Field Guide to the Kushiro Wetlands

～ Walking the Onnenai Nature Trail ～

❶ The wetlands in the SPRING,
when the water is warm, life is sprouting,
scents are floating in the breeze,
and many songs are drifting in the wind.
The wetlands in the SUMMER,
when the fog is drifting by,
the colors of the flowers are hiding,
fireflies are flying, and life is overflowing.
The wetlands in the AUTUMN,
when the ears of reeds show their white tips,
dragonflies play in swarms,
and the cool winds blow.
The wetlands in the WINTER,
when you can catch a glimpse of the shadows
of animals running in the quietness of the
sheet of snow and ice.

❷ The wetlands are vast lands of water and have many faces. Japan's largest wetlands, the Kushiro Wetlands, are considered a treasure house of northern flora and fauna.This Onnenai boardwalk allows you to directly enter these wetlands.

❸ Please enjoy the message that Nature sends to you, through the wild birds and insects that chose to live here, and the many flowers.

This Field Guide introduces only a small part of the Nature of the Kushiro Wetlands. Take a leisurely stroll through the wetlands while referring to the open pages of the Field Guide on the wooden path! Enjoy the new impressions and discoveries that you'll make on this trail!

0 Field Guide Information Map

Table of Contents
(Numbers indicate point numbers)

1 Flora Around Onnenai / Yachimanako and Yachibozu

2 Alder Forests and Regeneration by Sprouting / Summer Birds 1

3 Flowers on the Onnenai Wooden Path 1

4 Fen / Peat, Common Reeds, Sedges

5 Origins of the Kushiro Wetlands / Survivors from the Ice Age

6 Red-crowned Crane / Fireflies Insectivorous Plants

7 Bog / Flowers on the Onnenai Wooden Path 2

8 Summer Birds 2 / Winter Birds

9 Invasive Alien Species of the Kushiro Wetlands

10 Trees seen on the Tsurui Railroad Track ruin

11 Animals of the Kushiro Wetlands

12 Insects of the Kushiro Wetlands

13 Flowers on the Tsurui Railroad Track ruin

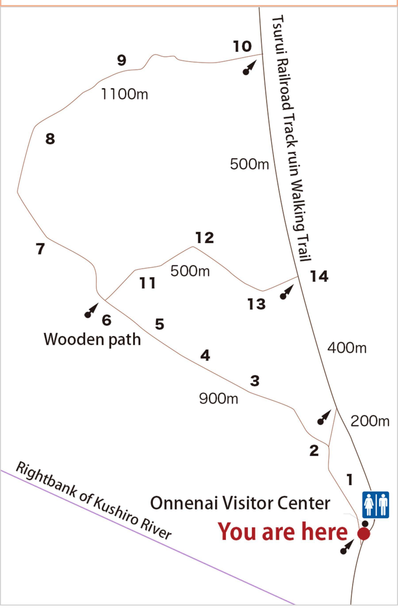
14 Resident Birds

❹ Wetlands Quiz Q&A

There is a quiz (Q) on the wetlands for each point (0 to 6) in this illustrated guide. Challenge yourself with these quizzes.
The answer (A) can be found at the next point.
How many can you answer?

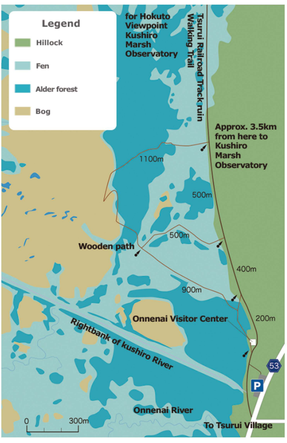
Q1 You can see a "puddle" up ahead, on the left side.
How deep is it?

①1m
②2m
③3m or more



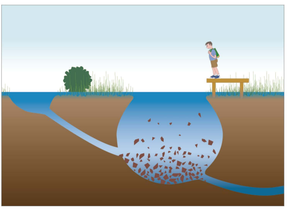
1 Flora around Onnenai

❶ The area around Onnenai is made up of common reed and sedge wetlands (low moors), bog moss wetlands (high moors), Japanese alder forests, hillock forests, etc. Here, you can observe the main flora of the Kushiro Wetlands. Each of the illustrated guides up ahead feature an explanation. Please refer to them.



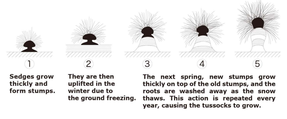
Yachimanako

❷ In the common reed and sedge wetlands, there are places with a gaping hole on the small water surface. These are called "yachimanako." "Yachi" means marsh, and it is believed that these holes came to be known as yachimanako because of the way that the water surface shines like an eye. Compared to the size of the water surface, the water is deep. When looking at it from the side, the shape looks like a pot with a narrow opening, as in the diagram. In the summertime, the water surface may become hidden among waterweeds, and due to the combination of water flow, such as spring water, and peat, various things can take shape.



Yachibozu

❸ In the marshy lands and Japanese alder forests near the hillocks, you can see many of the objects shown in the photo. These are known as "yachibozu," and are made by the stumps of sedges, etc., forming through a process like the one in the diagram. Tussocks are also the habitat of many living things.



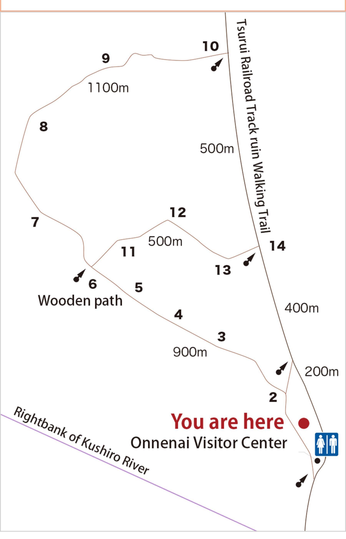
❹ Wetlands Quiz Q&A

Q2 On which tree does this fruit grow?

①Japanese oak
②Japanese alder
③Japanese larch

A1 (answer to Q1)

The depth of this "yachimanako" is ③ 3m or more. Check by using the stick that you can find nearby.

