

## LIFE WITH THE YAMABIRU (LAND-DWELLING LEECH) AFTER THE FAILURE OF A FENCE IN RURAL JAPAN

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**Abstract:** In recent years, *Haemadipsa zeylanica japonica*, a land-dwelling leech referred to as a “yamabiru” in Japanese, has proliferated in the countryside of Japan, because wild animals are a vector of the yamabiru. In some areas, the yamabiru suck the blood of people even in houses. This paper explores how residents living in a yamabiru “hot spot,” where the number of yamabiru is large, have coexisted with the creature which, though troublesome, is almost impossible to avoid. Z City in Kanagawa Prefecture attempted to maintain a long fence to prevent wild animals from entering the “human domain,” although this did not work as expected. Instead, the daily contact between people and the yamabiru generated various relationships other than a simple, hostile relationship: kill-or-be-killed. The trouble caused by the yamabiru encourages the interviewees to rethink their society and history, though coexistence with the yamabiru can never do away with the dream of extermination. Coexistence with yamabiru, in this context, means not living separately, but living with trouble in the contact zone, without making clear-cut borders between human and non-human domains. This paper attempts to demonstrate that people can make efforts to create various relationships even with “real,” not metaphorical, parasites. Insights from this research may bring to light new information that will be of value to contemporary society, where numerous borders that divide people and social groups are being drawn.

**Keywords:** Coexistence; Yamabiru (Land-dwelling leech); Extermination; Parasite; Japan

### 1. Introduction

#### 1.1. Yamabiru problem

Even when facing massive extinction, some species—including those troublesome to humans—increase their population. *Haemadipsa zeylanica japonica*, named yamabiru (land-dwelling leech) in Japanese, is one such species, and in recent years, it has proliferated in the countryside of Japan. Until recently, the yamabiru mainly sucked the blood of wild animals such as Sika deer (hereinafter, deer) and wild boar, not that of humans. According to the Yamabiru Research Group (YRG) website directed by Dr. Shigekazu Tani, a leading parasitologist of yamabiru, the species is found in 34 of 47 prefectures in Japan (Yamabiru Research Group, 2017). Their expanding habitat has become increasingly evident since the beginning of the twenty-first century. In “hot spots,” where the number of yamabiru is large, the yamabiru suck the blood of people passing through mountain roads and vegetable fields, gardens, backyards, and even houses and taxis.

This paper aims to explore the attempts of residents at one of the yamabiru “hot spots,” called Kitano district, to coexist with the leeches. Coexistence here means living with the possibility of direct contact in the shared place, without making clear-cut borders between human and nonhuman domains. Although this coexistence can never do away with the dream of extermination of the yamabiru, after the failure of the attempt to live separately by constructing a fence, the residents in Kitano district have been trying to create relationships with the yamabiru other than the simple, hostile relationship of kill-or-be-killed. Here, “simple” or “simplified” implies that various emerging relationships are erased. The challenge in this paper is to provide a new perspective for contemporary society by demonstrating that people can make efforts to create various relationships even with harmful parasites.

After situating this paper in the current academic enterprise, the following sections will examine (1) the interviewees’ attempts to share the place with the yamabiru with the possibility of direct contact in everyday life, (2) how they use even environmental pest control such as forest management to develop other relationships with the yamabiru, and (3) how extermination emerges as a solution when the yamabiru is simplified as a risk that should be removed.

### *1.2. Background of the research*

The yamabiru is a leech that lives on the ground, especially under fallen leaves in humid areas. The size ranges from approximately 1 centimeter (0.39 inches) to 6 centimeters (2.36 inches). The yamabiru is aware of humans approaching based on body temperature, CO<sub>2</sub>, and vibration. It moves like a measuring worm, and the most active season is from May to October. When a yamabiru attaches itself to one’s skin, it tears open a point with its small teeth and waits for the blood to flow into its open mouth, while it secretes the anticoagulant, hirudin, which has an anesthetic effect and prevents blood flow from stopping.

