

# 'Homeplace of the Heart'

*Fireflies, Tourism and Town-Building in Rural Japan*

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# Summary

This thesis discusses *hotaru no sato* (firefly villages) and the various ways in which they relate to fireflies and regional revitalisation. Fireflies have long wielded the imaginations of Japanese people, from featuring as aesthetic subjects in art and poetry to being caught or sold as commodities. They became endangered in the early 20<sup>th</sup> century, due to overharvesting, river pollution, and habitat destruction due to urban developments, which eroded the satoyama landscapes in which they dwelled. To counter the decline in fireflies, firefly protection groups emerged in the 1960s. Simultaneously, urbanisation and rural decline has caused local governments in rural towns and villages to attempt to ‘revitalise’ themselves through promoting unique aspects about themselves. Some towns use fireflies as a crowd puller, arranging firefly festivals in order to attract tourists. Firefly protection groups thus became entangled with regional revitalisation projects in the 1990s. In this thesis, I examine firefly festivals and their importance for town-building and the local community, and discuss how nostalgia imbued in the ideologies of furusato and satoyama impacts how people relate to fireflies. The thesis aims to answer the question of whether the wish to protect fireflies is compatible with their use as tools for town revitalisation. While I find the answer is often a complex interaction between the two, there are instances in which firefly ecology is ignored, for instance in the case of importation of foreign firefly species. Additionally, I find that a third element – affect – is also of significance, as people often structure their relations to fireflies around fond childhood memories. Throughout, I make a case for the importance of protecting insects in this age of mass extinction of insects and animals due to anthropogenic impacts on ecosystems. I therefore argue that firefly villages are only appropriate if they incorporate protection of firefly habitats as a main goal.



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# 1 Introduction to Firefly Villages

On a damp, thundery night in late June, I found myself in a car with seven Japanese people, parked on a small bridge overlooking a patch of rice fields and a little brook in the mountains of Gunma prefecture. We had turned off the car lights and were staring silently into the dusk. All of a sudden, one of the women exclaimed, “There! There!” Outside, the yellowy-green light of a firefly had suddenly become visible in the dark. Everyone in the car clamoured to get outside, where several more little lights were now visible above the rice paddies. Once outside, we stood by the edge of the bridge and took in the sight of fireflies dancing around in front of us, excitement and wonder palpable in the air. One of the small insects suddenly flew above our heads, and we all stretched out our hands to try and catch it. The young boy in our party finally managed to trap it between his fingers, and the adults all praised him as we peered at the little bug perched on his palm, glowing silently.

## 1.1 What Are *hotaru no sato*? Background and Aims of Research

A scene such as the one described above, of fireflies flitting around a riverbank at twilight, is a familiar one in Japanese culture. The firefly (*hotaru* in Japanese, also known as lightning bug in English), with its mystical, green-yellow light has captured the imagination of many a poet and artist throughout the country’s history and remains a highly symbolic creature in Japanese culture. In the Edo period (1603-1868), firefly catching was a popular hobby for common people, during which time an industry of catching and selling fireflies also developed (Lewis 2016c, 136). Firefly merchants would sell millions of these bioluminescent bugs to hotel and restaurant owners, who would release them into their gardens, where customers would pay to enjoy their beauty. Because of this commercial over-catching of fireflies, firefly populations began to dwindle. Rapid industrialisation during the Meiji period (1868-1912) caused the increase of several issues that affected firefly populations, such as river pollution and urban development, which continued to further endanger fireflies into the Shōwa period (1926-1989).

As a response to this decline in fireflies, nature protection groups started launching campaigns in the 1960s to ensure their protection and revival (Moon 1997, 225). Since then, firefly revival movements, known as ‘firefly villages’ (*hotaru no sato*), have been working to protect fireflies and their natural habitats. Today, there are a great number of such ‘villages’

in rural areas – Hosaka et al. (2016, 233) put the number at 650 in 2016. They are not necessarily actual villages, but may refer to a natural habitat of fireflies, whether in towns where fireflies emerge in the summertime, or in a secluded landscape with very few or no inhabitants. To be designated as a firefly village, however, there must be some form of organised action (volunteer-based or otherwise) taken in order to protect fireflies and their habitats. A typical activity or event organised by such places is the firefly festival (*hotaru matsuri*), in which tourists and locals are all invited to view fireflies together. In addition to firefly viewing, other common elements of a firefly festival include events and activities such as stage performances, craft workshops, and eating at food stalls.