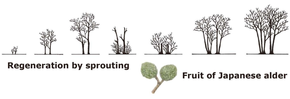


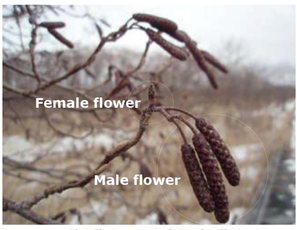
2 Alder forests (yachihan no ki)

❶ The only type of forest that can be seen in the wetlands is Japanese alder. Forests are formed in places where the earth and sand that flow in from the hillocks around the wetlands, and the soil brought in from the rivers, accumulate.

Regeneration of Japanese alder by sprouting

❷ When looking at the Japanese alder in this area, you'll be able to see that several new trunks are growing out of a single dead stump. In peat bogs, where there are very few nutrients and growing conditions are harsh, trees are only able to grow for 20 to 30 years, after which the trunks end up standing decayed.
From the remaining stumps, several new buds sprout out again and a new trunk grows.This is referred to as regeneration by sprouting.





Female flower and male flower of Japanese alder

❸ Wetlands Quiz Q&A

Q3 Among flora living in Japan that are commonly referred to as grasses or flowers, waterweeds (aquatic plants) account for how many percent?

①Approx. 4% ②Approx. 16%
③Approx. 28%

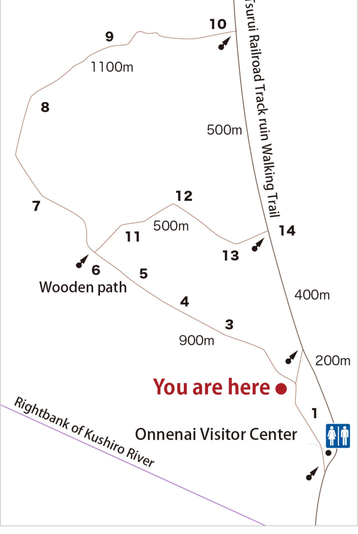
A2 (answer to Q2)

② Japanese alder. This tree bears green fruit in the summer, which turn into pine cones in the autumn. The seeds inside also become feed for small birds. Incidentally, the seeds of Japanese oak and Japanese larch look like the following.

Fruit of Japanese oak — Fruit of Japanese larch

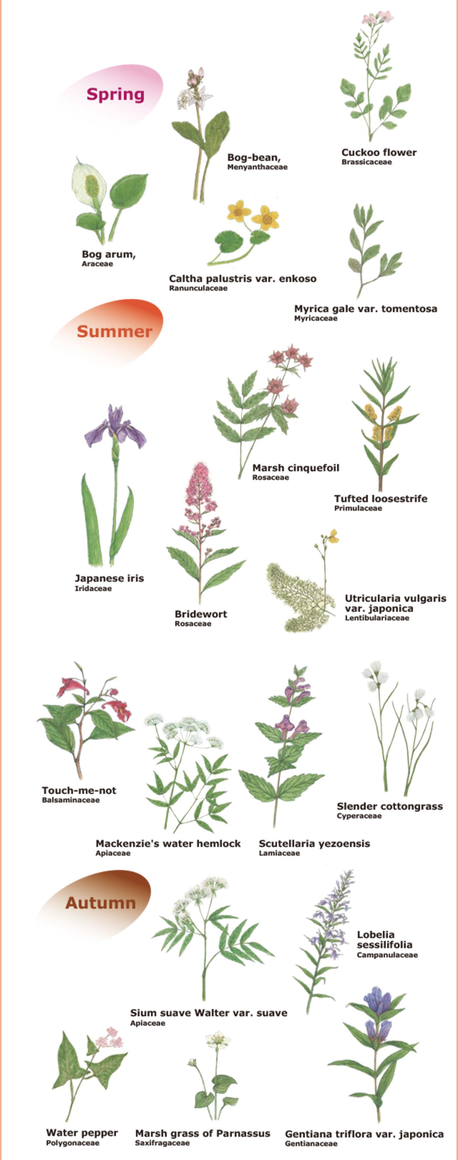
Summer Birds 1

Birds that can be seen frequently in the area around Onnenai in the summertime



3 Flowers on the Onnenai Wooden Path 1

Flowers in common reed/sedge wetlands and spring water areas



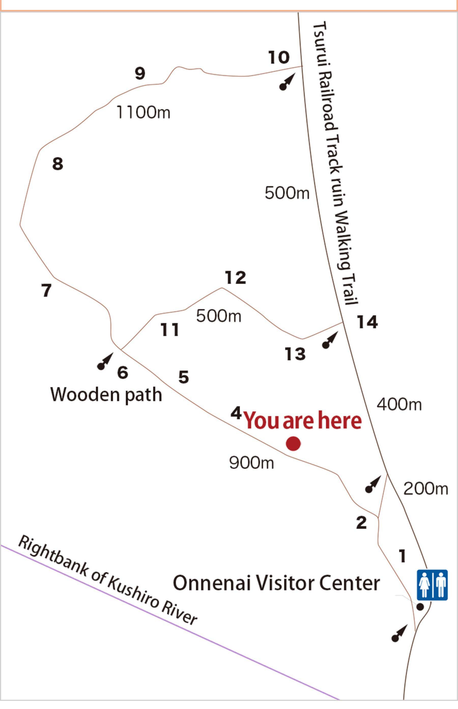
❶ Wetlands Quiz Q&A

Q4 Common reeds have been used since past ages in people's lives. What were they actually used for from among the following? (Multiple answers)

① Reed boats ② Fuel
③ Roof and wall material, fences

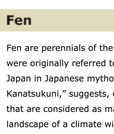
A3 (answer to Q3)

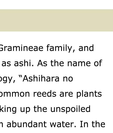
① Approximately 4%. Although researchers have various ideas such as for the definition of aquatic plants, it is a fact that there are extremely few aquatic plants among the flora of Japan, of which there are said to be more than 8,000 types. The plants in the Kushiro Wetlands are considered as being an important entity as a decline in wetlands progresses.



