama*) called Dachibokubora in Gifu City, the clear waters of the Sakashima River gush forth from Mt. Kinka. The Japanese spatterdock (*Nuphar subintegerrima* [Casp.] Makino), a vulnerable species of plant that is listed on the Ministry of the Environment's Red List, grows along these pristine waters (image 9).



Image 9: Japanese Spatterdock
(*Nuphar subintegerrima* (Casp.) Makino)

e) Aquatic Life

This area does not border the ocean and has no large natural lakes, but the riverside region that flows from the river's source to the plains downstream possesses a myriad of aquatic environments with a wide distribution of fish species, including fishes that swim through mountain streams and favour cold water, as well as fishes that prefer brackish water in warmer environments (see Appendix 4).

The Nagara River is home to migratory fish such as ayu, red spotted masu trout and different species of goby and sculpin that climb up from the Pacific Ocean, as well as the bagrid catfish (*Pseudobagrus ichikawai*) (endangered species; image 10) that is designated a natural monument by the nation. Additionally, the southern plains region has many rivers and ponds that make favourable homes for small freshwater fishes such as the dwarf topmouth minnow (*Pseudorasbora pumila* subsp. 2) (critically endangered species; image 11), which is included on the Ministry of the Environment's Red List.



Image 10: Bagrid Catfish
(*Pseudobagrus ichikawai*)
[Courtesy of: Aqua Totto Gifu]



Image 11: Dwarf Topmouth Minnow
(*Pseudorasbora pumila* subsp. 2)



Image 12: Japanese Giant Salamander
(*Andrias japonicus*)

There is also high biodiversity amongst amphibians, with Japanese giant salamanders (*Andrias japonicus*) (special natural monument, vulnerable species; image 12) and clouded salamanders (*Hynobius nebulosus*) inhabiting the area.

Ayu are a migratory fish and therefore have a very large inhabitation zone, which is also inhabited by other endangered species such as the bagrid catfish and the Japanese sculpin, as well as other animals like the Japanese giant salamander. Ayu inhabit all stages of the river all the way from its upper to lower courses depending on their stage of development, and the very initiatives intended to conserve the ayu resources and river environments also directly contribute to the conservation of inhabitation zones for many

other rare species that live in the Nagara River region.

f) Mammals

There are a wide variety of mammals that inhabit the forests stretching across the region's mountains, plains and subalpine areas. The presence of so many small mammals like moles, bats and mice in addition to large mammals like black bears (*Ursus thibetanus*) and Japanese serows (*Capricornis crispus*) (national special natural monument; image 13) is indicative of the area's bountiful natural environments.



Image 13: Japanese Serow
(*Capricornis crispus*)

g) Birds

Japanese robins (*Erithacus akahige*) and red-flanked bluetails (*Tarsiger cyanurus*) use the coniferous forests of the subalpine region for breeding, and the regions connecting mountains and plains are home to northern goshawks (*Accipiter gentilis fujiyamae*) (near threatened species; image 14), ural owls (*Strix uralensis*), Japanese pheasants (*Phasianus versicolor*) and more. Birds whose habitat lies along the water's edge live and reproduce in riverside regions. Many species of the Anatidae family, such as mandarin ducks (*Aix galericulata*) and grebes (*Tachybaptus ruficollis*), can be seen along the lower course of the Nagara River, where they pass the winter months.



Image 14: Northern Goshawk
(*Accipiter gentilis fujiyamae*)
(Courtesy of Mr. Yukitoshi Otsuka)

It is through the efficient coexistence of humans and nature that a great number of threatened animal species (4 critically endangered species, 19 endangered species, 63 vulnerable species and 62 near threatened species) are able to inhabit the region.

ii) Ecosystem Functions

Despite supporting a population of 860,000 people, the Nagara River is counted amongst the three clearest streams of water in Japan, with the quality of the water flowing through the upper course of the river being such that it met the environmental quality standards¹ required to be designated AA class, with the lower course of the river being A class (18). The Nagara River (the central area) has also been one of the nation's Selected 100 Exquisite and Well Conserved Waters by the Ministry of the Environment since 1985.

1 Environmental quality standards are a means of evaluating water quality with respect to five parameters: pH, BOD, SS, DO and TC (total coliform). The water's purity is then classified as one of six possible levels, with AA class being the highest and E being the lowest.

The reasons why the quality of the Nagara River's water has been able to be maintained are several-fold. Flowing swiftly throughout the 166 kilometre stretch from its origin point of Mt. Dainichigatake to the mouth of the river, the river's main current passes through fixed farmlands and settlements and is not dammed. It is also blessed by purification effects due to an abundance of ground water.

Moreover, this is made possible not simply due to natural factors, but also thanks largely to the people along the upper course of the river who live lifestyles that aim to conserve the area's pristine waters. Locals also conduct nature beautification initiatives along the river's central region.

The Nagara River possesses such an abundance of water because of the mountainous areas being a region that sees some of the most rainfall nationwide with 3,000 mm of precipitation annually (19), and because 90% of the city of Gujo (a city along the upper course of the river) is forested (image 15).



Image 15: View of Mt. Dainichigatake from Takasu-cho, Gujo City

A river must satisfy several natural conditions in order to make it a favourable environment for raising ayu, including an ample supply of the attached algae that ayu feed on, regions suitable for spreading feeding territories, an abundance of high-quality water, a gravelly riverbed that can be used as a spawning ground, and it must also connect to the ocean. In this respect, the upper course of the Nagara River has many large stones in the river with great variations in the current between shallows and trenches, while the riverbed in the central area is packed with small rocks. All the conditions required for raising ayu are assembled here.

3. Knowledge Systems and Adapted Technologies

i) Knowledge Systems and Adaptations

a) Traditional Fishing Techniques

Many traditional techniques for catching ayu exist on the Nagara River, including cormorant fishing, Gujo fishing, shoal net fishing, night net fishing and *yana* fishing.

Since Japanese cormorants (*Phalacrocorax capillatus*) capture as many fish that enter their line of sight as possible, fewer ayu escape than in other fishing techniques. When compared with net fishing that occurs in set locations, ayu can be captured more easily and efficiently by moving on boats along shallow areas where ayu live. Since ayu perish the very instant when they are snapped up by the cormorant, ayu captured this way are particularly fresh. Important nowadays mostly for tourism purposes, there are records indicating that as many as 335,000 ayu were caught in a single season back in the Meiji period (1868-1912), and were an important source of income for cormorant fishing masters (20).

Ayu, in order to secure the attached algae that are their primary food source, establish feeding territories that are one square meter in size. Should other ayu enter this territory, they slam against them in order to force them out. *Tomozuri*, a kind of live decoy fishing, exploits this behaviour and is a standard technique amongst ayu fishers. *Tomozuri*, along with other techniques to catch fish such as red spotted masu trout, are

collectively known as Gujo fishing (image 16), which is well known amongst fishermen nationwide.

This highly efficient technique requires the observation ability necessary to read the flow of the river, using specially modified fishing tools such as rods and nets to pull snared ayu from the water in a single movement. This technique originated among the professional fishermen of the Taisho period (1912-1926), who developed the skill in order to catch as many fish as possible. This also led to the creation of tools such as the Gujo rod (image 17) and Gujo fishing net (image 18), which are valued as traditional crafts to this day. The body of a Gujo rod is made with bamboo, giving it the elasticity necessary to pull ayu from the water in a single stroke. The handles of Gujo fishing net are attached to the frame at a specific angle in order to enable the more swift capture of ayu (21).



Image 16: Gujo Fishing



Image 17: Gujo Rod



Image 18: Gujo Fishing Net

Traditional fishing techniques using nets also occur on the Nagara River, such as shoal net fishing (image 19) and night net fishing (image 20). Shoal net fishing is the practice of casting nets in shallow waters in autumn, startling ayu and catching them as they head for spawning grounds. Night net fishing involves scaring ayu with the bright light of torches and the sound of oars smacking against the edge of the boat, chasing them into nets spread across the river. This fishing technique is said to have begun on the upper course of the river sometime during the late 16th to early 17th centuries.



Image 19: Shoal Net Fishing



Image 20: Night Net Fishing

Other fishing techniques include *noboriochi* fishing (image 21), which is used to catch fish that travel up rivers. Luring fish into boxes at dams while they travel upstream, this method is particular to the Nagara River. In order to catch fish as they travel downstream, large fixtures of slatted wood called *yana* are set up on the river, with five locations in total along the Nagara River (seven if you include *yana* along branches of the river). *Yana* fishing (image 22) takes place in autumn and its fishing spots are often bustling with visitors who come to enjoy the ayu cuisine prepared there.



Image 21: *Noboriochi* Fishing



Image 22: *Yana* Fishing

Because the site does not lie along the ocean, the rich yield of fish from the Nagara River has always been a valuable source of protein for the people of Gifu Prefecture. It is for this reason that there are many different long-standing fishing methods; cormorant fishing foremost among them. These traditional techniques came about as a result of thoroughly comprehending the natural behaviour of fish, giving birth to methods of fishing that allowed for their most efficient capture. These skills continue to be practiced and passed down by members of fisheries cooperatives that operate along the Nagara River.

Strong Bond Between Fishermen and Cormorants:

In cormorant fishing, a strong bond between the cormorant birds and their masters is vital (image 23). The Japanese character for cormorant bird can itself be divided into two separate parts, meaning “little brother” and “bird”. In the homes of each cormorant fishing master, over 20 birds are kept and raised as part



Image 23: Cormorant Bird in the Yard

of the fisherman’s family. In addition to caring for the birds’ health and seeing to their proper feeding, cormorant masters pay special attention to their condition by closely examining their faces, smelling their breath, and touching their throats and stomachs. A cormorant fishing master handles each of his birds with utmost care, carefully judging how much to feed them, their physical condition, and whether or not a particular cormorant is in proper shape to join in the day’s fishing.

It is due to such careful care by fishing masters that the cormorants that are used as part of cormorant fishing boast a life span of between 20 to 25 years, while wild cormorants live for an average of but seven short years. Out of respect for their many years of service, the cormorants of fishing masters are deeply mourned following their passing.

By tying a hemp string around the necks of their birds, cormorant masters are able to issue commands to their birds while fishing. Cormorant fishing masters examine each bird’s physical condition, personality, and the state of the river before choosing 10 to 12 birds to accompany him for the days’ fishing. The tightness of the hemp string is adjusted differently for each bird, set at a tightness that will prevent larger fish from sliding into their throat, but will allow for fish smaller than ayu to pass by unhindered, allowing the cormorant to eat.

This peaceful coexistence between people and cormorants is a result of the knowledge and ingenuity passed down by previous generations.

In 1883, cormorant fishing on the Nagara River faced terrible financial trouble as a result of a poor yield combined with the loss of cormorant birds. These problems made it difficult to secure sufficient funds to put away for the following year.

The same problem occurred again in 1885. In order to ameliorate the situation, cormorant fishing masters moved away from depending solely on an unreliable yield of

fish in order to secure their livelihood and began to provide observation boats from which their fishing could be seen. This aided in the preservation of their craft, which survives to this day.

b) The Securing of Resources

Ayu are a precious resource for people living along the Nagara River, but their conservation has not simply been left to chance. The continued conservation of the ayu would not be possible without the cooperation of the people, and much effort is invested by the people of the region, particularly by the fisheries cooperatives along the river.

The fisheries cooperatives that engage in fishing in the area are also responsible for increasing the amount of fish that are target species for fishing, and release 120 tonnes of ayu fry (10 million fish) into the waters of Gifu Prefecture every year. Roughly half of these released ayu fry are descended from natural ayu caught in the rivers, which are then bred at the Gifu Prefectural Ayu Hatchery. These ayu fry are genetically consistent with the indigenous ayu found in the Nagara River and are resistant to cold water disease¹. Releasing the fry of these bred fish serves as both a means of conserving genetic diversity as well as a countermeasure to prevent cold water diseases. Activities intended to increase the number of indigenous ayu resources in the region have also been carried out by the fisheries cooperatives on the Nagara River through the operation of artificial ayu hatching tanks (image 24, 25, 26) near the mouth of the river, which produce a total of 100 million eggs per year.



Image 24: Artificial Fertilisation



Image 25: Artificial Ayu Spawning Ground



Image 26: Fertilised Eggs

¹ Cold water disease is a bacterial disease caused by *Flavobacterium psychrophilum*. This disease is one of the most frequent causes of the elevated mortality rate in ayu and has been found in both fish farms and natural rivers in Japan. Moreover, inbreeding or landlocked forms of ayu have no resistance to the disease.

In 1880, the Gifu Prefectural Government set a restriction on the times of year during which ayu could be caught. With administrative guidance to assist in the securing of fishing resources, the Nagara River Fisheries Association (the antecedent organisation of the modern fisheries cooperative) undertook the task of creating artificial hatching and releasing programmes for ayu in 1915 (8).