Firefly villages are in many cases part of a larger project for the revival of depopulated rural areas, in the sense that fireflies are used as a tool for attracting tourists. Towns struggling with economic and population decline might thus arrange a firefly festival to promote their town. Firefly festivals and events also provide an opportunity for townspeople to sell local specialty foods and products. Such festivals can be characterised as a type of nature tourism, where the main goal is not necessarily the protection of the natural resource that is being showcased, but rather the economic benefits to be gained from it. In this case, fireflies are being ‘packaged and sold’ to tourists, who want to experience ‘nature’ (in this case, nature in a wrapped, packaged form). Laurent and Ono (1999, 151) state: “The issue of firefly protection is entangled in a criss-cross of interests involving environmental concerns, urban renewal policies and the revival of depopulated rural areas, for which the firefly has become a widely used symbol”. One of the goals of my research has been to explore this statement and investigate these entanglements. How and why is firefly protection connected with urban renewal policies and regional revitalisation?

There are several facets that need to be discussed in order to understand this issue in its entirety. One of these has to do with the role of pollution in Japan. Much of the Japanese discourse on fireflies revolves around an imagined past in which people lived closer to nature and thus had a closer and more familiar relationship with fireflies. Part of this relationship involved catching them and releasing them indoors or in gardens, a practice particularly prolific in the Edo period, but still practised in the 1920s and 30s (Moon 1997, 225). However, fireflies became protected at the national level in 1935, changing the way people interacted with them. Catching fireflies was now prohibited, but by this time, pollution had become a big problem in the country.

One might say that the Meiji period industrialisation was characterised by a concern with producing and developing new technologies rather than with environmental concerns, a fact reflected in the environmental damage caused during this period. The first major incidence of pollution occurred in 1878, when drainage from a copper mine in Tochigi prefecture contaminated several rivers, causing flooding and further damage caused by the copper content of the water (Stolz 2014). Industrial pollution contaminated not only the environment, but also humans. Brett Walker (2010, 6) writes:

With the nineteenth century came the advent of *Homo sapiens industrialis* on the Japanese Islands, a new breed of human utterly penetrated, engulfed, and transformed, often at the molecular level, by the engineering, industrializing, and poisoning of the environment in and around it.

Several diseases broke out due to toxic pollution – one in 1912 and the others in the 1950s and 1960s. The most famous of these is perhaps Minamata disease, a condition caused by methylmercury poisoning first recorded in the town of Minamata in Kumamoto prefecture. These incidents all happened due to incorrect handling of industrial waste by large corporations, and thousands of people suffered grave consequences. However, these incidents also served, mainly due to activism carried out by the victims, as the catalyst for the implementation of environmental regulations and policy, such as the enactment of Japan's Basic Law for Environmental Pollution Control in 1967, and the formation of the Consumers Union of Japan in 1969. In 1993, the Basic Environment Law was implemented, which included among other things restrictions on industrial emissions and waste, as well as the promotion of recycling (Ministry of the Environment, n.d.).

In addition to humans, man-made pollution has also affected other species, notably the firefly. River pollution due to unfiltered waste from factories and household sources, especially untreated sewage and phosphate-rich detergents, led to a huge decline in firefly populations in the middle of the 20<sup>th</sup> century. It is now known that firefly larvae are very sensitive to water pollution, and the adults do not tolerate heavy light pollution (e.g. Yūma 1993). Therefore, a large amount of firefly protection work today is concerned with ensuring that rivers remain clean, dark environments in which fireflies may thrive and survive.

In order to understand how fireflies became endangered, one must also consider developments of postwar Japanese society. In the 1960s, job opportunities in the cities caused many people to leave their towns and villages and congregate in the cities (Bird 2009). This urbanisation led to a severe rural decline: in 1920, nearly half the population of Japan lived in towns and villages of fewer than 5,000 people, but by 2000 this number had declined to just 1.7 per cent (Bird 2009). This rural depopulation has had several consequences for society. Problems caused by this include the declining economy of rural areas, local governance struggling to run with fewer people, and populations of mostly elderly people who become vulnerable to attacks and crop destruction by wild animals as they cease pruning back trees and maintaining their land.