4 Fen (low moors)

As you continue along the Onnenai wooden path, you will see that there is an area where it looks like tall grass is hanging over the wooden path, and another area with shorter grass that is 1m or lower. If you look under either of these types of grass, you will see that they are submerged in water, but their habitats do not overlap much. The depth and transparency of the water are also different. The taller grass is the common reed, and the shorter grass is sedge. The prevalent flora differs depending on the soil (peat, etc.) that has deposited under the water, as well as the groundwater level conditions, etc. Common reed wetlands are somewhat nutrient-rich wetlands due to the soil and organic matter that are supplied from the flooding of rivers, and they are the most expansive. Sedge wetlands are wetlands that stretch across the depths of the central areas of old ponds and rivers; as the water level is high and sunlight easily passes through, these are environments where flower communities can form easily. The flowers that are representative of Onnenai, such as bog-bean, cuckoo flower, Sium suave Walter var. suave, Lobelia sessilifolia, and Utricularia vulgaris var. japonica, are those that color these sedge wetlands.


Fen


Sadge

Peat

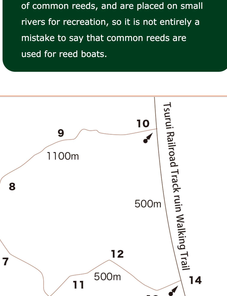
Underneath the water of common reed and sedge wetlands, underneath the bog moss of bog moss wetlands, peat and volcanic ash form layers. Peat is an accumulation of withered plants that have accumulated without completely decomposing, and often form in cold environments where there is a lot of water. There are many kinds of peat (bogs) depending on the constituent plants. There was also a point in time when peat was dried and used as fuel.

Fen

Fen are perennials of the Gramineae family, and were originally referred to as ashi. As the name of Japan in Japanese mythology, "Ashihara no Kanatsukuni," suggests, common reeds are plants that are considered as making up the unspoiled landscape of a climate with abundant water. In the Kushiro Wetlands, where Red-crowned Cranes, which are at the top of the ecosystem, are dependent on the common reeds, the diversity of living organisms is supported by the biota, starting with the microorganisms that coexist in the rhizomes of the common reeds. Recently, there is also focus on their function in purifying water quality.

Sedges

When it comes to the sedges of wetlands, the kind that is recognized the most easily is hare's-tail cottongrass; however, slender cottongrass, which are white and float in the sedge wetlands where fireflies fly, is also prominent. Sedges are perennials (with some being annuals) of the Cyperaceae family. More than 60 types have been confirmed in the Kushiro Wetlands, and more than 15 types on this wooden path. Both flowers and fruits of sedges are plain, for the most part, although some sedges bear fuzzy fruit similar to hare's-tail cottongrass. Sedges, like common reeds, are important plants that support the wetland environment, rather than simply making up the landscape, as characterized by Carex caespitosa and Carex thunbergii var. appendiculata, which form yachibozu, and Carex rhynchophysa, which stretch to more than 1m. The stems of sedges are triangular and are not hollow. The culm (stem) of the Poaceae family, such as common reeds, is cylindrical and hollow. Touch them and see for yourself.



1 Wetlands Quiz Q&A

Q5 6,000 years ago, what kind of place was the one that you are standing on now?

① Ocean ② Lake ③ River

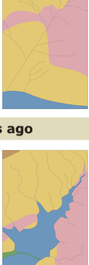
A4 (answer to Q4)

② and ③. For people in the past who lived near water, common reeds were an important plant, and were dried and used as fuel, roofs (thatched reed) and fences (reed fences). Even at the reconstructed dwellings (Satsumon period) at the Hokuto ruins, large amounts of common reeds are used. The reed boats in ① are boats used for reaping and transporting common reeds; Cyperus papyrus and Totora of the Cyperaceae family are used for the well-known reed boats on the Nile River and Lake Titicaca in South America, rather than common reeds. There are times, however, when boats are made by folding the leaves of common reeds, and are placed on small rivers for recreation, so it is not entirely a mistake to say that common reeds are used for reed boats.

5 Origins of the Kushiro Wetlands

Approximately 20,000 years ago

During the last ice age, the sea surface was lower than the current level, and the wetlands area of today used to be dry land.



10,000 to 6,000 years ago

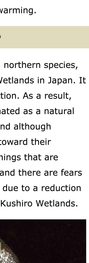
Ocean water penetrated the dry land, and the wetlands area of today turned into an ocean (Jomon transgression).

6,000 to 4,000 years ago

The seawater ebbed away, causing soil and peat to accumulate, and the wetlands started to form (Jomon regression). In addition, formation of land started on the west side due to earth movement caused by high barometric pressure to the west and low pressure to the east.

Today

Lagoons were left behind approximately 3,000 years ago, and became the wetlands of today.



Survivors from the Ice Age

❶ During the ice age approximately 20,000 years ago, temperatures dropped, and as the northern area became connected to the mainland, many northern flora and fauna moved south. Afterwards, the ice age ended about 10,000 years ago, and temperatures rose. These flora and fauna became unable to live in the south, and now they are only surviving in areas of cold climates, such as the alpine belt and Kushiro Wetlands. A decrease in the wetlands area of the Kushiro Wetlands, and changes to the vegetation of the wetlands greatly affect the survival of endemic species of the Kushiro wetlands. In addition, there have also been concerns recently about the impacts of global warming.

Siberian salamander

❷ The Siberian salamander is a northern species, inhabiting only the Kushiro Wetlands in Japan. It is also on the verge of extinction. As a result, part of their habitat is designated as a natural monument of Kushiro City, and although approaches are being made toward their protection, there are many things that are unclear about their ecology, and there are fears of a decline in their numbers due to a reduction of the wetlands area around Kushiro Wetlands.

Source: Kushiro Shitsugen Shizen Guide (Kushiro Wetlands Nature Guide)

Bog-bean

❸ A representative plant that favors cold climates that can be seen in the cold wetlands and lakes of the northern hemisphere.

Cuckoo flower

❹ A plant that favors cold climates that is centrally distributed in Sakhalin and northward areas, and that can also be seen in the Kiritappu Wetland.

