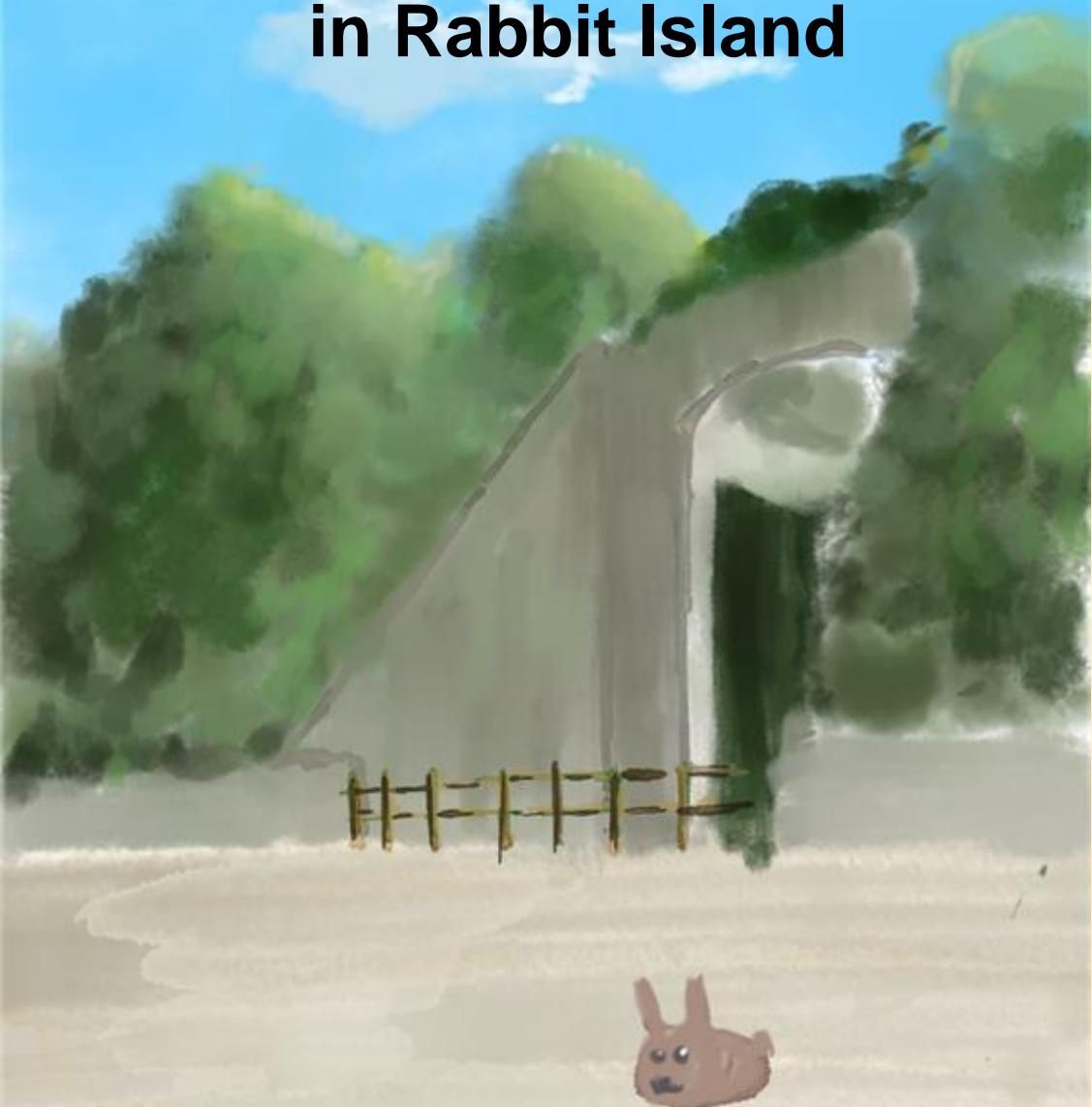


Grace and Petit in Rabbit Island



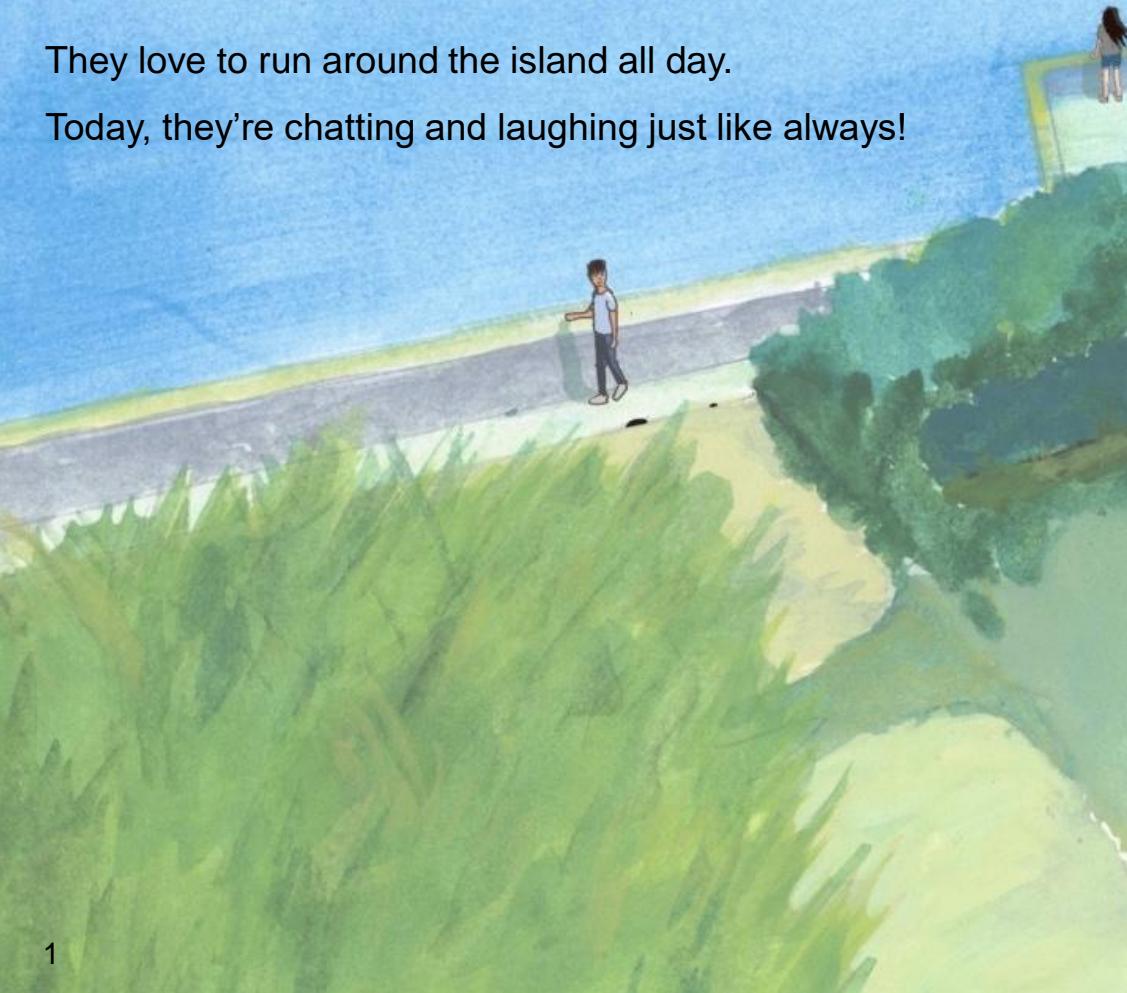
Created by students of National College of Technology(KOSEN),
Kure College during the school-wide project-based Incubation
Work (IW) program.