Initiatives to conserve the fisheries resources are carried out not only by those associated with artisan fishing, but by those in the forestry industry as well. 4.5 hectares of forest along the Nagara River have been designated as “fish breeding forests” that support and nurture the fish population. These forests are a crucial part of the river’s health, because the leaves that have fallen from trees provide sustenance for aquatic insects, the trees and undergrowth that cover the ground maintain the water’s quality by preventing the erosion of soil, and shade from the trees on the water’s surface keeps the temperature of the water in check, contributing to the area’s ongoing status as a preferable habitat for many species of fish. The amount of fish breeding forests in Gifu Prefecture is the greatest amongst prefectures in Japan that do not have a coast.

c) Agricultural Products that Utilise the Characteristics of the Land

Agricultural products such as radishes and green soybeans are grown in the region, taking advantage of the area’s excellent water drainage and fertile lands. Through the various implementations of cropping, different varieties of products, and cultivation methods, it is possible to distribute a single product for almost an entire half-year period. This method of farming has yielded an improved reputation in the marketplace, and is an important source of profitability for suburban agricultural businesses. For example, over 15 varieties of green soybeans are grown in the area, which are separated by maturation and come in different flavours such as green or black soybeans. These green soybeans can be distributed over the half-year period from May to October due to the protective covering that is designed to maintain temperature and eliminate pests (image 27).



Image 27: Green Soybean Fields (Gifu City)

4. Cultures, Value Systems and Social Organisations (Agri-Culture)

i) Culture and Values

a) Cormorant Fishing

Cormorant fishing (*ukai*) is an ancient tradition, with people of the surname “Ukaibe¹” appearing in family registers dating back to the 8th century. Cormorant fishing on the Nagara River (image 28) boasts a long history, with records indicating that it has remained essentially unchanged since the Muromachi period (1392 - 1573) (20). There are two places where cormorant



Image 28 : Cormorant Fishing on the Nagara River

fishing occurs on the Nagara River: “Nagara Cormorant Fishing” in Gifu City and “Oze Cormorant Fishing” in Seki City. Although cormorant fishing is conducted in 12 locations across the country, the cormorant fishing masters of the Nagara River are unique in that they have been attached to the Imperial Household Agency’s Board of Ceremonies since the Meiji period (1868 - 1912).

1 The suffix “-be” was attached to surnames of servants of the Imperial House. The “Ukaibe” family were those that engaged in cormorant fishing (*ukai*) under the auspices of the Imperial Family.

This fishing tradition holds incredible value, with the complete set of “Tools for Cormorant Fishing on the Nagara River” being designated as Important Tangible Folk Cultural Properties by the nation and the practice of cormorant fishing on the Nagara River itself registered as an Important Intangible Folk Cultural Property of the prefecture. As of present, there are also ongoing examinations being conducted to determine whether or not the cormorant fishing tradition will be designated an Important Intangible Folk Cultural Property of the nation.

b) Food Culture

In the homes of cormorant fishing masters, a cuisine called ayu sushi (image 29) made using fermented fish, salt and rice has been passed down throughout the ages, and is currently created as a product for end-of-year gift exchanges. References to ayu sushi can be seen in a set of government regulations called the “*Engishiki*” that dates back to the Heian period (794 - 1185), suggesting that it has been in production since at least that time. Other local culinary techniques, such as a salted ayu entrails dish called *uruka* that is made using the eggs and innards of ayu, or the practice of salting ayu and drying them overnight, also survive to this day.



Image 29: Ayu Sushi

There are six stores specialising in ayu that have been selling ayu boiled in sweet sauce along the Nagara River basin for over 100 years, and *ayugashi* (image 30) sweets are said to have been invented in 1908. Created in the shape of the ayu, these famous treats are lightly roasted and filled with a gummy confectionary. It is said that no other region has as many varieties of *ayugashi* as Gifu Prefecture. *Ayugashi* are a popular souvenir that can also be used to introduce the ayu that is the area’s pride and joy (22).



Image 30: Ayugashi



Image 31: Hoba Sushi

Hoba sushi (image 31) is a dish created by placing sushi rice, mountain vegetables and river fish atop the leaf of a white bark magnolia tree (*Magnolia obovata* Thunb.), and is one of Gifu’s foremost forms of local cuisine. In Gifu, white bark magnolia trees are a common sight in fields or the gardens of homes, and *hoba* sushi was created as a way for labourers working in the fields or forests to have a quick and easy meal. In

recent years, *hoba* leaves have also become well-known for their anti-bacterial properties as well (23).

c) The Worship of Water and Sentiments Towards Ayu

The cultural landscapes that have been maintained by the forests near the source of the Nagara River basin are said to have their origin in the 8th century, with the development of a Mt. Hakusan Worship (24) that centred around the god Mikumari, who was thought to have controlled the distribution of water between Mt. Hakusan and Mt. Dainichigatake, the source of the Nagara River. The Nagataki Hakusan Shrine in Gujo City that is thought to have been established in 717 is home to many rituals surrounding Mt. Hakusan Worship, such as the “Nagataki *En-nen* Festival” (Important Intangible Folk Cultural Property; image 32) that is part of the area’s “Six Day Festival” (25, 26). Also located in Gujo City are the Amida Falls (a place of scenic beauty in Gifu Prefecture), which is used not only in Mt. Hakusan Worship as a place for spiritual training, but is also a spot of majestic beauty that was depicted in one of the famous Japanese artist Hokusai’s eight illustrations of waterfalls and is currently counted amongst “Japan’s Top 100 Waterfalls” (27).



Image 32: Nagataki *En-nen* Festival

Another distinctive element of the culture along the river’s basin is the “Gujo *Odori*” dance festival (Important Intangible Folk Cultural Property; image 33) in Gujo City, which is one of Japan’s three great *bon-odori* dances and is said to have began in the Edo period (1600 - 1867) as a means to promote harmony amongst the different classes of people (28).



Image 33: Gujo *Odori* Dance Festival

The Gujo *Odori* also has songs with lyrics singing the praises of the Nagara River and the ayu. The English translations of some of those songs are as follows:

“The pride and joy of a people;

Gujo *Odori* and the ayu sweetfish (song title: Kawasaki)”

“The brilliant torches of cormorant fishing and a name known throughout the world;

The Nagara River (song title: Matsusaka)”

Furthermore, purification ceremonies are conducted in the river during the “Ikenoue *Misogi* Festival” that is held at the Katsuragake Shrine in Gifu City along the Nagara River’s middle course. It is through these methods of worship, festivals and dances that the water and mountains have been celebrated in the region since long ago. Gujo City lies along the upper course of the Nagara River and the reverence the people have for the water is represented in many ways. Locations pay respects to the gods of the water like the Naginatashimizu Spring or Minakami Shrine exist alongside traditional communal water facilities such as *mizubune* and *Sogi* Spring (Gifu Prefectural Historic Site), the latter of which is designated the Selected 100 Exquisite and Well Conserved Waters by the Ministry of the Environment and is symbolic of the area’s veneration of water (29).

d) Social Organisations

Cormorant fishing on the Nagara River received the protection of the shogunate and of the former domain of Owari (present day western Aichi Prefecture) back in the Edo period, and the cormorant fishing masters were inducted into the Imperial Household Agency in 1890. The cormorant fishing techniques are passed down separately by each house that practices them and one may only become a cormorant fishing master after the previous one retires (20). Presently, the only cormorant fishers designated as “Cormorant Masters of the Imperial Household Agency” across the nation are those who practice their craft on the Nagara River (six in the Nagara area of Gifu City and three in the Oze area of Seki City).

What is required of cormorant fishing masters is not just the ability to manipulate the cormorant birds. Being able to judge which birds will be best suited to fishing on that day, the agility to carry out multiple movements atop the boat in a single moment, and the stamina and concentration to handle the pulling power of the birds are all important as well. Each boat carries a team of one cormorant master and two boatmen (one at the stern and one in the middle). It is only when the trinity of man, bird and boat become one that the true beauty of this traditional fishing method that has been transmitted throughout the ages can be realised.

Fisheries cooperatives exist with the purpose of conserving the resources available to the industry. Under the Fishery Act, these organisations that possess the right to engage in industrial fishing also bear the responsibility of engaging in activities to increase the area's resources so that the resources available to the inland artisan fishing do not dwindle. There are eight fisheries cooperatives that operate on the basin of the Nagara River (including the lower course that flows downriver of Gifu City). They engage in activities intended to maintain the high quality of the river's environment through the breeding of ayu and other freshwater fish as well as the maintenance of the environments around fishing locations. In addition to the continued releasing of fish into the river and countermeasures against the wild birds that are a threat to the ayu, these are but some of the ways these organisations manage a system of continued production while conserving resources.

The abundant waters of the Nagara River are nurtured by the forests along the upper course of the river. The wilderness and forests surrounding farmlands in the same area serve multiple functions for resource gathering as an important source of fertiliser for farmers, fodder for livestock, grass for thatched roofing, firewood, and charcoal. These countryside areas are cooperatively managed as controlled zones (a predetermined area which people from a specific region can receive special permission to enter and use the natural resources for personal benefit [30]).

Activities to conserve the forestry resources are handled mainly by forestry cooperatives, of which there are three that operate on the basin of the Nagara River. They engage not only in logging, but in tree planting and thinning as well.

5. Remarkable Landscapes, Land and Water Resources Management Features

i) Remarkable Landscapes

In Gujo City, the winding river connects seamlessly with expansive farmlands and residential districts, creating a rural landscape that continues as far as the eye can see (image 34), and the surface of the water teems with people enjoying ayu fishing in the summer. In addition to fishing, other common sights on the Nagara River include children playing in the Yoshida River that is a tributary of the Nagara River, or people engaging in activities like rafting or river climbing (mountaineering that involves climbing up rivers), which have seen an increase in popularity in recent years.



Image 34: Rural Landscapes of the Nagara River Basin

On the basin of the Nagara River, the people receive the river's bounty, develop an attachment to it, and are given peace of mind by its many beautiful riverside rural landscapes.

In Gifu City, the scenery of the 331.9 hectare area surrounding Gifu Castle (National Historical Landmark) that includes Mt. Kinka, the Nagara River, the Kawara-machi area and the old castle town shares a deep connection with the lifestyles and occupations of the local people. This "cultural landscape" along the middle course of the Nagara River has been designated an "Important National Cultural Landscape" by the Agency for Cultural Affairs.

Moreover, in Gujo City, the *Sogi* Spring and central basin of the Nagara River are counted amongst the Selected 100 Exquisite and Well Conserved Waters, and the rice terraces of Shougahora are selected as one of the 100 Best Rice Terraces in Japan by the Ministry of Agriculture, Forestry and Fisheries (31). The Nagara River is the only river to be counted amongst Japan's 88 Best Bathing Spots, and the water itself is an integral part of the area's many breathtaking sceneries.

ii) The Management of Land and Water

a) Initiatives to Nurture Forests

In order to establish a system that can supply the abundance of water required for a thriving fisheries yield and the sustainable production of agricultural products, the creation of forests is utmost. Fisheries and forest cooperatives engage in activities to nurture forests near the origin of the Nagara River (image 35) through the planting of broadleaf trees, and the people of Gifu City along the middle course of the river participate in initiatives intended to conserve the forests and cultivate aquatic resources in areas such as Gujo City, Seki City and Yamagata City along the upper reaches of the river.



Image 35: Forestation Activities near the Source of the Nagara River

A 3,000 hectare area within the region is thinned annually in order to improve the water retaining capacity of the soil in the forests.

b) A Mentality that Values Water

In the city of Gujo near the Nagara River's source, a mentality and belief in the importance of treasuring the water and delivering clear water downstream has been passed from generation to generation. Whether it comes from mountains, wells, or rivers, traditional fixtures designed to make effective use of the water have existed for hundreds of years (25).

Places for washing various items called *kawado* or *mizuya* (image 36) exist along canals that have been constructed to use the natural flow of the river and mountain streams. Multi-layered tanks in the shape of boxes that receive water from the mountains and separate it into distinct levels are called *mizubune* (image 37, 38). Similar tanks embedded in the ground are called *shimizu*. Representative of these is the

Sogi Spring (image 39), which has been designated one of the Selected 100 Exquisite and Well Conserved Waters by the Ministry of the Environment. Wells that draw usable ground water are divided into personal wells, group wells and communal wells, with communal wells being managed by a cooperative dedicated to their maintenance.



Image 36: *Kawado*



Image 37: *Mizubune*



Image 38: *Mizubune*



Image 39: *Sogi* Spring
(Gifu Prefecture Historic Landmark)

There are 11 *mizubune* in the Hachiman-cho area of Gujo City, with each box-like tank having two or three levels. The top level for drinking water, the middle for rinsing vegetables or fruits and the bottom for washing dishes or linens; this method wastes no water and is thought to contribute towards delivering clean water downstream.

The waterworks that support the 400,000 people that live in Gifu City is drawn from a system of underground reservoirs at the base of Mt. Kinka that consists of 69 wells that draw from groundwater as their source. The high quality of this particularly delicious water was recognised by the former Ministry of Health and Welfare (now Ministry of Health, Labour and Welfare) in 1985 (32). Environmental conservation initiatives are conducted by many different groups, including regular citizens, non-profit organisations and corporations who receive the blessings of the Nagara River, whether it be in the shape of clean water or calming scenery.

c) Traditional Disaster Prevention Systems

Many floods occurred on the central and lower reaches of the Nagara River in the past. People in the area developed unique disaster prevention systems, such as the *kasumitei* open levees on the middle course of the river and the *wajuutei* embankments that were constructed to completely surround settlements and farmlands on the lower reaches of the river (Figure 1). The *kasumitei* open levees have openings in them which allowing floodwater to pass through. They can be seen in Mino and Seki City (33).