White-faced darter

❺ An endemic subspecies of Hokkaido that was discovered in 1954, inhabiting only the Kushiro Wetlands.

Photographer: Seiji Sasaki

❻ Wetlands Quiz Q&A

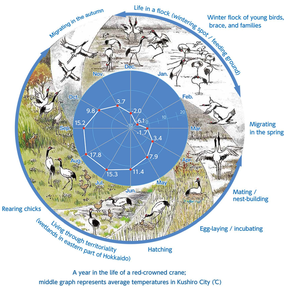
Q6 Red-crowned Crane is a beautiful wild bird with a predominantly white image. Which is the correct representation of a Red-crowned Crane?

A5 (answer to Q5)

① It used to be an ocean. Please look at the page on the left.

6 Red-crowned Crane

❶ The Red-crowned Crane is considered as being a symbol of the Kushiro Wetlands today, but it is thought to have been extinct in Japan at one point. Their habitation of the Kushiro Wetlands was confirmed in 1926, and when a large-scale survey was conducted in 1952, 33 cranes were found. Since then, protection activities have progressed, centering on the local area, and their numbers have increased to more than 1,000 birds today. Their habitat has also expanded, and the Doto wetlands are their main nesting grounds, rather than only the Kushiro Wetlands. A pair of cranes has claimed the area around this sightseeing path as their territory.



A year in the life of a red-crowned crane:
middle graph represents average temperatures in Kushiro City (℃)

Light of the Wetlands: Fireflies

❷ On this wooden path, you can observe Japanese fireflies for a short period during the summer. Japanese fireflies are small fireflies that are 8 to 10mm long, and are distributed from Hokkaido to Kyushu. In the Kushiro Wetlands, the development of adults can be seen from mid-July to early August, and many visitors come to the wetlands to take a walk in the nighttime.

Insectivorous Plants of the Kushiro Wetlands

Four types of insectivorous plants grow naturally in the Kushiro Wetlands, of which two can be seen along this wooden path.

Utricularia vulgaris var. japonica

❸ With small insectivorous sacs on its leaves, Utricularia vulgaris var. japonica catch small plankton in the water and use it as nutrition. From July to August, yellow flowers bloom on the water surface.

Round-leaved sundew

❹ This plant uses its many red, glutinous glandular hairs on its leaves to catch small insects. It grows in bog moss wetlands, and grows small, white flowers in July.

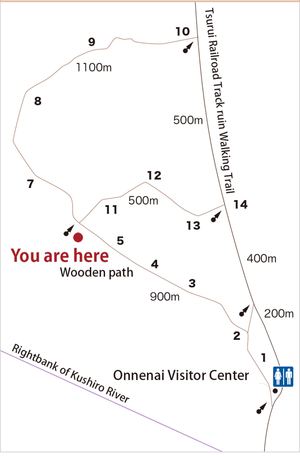
❺ Wetlands Quiz Q&A

Q7 What is the average annual temperature of Kushiro? (Tokyo's is 15.9 ℃)

①1.0℃ ②6.0℃ ③11.0℃

A6 (answer to Q4)

①. The black part of the tail seen in the photo (standing) is actually flight feathers (secondary feathers, tertiary feathers), and when its wings are folded, its white tail is hidden.

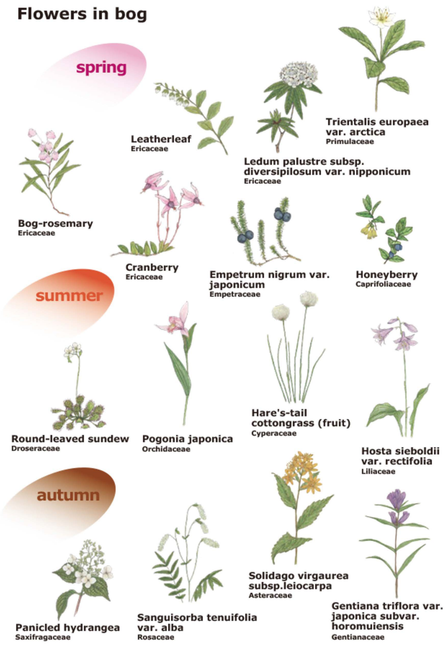


Bog (High Moors)

❶ The bog were created on peat situated at altitudes higher than the surrounding water level. Bog moss, which accumulates by approximately 1mm per year, obtains its water and nutrients from rainwater. Thus, it has poor nutrition, and makes up a special zone even within the Kushiro Wetlands, as communities of alpine plants that grow even in a harsh environment expand. If you look at it closely, the expansion of bog moss is not uniform; the various bog mosses create an uneven surface, and you can discover differences between plants in high places and low places.

Flowers on the Onnenai Wooden Path 2

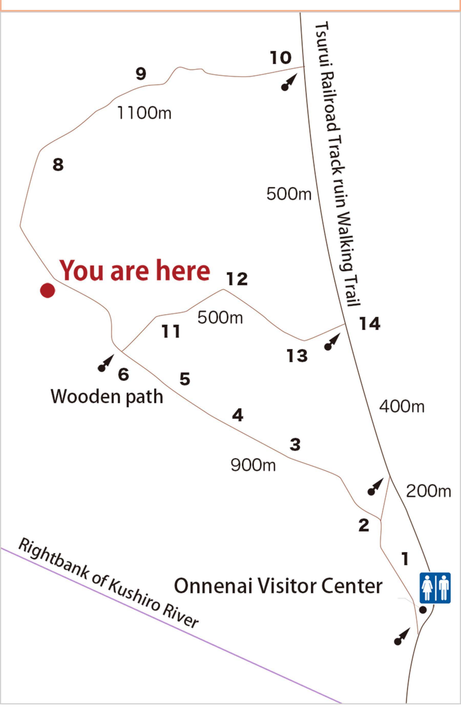
Flowers in bog



❷ **Wetlands Quiz Q&A**

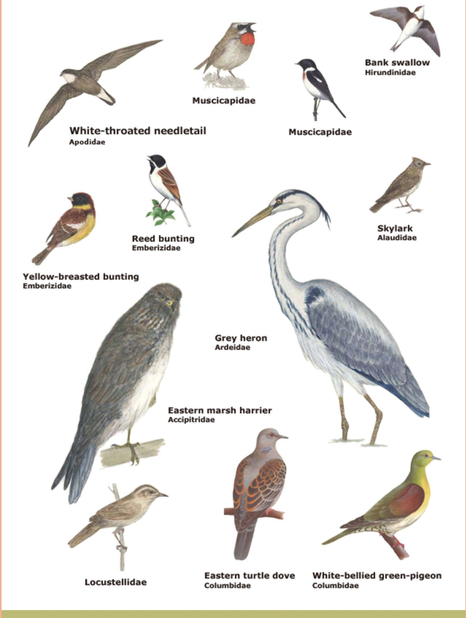
A7 (answer to Q7)