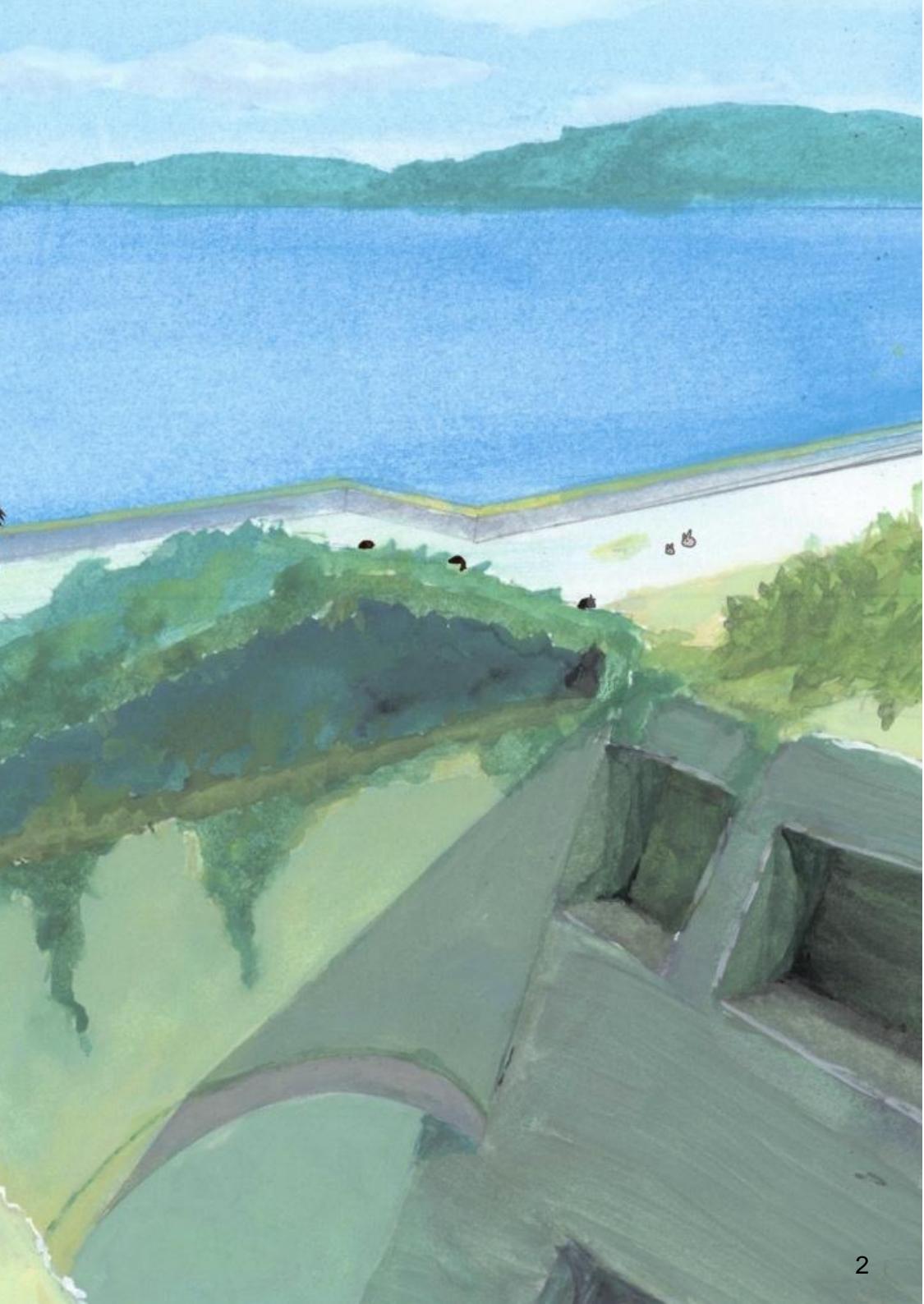


There's a small, green island in the Seto Inland Sea.
Lots of bunnies live there happily.