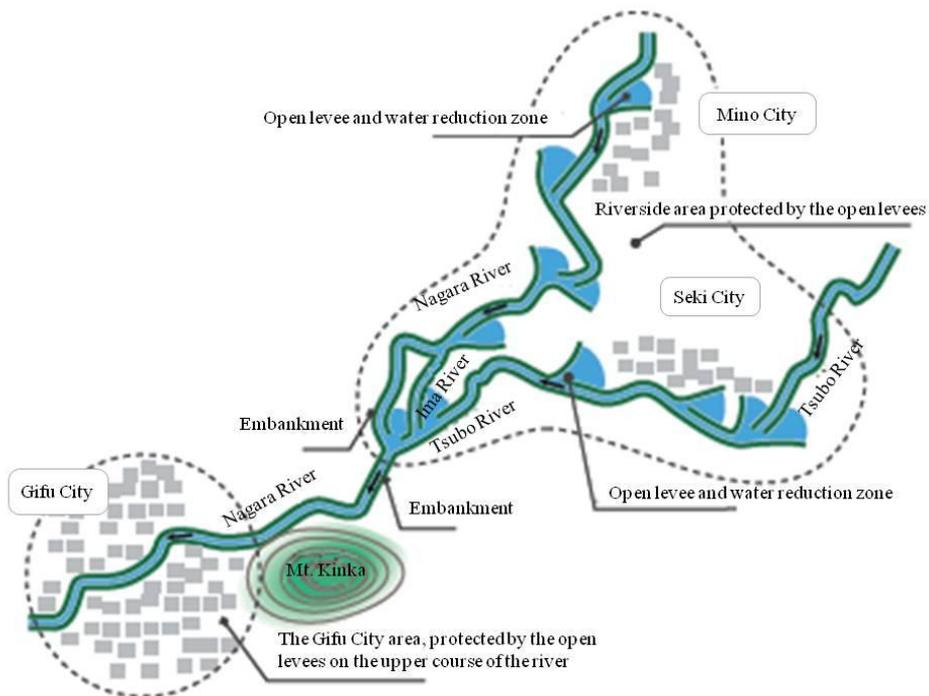


Figure 1: Traditional Disaster Prevention System

II. Other Social and Cultural Characteristics Pertinent to the Management of the Agricultural System

a) Unique Social and Cultural Characteristics

Along the basin of the Nagara River, traditional crafts with deep ties to the water are handed down from generation to generation. The production of Japanese paper is dependent on pristine, clear water and mulberry trees (*Broussonetia kazinoki* × *B. papyrifera*) which are in plentiful supply in Mino City where the tradition of Mino *Washi* Japanese paper, one of the three great Japanese *washi* paper types is still passed on to this day (34). A particular variety of this paper known as “*Honminoshi*” was designated a UNESCO Intangible Cultural Heritage (image 40) in November, 2014. Mino *Washi* Japanese paper is used in Japanese *wagasa* umbrellas, as well as a number of traditional crafts such as Gifu *chouchin* paper lanterns and Gifu *uchiwa* fans.



Image 40: Making *Honminoshi*
(UNESCO Intangible Cultural Heritage)

The *kanzarashi* event involving Gujo *honzome* dyeing (an intangible cultural heritage of the prefecture) is carried out during the coldest period of the winter in the Yoshida River, a tributary of the Nagara River. This type of dyeing helps to give fabrics a more vivid hue.

The presence of the Nagara River has led to the creation of settlements with unique features along its basin. In the Minato-machi area of Gifu City which once acted as the landing point for shipments of wood or Mino *Washi* Japanese paper from upstream, traces of architecture from the time are still visible in the wood merchant houses which stand side by side there to this day.



Image 41: *Udatsu*-Lined Old Streets of Mino

In the old town area of Hachiman-cho in Gujo City’s, the tradition of large communal water fountains which leverage the streams that flow between houses helps to convey the atmosphere of the old castle town in the modern day. Moreover, the Mino-machi

area in Mino City, where merchant houses line the streets, is a conserved traditional architectural district known as the “*Udatsu*-lined old streets of Mino” (image 41). *Udatsu* is the name given to firewalls erected on both sides of the roofs of houses there in order to prevent the spread of fire. Both areas of the old town in Gujo City and Mino-machi are designated as “Important Preservation District for Groups of Traditional Buildings”.

III. Historical Relevance

a) Cormorant Fishing and Ayu

The history of the culture of cormorant fishing and eating ayu can be gleaned from the poems of haiku master Matsuo Basho:

Basho, who visited Gifu in 1688, left us with the following words.

Exciting to see/ but soon after comes sadness/ the cormorant boats

One more to describe/ the Nagara Rivers’ own/ sweetfish *namasu*

From these words we understand that even at that time cormorant fishing was seen as a charming spectacle in the eyes of travellers. We also know that the way they used to eat ayu was not by grilling it with salt as we do today but as *namasu* (a pickled delicacy made with the fish). Before the era of Basho, in 1603 it is recorded that the feudal lord of southern Gifu presented the Shogunate Tokugawa Ieyasu with ayu sushi which was prepared as a fermented product that could be preserved for a long time. Nowadays, this tradition is carried on in the cuisine served at cormorant fishermen’s houses and through local souvenirs (35).

Some pictures exist of the more longstanding merchants in Gifu City showing how they looked in the Meiji period (image 42). Looking at the shop fronts in the images they tell us that *moriguchizuke* (a *moriguchi* radish pickled in Japanese sake lees) and

ayukasuzuke (ayu pickled in sake lees) were famous in Gifu at the time. The *moriguchi* radish has always been subject to pickling, however from these sources we came to know that ayu also underwent the pickling process. Another traditional way of preparing ayu is to pickle the entrails in salt (known as *uruka*), a highly prized delicacy. Furthermore, we now also know from the shop fronts that handheld fans were a speciality of the area at the time. Tannic acid solution taken from the sour persimmon was applied to fans, making them durable and garnering them a great reputation as products that could be used every day.



Image 42: Longstanding Merchant, Izumiya Shop (Meiji Period)

In modern times, fresh ayu has come to be able to be sold on the market with the development of the road network. Around 1910, in the Taisho period, ayu was packaged under the name Gujo Ayu. At that time there was no process to manufacture ice. To overcome this problem water from flooded paddy fields was frozen in the winter and preserved for use in the transport of natural, fresh ayu to market in the summer. This system for preserving Gujo Ayu was the only one of its kind in the country. Grilled ayu became the most popular cuisine thanks to the development of this collaborative distribution system (36).

b) Culture Born from Pristine Waters

The old region of southern Gifu Prefecture was rich in resources, and famous for its traditional crafts, timber, swords and knives. The traditional Gifu *wagasa* Japanese umbrellas (image 43) and Gifu *chouchin* paper lanterns (image 44) which make use of Mino *Washi* Japanese paper, as well as Gujo *honzome* dyeing in Gujo City, all have a history dating back about of around 400 years (24, 37).

The fishery sector and traditional craftsmanship which support industry in Gifu Prefecture have developed alongside the clear waters of the Nagara River. These clear waters have been conserved so that fishery and traditional crafts could continue to be practised here to this day.



Image 43: Gifu *Wagasa* Japanese Umbrellas



Image 44: Gifu *Chouchin* Paper Lanterns

On the middle course of the river in the 16th century, an inland port was established at the site of current day Gifu City and the industry of transporting logs via the river developed (34). Efforts to conserve the forests around the streams of water have a long history. In the Edo period, in the old fiefdom of Gujo City which lies along the upper course of the river, a number of initiatives were carried out, such as banning the felling of trees, continuously planting new trees, and the creation of the *mizuneyama*¹ area (34). In more recent times, the demand for wood before and after World War 2 led to deforestation and the decay of the land. In response to this, reforestation efforts were initiated leading to the current rich forest resources we enjoy today.

1 A mountainous and forested area in which water slowly and peacefully sinks into all aspects of nature. The free felling of trees is actively prohibited and planting is carried out in order to combat against landslides.

IV. Contemporary Relevance

a) Responding to the Climate and Carbon Sequestration

Ayu live for just one year and because they inhabit rivers with swift currents they are vulnerable to the effects of floods and other natural factor this results in significant fluctuation both in the number of fish swimming upstream and also the annual yield. Research related to the cause of these fluctuations in resources is being undertaken in order to ensure a sustainable catch and the continued conservation of this natural resource. In recent year, as the correlation between the number of ayu flowing upstream and the environment in the sea when they live as juveniles become increasingly apparent, further research is being carried out in order to grasp the relationship between

the ayu's life cycle and its environment. The results of this research should have a wide-ranging impact on the drive conserve the habitat of ayu in the East Asia region.

As global warming continues to accelerate rapidly due to the release of carbon dioxide and other greenhouse gases, the Gifu Prefectural Government established the Gifu Prefectural Ordinance on Forest Management and Development for the Conservation of the Global Environment. Through this ordinance we are maintaining or even lowering the amount of carbon dioxide absorbed by the forests and also continuing our drive to expand forest areas.

In Gujo City, 49,560 hectares of planted forest are well managed through appropriate thinning and contribute to a reduction of 235,977 tonnes of CO₂ a year (38).

b) Water, Land and Biodiversity Conservation

Efforts in conserving the habitat and spawning grounds of ayu are thought to be linked to the conservation of rarer species in the Nagara River, such as the Japanese giant salamander, bagrid catfish, and Japanese sculpin.

These links are being continuously investigated by NPOs and other groups. Moreover, the dwarf topmouth minnow that live in small rivers, ponds and marshes have deep ties to the local rice based farming industry. For this reason, local children and environmental groups are continuing with conservation projects and in doing so are playing an important role in educating people about the environment.

In Gifu Prefecture, an initiative called "Gifu Clean Agriculture" is implemented in order to promote the more effective and reduced use of chemical fertilizers and agrochemicals. In Gifu City along the middle course of the river, a type of green, environment-friendly cultivation of *moriguchi* radishes in arable land is achieved through the use of organic materials and insect screens, cutting the use of chemical fertilisers and agrochemicals by over 30%.

Following the harvesting of carrots or radishes in the Hirugano Highland area that lies at the uppermost reaches of the Nagara River, clean agriculture is implemented in combination with the practice of sowing wheat in the furrows that remain or turning them into settling basins, preventing the runoff of soil and maintaining the water's quality.

Furthermore, the “Greenery and Water Kids’ Convention” was held in 78 schools across the prefecture in 2013 in order to teach the children who hold the future of Gifu Prefecture in their hands about forests and aquatic environments. Through this event, children will develop a deeper affection for their region, and will later become people capable of protecting and supporting it down the road.

As well as this, groups of local residents and NPOs are involved in efforts to clean rivers, carry out environmental surveys, and hold viewings at egg hatching sites in the urban Gifu City region. These initiatives are linked to the conservation of ayu as a resource and also the raising of awareness about the environment (image 45).



Image 45: Nagara River Cleaning Initiative

c) Social Contribution

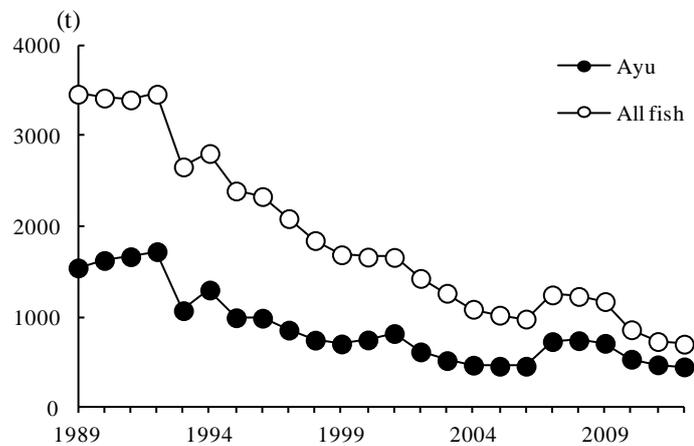
Inland fishery, when compared to saltwater fishery, is carried out over a much smaller area and as such, depending on the yield, stock may be depleted more easily. For this reason, fisheries cooperatives are engaging in efforts to increase fishing resources in the area. Along the Nagara River basin breeding programmes for ayu and other freshwater fishes, as well as the maintenance of fishing grounds has led to the conservation of the river environment.

Moreover, because it is recognised that bountiful and pristine waters are needed in order to support ayu, groups such as the aforementioned fisheries cooperatives are involved in the propagation of forests connected to the clear waters.

V. Threats and Challenges

a) Reduction in the Number of Ayu

A downward trend in the yield of ayu continues to be observed (graph 2) since 1993 in Gifu Prefecture. There are a number of reasons for this, including cold water diseases and feeding damage by wild birds around the river.



Graph 2 : Changes in the Yield of Ayu and All Fish in Gifu Prefecture

[Small number of ayu → Being unable to fish for ayu → Loss of focus on the ayu, rivers and declining consumption]

In order not to fall into this negative cycle, it is necessary that we must continue with our comprehensive efforts to increase the population of ayu for the inland fisheries while at the same time, to ensure that people are able to fish for leisure on the river, to prevent against disease and to expand consumption.

b) The Creation and Dissemination of Ayu Culture

Consumption of fish has been declining due to the westernisation of eating habit in Japan. As a result of this, in the long established merchants of Gifu City who deal with ayu based food products, they are no longer simply producing the *kanroni* (boiling with

soy sauce and sugar) and salt grilled staples of ayu cuisine, but are instead beginning to make efforts to rejuvenate the area with modern ways of preparing ayu.