② 6.0°C (It was 5.7°C in 1999, based on the 2009 Chronological Scientific Tables). Among the weather stations in Japan, Kushiro has the second lowest temperature, after Mt. Fuji. This cold climate is also a factor that supports the nature that is unique to the Kushiro Wetlands.



Summer Birds 2

Birds that are seen frequently in the summer around Onnenai



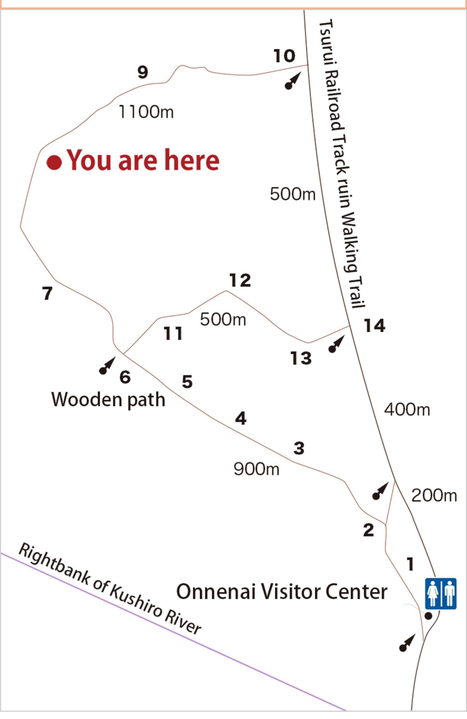
Winter birds

Wild birds that can be seen mainly from the autumn to the spring

❶ Short memo

Migration of wild birds depending on the seasons

Many wild birds migrate depending on the seasons. Birds that migrate from the south in the springtime in order to breed, and that depart in the autumn, are known as "summer migrants"; birds that migrate from the north in the winter to pass the winter, and that return by spring, are known as "winter migrants"; and birds that stay in the same area year-round are known as "resident birds" (Birds that migrate from mountainous regions to lowlands depending on the season are known as "wandering birds"). Wild birds that are the same may also differ depending on the region. For example, Japanese bush warblers and grey herons are summer birds in the Kushiro Wetlands, but are resident birds on Honshu.



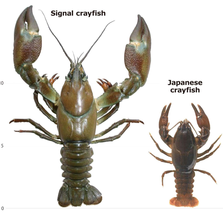
9 Invasive Alien Species of the Kushiro Wetlands

What are alien species?

Living things that originally lived abroad but that came to Japan for some reason and rooted themselves in Japan are known as "alien species." It is said that there have been approximately 2,000 types of alien species starting in the Meiji era. Even among alien species, those that have an impact on the ecosystem of a particular location, such as by taking over the dwellings of species that were originally in that location (native species), or by eating such species, are known as "invasive alien species." These "invasive alien species" have been increasing in the Kushiro Wetlands, and have been affecting the ecosystem in the wetlands.

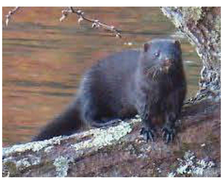
Signal crayfish

❶ Native to North America, signal crayfish were believed to have been brought to Japan as feed for fish. In addition to capturing various small animals and cutting aquatic plants, there is also the danger of signal crayfish affecting the habitat of Japanese crayfish, which are a native species. They inhabit a broad zone across the Kushiro Wetlands, and can also be used for food.



American mink

Native to North America, American mink were believed to have been brought to Japan for the purpose of fur trapping at the beginning of the Showa period. Afterwards, American mink that escaped from fur factories, etc., came to breed and proliferate in the Kushiro Wetlands area. There are concerns of their predation on native species and their impact on the chicks of Japanese cranes. They can also be seen in rare cases when one is canoeing.



Buff-tailed bumblebee

Native to Europe, buff-tailed bumblebees were thought to have been brought to Japan for the purpose of carrying out the pollination of crops. They pose a threat to nest building and feed resources of native bumblebees. Buff-tailed bumblebees fly around the wetlands, mainly in the spring and summer, in order to gather the nectar of flowers blooming in the Kushiro Wetlands.

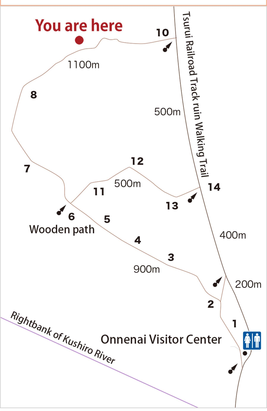
Golden glow

Native to North America, golden glows were introduced to Japan for enjoyment. With strong reproductive power, this plant is expanding its habitat by taking over the habitat environments of native flora. Golden glows bloom flowers from July to October, and can be seen commonly in the Kushiro Wetlands, particularly along the roads and in the Kushiro River area.

❷ Short memo

Invasive Alien Species Act

The objective of the Invasive Alien Species Act is to prevent invasive alien species from causing damage to ecosystems, human lives and persons, and agriculture, forestry and fisheries. Based on this Act, it is fundamentally prohibited to breed, cultivate, store and transport invasive alien species, and to release invasive alien species into the wild. Your cooperation is requested in order to protect the species that live in the Kushiro Wetlands.



10 Trees Seen on the Tsurui Railroad Track ruin

❶ Although most of the trees in the wetlands are Japanese alder trees, you can see a variety of trees along these Railroad Track ruin.