The reason the yamabiru is proliferating is simple: there are more wild animals such as deer, wild boar, and serow in rural areas than before. A DNA analysis of the blood in the yamabiru indicates deer as one of the main vectors (Sasaki and Tani, 2008: 27). A statistical estimation, for example, shows approximately 2.49 million deer in 2012, but only around half a million in 1989 (Ministry of Environment, 2015a). However, the habitat area in 2014 was almost 2.5 times larger than that in 1978 (Ministry of Environment, 2015b). Since the 1960s, many rural areas have faced rapid ageing and depopulation, and many rural people and their children have abandoned farming and forestry and moved to the cities or changed jobs. Furthermore, by the 1960s, they no longer frequently entered and used the woodlands around villages to collect firewood or manure. An increasing number of abandoned farmlands transformed into bush or forests, enabling wild animals to approach and live in rural areas. In addition, in the abandoned conifer forests for commercial forestry, overgrown branches block the sunlight from penetrating the forest floor, and dark forests can no longer provide food for the increasing number of deer.

Along with the expansion of the yamabiru habitat, a few methods to avoid having one’s blood sucked have gradually been developed. The first method is killing the yamabiru using an expellant, although merely spraying this on the ground is not effective. People must lure the yamabiru by walking around or breathing heavily onto

the ground and then spray the expellant directly onto the leech. Next, using a flame blower is reportedly effective, especially when burning the eggs in the ground. The second method is using repellent on shoes. The third is changing behavior and clothes. Checking others' backs frequently when working together and covering the ends of trousers with socks to prevent the yamabiru from entering them, for example, are common practices. The fourth method is preventing wild animals from entering villages by erecting fences. The fifth is environmental pest control such as forest management, which refers to removing bushes, low trees, and fallen leaves from the ground in ex-woodlands so that sunshine can penetrate to the ground. The ground temperature then becomes too high and the humidity too low for the yamabiru. Forest management also works to keep wild animals away as people more frequently enter the area.

Nowadays, there are local governments, for example, in the Akita, Kanagawa, and Hyogo prefectures, which are often referred to as yamabiru hot spots, that are attempting to introduce various methods by holding workshops with scientists and offering subsidies to purchase expellants, repellants, and machines needed for forest management.

### *1.3. Why is yamabiru important?*

The purpose of seeking alternative relationships with other creatures is not confined to the domains of so-called environmental ethics or environmental problems. Hugh Raffles illustrated how the relationship between humans and parasites in biological discourse was transcribed to the relationships between people and people: "insectification" of Jews (Raffles, 2010: 400). Raffles explores the process of anti-Semitism, the discourses on entomology and hygiene, the development of technology, and other factors, and the roles they played in the collapse of distinctions between humans and insects, which allowed the extermination of Jews (Raffles, 2010: 157).

The historians Kirk and Pemberton, in their study of the history of the human-leech relationship in the fields of medicine, economics, literature, and contemporary art, resisted classifying leeches as parasites. Probably taking the current exclusionist atmosphere into consideration, they warn that "having othered the leech, it is then a simple step to other groups of humans who are made to take on this name," and "in the darkest moments of our shared history, millions have died because some have successfully labelled others as parasites" (Kirk and Pemberton, 2013: 182). Kirk and Pemberton, therefore, attempt to demonstrate that "leeches might be understood to play a symbiotic role in human culture" (Kirk and Pemberton, 2013: 13).

Sharing the viewpoint of Raffles and the two historians, this paper pursues another aspect of the relationship between people and parasites. Raffles focused on the risk that the discourse of a parasite can be transferred to a group of people, and Kirk and Pemberton tried to propose a parallel "symbiotic relationship" to show that the parasite was not a parasite in cultural history. The author, however, attempts to demonstrate that people can cultivate other relationships even though they keep living with the possibility of direct contact with "real" biological parasites in everyday life. This viewpoint requires field research.

In this context, Donna Haraway's argument is inspiring. She focuses her research on the emergence of "promising patterns for multispecies response-ability inside ongoing trouble" (Haraway, 2016: 16) among pigeon, art activists, and scientists. Her purpose is

to shed light on the relationships that people have had with “rats with wings.” She writes,

As spies, racers, messengers, urban neighbors, iridescent sexual exhibitionists, avian parents, gender assistants for people, scientific subjects and objects, art-engineering environmental reporters, search-and-rescue workers at sea, imperialist invaders, discriminators of painting styles, native species, pets, and more, around the earth pigeons and their partners of many kinds, including people, make history (Haraway, 2016: 29).