One example of this is preparing the innards of ayu in the style of rillettes, known as “Ayu Rillettes”. Another way is to blend together sour cream, fermented ayu sushi and the rice in which the same ayu sushi has been fermented to create “White Fermented Cream”. In 2013, at the Ministry of Tourism’s “Ultimate Souvenirs which are Popular Worldwide Forum” they were chosen together as one of the “Nine Ultimate Souvenirs”.

In addition, in order to protect those who fish for sport of and continue to allow people to enjoy the ayu fishing culture, the fisheries cooperatives have opened fishing classes and offered direct chances for people to fish. Gifu Prefectural Government is continuing with the development of the “Nagara River Ayu Park” (tentative) facility, which will offer information about, and opportunities for, people to study and experience the artisan fishing on the Nagara River.

c) Inheriting Traditional Methods and Skills in Fishing and their Successors

Cormorant fishing on the Nagara River and the ayu culture linked to it are vital and should be shared with those outside of our region. Going forward we must continue to ensure their survival and development. The success of cormorant fishing on the Nagara River does not rest solely with the cormorant fishing masters or the birds themselves but rather with a collection of various skills sourced from the surrounding area. For example, the cormorant fishing boat and a basket used to place cormorants in are built by specially skilled workers who possess necessary traditional techniques.

Both the boat and basket are highly unique and special. As a result of this, as cormorant fishing is passed on from generation to generation it is necessary that these unique regional crafts are also protected. There is only one craftsman left of each these products in the prefecture. As they continue to grow older, accelerated efforts are being made to pass on the skills to successors. Furthermore, the Japanese cormorant birds used in Gifu and the other places are caught on the coast in Hitachi City, Ibaraki Prefecture while they are young. However, there are currently challenges related to the passing on of the skills needed to catch these birds.

Cormorant Fishing Boats and Viewing Boats: The viewing boats for cormorant fishing (image 46) are being manufactured by a municipal shipyard in Gifu City and by a building firm in Seki City which is also involved in the construction of shrines and temples. The boats on which the cormorant masters ride (image 47) are built by a boat builder who specialises in traditional wooden fishing vessels. The wood used in the production of the boats is Japanese umbrella-pine (*Sciadopitys verticillata* [Thunb.] Siebold et Zucc.), which is sourced within Gifu Prefecture. The cedar is often used in boat construction,



Image 46: Viewing Boat



Image 47: Cormorant Fishing Boat

however, in the southern Gifu Prefecture one can find high quality umbrella-pine which is resistant to the effects of water, and also light and flexible (39). As the producer of the cormorant fishing boats has grown older, a new boatwright from Gujo City was trained under his guidance and has been placed in charge of building these boats in recent times. It is said that it takes 10 years to become skilled in this art and therefore, there are concerns about training the next generation of boatbuilders.

Baskets for Cormorant Fishing: There are a number of baskets used in the cormorant fishing process. There is a basket used to carry four cormorants, known as *yotsuzashi* (image 48), a basket used to carry two cormorants, *futatsuzashi*, a basket used to hold the ayu caught by the cormorants, called the *hakekago* and the basket where the cormorants are left to sleep,



Image 48: *Yotsuzashi*



Image 49: *Toyakago*

the *toyakago* (image 49). All of these are made from locally sourced henon bamboo (*Phyllostachys nigra* [Lodd. ex Loud.] Munro var. *henonis* [Bean ex Mitford] Stapf ex Rendle). These baskets are considered some of the larger projects in modern Japan to use bamboo in their production and thus, the Seki City based craftsman, the only of his kind remaining, came to have a hand in the making of baskets for cormorant fishing in Gifu Prefecture (Gifu and Seki Cities), in Aichi Prefecture on the Kiso River, as well as

for Kyoto and Yamaguchi prefectures. Following his retirement, there had been no replacement found for three years. However, the Gifu Academy of Forest Science and Culture made efforts to preserve the tradition and thus graduates are currently making these cormorant baskets in Mino City.

Materials used in the production of Gifu *wagasa* Japanese umbrella are sourced along the Nagara River basin and 90% of all Japanese umbrellas are produced in Gifu Prefecture. The runner used in the frame of traditional Japanese *wagasa* umbrellas (image 50) is made only in one factory in Japan. That factory is in Ginan Town, south of Gifu City (40). The wood used in the production is the Japanese snowbell (*Styrax japonica* Sieb. et Zucc.), sourced from Gifu Prefecture. The collection of appropriate volumes of the wood for use in the making of the umbrellas had been outsourced to a forester in Gero City, east of Gujo City. However, in 2012 this forester ceased operations and the gathering of the wood was suspended. The Gifu Academy of Forest Science and Culture discovered suitable sources of wood in Mino City and harvests it in tandem with a local forestry volunteer group as well as umbrella makers from all over Japan. They collect together the required amount of wood for one year of production of this part. It is known as the “Snowbell Project” and was established in 2013. In order to pass on the traditional crafts borne of the Nagara River, they are also training the next manufactures of these umbrella runners and covers.



Image 50: Umbrella Runner

Successfully passing on the skills involved in this timber processing requires those involved in the forestry industry and the arts and culture field to come together and work as one.

The standard price of timber is low, thus there are concerns as to whether the owners of forest lands will continue to devote themselves in a self motivated way to the management of their forest.

As a result of this, starting with creation of a road network dealing with logging roads, initiatives are being created to improve profitability through the lowering of the costs

involved in forest management. As well as this, efforts are continuing towards the improvement of the competitiveness of Gifu sourced wood through the management of relevant facilities and the implementation of a performance indication system amongst other initiatives designed to add value to the end products.

The lowering of prices is not limited solely to the timber industry, with a similar trend being observed in the agricultural sector which continues to see a drop in the number of people involved in the field. To combat this, the Prefectural Government is working with the agricultural cooperatives to offer those interested parties a chance to experience what it is like to work in agriculture. They are also working with farmers to develop a system of professional development for those who are actively pursuing a career in the field.

d) Conservation of Water and Resources

Around the world approximately 700 million people are currently experiencing water shortages and it is said that in this age of global warming, climate change, rising global population, economic growth in developing countries and increasing demand for water resources that this problem is expected to worsen going forward.

Efforts will continue to be made to spread the word of the compact water cycle of the Nagara River both nationally and worldwide, which begins with the nurturing of the forests. We understand and recognise the importance of conserving its safe drinkable waters, its role in food production, the resources born of it and the unique ecosystem it provides.

VI. Practical Considerations

a) Ongoing Efforts to Promote the GIAHS

Local authorities in each of the four cities on the upper and middle courses of the Nagara River, the Prefectural Government and groups related to the agriculture, forestry

and fisheries sectors are all involved in planning and discussions as part of the Nagara River Agriculture, Forestry and Fisheries Association as well as being involved in public efforts linked to attaining GIAHS recognition.

Moreover, the prefectural government, Gujo City and bodies related to the fishing sector are continuing with the planning of the “Nagara River Ayu Park” (tentative). It is expected that this facility will form a focal point of the GIAHS and allow people to learn about ayu, related industries and links between rivers, forests and seas in general. It will also offer a space for visitors to experience first-hand how to fish and also act as a space to disseminate information to the public.

b) Potential and Opportunities for Sustainability and Management of GIAHS

Through the continuation and development of the aforementioned Nagara River Agriculture, Forestry and Fisheries Promotion Association and the exchange of information on events, event planning and the current status of conservation efforts, this association, together with workers in the agriculture, forestry and fisheries sectors as well as NPOs, corporations and ordinary citizens in related cities forms the nucleus of a broad social movement aimed at passing on the culture of the region to future generations.

c) Expected Impact of GIAHS on Society and Ecology

The Nagara River’s natural features, such as the rate of precipitation and the topography of its surroundings, when added to its importance in manufacturing, the livelihoods of the people along its basin and the environmental efforts which they carry out have led to the conservation of the river. It can thus be called a *satokawa*. The phrase “The links between the forest, river and sea” encapsulates the life of the ayu and with this concept, we will register the sustainable agriculture, forestry and fisheries system as a GIAHS, the “Nagara River System” and expect to spread information about it as an environment with a river at its core. Beginning with cormorant fishing, we believe we can leverage the opportunity given to us by registration as a GIAHS in the search for successors to carry on the traditional crafts and culture fostered by the river.

To assist in the continued inhabitation of multiple fish species on the Nagara River, constructions of fishways exist in order to facilitate the ease of travelling upstream for ayu and other fishes.

Moreover, there are three types of fishways (five fishways in total) placed at the estuary barrage with moveable gates near the mouth of the Nagara River. During the times of year where ayu fry travel upstream, videos are recorded at a certain fishway every day in order to continuously monitor ayu swim upstream through it. The total number of fish that pass through the fishway is calculated, and for the past ten years (2005 - 2014) an average of 940,000 ayu have been confirmed to travel upstream each year.

In order to increase the amount of ayu fry swimming upstream from gates near riverbanks, the river flow is increased by operating the gate to lure them into fishways that lie along the banks on either side. This takes advantage of the behavioural patterns of ayu fry, exploiting how they swim against the current and travel upstream along riverbanks. The operation of these gates at the estuary barrage is conducted based on information about spawning during the period juvenile travel downstream, increasing the speed of the water's flow and causing juvenile to drift downstream faster.

In order to prevent the reduction of dissolved oxygen (DO) content present in riverbeds around the estuary barrage near the mouth of the river's upper course during April - September, gates are opened fully three times per four-day period.

The dissemination of information that would come as a result of this site being designated a GIAHS would be directly linked to the conservation of various species and environments across the East Asia region, and the provision of foodstuffs. It could also contribute to the continued succession of traditional culture (such as cormorant fishing) and crafts.

d) Motivation of the Local Community, the Local/National Authorities and Other Relevant Stakeholders

In order to conserve and leverage our pristine waters, efforts by relevant agricultural parties and normal citizens to clean the rivers, conserve streams in forests and generally care for the environment surrounding the river are ongoing. In 2006, the 57th National Tree Planting Ceremony was held in Gifu, the second time the prefecture had staged this event. This was followed in 2010 by the first ever riverside staging of the 30th National Convention for the Development of an Abundantly Productive Sea. In 2015, the 39th National Tree Arboriculture Festival will also be held in Gifu and at the 2014 Prefectural Citizens' Conference on the Creation and Promotion of "Gifu, the Land of Clear Waters", "The Charter of Gifu, the Land of Clear Waters" was enacted. Through these events awareness of the importance of the concept of "clear waters" continues to increase amongst citizens in our prefecture.

In Gifu Prefecture, as this awareness has continued to increase, the "Forest and Environment Tax of Gifu Land of Clear Waters" was introduced. Local governments and a wide range of other groups will continuously be supported in their conservation efforts. It was with this backdrop that, in 2013, the "Gifu Prefectural Water Source Area Conservation Regulation" was enacted.

Local governments in related municipalities and groups involved in manufacturing will continue to search for ways to add value to their existing products and in response to this the Gifu Prefectural Government will continue to try to attract foreign visitors and also export a range of agricultural, forest and aquatic products, led by ayu, to overseas markets as well as providing national grants to help local municipalities in their efforts.

Together, association as a central base, groups along the river basin are uniting in order to create the "Nagara River Brand" consisting not only of agriculture, forest and fishery based products but also services in the commercial sector and efforts being made in promoting tourism.

VII. Dynamic Conservation Plan for GIAHS Selected Site

1. System of Promotion

The four cities on the upper and middle courses of the Nagara River and bodies in agriculture, forestry and fisheries fields, in tandem with the Prefectural Government, have formed the “Nagara River Agriculture, Forestry and Fisheries Promotion Association”. This group is spearheading the drive to gain Globally Important Agricultural Heritage System status. We will pursue the below outlined general initiatives, as affiliated bodies of the aforementioned association and as the Pristine Nagara River Agriculture, Forestry and Fisheries Sector Players in the related fields on the Nagara River.

2. Action Plan

(1) Promotion of Agriculture, Forestry and Fisheries Industries

- Governmental groups and private groups along the basin of the river have come together as one. The efforts of the Prefectural Government with the registered trademark slogan “Gifu, Land of Clear Waters” as well as efforts being made in the manufacturing of agricultural, forestry and fisheries products, stretching to encompass tourism resources as well, have led to the creation of the “Nagara River Brand”.
- In order to plan for the propagation of inland fishery centred on ayu, it is necessary to ensure the supply of hatchlings, prevent against diseases and increase the number of recreational fishermen. As well as this, plans for the creation of the “Nagara River Ayu Park” (tentative) will be proceeded with and this facility will be used to spread information and engage with the public.
- Efforts will be made to pass down the culture of cormorant fishing to the next generation through exhibitions and workshops at the Nagara River Ukai Museum.
- Agricultural products such as Hida Beef, *fuyu* persimmons and strawberries will continue to be exported to the East Asian market. New efforts will be made so that ayu may also be exported in the future.