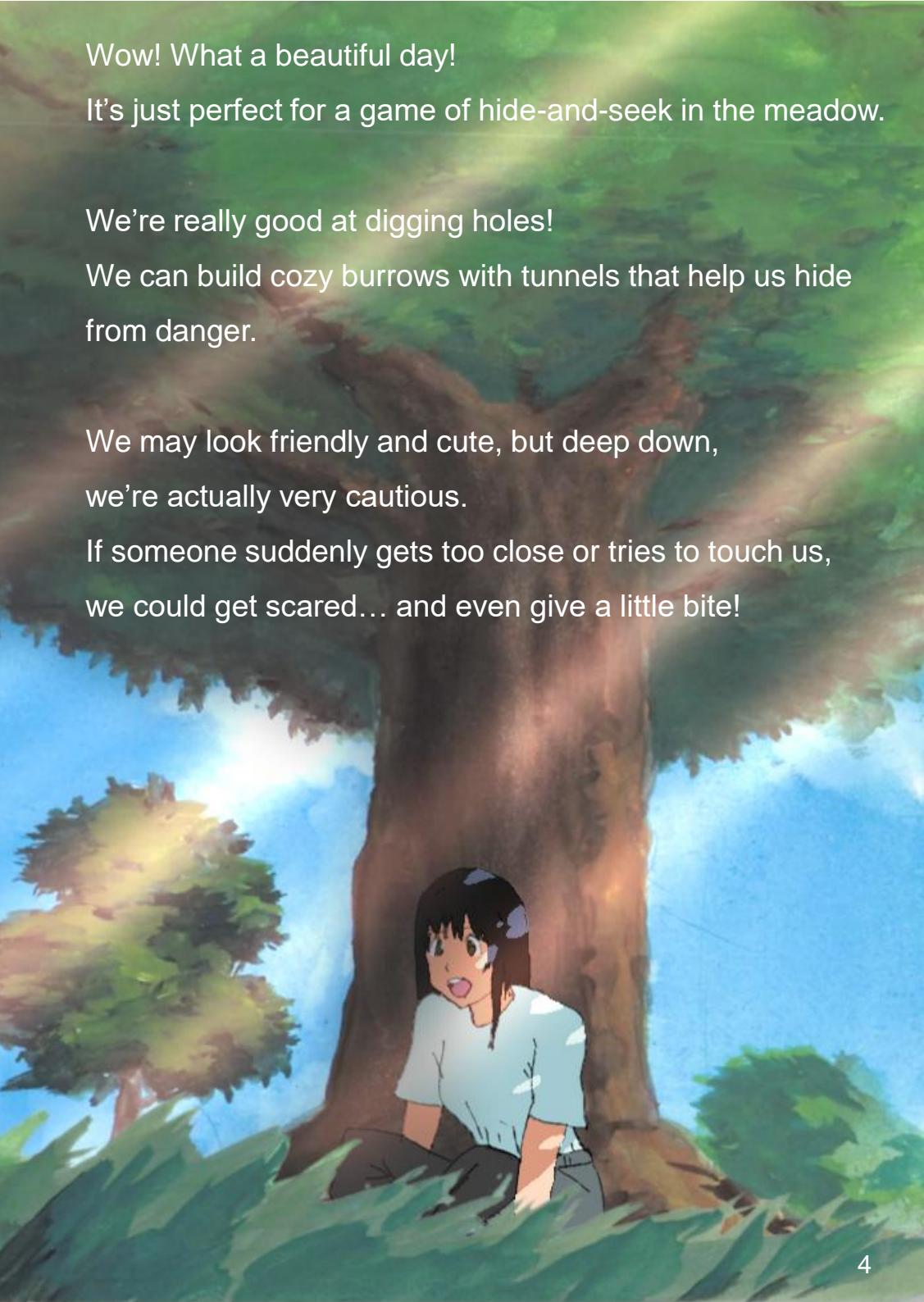
Grace and Petit are bunny brothers and best friends!

They love to run around the island all day.
Today, they're chatting and laughing just like always!







A large, brown tree trunk stands in a green meadow. A girl with dark hair and a white t-shirt is peeking out from behind the tree, looking surprised. The background shows more green grass and a blue sky with a smaller tree on the left.