However, there have been conscious attempts to reverse this trend, exemplified by regional revitalisation movements or town renewal projects. Such movements are known by various names, such as *muraokoshi* (village revitalisation), *machiokoshi* (town revitalisation), *machizukuri* (town building/making), *chiikiokoshi* (region revitalisation), and *furusato-zukuri* (hometown building/making). A prominent goal of such movements is to promote towns and villages in declining rural areas by advertising for their good points and attempting to attract people and make them see the appeal in visiting or even moving there (see, for instance, Sorensen and Funck 2007; Love 2010). Often, a single characteristic of the town in question is emphasised, such as a local product or landmark – or, in the case of firefly villages, mysterious shining beetles.

Other factors contributing to the changing landscape of rural Japan include the postwar urban housing development, as well as the creation of extensive plantation forests, both of which encroached on rural landscapes. In an ecological perspective, the loss of rural areas also contributed to a loss of biodiversity. According to the Environment Ministry, nearly a quarter of Japan's mammals and plants, and more than a third of its freshwater, estuarine and mangrove-dwelling fish are threatened (Bird 2009). These threats to biodiversity are partially caused by changes in so-called *satoyama* landscapes (a form of 'encultured' nature epitomised by coppiced woods and rice paddy fields; a much-touted example of humans coexisting with nature), as most of the biodiversity in Japan exists in such places in which humans have traditionally lived close to nature (Ibid). Wood and charcoal from *satoyama* woodland were the primary fuels of prewar Japan, but these were replaced by oil and gas after the war. At the same time, the Japanese state began a project of reforestation in order to

correct the widespread overfelling and deforestation of the prewar and wartime periods (Knight 1997, 711). Satoyama landscapes were thus transformed in the postwar period, as the state began felling satoyama mixed woodland and in its stead planting fast-growing cedar and cypress trees on a massive scale. The real estate boom of the 1980s caused demand for timber to soar, but by this time, Japan was importing almost eighty per cent of its wood from South-East Asia (Knight 1997, 717).

With the low demand for domestic wood, maintenance of replanted forests (which require consistent pruning) declined, leaving the plantations to become overgrown and encroach into the satoyama woodland that previously had acted as a buffer zone between the village and the forest. The traditionally maintained boundary between forest and village thus became threatened, as neglected plantation forests swallowed satoyama – and, in some cases, the village as well. According to Knight (Ibid, 719), this reforestation project constituted an environmental crisis in itself, as it brought with it a risk of landslides and flooding. Additionally, plantation forests caused a transformation of the forest ecology, as they disrupted wildlife habitats, leading to an increase in animal damage to both timber plantations and farms (Ibid, 721). Simultaneously, satoyama woodland was being felled to make room for suburban housing developments (Bird 2009).

The environmental changes happening in Japan are not unique to this country, but are rather indicative of a worldwide problem. The world is now in what has been described by many as the *Anthropocene*, a proposed new geological age characterised by human impact and change on the environment (Crutzen and Stoermer 2000). Crutzen and Stoermer (2000, 17) argue that the Anthropocene began about two hundred years ago around the time of the invention of the steam engine, which became the catalyst for a transformation of the environment. The cumulative effects of human activities since then have resulted in “changes to the basic biological, chemical, and climatic processes of the whole earth, changes that ultimately affect all humans” (Hudson 2010, 934). Anthropogenic impacts on the environment have caused widespread ecosystem deterioration, issues of pollution and waste, and climate change, to name only a few. Another consequence of such impacts is the mass-extinction of species: scientists have estimated that half the world’s individual animals have been lost since the 1970s (Carrington 2017). Particularly at risk are insects – due to the sheer number of species, insects constitute the dominant form of animal life. The decline of insects will have heavy consequences for ecosystems as, when insects die out, so do larger animals who feed on



them, and so on. In fact, scientists have already reported a 75 percent decline in insect biomass across 63 nature areas in Germany between 1989 and 2016 (Hoff 2018). Similarly, in the rainforests of Puerto Rico, 98% of ground insects were observed to have vanished in a span of 35 years (Carrington 2018). Insects are being killed off increasingly due to use of insecticides, habitat loss and degradation, global warming, invasive species, decline in plants or animals insects depend on, and so on. The picture is still mixed, as we must count the many thriving invasive and pest species, but clearly there is reason to care about protecting insects.

It would seem that humans are doing their best to accelerate the natural movements of climate and environment on Earth in a miniscule amount of time. Scientists speak of a “Great Acceleration” (McNeill 2014), characterised by the increasing rate of human impact on the environment in recent years. Building cities, societies and a capitalist world order requires the exploitation of natural resources – and as technology develops, so escalates the need to exploit further and reach deeper into the inner workings of ecosystems, extracting the very basis of the existence of countless species. The steady deforestation of the Amazon rainforest, which threatens the lives of all the species that live there – 10% of known species on Earth, according to World Wide Fund for Nature (n.d.) – is but one of countless examples across the globe. In Japan, in addition to numerous problems with pollution and waste issues, urban development projects have deteriorated many rural areas, swallowing natural landscapes into suburbia.