- Moreover, in order to conserve the ayu species which is endemic to East Asia, efforts across the continent will be developed and expanded.
- In 2015 with the staging of the 39th National Tree Arboriculture Festival as well as the already enacted Forest and Environment Tax, coupled with the Water Source Area Conservation Regulation, the people are continuing to be informed of the role of the forest. At the same time, local authorities are engaging in thinning of the forests, improving the road network within forest areas and establishing facilities for practicing sawing and creating biomass. All of these initiatives are designed to aid in passing down the rich forest resources from generation to generation.

(2) Tourism Promotion

- Beginning with recreational resources related to the Nagara River, like cormorant fishing and rafting, efforts in tourism will be strengthened in order to attract visitors from overseas with traditional culture such as the Gujo *Odori* and green tourism in the form of opportunities to experience the agriculture, forestry and fishery fields first hand. We will combine these efforts with the promotion of existing tourist sites outside of the river basin; the UNESCO World Heritage Site Shirakawa-go and the traditional town of Hida Takayama.

(3) Cultural Promotion

- Leveraging the resources of the Nagara River such as traditional crafts, scenery and local drama performances, the efforts of a number of cultural artifacts to achieve recognition with various different bodies will be combined and bolstered. Through the opportunities for promotion provided by each system we will also search for successors to carry on the related traditions to each of these artifacts.

(4) Conserving the Environment

- Environmental conservation groups, citizens, companies and, government bodies are coming together and increasing their efforts in the field of environmental conservation. At the same time, with the creation and dissemination of “The Charter of Gifu, the Land of Clear Waters”, the people of Gifu are continuing to become more aware of the importance of the environment around the Nagara River.

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Appendix 1: Location of the Site



Appendix 2: Agricultural, Forestry and Fisheries Products Diversity List

Category	English name	Scientific Name
Fishing Products	Ayu	<i>Plecoglossus altivelis altivelis</i>
	Red spotted masu trout	<i>Oncorhynchus masou ishikawae</i>
	Whitespotted char	<i>Salvelinus leucomaenis</i>
	Rainbow trout	<i>Oncorhynchus mykiss</i>
	Japanese eel	<i>Anguilla japonica</i>
	Japanese dace	<i>Tribolodon hakonensis</i>
	Pale chub	<i>Zacco platypus</i>
	Common carp	<i>Cyprinus carpio</i>
	Japanese barbell	<i>Hemibarbus barbus</i>
	Crucian carp	<i>Carassius spp.</i>
	Weather loach	<i>Misgurnus anguillicaudatus</i>
	Delicate loach	<i>Niwaella delicata</i>
	Japanese minnow	Species of genus <i>gnathopogon</i> or <i>squalidus</i>
	Japanese catfish	<i>Silurus asotus</i>
	Freshwater goby	<i>Rhinogobius spp.</i>
	Japanese sculpin	<i>Cottus spp.</i>
	Japanese mitten crab	<i>Eriocheir japonica</i>
Freshwater prawn	<i>Macrobrachium nipponense</i>	
Rice	Rice	<i>Oryza sativa</i> L.
	Sticky rice	<i>Oryza sativa</i> L.
Wheat	Wheat	<i>Triticum aestivum</i> L.
	Barley	<i>Hordeum vulgare</i> L.
Cereals	Buckwheat	<i>Fagopyrum esculentum</i> Moench
Beans	Soybeans	<i>Glycine max</i> (L.) Merrill
Vegetables	Spinach	<i>Spinacia oleracea</i> L.
	Eggplant	<i>Solanum melongena</i> L.
	Tomato	<i>Lycopersicon esculentum</i> Mill.
	Cucumber	<i>Cucumis sativus</i> L.
	Strawberry	<i>Fragaria</i> × <i>ananassa</i> Duch.
	Green soybeans	<i>Glycine max</i> L.
	Taro	<i>Colocasia esculenta</i> (L.) Schott
	Welsh onion	<i>Allium fistulosum</i> L.
	Onion	<i>Allium cepa</i> L.
	Burdock	<i>Arctium lappa</i> L.
	Hyacinth bean	<i>Lablab purpurea</i> (L.) Sweet
	Japanese radish	<i>Raphanus sativus</i> L.
Fruits	Japanese apricot	<i>Prunus mume</i> Sieb.et Zucc.
	Japanese persimmon	<i>Diospyros kaki</i> L. f.
	Kiwifruit	<i>Actinidia chinensis</i> Planch.
	Japanese chestnut	<i>Castanea crenata</i> Sieb. et Zucc.
	Japanese pear	<i>Pyrus pyrifolia</i> (Burm. F.) Nakai
	Passion fruit	<i>Passiflora edulis</i> Sims
	Grape	<i>Vitis</i> spp.
	Blueberry	<i>Vaccinium</i> spp.
	Yuzu	<i>Citrus junos</i> Sieb. ex Tanaka
Apple	<i>Malus pumila</i> Mill.	

Category	English name	Scientific Name
Horticulture Plants	Nandina, heavenly bam-boo	<i>Nandina domestica</i> Thunb.
	Winter-flowering begonia	<i>Begonia</i> × <i>hiemalis</i>
	Palm-beach-bells	<i>Kalanchoe</i> spp.
	Flannel flower	<i>Actinotus helianthi</i> Labill
	Grey-leaved euryops	<i>Euryops pectinatus</i> (L.) Cass.
Stock Raising	Japanese black cow	<i>Bos taurus</i>
	Holstein	<i>Bos taurus</i>
	Pig	<i>Sus scrofa domesticus</i>
	Broiler	<i>Gallus gallus domesticus</i>
	Layers	<i>Gallus gallus domesticus</i>
Forest Products	Cedar	<i>Cryptomeria japonica</i>
	Japanese cypress	<i>Chamaecyparis obtusa</i>
Mushrooms	Fresh shiitake mushroom	<i>Lentinula edodes</i>
	Fresh shiitake mushroom	<i>Lentinula edodes</i>
	Dried shiitake mushroom	<i>Lentinula edodes</i>
	Dried shiitake mushroom	<i>Lentinula edodes</i>
	Maitake	<i>Grifola frondosa</i>
	Judas' ear fungus	<i>Auricularia auricula</i>

* Investigated by Gifu Prefecture

Appendix 3: Biodiversity List (Animals)

No.	Taxon	Scientific Name	English Name	Red Data Book	
				MOE	Gifu Pref.
1	Mammal	<i>Nyctalus aviator</i> Thomas	Birdlike noctule	NT	CR+EN
2	Mammal	<i>Murina leucogaster</i> Milne-Edwards	Greater tube nosed bat	VU	VU
3	Mammal	<i>Micromys minutus</i> (Pallas)	Eurasian harvest mouse		NT
4	Fowl	<i>Eurystomus orientalis calonyx</i> Sharpe	Broad billed roller	EN	CR+EN
5	Fowl	<i>Gorsakius goisagi</i> (Temminck)	Japanese night heron	EN	VU
6	Fowl	<i>Spizaetus nipalensis orientalis</i> Temminck et Schlegel	Mountain hawk eagle	EN	VU
7	Fowl	<i>Porzana fusca erythrothorax</i> (Temminck et schlegel)	Ruddy crane	VU	VU
8	Fowl	<i>Gallinago hardwickii</i> (Gray)	Latham's Snape	NT	VU
9	Fowl	<i>Sterna albifrons sinensis</i> Gmelin	Little tern	VU	VU
10	Fowl	<i>Otus scops japonicus</i> Temminck et Schlegel	Eurasian scops owl		VU
11	Fowl	<i>Podiceps ruficollis poggei</i> (Reichenow)	Little greb		NT
12	Fowl	<i>Aix galericulata</i> (Linnaeus)	Mandarin duck	DD	NT
13	Fowl	<i>Pernis apivorus japonicus</i> Kuroda	Crested honey buzzard	NT	NT
14	Fowl	<i>Accipiter gentilis fujiyamae</i> (Swan et Hartert)	Northern gashawk	NT	NT
15	Fowl	<i>Accipiter nisus nisosimilis</i> (Tickell)	Eurasian sparrowhawk	NT	NT
16	Fowl	<i>Butastur indicus</i> (Gmelin)	Grey faced buzzard	VU	NT
17	Fowl	<i>Falco peregrinus japonensis</i> Gmelin	Falcon	VU	NT
18	Fowl	<i>Phasianus soemmerringii scintillans</i> Gould	Copper pheasant		NT
19	Fowl	<i>Rostratula benghalensis benghalensis</i> (Linnaeus)	Painted snipe		NT
20	Fowl	<i>Charadrius alexandrinus nihonensis</i> Deignan	Kentish plover		NT
21	Fowl	<i>Ninox scutulata japonica</i> (Temminck et Schlegel)	Brown hawk owl		NT
22	Fowl	<i>Strix uralensis</i> Pallas	Ural owl		NT
23	Fowl	<i>Caprimulgus indicus jotaka</i> Temminck et Schlegel	Grey nightjar	VU	NT
24	Fowl	<i>Ceryle lugubris lugubris</i> (Temminck)	Crested kingfisher		NT
25	Fowl	<i>Pericrocotus divaricatus divaricatus</i> (Raffles)	Ashy minivet	VU	NT
26	Fowl	<i>Phylloscopus occipitalis coronatus</i> (Temminck et Schlegel)	Eastern crowned warbler		NT
27	Fowl	<i>Muscicapa latirostris</i> Raffles	Asian brown fly catcher		NT
28	Fowl	<i>Terpsiphone atrocaudata atrocaudata</i> (Eyton)	Japanese paradise flycatcher		NT
29	Fowl	<i>Emberiza sulphurata</i> Temminck et Schlegel	Japanese yellow bunting	NT	NT
30	Reptile	<i>Mauremys japonica</i> (Temminck et Schlegel)	Japanese pond turtle	DD	NT
31	Amphibian	<i>Hynobius nebulosus</i> (Temminck et Schlegel)	Clouded salamander	VU	CR+EN
32	Amphibian	<i>Andrias japonicus</i> (Temminck)	Japanese giant salamander	VU	VU
33	Amphibian	<i>Rana porosa brevipoda</i> Ito	Daruma pond frog	EN	VU
34	Amphibian	<i>Hynobius kimurae</i> Dunn	Hida salamander	NT	NT
35	Amphibian	<i>Rana japonica</i> Boulenger	Japanese brown frog		NT
36	Fish	<i>Acheilognathus cyanostigma</i> Jordan et Fowler	Striped bitterling	CR	CR+EN
37	Fish	<i>Acheilognathus tabira tabira</i> Jordan et Thompson	White tabira bitterling	EN	CR+EN
38	Fish	<i>Hemigrammocypripis rasborella</i> Fowler	Golden venus chub	EN	CR+EN
39	Fish	<i>Pseudorasbora pumila</i> subsp. 2	Dwarf topmouth minnow	CR	CR+EN
40	Fish	<i>Pseudobagrus ichikawai</i> (Okada et Kubota)	Bagrid catfish	EN	CR+EN
41	Fish	<i>Gasterosteus aculeatus leirurus</i> Cuvier	Three spined stickleback	CR	CR+EN
42	Fish	<i>Lethenteron</i> sp. 1	Far Eastern brook lamprey northern form	VU	VU
43	Fish	<i>Cottus kazika</i> Jordan et Starks	Fourspine sculpin	VU	VU
44	Fish	<i>Cottus reinii</i> Hilgendorf	Amphidromous sculpin	EN	VU
45	Fish	<i>Lethenteron</i> sp. 2	Far Eastern brook lamprey thouthern form	VU	NT
46	Fish	<i>Tanakia lanceolata</i> (Temminck et Schlegel)	Slender bitterling	NT	NT
47	Fish	<i>Tanakia limbata</i> (Temminck et Schlegel)	Oily bitterling	NT	NT
48	Fish	<i>Zacco sieboldii</i> (Temminck et Schlegel)	Dark chub		NT
49	Fish	<i>Squalidus gracilis gracilis</i> (Temminck et Schlegel)	Small sliver gudgeon		NT
50	Fish	<i>Lefua echigonia</i> Jordan and Richardson	Japanese eight-barbel loach	EN	NT