Wow! What a beautiful day!

It's just perfect for a game of hide-and-seek in the meadow.

We're really good at digging holes!

We can build cozy burrows with tunnels that help us hide from danger.

We may look friendly and cute, but deep down, we're actually very cautious.

If someone suddenly gets too close or tries to touch us, we could get scared... and even give a little bite!

Want to know what we love to eat?

We totally love soft grass, yummy leaves, and fresh buds!

People who come to the island give us all sorts of snacks.

Some bring carrots, some bring cabbage,
and we just munch away!

But sometimes, we eat too much and get tummy aches.
It's a bit tricky when people give us bread or onions,
because we can't eat those at all!





Uh-oh, leftover food can go bad,
and that's a big problem for us!

Sometimes wild boars or crows come to eat it-
they're super scary!

So, we really hope people give us just the right amount,
only the things we like.

And we'd be happy if you could take the food we left behind!







We want to live safe and happy,
with all our friends-just like now!

To keep our island smiling too,
please follow the Bunny Rules. Will you?

(There's more to learn at the back—take a look!)



Thank you for picking up this booklet. It was created by students as part of a course at National College of Technology(KOSEN), Kure College. This page was developed based on a graduate research project (Oda et al., 2024) that investigated the impact of feeding the rabbits on Okunoshima Island. Our aim is to help more people understand the current state of the rabbits and natural environment on Okunoshima, and to encourage everyone to think about the island's future and its relationship with tourism. 【Asami OGURA】



What problems are arising on Okunoshima due to the increase in tourism?

Okunoshima Island became famous as “Rabbit Island” through the internet and television, causing number of tourist to nearly double from 2014 to 2017. Consequently, a phenomenon known as overtourism¹ has emerge on the island, negatively impacted tourists, the local ecosystem, and the rabbits. For example, there were too many tourists to fit on the ferry and food left uneaten by the rabbits is abandoned, attracting rats and wild boars. Furthermore, the rabbit population has grown excessively large, resulting in an increase in number of sick rabbits².

¹ The situation when too many people visit a place on holiday, so that the place is spoiled and life is made difficult for the people who live there(Cambridge Advanced Learner's Dictionary & Thesaurus).

² Ministry of the Environment, Government of Japan (2020) “Okunoshima and Our Future: Workshop Outcomes”.



Is it okay to feed the rabbits on Okunoshima?

Okunoshima Island, Takehara City, Hiroshima Prefecture, Japan, is located entirely within Setonaikai National Park, managed by the Ministry of the Environment, Government of Japan. The rabbits on Okunoshima Island are semi-wild descendants of domesticated European rabbits. **Regardless of whether you are inside or outside the national park, feeding unmanaged animals is not desirable. To avoid various problems caused by feeding, such as conflicts between animals and people, garbage issues, deterioration of animal health, and the spread of zoonotic diseases, it has become standard etiquette to not indiscriminately feed animals in the wild.** Leftover food can ultimately become food for wildlife, potentially breaking national park rules. In fact, wild boars and crows have been observed eating leftover food intended for the rabbits. Always collect leftover or abandoned food.



What are the specific effects of feeding the rabbits?

To clarify the impact of tourists feeding on the island's ecosystem, we conducted a survey targeting tourists in 2021 (valid responses: 264) and calculated the amount of grass grown on the island's lawns, which is a food source for rabbits, from 2022 to 2023. The results revealed the following:

- (1) In 2017, when tourist numbers peaked (410,000 visitors), approximately 6 times the amount of grass on the island (27.0 t)³ was brought in as feed (Fig.1).
- (2) The sustainable rabbit population can be estimated based on feed quantity⁴ (Fig.2).
 - ▲ When the rabbits are fed only grass from island lawns (4.7 t) → 200–300 rabbits
 - When tourists feed the rabbits a quantity of supplemental food equivalent to that of the island's grass (totaling 9.4 t) → 400–600 rabbits
- (3) The increase in the rabbit population has impacted the island's vegetation and more. (Fig.3)