Haraway upholds the slogan, “staying with the trouble.” For her, trouble is not something that should be erased, but something that should be embraced to stir up what is conventional and create the “compost” from which something emerges (Haraway, 2016: 1). Trouble is, in other words, a catalyst for alternatives.

When this paper refers to the yamabiru as a troublesome species, it uses the term “troublesome” in Haraway’s context. Although the yamabiru causes various problems as described in the following sections, it also provides local residents with opportunities to rethink their way of life. In this context, the yamabiru problem is in an important position. It shows that creating other relationships is a very everyday practice in rural area. If the times are getting darker, as Kirk and Pemberton imply, this paper would contribute to seeking ways to keep embracing trouble, not erasing it.

## 2. Method

The field research was conducted in 2016 and all the sources of information are limited to that year, meaning that this paper only deals with one yamabiru season. It consisted mainly of two types of interviews. The author participated in some activities such as forest management, communal cleaning, community meetings, farming, local festivals, and hiking events. During this participation, the author discussed the yamabiru with twenty-four interviewees without a structured list of questions. Along with this style, five interviewees the author met took him to see their gardens and farmlands and participated in a two-to-three-hour semi-structured interview. The list of questions is not only about their experiences with the yamabiru, but also about how they evaluate the postwar changes in Kitano district. The author also conducted structured interviews with two local government officials and participated in the habitat research of the parasitologists and officials; this information is just used as supplementary material in this paper. The bias of the research is, first, that because the author met the interviewees mainly in communal activities that address the yamabiru problem, they might be “yamabiru-conscious.” Second, for the same reason, most of the interviewees are over or around sixty years and have enough time to conduct communal activities. These activities are named TCG (Terasawa Conservation Group; Terasawa is the name of a riverhead area located in the upper region of Kitano district.) and KSG (Kitano Satoyama Group), conducting community revitalization, which the following sections will explore. The cases in this paper, nevertheless, show various forms of relationships with the suddenly appearing parasites. Note that pseudonyms are used for most interviewees’ names and districts in the description.

### 3. Results and Discussion

#### 3.1. Yamabiru problem in Z City and Kitano district

Z City is part of the hinterland of the Tokyo metropolis. It is located west of Kanagawa Prefecture, around one and a half hours from the center of Tokyo by train. Z City is famous for a trailhead of the Tanzawa Mountains, a popular mountain for hikers. Kitano district, where 2,457 people in 840 households lived in 2016, is located on the edge of Z City, and forests and mountains surround the city's houses and farmlands.

According to the testimonies of residents in Kitano district, the yamabiru first emerged around 2005 in Kitano district. This was also when wild animals proliferated in the farmlands. To prevent deer and other wild animals from approaching the human domain, the local government of Kanagawa Prefecture constructed a fence measuring 83km long over the base of the Tanzawa Mountains from 2002 to 2004. However, the effectiveness of the fence is limited or questionable, as wild animals have destroyed many sections and there are openings at roads and rivers, which the animals use as gates. Anyway, animals had already found places to rest "inside" the fence. Therefore, the fence did not resolve the yamabiru problem. Habitat density research conducted by the local government and Dr. Shigekazu Tani in thirteen spots in Z City in July 2016 indicates that there are many spots whose indices are high, regardless of the inside and outside of the fence (the overall tendency is that the indices of the inside are relatively low)<sup>1</sup>.

Z City began holding workshops such as the one described earlier and compiled a new budget for the subsidy program to support local groups trying to reduce the number of yamabiru in 2012. One third of this budget came from Kanagawa Prefecture, where Z City is located. Annually since then, approximately 100,000 yen (900 US dollars) are allocated to about ten local groups to purchase machines and chemicals. One Z City official, who was in charge of the program, said that he often turned down requests for interviews from newspapers and TV programs because he was concerned that they would sensationalize the issue. After several years, he began believing that it would be better to demonstrate how eager Z City was to solve the problem. However, the solution is not clear. Another Z City official, in charge of the program in 2015, confessed that he realized just after taking charge of the subsidy program that it was almost impossible to eradicate the yamabiru. "In fact, to reduce the population of the yamabiru can hardly be the primary policy target. Not increasing the population is what we can manage to pursue." Field research found that nobody denied that the extermination was a potential, alluring dream. At the same time, the interviewees knew that unless a drastic change occurred, they would have to live with the yamabiru.