Maple family

Red leaves

Painted maple
Aceraceae

Japanese maple
Aceraceae

Acer ginnala
Aceraceae

Willow family

There are many types of willows, such as Salix sachalinensis, Salix schwerinii, Salix integra, Rose-gold pussy willow, etc.

Salix sachalinensis
Salicaceae

Various fruits

These fruits serve as food for many birds and squirrels.

Crimson glory vine
Vitaceae

Japanese oak
Fagaceae

Actinidia kolomikta
Actinidiaceae

Japanese walnut
Juglandaceae

Hardy kiwi (Kokuwa)
Actinidiaceae

These kinds of trees can also be seen.

Alnus hirsuta
Betulaceae

Lespedeza
Fabaceae

Japanese lime
Tiliaceae

North Japanese hill cherry
Rosaceae

Japanese tree lilac
Oleaceae

Manchurian ash
Oleaceae

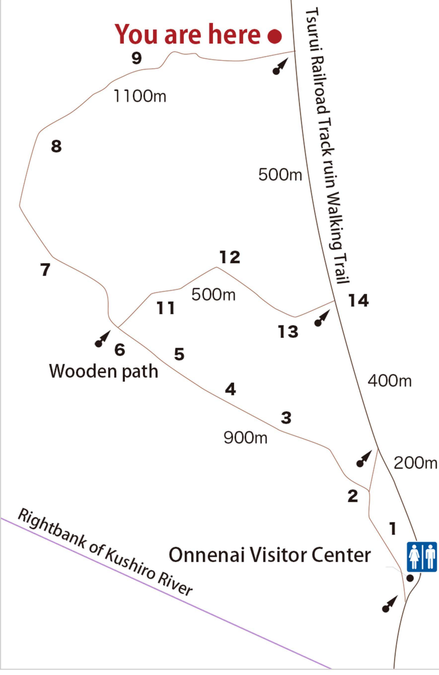
Manchurian crab
Rosaceae

Hamilton's spindletree
Celastraceae

❷ Short memo

The marvel of leaves

Why do leaves changes colors in the autumn? As winter draws near and temperatures drop, the pigment that makes leaves appear green is broken down, the yellow pigment that was hidden becomes prominent, and leaves turn yellow. On the other hand, in order for deciduous trees to detach their leaves, a partition is gradually formed between leaves and branches. Thus, the sugars that are formed through photosynthesis accumulate in the leaves, creating a red pigment and turning the leaves red. Leaves that turn brown do so because brown pigment is formed.



11 Animals of Kushiro Wetlands

❶ There are many kinds of animals in the Kushiro Wetlands. Even animals that are seen rarely leave footprints and manure. Let's try to look for some!

Mammals

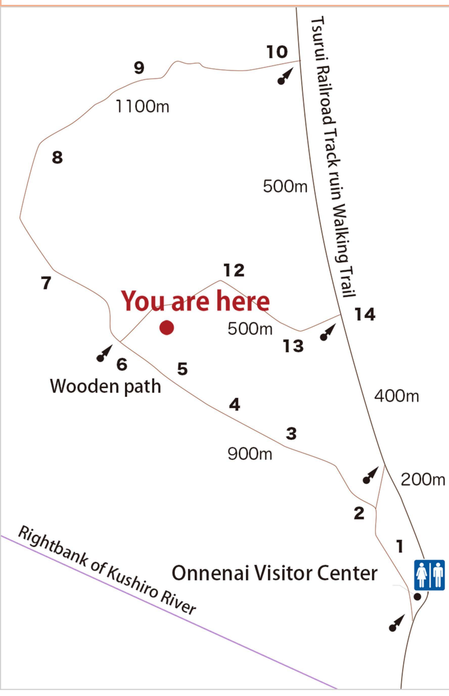
Reptiles

Amphibians

❷ Short memo

If you come across a snake

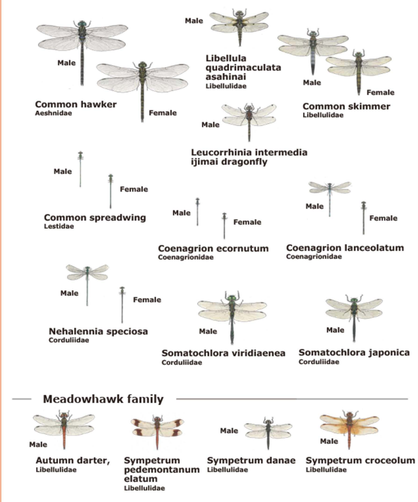
There are three types of snakes (the two types above and the Japanese forest rat snake) living in the Kushiro Wetlands, but none of them are venomous. In most cases, the snake will move away if you stand still. If the snake starts coiling and stretches its head, this is a sign of threat. Try moving away after letting some time pass and seeing that the snake has calmed down. Never poke at the snake with a stick. Consider your encounter with a wild snake a stroke of good fortune, and take a careful look.



12 Insects of the Kushiro Wetlands

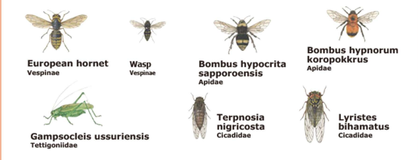
❶ The Kushiro Wetlands and the surrounding areas are considered as being a world of diverse insects. In the ongoing survey, 46 types of dragonflies, 84 types of butterflies, and 800 types of moths have been confirmed. In addition to these, there are more than 1,000 types of large and small beetles, bees, locusts, and caddisflies in the area around Onnenai alone.