As for fireflies, they continued to decrease in number throughout the Shōwa period due to river pollution and the increasing use of chemical insecticides and herbicides in agriculture. Additionally, extensive river refurbishments led to many riverbanks being lined with concrete, which hindered adult fireflies in laying their eggs. Although there had been some prior efforts among biologists to warn about the decrease in fireflies (Laurent and Ono 1999, 151), it was not before the 1960s that the public became aware of the issue, as nature protection groups began launching anti-pollution campaigns to decrease river pollution and increase firefly populations (Moon 1997, 225). It seems it was here the entanglement between regional revitalisation and firefly protection first began, as Moon (Ibid) writes: “The increase in water pollution in Japan during the 1960s and 1970s further stimulated the spread of *hotaru* revival movements and some *muraokoshi* (village revitalisation) developers began to ride on this boom”. We might thus see the causes of the endangerment of fireflies and the

decline of rural areas as being connected. First, issues such as overharvesting, environmental pollution and urban development caused firefly populations to decrease. The same urban development schemes affected rural areas, along with the steady urbanisation and rural depopulation of the country. At the same time as people were becoming concerned about water pollution, local governments of rural towns and villages began to brand and promote themselves in order to increase their populations and improve their economy and image. Some of these places utilised fireflies as advertisement fodder in the mission to promote the uniqueness of their own area or town. We can thus assume that it is not just love of fireflies that makes people want to protect them – although it must be mentioned that there were simultaneously many groups concerned mainly with protecting fireflies. While fireflies have become a symbol of a good water environment, they are also a town-building tool. In many ways, then, the issue of firefly protection is entwined in several different notions of environmentalism, regional revitalisation projects, nature tourism and nostalgia.

## **1.2 Main Research Question and Subquestions**

Fireflies have been celebrated, but also exploited, throughout Japanese history. In this thesis, I wish to examine the intersection of environmentalism and regional revitalisation. It seems the wish to protect fireflies is often intertwined with a wish to make profit off them for tourism. How can we understand the motivations behind firefly protection movements? Can firefly protection be said to be compatible with nature tourism? I believe these questions are central to the phenomenon of firefly protection movements and their entanglement with regional revitalisation and the idea of being in harmony with nature.

My main research question is therefore: “Is the wish to protect fireflies compatible with their use as tools for town revitalisation?” Among other things, I wish to explore the apparent tension between economy (the desire to make profit for the local community) and ecology (the desire to protect the habitat of fireflies). Further, I will consider the emphasis placed on nostalgia by analysing various ways in which firefly protection movements draw on notions of *furusato* and *satoyama*. By looking at current activities of some firefly protection groups through ethnographic fieldwork, I wish to shed light on the motivations and goals of firefly protection and why it has become so widespread. By doing so, I hope to spark not only a discussion of the intertwining of firefly protection and commodification, but also of the ethics of wildlife exploitation and nature tourism.

### 1.3 Conceptual Framework

This thesis will for the most part employ theory on Japanese perceptions of nature, including the concepts of *furusato*, *satoyama* and nostalgia. Inspiration and insights have also been taken from the fields of ecology (mainly regarding ecosystems and biodiversity) and multispecies ethnography. I will in this section give a brief introduction to key terms and concepts I will be employing in my thesis.