#### 3.2. Sharing places

First encounters with the yamabiru in Kitano district are full of surprise and fear. Mr. Nitta, one of the leaders of TCG (Terasawa Conservation Group), a communal activity group, recalled his first encounter with a yamabiru. "It was about ten years ago. Kitano

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<sup>1</sup> If the index is over 1.0, the chance of blood sucking increases, and if 10.0, people feel hesitant to enter the zone because they can clearly see many leeches approaching. Actually, nine spots showed over 1.0, and five particular spots were over 5.0, which indicates that people cannot stay there any longer. The highest was 9.8 in a forest trail. The spots also include the place next to a house where people live. Its index was 5.0.



district has a communal activity to clean up and mow the banks of the river.” Many residents in Kitagawa gathered and were working together. “Suddenly a man shouted to someone, ‘your back is red (because of blood)!’” Another woman in her fifties told a story about when she was walking her dog. Her dog liked to enter the bush, and she always followed him. When she went home, she felt something wrong with her leg, and found a yamabiru attached to it. “I screamed and burned the clothes I was wearing in my backyard that day. It was really creepy.”

The border made by the long fence was easily broken. As a result, an area where people felt comfortable and secure became uncanny one that they do not know well, do not want to stay in, and cannot love. The concern is often expressed that the children and grandchildren of interviewees would no longer love the district, because they no longer want to play in the bushes and forests, which means that they would not have good memories of the place. For example, a woman in her seventies in KSG (Kitano Satoyama Group) said, “When my grandchildren come to visit me, I cannot let them go outside, even in my garden. See, there are some bushes. There are yamabiru.” The three people seated nearby nodded to show their agreement with her.

Although the interviewees often describe the yamabiru as a big problem, they nevertheless seem calmer. In 2016, about ten years after the first encounter, Mr. Nitta was wearing a T-shirt even though it was the day when he was supposed to enter the forest. His tanned arms indicated that this was his usual attire. “I do not care if I get bitten. I have already been bitten three times this season. My instep is swollen now.” That the residents have already lived with the leeches for more than ten years means that they have acquired practical knowledge to live with them through daily contact and a series of workshops. “Nowadays, nobody in the districts where the yamabiru exist is interested in a lecture. They have already heard everything we can provide. Rather, people outside the districts are interested, just like you,” a local official in charge of the yamabiru problem said<sup>2</sup>.

The interviewees have customized ways to avoid getting bitten. They rarely use an expellant or yamabiru repellent, either because they are too expensive for daily use or because they “cannot be bothered” to use the chemicals every time they need. Instead, they have changed their behavior in everyday life. The two cases below are from interviews conducted in the interviewees’ gardens or farmlands.

(Case 1)

A woman in her seventies explained that the most important thing is just “not approaching places liked by the yamabiru.” She grows ginger in a narrow space in her humid backyard and found that the area was inhabited by the yamabiru. She has even seen one on the floor in her house. She probably transported it in without noticing. “At first, I tried everything, like spraying desiccant. However, I found that this was pointless. Deer and wild boar come here frequently and leave the yamabiru,” she laughed. “I realized I just had to give this place over to them. When I need ginger, I carefully stretch my arm out so as not to stimulate them. Coexistence and co-flourishing (kyozon-kyoei) is important.”

<sup>2</sup> The yamabiru even becomes the object of jokes. When the members of TCG and the author entered the forest and saw some yamabiru begin their approach toward them from the side of the paved road, a TCG member laughed, saying, “They are welcoming us.”

(Case 2)

A woman in her fifties told the author that she sometimes used a cheaper repellent for mosquitoes. “Well, I think it is effective, but I basically avoid approaching the places they inhabit (in her garden). I know where they are, so I do not need a special repellent. I allow them to do what they like.” Her garden has yamabiru bushes. When she said that she was once eager to help the local government build the long fence in the 2000s, I asked if she tried to exterminate the yamabiru in her garden. She answered, “No. If we know how to behave, we do not have to do that.”