No.	Taxon	Scientific Name	English Name	Red Data Book	
				MOE	Gifu Pref.
51	Fish	<i>Oncorhynchus masou ishikawae</i> Jordan et McGregor	Red spotted masu trout	NT	NT
52	Fish	<i>Lateolabrax japonicus</i> (Cuvier)	Japanese sea perch		NT
53	Fish	<i>Odontobutis obscura</i> (Temminck et Schlegel)	Dark sleeper		NT
54	Fish	<i>Rhinogobius</i> sp. TO	Tokai fresh water goby	NT	NT
55	Insect	<i>Lestes japonicus</i> Selys	Kobanaeaitonbo damselfly	EN	CR+EN
56	Insect	<i>Ceriagrion nipponicum</i> Asahina	Beniitonbo damselfly	VU	VU
57	Insect	<i>Lethocerus deyrollei</i> (Vuillefroy)	Tagame water bug	VU	VU
58	Insect	<i>Nepa hoffmanni</i> Esaki	Himetaikouchi water scorpion		VU
59	Insect	<i>Lucidina okadai</i> Nakane et Ohbayashi	Kokuroobabotaru firefly	VU	VU
60	Insect	<i>Brachyta bifasciata japonica</i> (Matsushita)	Futasujikatabirohanakamikiri coprocorn beetle		VU
61	Insect	<i>Eurema laeta bethesaba</i> (Janson)	Tsumagurokichou butterfly	VU	VU
62	Insect	<i>Niphanda fusca</i> (Bremer)	Kuroshijimi butterfly	EN	VU
63	Insect	<i>Spindasis takanonis</i> (Matsumura)	Kimadararuritsubame butterfly	NT	VU
64	Insect	<i>Strymonidia mera</i> (Janson)	Miyamakarasushijimi butterfly		VU
65	Insect	<i>Cercion sexlineatum</i> (Selys)	Musujitotonbo damselfly		NT
66	Insect	<i>Coenagrion lanceolatum</i> (Selys)	Ezoitonbo damselfly		NT
67	Insect	<i>Gomphus postocularis</i> Selys	Clubtail dragonfly		NT
68	Insect	<i>Stylurus nagoyanus</i> (Asahina)	Nagoyasanae	NT	NT
69	Insect	<i>Cordulia aenea amurensis</i> Selys	Downy emerald		NT
70	Insect	<i>Epiheca marginata</i> (Selys)	Torafutonbo dragonfly		NT
71	Insect	<i>Sympetrum kunckeli</i> (Selys)	Maikoakane dragonfly		NT
72	Insect	<i>Euterpnosia chibensis chibensis</i> Matsumura	Scissor-grinder		NT
73	Insect	<i>Poecilophilides rusticola</i> (Burmeister)	Akamadarakogane flower chaffer	DD	NT
74	Insect	<i>Glipa shirozui</i> Nakane	Oobihananomi beetle		NT
75	Insect	<i>Xylotrechus chinensis</i> Chevrolat	Mulberry borer		NT
76	Insect	<i>Dolichoprosopus yokoyamai</i> (Gresiitt)	Yokoyamahigenagakamikiri long horned beetle		NT
77	Insect	<i>Leptalina unicolor</i> (Bremer et Grey)	Ginichimonjiseseri skipper	NT	NT
78	Insect	<i>Thymelicus leoninus leoninus</i> (Butler)	Sujigurochabaneseseri skipper	NT	NT
79	Insect	<i>Luehdorfia japonica</i> Leech	Gifu butterfly	VU	NT
80	Insect	<i>Chrysozephyrus ataxus kirishimaensis</i> (Okajima)	Kirishimamidorishijimi butterfly		NT
81	Insect	<i>Kirinia epaminondas</i> (Staudinger)	Kimadaramodoki butterfly	NT	NT
82	Insect	<i>Conistra sakabei</i> (Sugi)	Isekiriga moth		NT
83	Insect	<i>Amphipoea subrigua</i> Bremen et Grey.	Yahikokarasuyotou moth		NT
84	Insect	<i>Asidemia inexpecta inexpecta</i> (Sugi)	Echigohagatayotou moth		NT
85	Insect	<i>Megaloctena punctilinealis</i> (Leech)	Iwaatsuba moth		NT
86	Insect	<i>Pseudalelimma miwai</i> Inoue	Ookirotsuba moth		NT
87	Shellfish	<i>Inversidens brandti</i> (Kobelt)	Obaeboshigae freshwater mussel	VU	CR+EN
88	Shellfish	<i>Inversiumio yokohamensis</i> (Ihering)	Yokohamashijiragai freshwater mussel	NT	CR+EN
89	Shellfish	<i>Unio douglasiae nipponensis</i> (Martens)	Ishigai freshwater mussel		VU
90	Shellfish	<i>Obovalis omiensis</i> (Heimburg)	Fresh water bivalves	VU	VU
91	Shellfish	<i>Margaritifera laevis</i> (Haas)	Kawashinjugai freshwater mussel	VU	VU
92	Shellfish	<i>Lanceolaria grayana</i> (Lea)	Tongarisasanohagai freshwater mussel	NT	VU
93	Shellfish	<i>Pronodularia japonensis</i> (Lea)	Matsukasagai freshwater mussel	NT	VU
94	Shellfish	<i>Satsuma fusca</i> (Gude)	Koshitakakobesomaimai snail	NT	NT
95	Shellfish	<i>Cipangopaludina chinensis laeta</i> (Martens)	Marutanishi snail	NT	NT

* Ministry of the Environment (MOE) (2012) The 4th Red List

* Gifu Prefecture (2012) Gifu Prefectural Red Data Book (Animals) Revised Edition

Appendix 4: Biodiveristy List (Plants)

No.	Scientific Name	English Name	Red Data Book	
			MOE	Gifu Pref.
1	<i>Isoetes japonica</i> A.Braun	<i>Mizunira</i> quillwort	NT	CR+EN
2	<i>Equisetum palustre</i> L.	Marsh horsetail		CR+EN
3	<i>Ophioglossum thermale</i> Kom. var. <i>nipponicum</i> (Miyabe et Kudô) M.Nishida	<i>Kohanayasuri</i> adder's tongue fern		CR+EN
4	<i>Crepidomanes schmidtianum</i> (Zenker ex Taschner) K.Iwats.	<i>Chichibuhoragoke</i> fern		CR+EN
5	<i>Hymenophyllum mikawanum</i> (Seriz.) Seriz.	<i>Shikawakokeshinobu</i> fern	EN	CR+EN
6	<i>Monachosorum arakii</i> Tagawa	<i>Himemukagoshida</i> fern	EN	CR+EN
7	<i>Pteris nipponica</i> W.C.Shieh	<i>Matsuzakashida</i> fern		CR+EN
8	<i>Asplenium capillipes</i> Makino	<i>Himeiwatoranoo</i> fern		CR+EN
9	<i>Asplenium pekinense</i> Hance	<i>Tokiwatoranoo</i> fern		CR+EN
10	<i>Asplenium wilfordii</i> Mett. ex Kuhn	<i>Aoganeshida</i> fern		CR+EN
11	<i>Asplenium yoshinagae</i> Makino	<i>Tokiwashida</i> fern		CR+EN
12	<i>Leptorumohra sinomiqueliana</i> (Ching) Tagawa	<i>Hirohanarashida</i> fern	EN	CR+EN
13	<i>Thelypteris hattorii</i> (H.Itô) Tagawa	<i>Yokogurahimewarabi</i> fern		CR+EN
14	<i>Athyrium kuratae</i> Seriz.	<i>Tsukushiinuwarabi</i> lady fern		CR+EN
15	<i>Diplazium doederleinii</i> (Lueruss.) Makino	<i>Shimashiroyamashida</i> twinsorus fern		CR+EN
16	<i>Diplazium okudairae</i> Makino	Vegetable fern	EN	CR+EN
17	<i>Drymotaenium miyoshianum</i> (Makino) Makino	<i>Kuragarishida</i> fern	EN	CR+EN
18	<i>Marsilea quadrifolia</i> L.	Four leaf clover	VU	CR+EN
19	<i>Pilea kiotensis</i> Ohwi	Aluminium Plant		CR+EN
20	<i>Rumex madaio</i> Makino	<i>Madaiou</i> Dock		CR+EN
21	<i>Pseudostellaria palibiniana</i> (Takeda) Ohwi	<i>Higenewachigaisou</i> pseudostellaria		CR+EN
22	<i>Aconitum japonicum</i> Thunb. subsp. <i>ibukiense</i> (Nakai) Kadota	<i>Ibukitorikabuto</i> monkshood		CR+EN
23	<i>Dichocarpum dicarpon</i> (Miq.) W.T.Wang et P.K.Hsiao	<i>Sabano</i> Flower		CR+EN
24	<i>Euryale ferox</i> Salisb.	Foxnut	VU	CR+EN
25	<i>Nuphar oguraensis</i> Miki	<i>Ogurakouhone</i> water-lily	VU	CR+EN
26	<i>Nuphar subintegerrima</i> (Casp.) Makino	<i>Himekouhone</i> water-lily	VU	CR+EN
27	<i>Aristolochia kaempferi</i> Willd. var. <i>tanzawana</i> Kigawa	<i>Tanzawaumanosuzukusa</i> pipe-vine		CR+EN
28	<i>Arabis serrata</i> Franch. et Sav. var. <i>japonica</i> (H.Boissieu) Ohwi	<i>Iwahatazaô</i> rockcress		CR+EN
29	<i>Arabis serrata</i> Franch. et Sav. var. <i>shikokiana</i> (Nakai) Ohwi	<i>Shikokuhatazaô</i> rockcress		CR+EN
30	<i>Cardamine anemonoides</i> O.E.Schulz	<i>Mitsubakonronsou</i> bittercress		CR+EN
31	<i>Rorippa cantoniensis</i> (Lour.) Ohwi	Chinese yellowcress	NT	CR+EN
32	<i>Orostachys malacophylla</i> (Pall.) Fisch. var. <i>iwarenge</i> (Makino) H.Ohba	Chinese dunce caps	VU	CR+EN
33	<i>Rubus pungens</i> Camb.	<i>Sanagiichigo</i> berry	VU	CR+EN
34	<i>Impatiens hypophylla</i> Makino var. <i>microhypophylla</i> (Nakai) H.Hara	<i>Enshuutsurifuneso</i> jewelweed	EN	CR+EN
35	<i>Berchemia pauciflora</i> Maxim.	Brazil raintree		CR+EN
36	<i>Viola patrinii</i> DC. var. <i>patrinii</i>	China violet		CR+EN
37	<i>Trapa incisa</i> Siebold et Zucc.	<i>Himebishi</i> water chestnut	VU	CR+EN
38	<i>Trapa natans</i> L. var. <i>pumila</i> Nakano ex Verdc.	Water chestnut		CR+EN
39	<i>Myriophyllum oguraense</i> Miki	Oguranofusamo milfoil	VU	CR+EN
40	<i>Primula Sieboldii</i> E.Morren	Japanese Primrose	NT	CR+EN
41	<i>Gentiana squarrosa</i> Ledeb.	<i>Kokerindou</i> Gentian		CR+EN
42	<i>Pterygocalyx volubilis</i> Maxim.	<i>Pterygocalyx volubilis</i>	VU	CR+EN
43	<i>Swertia tosaensis</i> Makino	<i>Inusenburi</i> Gentianaceae	VU	CR+EN
44	<i>Nymphoides coreana</i> (H.Lév.) H.Hara	Fringed yellow water snowflake	VU	CR+EN
45	<i>Nymphoides indica</i> (L.) Kuntze	Water snowflake	NT	CR+EN
46	<i>Nymphoides peltata</i> (S.G.Gmel.) Kuntze	Yellow floating-heart	NT	CR+EN
47	<i>Amsonia elliptica</i> (Thunb.) Roem. et Schult.	Japanese bluestar	NT	CR+EN
48	<i>Damnacanthus macrophyllus</i> Siebold ex Miq.	<i>Juzunenoki</i> m adder		CR+EN
49	<i>Verbena officinalis</i> L.	Common vervain		CR+EN
50	<i>Ajuga japonica</i> Miq.	<i>Ogikazura</i> bugle		CR+EN