The image of *furusato* evokes an image of “forested mountains, fields cut by meandering rivers, and a cluster of thatch-roof farmhouses” (Robertson 1988, 494). A combination of the words ‘old’ and ‘village’, *furusato* does not have an exact English translation, but may be used to mean things like ‘home’ and ‘native place’ (Robertson 1988, 494) – the place in which one (or one’s parents) grew up. *Furusato* may be said to represent everything that the city is not, as *furusato* is signified by words such as *camaraderie*, compassion and tradition – all presumed absent from post-war urbanised societies (Ibid, 503). The idea of *furusato* also overlaps with the concept of *satoyama* – and certainly the rural scenery evoked by *furusato* in many ways overlaps with the scenery of *satoyama*. But whereas the idea of *furusato* appeals to the Japanese sense of ‘belonging’ and having a comfortable and peaceful place to return to, *satoyama* appeals more to the Japanese conviction that they are a people that have traditionally lived in harmony with nature (Knight 2010, 436). *Satoyama* is a term for a half-cultivated, ‘encultured’ landscape, and it has become intimately connected with a Japanese nostalgia for a more idyllic past when Japan was less urbanised and industrialised and the countryside a more scenic and peaceful place (Knight 2010, 436). Indeed, *satoyama* landscapes have increasingly given way to modern housing developments, or in other cases, been abandoned and left to grow back into the wilderness it once used to be. As mentioned earlier, this steady loss of encultured nature has also contributed to a loss of biodiversity (Bird 2009). As the public became increasingly concerned about the loss of *satoyama* landscapes, conservation movements focused on the preservation of *satoyama* sprang up in the 1980s and 1990s (Knight 2010, 425). The concept of *satoyama* thus features heavily in discourse surrounding the conservation of nature and endangered species. Prominently, the Japanese government has promoted *satoyama* as a sustainable way of interacting with the environment, which will be discussed in chapter six.

A central driving force behind discourse on *furusato* and *satoyama* seems to be *nostalgia*. Svetlana Boym defines nostalgia as “a longing for a home that no longer exists or has never existed” (2007, 7). This longing appears to be for a place, but is actually a yearning for a different time; it is a wish to be able to revisit time as one is with space (Boym 2007, 8). Japanese people’s nostalgia towards rural landscapes such as *furusato* and *satoyama*, which have become more urbanised and changed with time, may be fueled by a sense of dissatisfaction with the current state of Japanese society, in which economic instability looms and many perceive community and tradition to have faded.

I will also discuss the term ‘nature’ and how the concept has been understood in Japan. There is one point in particular on which ‘Japanese’ understandings differ from other cultures’, examined by Kalland and Asquith (1997) in their introduction to an anthology on Japanese conceptualisations of nature. This concerns the difference between how nature is perceived and interacted with. Whereas in Western literary tradition, wilderness has often been seen as a zone of mystery and adventure, to Japanese it rather constitutes a dangerous, spiritual space. According to Kalland and Asquith (1997, 13), in Japan there is therefore a need to ‘tame’ wild nature to make it more safe and appealing to humans. The authors conceptualise nature as a continuum, on which one pole represents nature in its more ‘cultured’ form (terms used by the different authors in the book vary between domesticated, bound, wrapped, and cooked) and the other the wild, unwrapped/bound, raw version of nature (that is, a nature that lies further away from humans). Real events, such as the firefly festival, exist somewhere in between these two extremes. Lines between dichotomies intersect and blur, as what is wild or tame (or what is nature or culture) is not always fixed, but rather a continuous process. Thus, a Japanese garden, often the very epitome of aesthetic artifice, may be viewed as nature (Hendry 1997). Similarly, *satoyama* landscapes, an intersection of nature and culture, are seen by many as the embodiment of true nature. The above points will be further discussed in chapter five.

The topic of firefly protection involves studying the ecology of fireflies – in other words, how they live and how they interact with their environment. For my purposes, there are two terms in particular that I would like to define before moving forward: ecosystem and biodiversity. There are several ways to define what an *ecosystem* is, but a basic definition is an “ecological system consisting of all the organisms in an area and the physical environment with which they interact” (Chapin et al 2002, 380). Examples include forest ecosystems,

aquatic ecosystems, and grassland ecosystems – all with their own makeup of climate, surroundings and species. An ecosystem is controlled by internal and external factors, the most important one being climate. Humans receive numerous benefits or ‘services’ from ecosystems, including natural pollination of crops, clean drinking water, and the decomposition of wastes (Daily 1997). Because the processes of an ecosystem are driven by the species within it, it is closely connected to *biodiversity*. Biodiversity, derived from the term ‘biological diversity’, may be defined as “the variety of life on Earth: it includes all organisms, species, and populations; the genetic variation among these; and their complex assemblages of communities and ecosystems” (United Nations Environment Programme 2010). It also incorporates the interrelatedness of genes, species, and ecosystems, as well as their interactions with the environment. As mentioned above, the world is facing biodiversity loss on a global scale, at a faster rate than has ever been known. The main causes of biodiversity loss include habitat destruction, invasive alien species, overexploitation (such as overhunting, or in the case of fireflies, overharvesting), pollution and contamination, alterations in ecosystem composition, and global climate change. Many of these are directly caused by human activity. Biodiversity loss has serious consequences for all life on earth, as it involves a loss of sustenance and resources for countless species, including humans.