The first common characteristic in these two cases is that they abandon complete “ownership” of their gardens and try to share the spaces with the yamabiru. The second is that both of the women experienced failure in their attempts to remove all the yamabiru from their gardens; the woman in Case 1 used desiccant and the woman in Case 2 assisted in the construction of the fence. After their failures, they realized that the yamabiru were ineradicable and began to change their behavior to reduce the possibility of being bitten, rather than attempting to eliminate them.

The situation differs slightly when interviewees are engaged in commercial farming, as they must frequently enter the places the yamabiru inhabit.

(Case 3)

A man in his fifties invited the author to his tea farm when they met at a Kitano district community meeting and discussed about the author’s research. It was a rainy day. “This is the ideal condition. You will get many bites,” he smiled. His farmland is next to the forest, and he hears the deer every night. He had enclosed every block of his vegetable farm with small handcrafted fences and nets. “Watch out. The fence can prevent deer, but the yamabiru are everywhere.” When working on the farmland, he checks his body every ten minutes which, according to him, is how long a yamabiru needs to bite. If he finds a yamabiru attached to his body, he picks it up using his fingers and puts it into a small plastic bag filled with salt. “I kill the yamabiru only when they try to bite me. That is enough, and it is impossible to catch more.” That day, the author found only a few yamabiru on his farmland (which was disappointing for him). However, when they entered the edge of the forest just next to the tea farm and walked for a few minutes, the author saw more than fifteen on his shoe.

This interviewee said that he was accustomed to this. In the past, he had searched for other ways to exterminate the yamabiru on his farmland; however, “It was unnecessary. Now my motto is coexistence and co-flourishing (*kyozon-kyoei*). I do not care if I sometimes get bitten by a yamabiru.” He adds, “Of course, it would be better if the yamabiru and deer disappeared.” His wife slightly opposed him. “My skin is more sensitive than his and becomes swollen, painful, and itchy when I get bitten. It is so annoying to work in the places inhabited by the yamabiru.” Peoples’ bodies react differently depending on physical constitution.

Building relationships other than hostile relationships between people and parasites enables sharing of spaces. It, however, does not mean that the interviewees and the yamabiru live harmoniously without violence. On the contrary, as Case 3 shows, the yamabiru continuously try to hurt/bite the farmer, and he continuously kills them. Nevertheless, most yamabiru there have stayed and even flourish. The yamabiru is a creepy parasite, but at the same time, something with which people can coexist. It is undeniable that exterminating all the yamabiru and making places free of leeches would be ideal for most interviewees, as the wife in Case 3 implied. There are, however, some reasons that extermination is impractical. First and foremost, regarding cost matters, given the short-term durability of the effect of expellant and that new yamabiru are transported in daily, continuous use is not feasible. Second, regarding the matter of risk, the interviewees, especially those working in forest, consider both health and environmental risks. Specifically, Z City is famous for its clean water and it is one of the tourist resources. Therefore, they do not want to cause bad ecological and social effects. The third reason is history. Given that encountering the yamabiru is a historical phenomenon and that the yamabiru proliferated because of social and economic changes, the responsibility matters. A man in his forties referred to an “unfortunate history.” He said, “I believe the yamabiru did not like to come here and meet us. They were transported here by animals. I do not think killing them all is a justifiable attitude, even though they cause people trouble.”

It is also to be considered that people are not in favor of extermination because it would undermine their efforts of the past.

(Case 4)

A man in his eighties who eagerly worked to plant cedar trees on the mountain in the 1960s asserted, “The problem would be easily solved if we burned all the mountains.” Of course, he knows that it is impossible. He continues, “We cannot go back to that point and don’t want to undo those days of hard work.” He was then working in the local government office far from Kitano district and it took more than two hours to commute. He said that he worked on the mountain from morning to evening on Saturdays and Sundays, without any time for a rest in the week.

Case 4 implies that the yamabiru is something more than an creepy creature, related to the interviewee’s life history. The yamabiru requires him to evaluate his past effort. He had to affirm that his effort was the cause of today’s trouble and knew that he had to live with the consequences. The next section argues that the yamabiru actually provide the interviewees with opportunities to rethink their ways of life and the history of Kitano district.