3 All values are dry weight. 4 Calculated assuming the required amount of feed is 42–69 g/day/rabbit.

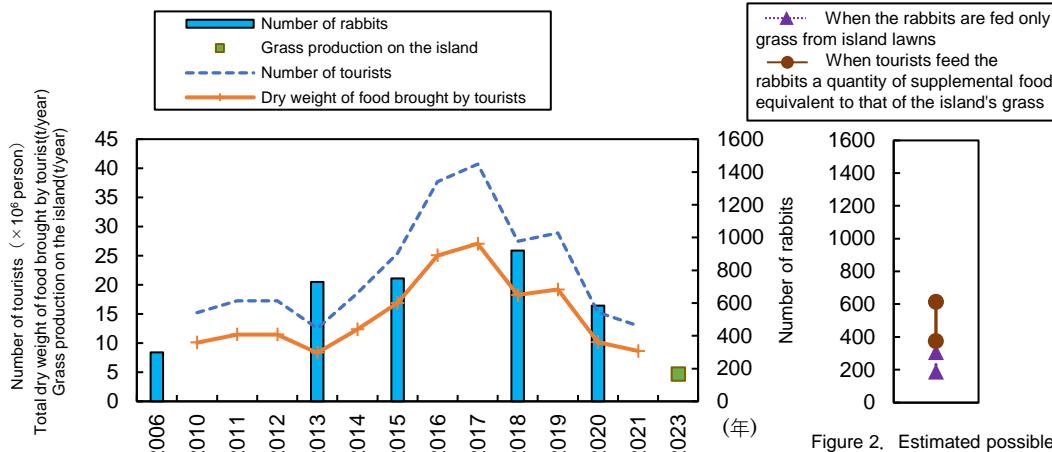


Figure 1. Changes in dry weight of food brought in by tourists and number of tourists from 2010 to 2021 and number of rabbits from 2006 to 2020, grass production in 2023.

*The number of tourists is from Takehara City, the number of rabbits in 2020 is from the Ministry of the Environment (June 19) and the number of rabbits others from Chugoku-Shikoku Regional Environmental Affairs Office(2020). The number of rabbits in 2006, 2013, 2018 investigated by from Okunoshima Visitor Center (2017), and in 2015 from Demello et al.(2016).

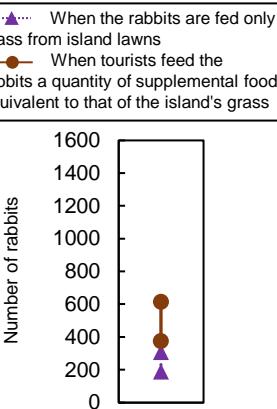


Figure 2. Estimated possible number of rabbits on the island calculated based on the quantity of food.



a) "Rabbit line" showing the plants consumed their leaves and branches to the height the rabbits can reach (photographs taken on 25 September, 2023).

Beware of thorns!
The fruit and seeds that form afterward have thorns.
Approximately 5 cm tall, it blooms in spring.



b) "Soliva sessilis" dominating an area where the turfgrass has been completely consumed by rabbits (photographs taken on 14 June, 2023).



c) A slope that appears to be collapsing due to rabbit burrows (photographs taken on 14 June, 2023).

Figure 3. The impact of the increasing rabbit population on the island's ecosystem.

Trivia About the Rabbits of Okunoshima

This page introduces the ecology of the rabbits on Okunoshima Island.



Why are there rabbits on Okunoshima Island?

It is believed that eight pairs of white and black rabbits were released on the island in 1970. Their population grew to over 200 within a year and a half. In addition, brown rabbits were subsequently released.

(Source: Chugoku Shimbun, 1972, 2023)

Note: Currently, releasing or removing rabbits is prohibited on Okunoshima.



The rabbits of Okunoshima are among the world's 100 worst invasive alien species!

The rabbits inhabiting Okunoshima are European rabbits that live in a semi-wild state on the island. The feral European rabbit (*Oryctolagus cuniculus*) is an invasive alien species in Japan that threatens biodiversity. It is listed among the IUCN's "100 of World's Worst Invasive Alien Species", the Ecological Society of Japan's "100 of Worst Invasive Alien Species", and the Ministry of the Environment, Government of Japan's priority alien species.