## **1.4 Multispecies Ethnography**

This thesis is inspired by multispecies ethnography, an emerging field within ethnographic research that examines how humans relate to and interact with other animals and species. Although animals have long been studied anthropologically, particularly in connection with hunting, husbandry and totemism, multispecies ethnography is concerned with *interspecies* dependence, exploring how “a multitude of organisms’ livelihoods shape and are shaped by political, economic and cultural forces” (Kirksey and Helmreich 2010, 545). It thus examines the linkages and interactions of creatures and organisms that are connected to human social worlds. Multispecies ethnography emerged at the turn of the 21<sup>st</sup> century as an intersection of environmental studies, science and technology studies (STS) and animal studies (Kirksey and Helmreich 2010, 566). Key researchers are Anna Tsing (2015), who studies the Matsutake mushroom and follows its chains of commodity across the world, and Hugh Raffles, who in his *Insectopedia* (2010) gives an anthropological account of insects and their interactions with humans across different cultures, including butterfly collection, cricket fighting, and the Japanese ‘beetle boom’. Such studies might be seen as an exercise in blurring the lines

separating nature from culture. Through decentring the human and emphasising the agency of other creatures, multispecies ethnography deconstructs and disassembles dichotomies of nature and culture, human and nonhuman. This makes it possible to offer an analysis of not only the relationship between organisms, but also the inherently entangled nature of the relationship in question – as such entanglements are often inescapable. As Tsing writes, “human nature is an interspecies relationship” (cited in Haraway 2008, 19). This is particularly true when considering the multitude of microbes, viruses and bacteria that reside in human bodies, further blurring the distinction between species. Thus, in Donna Haraway’s words (2008, 4), “to become one is always to *become with many*”. The term ‘becoming with’ signifies a symbiotic relationship, in which multiple species cohabit a single space and impact each other in various ways. Haraway maintains there are no clean lines between human and nonhuman, and seeks to focus on the muting and blending of the two – the spheres in which they (be)come together. The field of multispecies ethnography is thus a subversive project of giving voice and subjectivity to the nonhuman, which has typically been labeled as an ‘other’ to the rational man as autonomous subject (Haraway 2008, 18). My goals for this thesis align themselves with those of multispecies ethnography, as I wish to describe the multiple ways in which fireflies and humans have coexisted and shaped each other’s existence. Fireflies have long made their mark on human existence, aided by human impact on the environment. As they have shared the same environment, namely satoyama landscapes centred around the river, fireflies and humans have lived together, grown used to each other and affected each other in a form of co-becoming. As Raffles (2010, 3) writes, “Long before our time, there were the insects. For as long as we’ve been here, they’ve been here too (...) Not just deeply present in the world but deeply there, creating it, too”. Similarly, fireflies have been ever-present in the lives of humans living in satoyama landscapes, creating and shaping the environment they share. These notions will receive a more thorough examination in chapters five and six.

## **1.5 Summary of Earlier Research**

There is little information to be gained on firefly villages in English. In Japan, there is a considerable amount of scientific literature that focuses on the biology of the firefly (elaborated on in chapter two), whereas literature on firefly villages is more scarce and is limited mostly to website and newspaper articles advertising firefly festivals, as well as a few articles describing how firefly villages are used as a form of regional revitalisation. There are

also numerous websites or blogs (run by actual firefly organisations, or by laypeople with an interest in fireflies) that write about firefly protection. These articles and blogs generally hold positive attitudes toward the work of firefly protection groups, though there are critical views as well (I will elaborate on some such criticisms in chapters 3 and 5).

One of the largest (and also oldest) books on fireflies is “Hotaru no kenkyū” (Firefly research) by Minami Kiichirō, published in 1961. This book gives a detailed description of what was known about fireflies at that time, incorporating folklore, songs, regional differences, as well as the history of fireflies in Japan, making it an impressive, seminal work. Another work I have found illuminating is Kada Yukiko’s “Hotaru no fūkeiron” (Firefly landscape theory), a chapter in the 1992 book “Theories on Images of the Environment”. Here, utilising the results of a three-year study in Shiga prefecture, Kada discusses the symbolic value of fireflies and their meaning for people and the environment. Similarly, in “Hotaru no mizu, hito no mizu” (Fireflies’ Water, People’s Water, 1993), Yūma Masahide discusses the relations between fireflies and people in the context of water, as historically they both have depended on the same water source.