### 3.3. *Creating other relationships*

Direct contact and thus, having their blood sucked, is nevertheless still a major source of concern for the interviewees. If the residents of Kitano district want the yamabiru further away and wish to ensure density reduction in the number of yamabiru, focusing only on the yamabiru is insufficient. Here, environmental pest control or forest management is important. As explained earlier, it refers to removing bushes, low trees,



and fallen leaves from the ground of ex-woodlands, so that sunshine can penetrate to the ground and reduce the population. The forest management project conducted in Kitano district can be considered a process to generate various relationships other than the simple, hostile relationship between the KSG members and the yamabiru.

The “Kitano Satoyama no Kai (Kitano Satoyama Group)” (KSG) was founded in 2008. The group comprises around 45 members, including residents of Kitano and a few people from other districts in Z City. The KSG annually uploads its action plan to its website. Below is an excerpt from the 2016 version.

Due to the ongoing urbanization in Kitano district, it seems that the will to conserve the green heritage and cultural heritage that our ancestors had continuously worked for is decreasing and deteriorating. Thus, we take actions to conserve our forests and lands to hand them over to the next generation and revitalize our community. In addition to these activities, we promote environmental education based on cooperation with urban residents, students, kindergarten children, and consumer organizations.

The KSG conducts a range of activities, as this plan describes. The members mow the forest around the residential district, referred to as *satoyama*, and remove fallen leaves from the ground. Furthermore, they conduct habitat research on the yamabiru; cultivate abandoned fields to grow wheat, buckwheat, and vegetables; sell the harvest at local events and festivals to raise funds for activities; run a café several times a month to provide local foods; and invite children from urban areas to experience agriculture.

Although the KSG does not limit its main mission to dealing with the yamabiru problem, it was the initial trigger for organizing members. In other words, the yamabiru became the link connecting residents to take action. Currently, the KSG maintains about 2.8 ha (6.9 acres) of the members’ own forest land through forest management. Even though the KSG-maintained area is a small portion of the forest in Kitano district (it is not small if we consider that the members are not young and the area is located on a steep slope), the habitat density of yamabiru in the area has not increased, according to the members. The leader of the KSG, in his sixties and having worked for Z City’s government office, explained, “It was the local government office that introduced the yamabiru subsidy program for forest management.” He spoke in a modest way that what the KSG is doing is what the local government recommended, but stated, “We can say that the yamabiru gave us an opportunity to set up the various activities we engage in today.”

The purpose of KSG is to reduce the population of yamabiru, not exterminate them. Simply, forest management may insert physical distance between people and the yamabiru. When a person enters the field, the two creatures perhaps do not notice each other. While the possibility of being bitten does not completely vanish, that is considered enough. When asked, “Why are you not using chemicals?” the leader of the KSG raised the risks to environment and health and added, “Reducing the blood sucking is enough. We just want to decrease the population.” Another member described forest management as being akin to “asking the yamabiru and deer to give a bit of the area to other creatures.”

It is important to note that although the method of forest management adopted by the KSG is quite similar to that recommended by the experts, the members are conducting it as a repetition or restoration of what they did in the past. In other words, members' practices are firmly related to collective memory, the memory recollected and shared by the members of a group. Until 2011, besides cutting bushes, KSG members made fertilizers using the fallen leaves they carried out from the forest. This invokes the memory of tobacco farming, which was the principal agricultural product of Z City until the high economic growth era. Residents frequently needed large amounts of wood and fallen leaves for nurseries, fertilizers, and drying tobacco leaves, and in their daily lives. Therefore, the KSG's activities are not new for its members. How tobacco farming was related to the collective memory of the residents in Z City is partially showed by the fact that there is a stone monument in Z City that commemorates the end of farming in 1984. Z City was already a tobacco growing area in the Edo period. The postwar peak of farming was in the 1950s, but during the 1960s and 1970s, it was replaced by commercial farming of other crops such as flowers or by wage labor. Nevertheless, tobacco still remains in the name of the local festival annually held by Z City.