Cases have been reported both in Japan and other countries where European rabbits have become wild under various circumstances, adversely affecting native ecosystems and the agriculture and forestry industries.

Specifically, the following impacts are feared:

Actually: Destruction of vegetation and soil by overgrazing. Inhibition of reproduction of *Calonectris leucomelas*.

Potentially: Carrying virus for VHD. Agricultural damages in other countries.

Source: National Institute for Environmental Studies "Invasive Species of Japan"

Note: Within the nationally designated Nanatsushima Wildlife Sanctuary (an island off Wajima City, Ishikawa Prefecture, Japan), active culling was implemented to halt damage to the ecosystem. In 2019, it was reported that this effort achieved the eradication of European rabbits within Japan for the first time (Ministry of the Environment, Government of Japan, 2019).



What do rabbits eat?

European rabbits primarily eat grass as their staple food and consume plant leaves, buds, branches, and bark. Eating high-fiber food (grass) helps maintain digestive functions in the stomach and intestines. Overconsumption of vegetables, fruits, or treats can cause rabbits to stop eating their main diet of grass or pellets, leading to stomach upset, disruption of the gut bacterial balance, and poor health. In addition, bulbous vegetables such as onions and garlic, grains, tubers, nuts, and treats such as bread or cookies, should be avoided.

Source: Yamada, F. (2017). *Rabbit Science*. University of Tokyo Press. / Abe, H. (2010). *Mammals of Japan, Revised 2nd Edition*. Tokai University Press. / Yamane, Y. (2012). *Encyclopedia of Canine and Feline Medicine, Revised Edition*. Pai International.



Where do rabbits live? How do they live?

The European rabbit is native to the Mediterranean coast. It digs complex tunnel-shaped burrows in the ground and lives in groups of approximately ten individuals. Multiple groups can live together in large burrows. The European rabbit is highly prolific and produce 4–6 babies several times a year, totaling 15–45 offspring annually.

Young rabbits reach adulthood within 4–8 months of age.

Source: Yamada, F. (2017). *Rabbit Science*. University of Tokyo Press. / Abe, H. (2010). *Mammals of Japan, Revised 2nd Edition*. Tokai University Press.



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Okunoshima is an island where poison gas was manufactured during WWII, and it's also famous as “the island erased from maps.” Be sure to visit the Poison Gas Museum too!



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Kind Request to Visitors of Okunoshima:



Regarding Rabbit Rules

Okunoshima Island is home to many rabbits.

Very occasionally, some trouble can arise because they are in close proximity to humans.

Follow the rules and observe the proper conduct for the rabbits 'ecosystem and problems on the island.

For the safety of both humans and rabbits, we kindly request that you read and follow the guideline below.

1. Refrain from touching the rabbits or feeding them directly from your hand.

-There is a possibility of contracting disease or carrying fleas ticks.

-Touching or holding the rabbits may cause them psychological stress and they may be dropped or injured accidentally.

-Holding food out in your hand may cause the rabbits to bite and injure you.

2. Avoid feeding rabbits on the road and watch your step for rabbits.

-Roads are dangerous places for feeding as they are used by bicycles and vehicles.

-Rabbits crossing the road to search for food can cause accidents.

-Rabbits at your feet may be accidentally injured.

3. Observe the rabbits until they finish eating and please take leftovers with you.

-Too much food leads to too many rabbits which can lead to problems.

-Leftovers food can rot and become food for larger predatory, wild animals such as wild boars and rats.

-If wild boars increase in number and begin to approach humans, it could be dangerous.

4. Do not bring pets or take rabbits off the island.

-Released pets into the wild can cause ecological disruption and the possible death of the pets due to the harsh environment.

-There is a possibility of disease transmission between animals.

NOTE: Abandoning animals is prohibited by the

"Act on Welfare and Management of Animals" law.