As for literature written in English, there are not many sources that deal with the topic of firefly villages exclusively and in depth. The best example of such a source would be Okpyo Moon’s 1997 article “Marketing Nature in Rural Japan”. Here, Moon examines the ‘village revitalisation movement’ (*muraokoshi undō*) and the different ways such movements have exploited and commodified nature in the name of tourism. She cites firefly villages as an example of such commodification of nature, as they are often used as a way of drawing tourists to remote areas. With the decline in agriculture, tourism became an important part of the rural revitalisation movement in the 1970s and 80s, which resulted in the ‘wrapping’ (in Hendry (1997)’s term), advertising and selling of any elements of local culture that might appeal to outsiders (Moon 1997, 221). Seeing as such rural areas are rich in nature but lacking in economy, what gets wrapped and sold are often natural resources (but also regional products and historical or cultural items). Moon’s point is that this commodification of nature involves an inevitable destruction and transformation of the nature in question as well as the meaning of the concept of ‘nature’ itself. Nature is thus distorted and takes on new meaning, as something cultivated and tamed – much like the tamed nature of satoyama landscapes have come to be seen as natural landscapes. According to Moon, urban people are then encouraged to come and interact with this cultivated nature, rather than a wild, raw form of it. Fireflies

are thus exploited in the name of nature tourism, used as an attraction for urbanites who want to feel a connection (*fureai*) with nature. Here inherently lies an idealisation of a past in which fireflies were abundant and easily spotted, as well as nostalgia for such natural beauty and the community of one's *furusato*.

Erick Laurent and Ono Ken, in their article "The Firefly and the Trout" (1999), examine the activities of firefly protection groups in the Kansai area in the 1990s. However, rather than discussing particularities of these firefly groups, the paper seeks to compare their activities with those of trout fishing cooperatives, with the goal of analysing a shift in attitude toward animals in Japanese culture. At seven pages, the paper does not penetrate very deep, but manages to frame a perceived problematic shift in relations toward animals. For instance, the authors identify three 'chronological steps' characterising the relationship between fireflies and the Japanese: *hotarugari* (catching fireflies), *hotarutori* (taking fireflies) and *hotarumi* (looking at fireflies) (Laurent and Ono 1999, 150). They emphasise a shift from the 'traditional' way of handling fireflies (in which it was normal to catch and touch the fireflies, hence the taking and catching) to a supposedly 'non-cultural', scientific relationship in which anything but looking is strictly prohibited (Laurent and Ono 1999, 153). According to them, a consequence of the firefly protection movement is the loss of cultural characteristics in the way Japanese relate to animals. They argue that such a shift, from catching fireflies to looking at them, suggests a distancing, which then amounts to an objectification of the nature in question. Further, they write, "What is amazing, in both cases but perhaps mainly with regards to the firefly protection movement, is the speed with which the shift has occurred, without debate of any sort. All of a sudden, ecological concerns sprung around fireflies and everyone changed their habits without comment" (Ibid, 154).

Later, the authors point out the fact that most of the fireflies that can be seen now are in fact bred and not wild (i.e. local, natural) species, a valid point that is central to later discussion (mainly in chapters 3 and 4). Further, they mention the growing resistance of biologists and other specialists toward the firefly protection movement, as they stress the "dangers of blindly accepting environmental ideas to the detriment of traditional cultural values, and of focusing on one species" (Ibid, 154). Here they bring up the notion of a symbolic, flagship species of environmental protection that receives significant attention, thereby overshadowing other less charismatic species' need of protection. This will be further discussed later, notably in chapter 2.



Both of these articles are now over twenty years old, and since then, the word ‘firefly village’ only garners a few mentions in a few articles, mostly referring to Moon’s work. To my eyes, gathering more recent information on this topic is essential, so as to consider whether the situation is still the same. As firefly villages are an ongoing phenomenon it is natural to assume that they do not stay fixed and constant, but rather experience numerous shifts and changes. It is therefore high time, in my view, for a new study on the subject. On the other hand, there have been many works on the concepts of *furusato* and *satoyama* – Jennifer Robertson and Catherine Knight are but a few of them, but as their work is seminal I will be working with their definitions.