No.	Scientific Name	English Name	Red Data Book	
			MOE	Gifu Pref.
51	<i>Collinsonia japonica</i> (Miq.) Harley	Collinsonia		CR+EN
52	<i>Leonurus macranthus</i> Maxim.	Kisewata mint	VU	CR+EN
53	<i>Pogostemon stellatus</i> (Lour.) Kuntze	<i>Mizunekono</i> mint	NT	CR+EN
54	<i>Pogostemon yatabeanus</i> (Makino) Press	<i>Mizutorano</i> mint	VU	CR+EN
55	<i>Scutellaria shikokiana</i> Makino	Barbed skullcap		CR+EN
56	<i>Pedicularis resupinata</i> L. subsp. <i>teucrifolia</i> (M.Bieb. ex Steven) T.Yamaz. var. <i>caespitosa</i> Koidz.	<i>Tomoeshiogama</i> lousewort		CR+EN
57	<i>Rehmannia japonica</i> (Thunb.) Makino ex T.Yamaz.	<i>Senrigoma</i> figwort	CR	CR+EN
58	<i>Siphonostegia chinensis</i> Benth. ex Hook. et Arn.	<i>Hikiyomogi</i> broomrape		CR+EN
59	<i>Utricularia exoleta</i> R.Br.	Bladderwort	VU	CR+EN
60	<i>Utricularia minor</i> L.	Lesser bladderwort	NT	CR+EN
61	<i>Utricularia minutissima</i> Vahl	<i>Himemimikakigusa</i> bladderwort	EN	CR+EN
62	<i>Utricularia australis</i> R.Br.	<i>Inutanukimo</i> bladderwort	NT	CR+EN
63	<i>Aster microcephalus</i> (Miq.) Franch. et Sav. var. <i>microcephalus</i>	<i>Senbongiku</i> daisy		CR+EN
64	<i>Cirsium magofukui</i> Kitam.	Alameda Thistle	VU	CR+EN
65	<i>Ixeris chinensis</i> (Thunb.) Nakai subsp. <i>strigosa</i> (H.Lév. et Vaniot) Kitam.	<i>Takasagosou</i> daisy	VU	CR+EN
66	<i>Ixeris tamagawaensis</i> (Makino) Kitam.	<i>Kawaranigana</i> daisy	NT	CR+EN
67	<i>Ligularia japonica</i> Less.	<i>Hankaisou</i> leopardplant		CR+EN
68	<i>Nabalus tanakae</i> Franch. et Sav. ex Y.Tanaka et Ono	<i>Onigana</i> Daisy		CR+EN
69	<i>Blyxa echinosperma</i> (C.B.Clarke) Hook.f.	<i>Subuta</i> tape-grass	VU	CR+EN
70	<i>Hydrocharis dubia</i> (Blume) Backer	Frogbit	NT	CR+EN
71	<i>Ottelia alismoides</i> (L.) Pers.	Duck Lettuce	VU	CR+EN
72	<i>Potamogeton distinctus</i> A.Benn.	Roundleaf Pondweed		CR+EN
73	<i>Najas chinensis</i> N.Z.Wang	Sakamitorigemo	VU	CR+EN
74	<i>Najas gracillima</i> (A.Braun ex Engelm.) Magnus	Slender Waternymph	NT	CR+EN
75	<i>Najas marina</i> L.	Spiny Naiad		CR+EN
76	<i>Najas oguraensis</i> Miki	<i>Ootorigemo</i> waternymph		CR+EN
77	<i>Sciaphila nana</i> Blume	<i>Hongousou</i> triuris	VU	CR+EN
78	<i>Amana erythronioides</i> (Baker) D.Y.Tan et D.Y.Hong	<i>Tulipa erythronioides</i>	VU	CR+EN
79	<i>Allium inutile</i> Makino	<i>Sutegobiru</i> onion	VU	CR+EN
80	<i>Lloydia triflora</i> (Ledeb.) Baker	<i>Hosobanoamana</i> Flower		CR+EN
81	<i>Polygonatum humile</i> Fisch. ex Maxim.	Dwarf Solomon's seal		CR+EN
82	<i>Tofieldia coccinea</i> Richards. var. <i>gracilis</i> (Franch. et Sav.) T.Shimizu	Northern asphodel		CR+EN
83	<i>Smilax stans</i> Maxim.	<i>Marubasankirai</i> catbrier		CR+EN
84	<i>Burmanna cryptopetala</i> Makino	<i>Shiroshakujo</i> flower		CR+EN
85	<i>Eragrostis japonica</i> (Thunb.) Trin.	Pond Lovegrass		CR+EN
86	<i>Festuca japonica</i> Makino	<i>Yamatoboshigara</i> fescue		CR+EN
87	<i>Sparganium erectum</i> L.	Branched bur-reed	NT	CR+EN
88	<i>Carex ciliatomarginata</i> Nakai	Island brocade		CR+EN
89	<i>Carex fulta</i> Franch.	<i>Nikkoharisuge</i> sedge		CR+EN
90	<i>Carex lenta</i> D.Don var. <i>sendaica</i> (Franch.) T.Koyama	<i>Sendaisuke</i> sedge		CR+EN
91	<i>Fimbristylis stauntonii</i> Debeaux et Franch. var. <i>tonensis</i> (Makino) Ohwi ex T.Koyama	<i>Tonetentsuki</i> sedge	VU	CR+EN
92	<i>Chamaegastrodia sikokiana</i> Makino et F.Maek.	<i>Himenoyagara</i> orchid	VU	CR+EN
93	<i>Taeniophyllum glandulosum</i> Blume	<i>Kumoran</i> orchid		CR+EN
94	<i>Huperzia cryptomerina</i> (Maxim.) Dixit	Appalachian firmoss	VU	VU
95	<i>Plagiogyria adnata</i> (Blume) Bedd.	<i>Takasagokishino</i> fern		VU
96	<i>Adiantum monochlamys</i> D.C.Eaton	<i>Hakoneshida</i> maidenhair fern		VU
97	<i>Haplopteris fudzinoi</i> (Makino) E.H.Crane	<i>Nakashishiran</i> fern		VU
98	<i>Pteris wallichiana</i> J.Agardh	<i>Nachishida</i> fern		VU
99	<i>Asplenium pseudowilfordii</i> Tagawa	<i>Okutamashida</i> fern	VU	VU
100	<i>Arachniodes nipponica</i> (Rosenst.) Ohwi	<i>Okutamashida</i> fern		VU

No.	Scientific Names	English Name	Red Book Data	
			MOE	Gifu Pref.
101	<i>Dryopteris ryo-itoana</i> Sa.Kurata	Alpine buckler fern		VU
102	<i>Dryopteris sparsa</i> (Buch.-Ham. ex D.Don) Kuntze	<i>Nagabanoitachishida</i> fern		VU
103	<i>Thelypteris hattorii</i> (H.Itô) Tagawa var. <i>nemoralis</i> (Ching) Sa.Kurata	<i>Shikushiyawarashida</i> fern		VU
104	<i>Leptochilus buergerianus</i> (Miq.) Bosman	<i>Yanoneshida</i> fern		VU
105	<i>Pyrrosia hastata</i> (Houtt.) Ching	Felt fern		VU
106	<i>Micropolypodium okuboii</i> (Yatabe) Hayata	<i>Okuboshida</i> fern		VU
107	<i>Pellionia minima</i> Makino	<i>Sanshousou</i> nettle		VU
108	<i>Pilea angulata</i> (Blume) Blume subsp. <i>petiolaris</i> (Siebold et Zucc.) C.J.Chen	<i>Miyamamizu</i> nettle		VU
109	<i>Balanophora nipponica</i> Makino	<i>Miyamatsuchitotomochi</i> angiosperm	VU	VU
110	<i>Rumex dentatus</i> L. subsp. <i>klotzschianus</i> (Meisn.) Rech.f.	Toothed dock	VU	VU
111	<i>Magnolia stellata</i> (Siebold et Zucc.) Maxim.	Star magnolia	NT	VU
112	<i>Aconitum grossedentatum</i> (Nakai) Nakai	Monkshood		VU
113	<i>Aconitum kiyomiense</i> Kadota	<i>Kiyomitorikabuto</i> monkshood		VU
114	<i>Aconitum loczyanum</i> Rapaics	<i>Reijinsou</i> monkshood		VU
115	<i>Aconitum pterocaulis</i> Koidz.	<i>Azumareijinsou</i> monkshood		VU
116	<i>Caltha palustris</i> L. var. <i>enkoso</i> H.Hara	<i>Enkousou</i> buttercup		VU
117	<i>Caltha palustris</i> L. var. <i>pygmaea</i> Makino	<i>Kobanoryuukinka</i> buttercup		VU
118	<i>Clematis patens</i> C.Morren et Decne.	<i>Kazaguruma</i> buttercup	NT	VU
119	<i>Eranthis pinnatifida</i> Maxim.	<i>Setsubunsou</i> buttercup	NT	VU
120	<i>Hepatica nobilis</i> Schreb. var. <i>japonica</i> Nakai	Liverleaf	NT	VU
121	<i>Ranunculus nipponicus</i> Nakai var. <i>submersus</i> H.Hara	<i>Baikamo</i> buttercup		VU
122	<i>Berberis sieboldii</i> Miq.	<i>Hebinoborazu</i> shrub		VU
123	<i>Asarum fauriei</i> Franch. var. <i>nakaiianum</i> (F.Maek.) Ohwi ex T.Sugaw.	<i>Miyamamaoi</i>	VU	VU
124	<i>Hypericum japonicum</i> Thunb.	Matted St. John's Wort		VU
125	<i>Drosera peltata</i> Thunb. var. <i>nipponica</i> (Masam.) Ohwi	Pale Sundew	NT	VU
126	<i>Corydalis raddeana</i> Regel	<i>Nagaminotsurukikeman</i> crested lark	NT	VU
127	<i>Astilbe odontophylla</i> (Miq.) var. <i>okuyamae</i> (H.Hara) H.Hara	<i>Shikawashoma</i> false goat's beard	NT	VU
128	<i>Mitella stylosa</i> H.Boissieu var. <i>stylosa</i>	<i>Takimicharumerusou</i> miterwort	NT	VU
129	<i>Penthorum chinense</i> Pursh	Penthorum	NT	VU
130	<i>Ribes ambiguum</i> Maxim.	Trailing Gooseberry	NT	VU
131	<i>Rubus pseudoacer</i> Makino	<i>Miyamamomijichigo</i> rose	NT	VU
132	<i>Oxalis obtusifolia</i> Maxim.	<i>Ooyamakatabami</i> wood sorrel	VU	VU
133	<i>Euphorbia adenochlora</i> C.Morren et Decne.	<i>Sorushi</i> spurge	NT	VU
134	<i>Acer diabolicum</i> Blume ex K.Koch	Devil Maple		VU
135	<i>Daphne kiusiana</i> Miq.	<i>Koshonoki</i> tree		VU
136	<i>Elaeagnus montana</i> Makino	Goumi		VU
137	<i>Cicuta virosa</i> L.	Cowbane		VU
138	<i>Schizocodon ilicifolius</i> Maxim. var. <i>nankaiensis</i> T.Yamaz.	<i>Nankaihimeiwakagami</i> flower		VU
139	<i>Primula tosaensis</i> Yatabe var. <i>tosaensis</i>	<i>Iwazakura</i> primrose	NT	VU
140	<i>Mitrasacme pygmaea</i> R.Br.	Mitre flower		VU
141	<i>Dammacanthus indicus</i> Gaertn.f. var. <i>lancifolius</i> Makino	<i>Hosobaoaridooshi</i> madder		VU
142	<i>Pseudopyxis depressa</i> Miq.	<i>Inamorisou</i> madder		VU
143	<i>Myosotis sylvatica</i> (Ehrh.) Hoffm.	Forget-me-not		VU
144	<i>Salvia lutescens</i> (Koidz.) Koidz. var. <i>stolonifera</i> G.Nakai	<i>Dandotamurasou</i> mint		VU
145	<i>Physaliastrum japonicum</i> (Franch. et Sav.) Honda	<i>Aohoozuki</i> windshade	VU	VU
146	<i>Gratiola japonica</i> Miq.	<i>Ooabunome</i> hedgehyssop	VU	VU
147	<i>Siphonostegia laeta</i> S.Moore	<i>Oohikiyomogi</i> broomrape	VU	VU
148	<i>Veronica polita</i> Fr. var. <i>lilacina</i> (T.Yamaz.) T.Yamaz.	Grey field speedwell	VU	VU
149	<i>Aeginetia indica</i> L.	Forest ghost flower		VU
150	<i>Aeginetia sinensis</i> G.Beck	<i>Onanbangiseru</i> ghost flower		VU

No.	Scientific Name	English Name	Red Book Data	
			MOE	Gifu Pref.
151	<i>Plantago hakusanensis</i> Koidz.	Hakusanoobako plantain		VU
152	<i>Linnaea borealis</i> L.	Twinflower		VU
153	<i>Zabelia integrifolia</i> (Koidz.) Makino ex Ikuse et S.Kuros.	Iwatsukubaneutsugi honeysuckle	VU	VU
154	<i>Atractylodes ovata</i> (Thunb.) DC.	Okera daisy		VU
155	<i>Gnaphalium hypoleucum</i> DC.	Whiteleaved cudweed	EN	VU
156	<i>Hieracium umbellatum</i> L.	Narrow leaved hawkweed		VU
157	<i>Inula salicina</i> L. var. <i>asiatica</i> Kitam.	Willowleaf yellowhead		VU
158	<i>Tephrosia integrifolia</i> (L.) Holub subsp. <i>kiritlowii</i> (Turcz. ex DC.) B.Nord.	Field fleawort		VU
159	<i>Blyxa japonica</i> (Miq.) Maxim. ex Asch. et Gürke	Bamboo plant		VU
160	<i>Vallisneria denseserrulata</i> (Makino) Makino	Eelweed		VU
161	<i>Scheuchzeria palustris</i> L.	Rannoch-Rush		VU
162	<i>Potamogeton berchtoldii</i> Fieber	Berchtold's pondweed	NT	VU
163	<i>Allium kiiense</i> (Murata) Hir.Takah. et M.Hotta	Kiitorakkyou onion	VU	VU
164	<i>Allium monanthum</i> Maxim.	Korean wild chive		VU
165	<i>Allium victorialis</i> L. subsp. <i>platyphyllum</i> Hultén	Alpine leek		VU
166	<i>Asparagus schoberioides</i> Kunth	Kijikakushi asparagus		VU
167	<i>Gagea lutea</i> (L.) Ker Gawl.	Yellow star of Bethlehem		VU
168	<i>Veratrum stamineum</i> Maxim. var. <i>micranthum</i> Satake	Mikawabaikeisou corn lily	VU	VU
169	<i>Iris laevigata</i> Fisch.	Snowdrift iris	NT	VU
170	<i>Eragrostis aquatica</i> Honda	Numakazekusa lovegrass		VU
171	<i>Eulalia quadrinervis</i> (Hack.) Kuntze	Unnukemodoki grass	NT	VU
172	<i>Poa tuberifera</i> Faurie ex Hack.	Mukagotsudzuri meadow-grass		VU
173	<i>Arisaema angustatum</i> Franch. et Sav.	Hosobatennanshou cobra-lily		VU
174	<i>Arisaema ishizuchiense</i> Murata subsp. <i>brevicollum</i> (H.Ohashi et J.Murata) Seriz.	Kamikouchitennanshou cobra-lily	VU	VU
175	<i>Arisaema kishidae</i> Makino ex Nakai	Kishidamamushidusa cobra-lily		VU
176	<i>Bolboschoenus fluviatilis</i> (Torr.) Soják subsp. <i>yagara</i> (Ohwi) T.Koyama	River bulrush		VU
177	<i>Carex gifuensis</i> Franch.	Kurohinasuge sedge		VU
178	<i>Carex idzuroei</i> Franch. et Sav.	Umasuge sedge		VU
179	<i>Carex lonchophora</i> Ohwi	Ooaosuge sedge		VU
180	<i>Fimbristylis aestivalis</i> (Retz.) Vahl	Summer fringe bush		VU
181	<i>Schoenoplectus nipponicus</i> (Makino) Soják	Shizui club-rush		VU
182	<i>Scirpus mitsukurianus</i> Makino	Matsukasasusuki deergrass		VU
183	<i>Alpinia japonica</i> (Thunb.) Miq.	Hanamyouga ginger		VU
184	<i>Calanthe discolor</i> Lindl. var. <i>discolor</i>	Ground orchid	NT	VU
185	<i>Cephalanthera erecta</i> (Thunb.) Blume var. <i>subaphylla</i> (Miyabe et Kudó) Ohwi	Yuushunran orchid	VU	VU
186	<i>Cephalanthera falcata</i> (Thunb.) Blume	Sickle shaped leaf cephalanthera	VU	VU
187	<i>Dactylorhiza aristata</i> (Fisch. ex Lindl.) Soó	Key Flower		VU
188	<i>Lecanorchis japonica</i> Blume var. <i>hokurikuensis</i> (Masam.) T.Hashim.	Hokurikumuyouran orchid		VU
189	<i>Lecanorchis suginoana</i> (Tuyama) Seriz.	Enshuumuyouran orchid		VU
190	<i>Oberonia japonica</i> (Maxim.) Makino	Kourakuran orchid		VU
191	<i>Platanthera iinumae</i> (Makino) Makino	Platanthera iinumae orchid		VU
192	<i>Yoania japonica</i> Maxim.	Shoukiran orchid		VU
193	<i>Botrychium multifidum</i> (S.G.Gmel.) Rupr.	Leathery grapefern		NT
194	<i>Botrychium strictum</i> Underw.	Grapefern		NT
195	<i>Asplenium oligophlebium</i> Baker	Kamigamoshida spleewort		NT
196	<i>Asplenium wrightii</i> D.C.Eaton ex Hook.	Kurumashida spleenwort		NT
197	<i>Asplenium tripteropus</i> Nakai	Maidenhair spleenwort		NT
198	<i>Cyrtomium yamamotoi</i> Tagawa	Miyakoyabusotetsu fern		NT
199	<i>Dryopteris decipiens</i> (Hook.) Kuntze	Nachikujyaku wood fern		NT
200	<i>Diplaziopsis cavaleriana</i> (H.Christ) C.Chr.	Iwayashida fern		NT