Although the residents continued to use the materials procurable in the satoyama forest for their other farming or vegetable gardens after tobacco farming declined, the amount of necessary materials was incomparable. Along with the energy revolution that changed the energy source from firewood to gas and oil, the end of tobacco farming was obviously one of the main factors that allowed wild animals to approach residential areas.

(Case 5)

During the forest management activity, the man in Case 4 approached the author, who was cutting wood with a handsaw, and said, "We were all doing what you are doing now. When we were young or children, we were doing this. It is strange that the yamabiru maintained the practice common to the people of Kitano district."

(Case 6)

A man in his seventies, a former leader of the KSG, commented, "Thinking of the yamabiru is thinking of our life." He has been eager to expand the KSG's activities beyond forest management. When he and five other KSG members were sowing seeds of buckwheat to revive local agriculture and local noodles, they found that they were running short of seeds, which were imported from the United States. The local noodles shop owner happened to pass by the field and shared with them a local species of buckwheat, which he was using in a conservation activity. The KSG members were pleased with this incident because the seed was one that was not easy to get. When the sowing resumed, the man praised the local seed as being bigger and blacker than the one from America, saying, "We have to gradually restore what we were doing in the old days. The yamabiru problem is the same; it reminds us of what we have abandoned and what has changed. Thinking of the yamabiru is thinking of our life."

Nevertheless, it is not possible to conclude that the KSG's project is the same as their earlier activities related to farming. First, cutting trees and gathering leaves are no

longer part of agricultural production and daily life. Rather, forest management is the purpose itself and it is sustained through a subsidy from the local government. In addition, members receive a small pay “for lunch” from the KSG’s annual budget. Second, KSG’s forest management activities are geared toward attracting tourists and revitalizing the community. Landscape the KSG members are attempting to create and attract tourists and hikers through their activities, which differ from those in the past. It is easy to listen to testimonies and find pictures showing that the previous woodlands were almost bald consequent to overuse. In contrast, the focus now is on diversity of species, which is carefully observed and managed. For example, members intensively plant oriental paperbush trees, whose flowers are renowned in the Tanzawa Mountains and attract visitors. Furthermore, they are protecting a special type of tree, from which they are planning to produce a perfume for their activity fund.

As such, in the emerging landscape in the satoyama forest where the KSG is working, the yamabiru lives not only as a parasite, but also as a knot that connects people, a trigger to rethink lifestyles, a reminder of local memories, a source of a small income from people’s work, or just a creature living in the forest.

(Case 7)

After the man in Case 4 and 5 asked if the author had some new biological knowledge on the yamabiru, he said, “I wonder what the role of the yamabiru in the ecosystem is. I cannot determine this. However, it is at least significant in our activity.” He also lamented that the KSG activity is also in danger and that the activity is a small source of income for the members and is losing its original purpose.

As Case 7 implies, it is also necessary to note that there is no guarantee that the form of forest management described in this section will continue in the future. The members are ageing and their way of thinking might be changing. Besides, there is always the possibility that unpredictable incidents may occur. Currently, leaves are no longer collected from the field to make fertilizer. Now, the leaves are merely loaded onto the edge of the field, because of concerns pertaining to accumulated radioactive substances from Fukushima. Until the incident occurred, the residents still used the fallen leaves in their vegetable gardens. This provides good conditions in which the yamabiru can increase its population. The current form of coexistence is by no means resistant to change.

#### 3.4. *Extermination*

That the yamabiru is a parasite that hurts people is an undeniable fact. This section explores the moment people decided to erase the yamabiru from a vast area by using expellant. It shows how coexistence turns into extermination.

In 1985, the local group “Terasawa Hozon Kai” (Terasawa Conservation Group) (TCG) was founded in Kitano district. Terasawa is the name of a riverhead area located in the upper region of Kitano district, where small shrines and divine statues are scattered. The mission of the TCG is to maintain this historical heritage and the mountain roads to reach them, while reviving rituals related to them. About sixty people belong to the group and the board members are key members of the residents’

association, agricultural committee, forestry committee, and other important groups in Kitano district. In 2015, TCG named the mountain roads “the hiking trail of Kitano Gods” and created a map and brochure to promote it to tourists and hikers. As the Terasawa area is outside the fence, the yamabiru population is much larger than that inside. The TCG not only maintains the hiking trail by cutting bushes and small trees, but also puts small boxes at the starting points of the trail. There are some small plastic bags filled with salt inside of them. Those plastic bags are for hikers to kill the yamabiru on their skin (the Z City government does the same).