Dragonflies



Butterflies

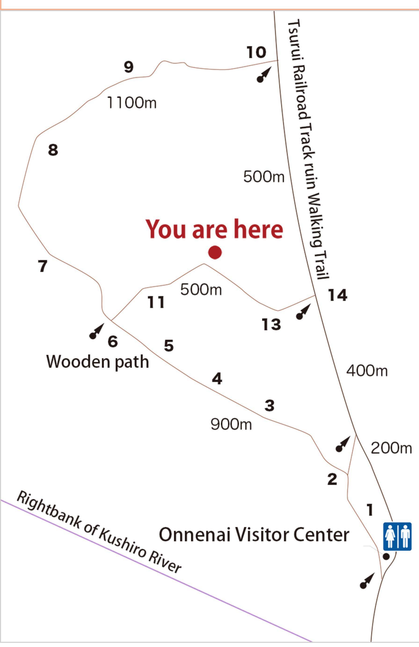
Other



❷ Short memo

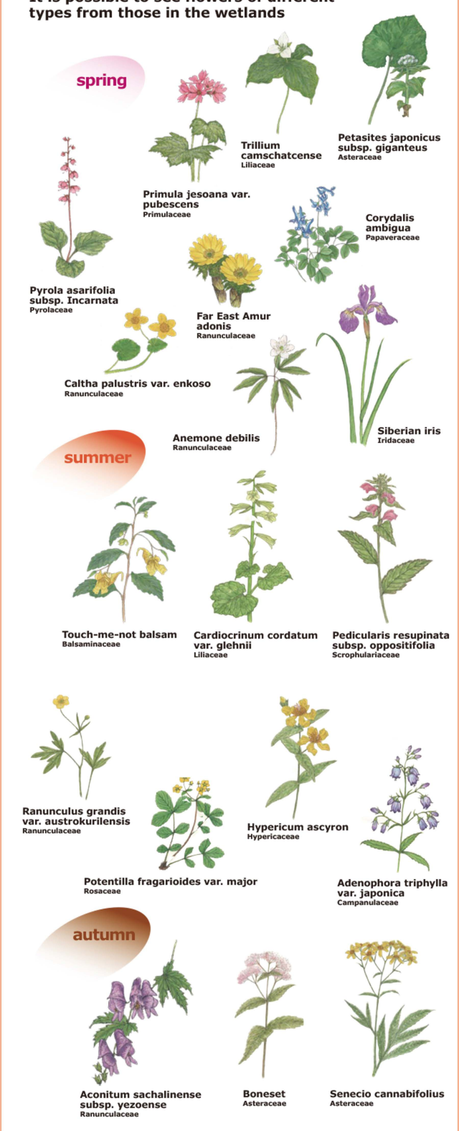
Beware of hornets!

Accidents caused by hornets are not uncommon. The term hornet is used loosely, and there are many types of hornets, from small to large. The larger they are, the more dangerous and severe their attacks will be. Small wasps and similar insects are frequently encountered on the wooden path, but they keep to themselves and will not sting unless you wave your hand aggressively at them or grab them.When one is stung, however, there is sharp pain, and the sting may also be life-threatening for some people. If an insect stops on your body, the best approach is to leave it alone until it flies away (this does not apply to mosquitos or gnats). When brushing off an insect, do so only after checking to see what kind of insect it is.



13 Flowers on the Tsurui Railroad Track ruin

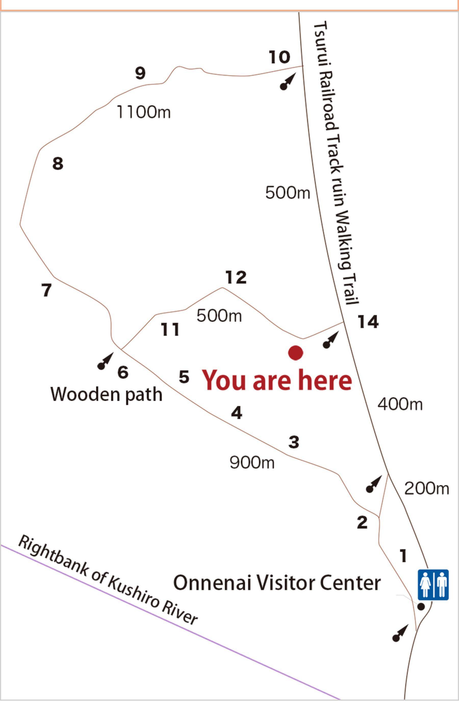
It is possible to see flowers of different types from those in the wetlands



❶ Short memo

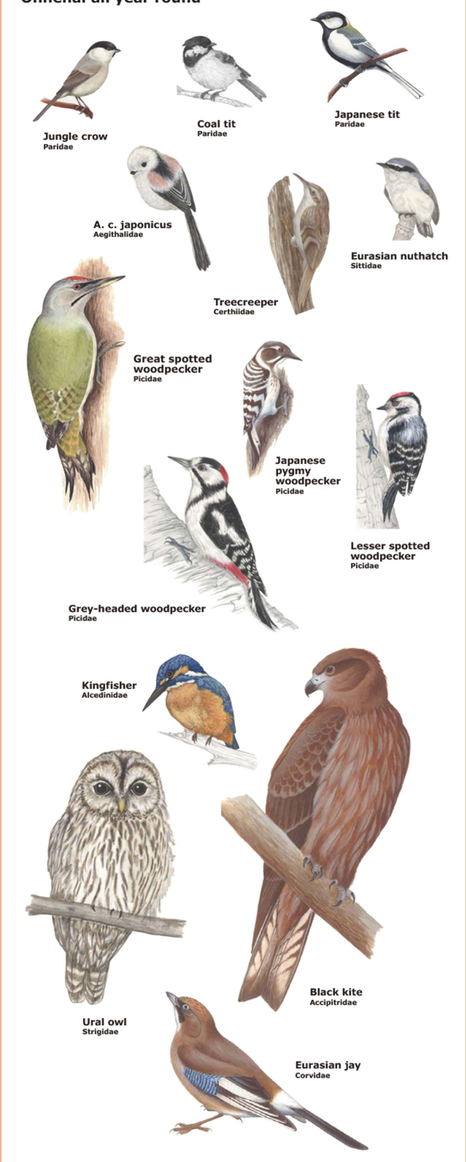
Wild vegetables and poisonous plants

Picking wild vegetables is fun, because you can bring the flavors of the season to your table. Please refrain from doing so at places with abundant nature, such as national parks. At your feet lie young trees and grasses that are impatient for spring and waiting to grow. You would only be trampling over these young trees and grasses. There are many poisonous plants that also look like wild vegetables, and food poisoning due to mistakes and mix-ups is not uncommon. Around here, it is necessary to be careful of young leaves such as false helleborine, Aconitum sachalinense subsp. yezoense, and lily of the valley. There were also accidents involving Mackenzie's water hemlock, as the rhizome looks like that of wasabi. Enjoy the flavors of the season safely, without overpicking.