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			MOE	Gifu Pref.
201	<i>Alnus trabeculosa</i> Hand.-Mazz.	<i>Sakurabahannoki</i> birch	NT	NT
202	<i>Pilea notata</i> C.H.Wright	<i>Komiyamamizu</i> flower		NT
203	<i>Taxillus kaempferi</i> (DC.) Danser	<i>Matsugumi</i> tree		NT
204	<i>Persicaria sagittata</i> (L.) H.Gross var. <i>sibirica</i> (Meisn.) Miyabe	American tearthumb		NT
205	<i>Persicaria praetermissa</i> (Hook.f.) H.Hara	Spotted knotweed		NT
206	<i>Persicaria hastatosagittata</i> (Makino) Nakai	<i>Nagabanounagitsukami</i> knotweed	NT	NT
207	<i>Persicaria maackiana</i> (Regel) Nakai	<i>Sadekusa</i> knotweed		NT
208	<i>Persicaria taquetii</i> (H.Lév.) Koidz.	<i>Nukabotade</i> knotweed	VU	NT
209	<i>Magnolia sieboldii</i> K.Koch subsp. <i>japonica</i> K.Ueda	Oyama Magnolia		NT
210	<i>Nymphaea tetragona</i> Georgi	Pygmy water Lilly		NT
211	<i>Ceratophyllum demersum</i> L.	Rigid hornwort		NT
212	<i>Drosera tokaiensis</i> (Komiya et C.Shibata) T.Nakam. et K.Ueda	<i>Toukaikomousengoke</i> sundew		NT
213	<i>Corydalis heterocarpa</i> Siebold et Zucc. var. <i>japonica</i> (Franch. et Sav.) Ohwi	Japanese false bleeding heart		NT
214	<i>Hylomecon japonica</i> (Thunb.) Prantl et Kündig	Forest poppy		NT
215	<i>Orostachys japonica</i> (Maxim.) A.Berger	Rock pine	NT	NT
216	<i>Chrysosplenium nagasei</i> Wakab. et H.Ohba var. <i>porphyranthes</i> Wakab. et H.Ohba	Iowa golden saxifrage		NT
217	<i>Deinantha bifida</i> Maxim.	False hydrangea		NT
218	<i>Peltoboykinia tellimoides</i> (Maxim.) H.Hara	<i>Yawatasou</i> grass		NT
219	<i>Parnassia foliosa</i> Hook.f. et Thomson var. <i>foliosa</i>	<i>Shirahigensou</i> bog-star		NT
220	<i>Geum ternatum</i> (Stephan) Smedmark	<i>Kokinbai</i> aven		NT
221	<i>Potentilla chinensis</i> Ser.	<i>Kawarasaiko</i> rose		NT
222	<i>Potentilla togasii</i> Ohwi	<i>Echigokijumushiro</i> rose		NT
223	<i>Potentilla rosulifera</i> H.Lév.	<i>Tsurukinbai</i> rose		NT
224	<i>Rubus mesogaeus</i> Focke	<i>Kuroichigo</i> berry		NT
225	<i>Sanguisorba hakusanensis</i> Makino	Lilac squirrel		NT
226	<i>Sanguisorba longifolia</i> Bertol.	<i>Miyamawaremokou</i> burnet		NT
227	<i>Spiraea dasyantha</i> Bunge	<i>Ibukishimotsuke</i> shrub		NT
228	<i>Astragalus reflexistipulus</i> Miq.	<i>Momendzuru</i> pea plant		NT
229	<i>Lespedeza tomentosa</i> (Thunb.) Siebold ex Maxim.	<i>Inuhagi</i> lespedeza	VU	NT
230	<i>Lespedeza virgata</i> (Thunb.) DC.	Wand lespedeza		NT
231	<i>Vicia amoena</i> Fisch. ex Ser.	<i>Tsurufujibakama</i> vetch		NT
232	<i>Vicia nipponica</i> Matsum.	<i>Yotsubahaki</i> vetch		NT
233	<i>Geranium yoshinoi</i> Makino ex Nakai	Variegated cranesbill geranium		NT
234	<i>Acer nipponicum</i> H.Hara subsp. <i>nipponicum</i> var. <i>nipponicum</i>	Nippon Maple		NT
235	<i>Celastrus flagellaris</i> Rupr.	<i>Iwaumedzuru</i> staff vine		NT
236	<i>Actinostemma tenerum</i> Griff.	<i>Gokidzuru</i> gourd		NT
237	<i>Ludwigia ovalis</i> Miq.	<i>Mizuyukinoshita</i> water primrose		NT
238	<i>Theligonum japonicum</i> Okubo et Makino	<i>Yamatogusa</i> madder		NT
239	<i>Libanotis ugoensis</i> (Koidz.) Kitag. var. <i>japonica</i> (H.Boissieu) T.Yamaz.	<i>Ibukiboufuu</i> celery		NT
240	<i>Hypopitys monotropa</i> Crantz	Dutchman's pipe		NT
241	<i>Ardisia crispa</i> (Thunb.) A.DC.	Coral berry		NT
242	<i>Primula japonica</i> A.Gray	Japanese primrose		NT
243	<i>Syringa reticulata</i> (Blume) H.Hara	Japanese tree lilac		NT
244	<i>Vincetoxicum pycnostelma</i> Kitag.	<i>Suzusaiko</i> dogbane	NT	NT
245	<i>Lithospermum zollingeri</i> A.DC.	<i>Hotarukazura</i> borage		NT
246	<i>Loxocalyx ambiguus</i> (Makino) Makino	<i>Manekiguza</i> mint	NT	NT
247	<i>Scutellaria dependens</i> Maxim.	<i>Semenamiki</i> mint		NT
248	<i>Scutellaria laeteviolacea</i> Koidz. var. <i>maekawae</i> (H.Hara) H.Hara	<i>Onagatatsunamisou</i> mint		NT
249	<i>Limnophila chinensis</i> (Osbeck) Merr. subsp. <i>aromatica</i> (Lam.) T.Yamaz.	<i>Shisokusa</i> plantain		NT
250	<i>Patrinia scabiosifolia</i> Fisch. ex Trevir.	Golden lace		NT

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			MOE	Gifu Pref.
251	<i>Scabiosa japonica</i> Miq. var. <i>japonica</i>	Pincushion flower		NT
252	<i>Platycodon grandiflorus</i> (Jacq.) A. DC.	Balloon flower	VU	NT
253	<i>Achillea alpina</i> L. var. <i>longiligulata</i> H. Hara	Chinese yarrow		NT
254	<i>Eupatorium japonicum</i> Thunb.	Pei lan	NT	NT
255	<i>Hololeion krameri</i> (Franch. et Sav.) Kitam.	<i>Suiran</i> daisy		NT
256	<i>Inula ciliaris</i> (Miq.) Maxim.	<i>Mizugiku</i> aster		NT
257	<i>Parasenecio yatabei</i> (Matsum. et Koidz.) H. Koyama var. <i>yatabei</i>	<i>Yamataimingasa</i> daisy		NT
258	<i>Parasenecio yatabei</i> (Matsum. et Koidz.) H. Koyama var. <i>occidentalis</i> (F. Maek. ex Kitam.) H. Koyama	<i>Mishinoyamataimingasa</i> daisy		NT
259	<i>Hemerocallis citrina</i> Baroni var. <i>vespertina</i> (H. Hara) M. Hotta	Long yellow day lily		NT
260	<i>Lilium leichtlinii</i> Hook. f. f. <i>pseudotigrinum</i> (Carrière) H. Hara et Kitam.	Leitchlin's lily		NT
261	<i>Triantha japonica</i> (Miq.) Baker	<i>Iwashoubu</i> grass		NT
262	<i>Iris gracilipes</i> A. Gray	Crested isis	NT	NT
263	<i>Juncus setchuensis</i> Buchenau var. <i>effusoides</i> Buchenau	<i>Hosoi</i> rush		NT
264	<i>Agrostis valvata</i> Steud.	<i>Himekonukagusai</i> grass	NT	NT
265	<i>Coelachne japonica</i> Hack.	<i>Hinazasa</i> grass	NT	NT
266	<i>Phragmites karka</i> (Retz.) Trin. ex Steud.	Tall reed		NT
267	<i>Spodiopogon depauperatus</i> Hack.	Frost grass		NT
268	<i>Spodiopogon sibiricus</i> Trin.	Grass ornamental		NT
269	<i>Carex ischnostachya</i> Steud. var. <i>fastigiata</i> T.Koyama	<i>Okinawajuzusuge</i> grass		NT
270	<i>Carex sachalinensis</i> F.Schmidt var. <i>aureobrunnea</i> (Ohwi) Ohwi	<i>Chaitosuge</i> grass		NT
271	<i>Cyperus nipponicus</i> Franch. et Sav. var. <i>spiralis</i> Ohwi	<i>Ooshirogayatsuri</i> sedge		NT
272	<i>Scleria parvula</i> Steud.	<i>Koshinjugaya</i> sedge		NT
273	<i>Bulbophyllum drymoglossum</i> Maxim. ex Okubo	<i>Mamedzutaran</i> orchid	NT	NT
274	<i>Bulbophyllum inconspicuum</i> Maxim.	<i>Mugiran</i> orchid	NT	NT
275	<i>Cephalanthera erecta</i> (Thunb.) Blume var. <i>erecta</i>	<i>Ginran</i> orchid		NT
276	<i>Dactylorhiza viridis</i> (L.) R. M. Bateman, A. M. Prielgeton et M. W. Chase	Frog orchid		NT
277	<i>Cyrtosia seotentrionalis</i> (Rchb. f.) Garay C.	<i>Tsuchiakebi</i> orchid		NT
278	<i>Dactyloctenium aegyptium</i> L. var. <i>ringens</i> Rchb. f.	The rigid dactyloctenium		NT
279	<i>Epipactis thunbergii</i> A. Gray	Thunberg's epipactis		NT
280	<i>Gastrodia verrucosa</i> Blume	<i>Gastrodia verrucosa</i> orchid		NT
281	<i>Neolindleya camtschatica</i> (Cham.) Nevski	<i>Nobinechidori</i> orchid		NT
282	<i>Neottia makinoana</i> (Ohwi) Szlach.	<i>Aofutabaran</i> orchid		NT
283	<i>Oreorchis patens</i> (Lindl.) Lindl.	The free oreochis		NT
284	<i>Platanthera florentii</i> Franch. et Sav.	<i>Jinbaisou</i> orchid		NT
285	<i>Platanthera mandarinorum</i> Rchb. f. var. <i>oreades</i> (Franch. Et Sav.) Koidz.	<i>Yamasagisou</i> orchid		NT

* Ministry of the Environment (MOE) (2012) The 4th Red List

* Gifu Prefecture (2014) Gifu Prefectural Red Data Book (Plants) Revised Edition