In July 2016, the TCG planned to invite children and their parents from Z City to the hiking trail. The TCG decided to use expellant on the hiking trail and purchased 72 kilograms of granule expellant, enough for about 1,400 square meters (0.35 acres). The local government subsidized it.

(Case 8)

On the day of using the expellant, Mr. Nitta, the leader of the TCG, explained, “Experienced hikers know there are yamabiru and how to deal with them. That is okay, but we cannot take responsibility for what happens to the children. We also do not want children to have bad memories.” The aim of the spray was an experiment to test the durability of the expellant. Mr. Nitta explained that they did not expect the permanent elimination of the yamabiru. Instead, they wanted to examine if they could use the expellant just before initiating programs such as inviting children or special guests. “Actually, it is impossible to use expellant frequently, because Terasawa is a famous source of good water,” added Mr. Nitta.

In this case, the status of the yamabiru is different from other cases. The yamabiru is supposed to be killed before it bites people as a precautionary approach. The yamabiru is changed from a creepy troublesome creature that is killed after it actually hurts people to a risk that has to be removed in advance. The place should serve one purpose, where the children and their parents can enjoy themselves without discomfort or any concern for the responsibility of the members. The simplification of the yamabiru here is, thus, related to the simplification of the place.

It is, however, also important to note that even though the TCG members conducted the extermination project, it does not mean that they completely abandoned other possible relationships with the yamabiru. The possibilities are recalled by direct contact.

(Case 10)

A member, in charge of mowing bushes to make spraying expellant easy, was sitting on the road eating lunch when he suddenly realized that a yamabiru had attached itself to his hand. He laughed, “I almost ate a yamabiru! They are like pasta in a lunch box!” Whether people can use the yamabiru as a food resource or medical tool is a topic sometimes jokingly discussed. “Expelling only is sad, is it not? It creates nothing. Why not study how to use the yamabiru?”

Two weeks later, the author received a phone call from Mr. Nitta, telling him that there were still many yamabiru on the trail.

#### 4. Conclusion

The yamabiru are a troublesome species. The trouble encourages the interviewees to rethink their relationships with the yamabiru, though coexistence with the yamabiru can never do away with the dream of extermination. Coexistence with yamabiru, in this context, means not living separately, but living with trouble in the contact zone, without making clear-cut borders between human and non-human domains. One of the main backgrounds of this mode of coexistence is that the residents experienced the failure of living separately by constructing the fence. In this sense, it is possible to argue that they are forced to search for relationships with the yamabiru other than a hostile relationship. Besides, although the yamabiru is creepy and harmful, direct contact does not mean an immediate threat to life because it does not carry serious disease so far.

However, these backgrounds do not justify ignoring the interviewees' efforts. Rather than a creature simply not to be killed, like an object to sympathize with, the yamabiru works as a trigger to rethink the interviewees' lifestyles, histories, and environment by continuously annoying people. This recognition of trouble that situates the yamabiru in a broader historical and social perspective supports the search for alternatives.

This paper also explored how the extermination project emerges when the yamabiru is considered as a risk that should be erased through a precautionary approach. The cases imply that the simplification of the yamabiru is related to the simplification of the place, making it serve one purpose.

Although further research is necessary to elucidate the conditions of how the trouble turns into the risk and vice versa, insights from this research may bring to light new information that will be of value to contemporary society, where numerous borders that divide people and social groups are being drawn. For example, Shozo Fujita, one of the leading political theorists in the postwar Japan, pointed out and was afraid of the ongoing social process that people develop lifestyles and mentalities only to seek security and comfort, and become eager to erase all sources of the uncomfortable (Fujita, 1995: 13-5). Today, we have various sites where projects to erase or separate the uncomfortable from our living world by constructing a fence have been implemented. Some are ongoing projects, while others have failed or are impossible to achieve. This paper is an attempt to capture the small possibilities emerging from one of these sites after failing the fence.

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