Resident Birds

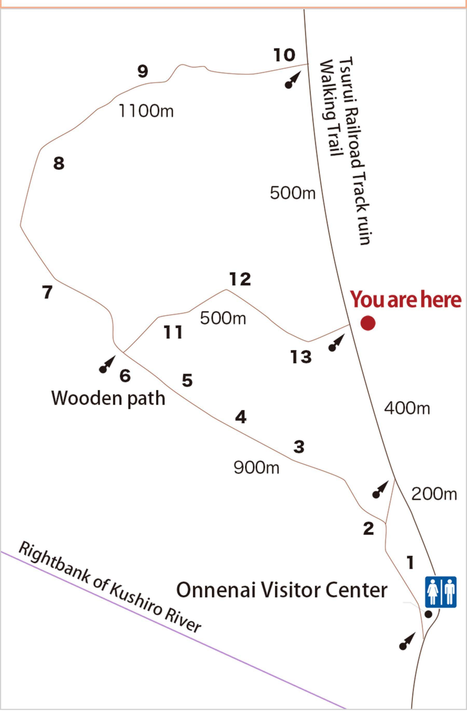
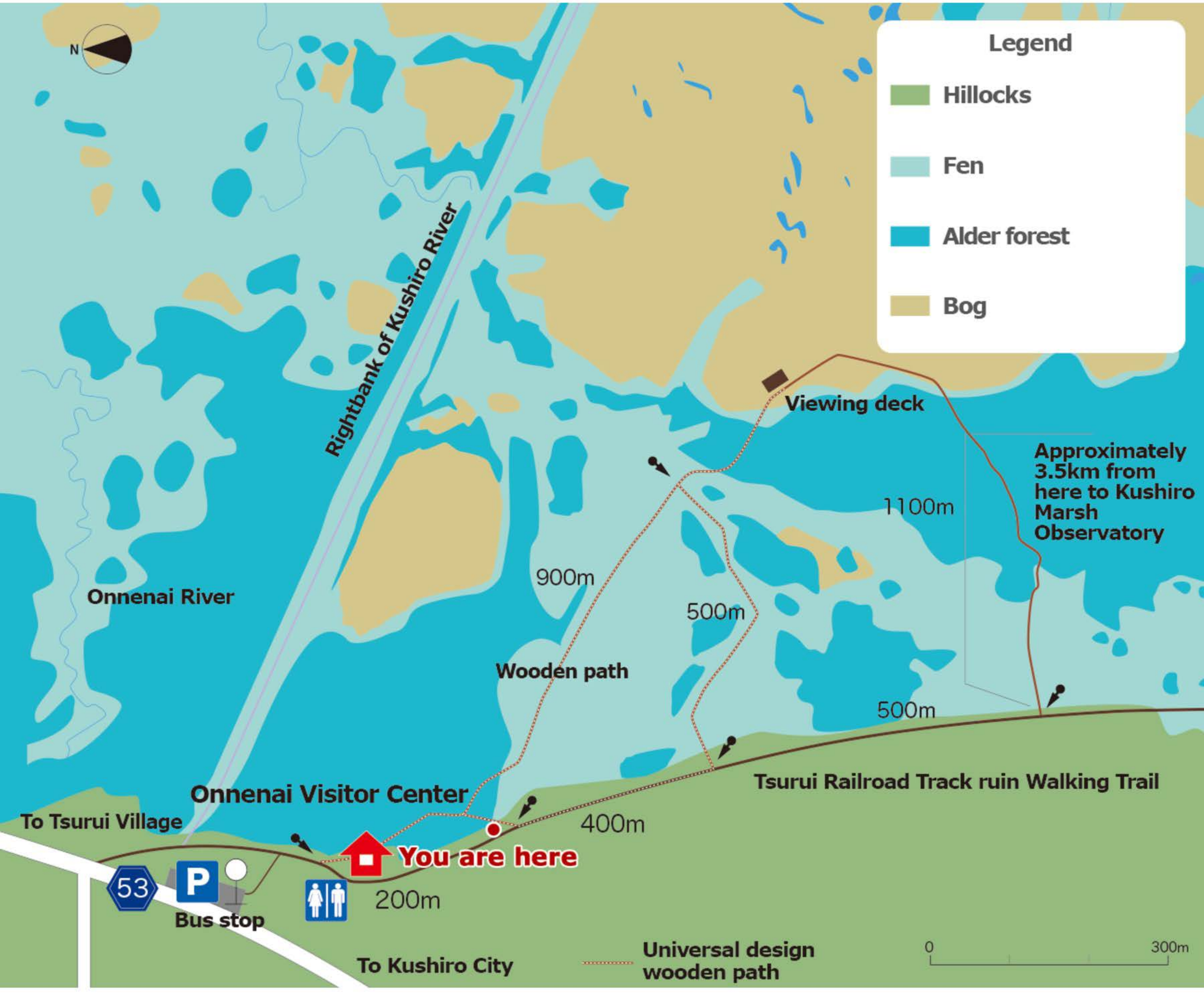
Birds that can be seen around Onnenai all year round



1 Short memo

Singing and Chirping of Wild Birds

There is great variety to the chirping of wild birds, and the singing of many small birds, known as "tweeting," was loved by people in the past. Most of the time, it is the male birds who "tweet," and many of the resident birds start chirping in February, while the summer birds start chirping after they reach their breeding grounds. As birds chirp to summon female birds, woo other birds, and to make their turf known, they become concentrated in the spring, which is their breeding season. The short, simple cry that differs from the tweet is known as a "call," and this is used to warn other birds, when birds are frightened, and when birds are conversing with other birds.



Information Map for Area Around the Onnenai Wooden Path