### *Note on Terminology: Hotaru no sato or Firefly Villages?*

The term ‘firefly village’ has been used both by Laurent and Ono and Moon to describe *hotaru no sato*. Moon also offers ‘firefly towns’, or *hotaru no machi*, as an alternative term. This latter term seems to have gone out of usage, as a web-based search in English reveals only Moon’s article. Searching in Japanese gives mostly results related to the newly constructed redevelopment project ‘Hotarumachi’ in Osaka (finished in 2008), which would give reason to suspect that *hotaru no machi* is no longer used in order to avoid confusing it with this new facility. As for the current term *hotaru no sato*, what exactly is meant by it? Is ‘village’ an accurate translation of the term?

The term ‘hotaru no sato’ is a name used for an institution, organisation or establishment working to protect fireflies, and is sometimes used more generally as a common name for a place in which fireflies thrive (in other words, their natural habitat). Thus, firefly villages are not real ‘villages’ as such, but could be used for either a village or town in which fireflies emerge each year, or more loosely, a natural habitat for fireflies, such as a landscape with a river or irrigated rice fields and low light pollution in which fireflies are able to prosper. Common for such places is that they are managed by local volunteers, normally non-profit organisations.

In 1989, the Ministry of the Environment (Department of Nature Conservation) designated 119 locations as protected areas for different species, as part of the program *furusato no ikimono no sato hyakusen* (‘one hundred habitats of the living creatures of our hometowns’).

This is a program created to raise awareness of biodiversity and increase public interest in endangered species. Most of the species on the list are charismatic, such as dragonflies, butterflies, frogs and fireflies. Notably, a disproportionately large amount of these locations is dedicated to fireflies and firefly protection. Kada (1992, 45) finds that of 119 locations, 64 are named after fireflies (*hotaru no sato* or firefly habitat), 17 are not named after fireflies but have firefly protection as their main goal, and 6 have fireflies as an auxiliary target of protection – making the total number 87. However, this was not the total number of firefly villages in existence at the time, and it goes without saying that the number looks different today. Whereas Moon (1997, 225) puts the number of places called *hotaru no sato* at 85, Hosaka et al. (2016, 233) put the number at 650 in 2016. Additionally, many of these are considered famous places to view fireflies (*hotaru meisho*) – but not all *hotaru meisho* are designated *hotaru no sato*. Some nature parks, for instance, have fireflies, but do not call themselves *hotaru no sato*.<sup>1</sup> To be considered *hotaru no sato*, it seems there must be an element of active conservation involved. Such an exponential growth of places called firefly village in the past thirty years may be an indicator of the popularity firefly protection has enjoyed in recent years.

I have chosen to follow Moon and use the translation firefly village for *hotaru no sato* throughout this thesis. The most obvious English translation of ‘sato’ is ‘village’ (or ‘hamlet’), but other possible translations include ‘countryside’ and ‘hometown’. Thus, it includes an implication of home, or at least one’s parents’ home. Perhaps it also bears a slight connotation to *furusato* and the nostalgia this word implies. According to one of my informants, a farmer in Fukuoka prefecture, ‘sato’ refers to the scenery or landscape of a village, whereas ‘mura’ (another word for village) refers more to the liveliness of a village – that is, to the people who live there. ‘Sato’ focuses more on aesthetic, and is more focused on surroundings than people. ‘Sato’ may thus be used to emphasise the rural or aesthetic beauty or atmosphere of a place – in this sense, it is definitely a more romantic and nostalgic term than ‘mura’. The English word ‘village’ does not carry such an implication, but refers to a small, often rural and perhaps quaint human settlement. The direct translation of ‘*hotaru no sato*’ itself is also ambiguous, as it may be translated either to ‘village of fireflies/firefly village’, or ‘home for fireflies/firefly hometown’. Depending on which perspective we have in mind, we may find either translation plausible. In the case of firefly villages, perhaps the

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<sup>1</sup> Examples include the Expo Commemoration Park in Osaka, Roman Forest Republic Park in Chiba, Uji City Botanical Park in Kyoto, and Nanatsudo Park in Ibaraki.

use of ‘sato’ is meant to show a close connection between people and nature by implying that the home of fireflies is also the home of people.

## **1.6 Methodology: Summary of Fieldwork**

To gather data for this thesis, I spent four weeks of June and July 2018 conducting ethnographic fieldwork, where I visited two different firefly villages located in central Honshu. It was necessary for the fieldwork to be done in June and July, as that is typically when fireflies emerge from their pupae, depending on the location.

One difficulty in planning the fieldwork was selecting the locations to visit – as there are so many different places throughout Japan that are classified as firefly villages, I felt there should be some sort of selection criteria. How many should I visit and where? Should they be situated close to each other, or fairly spread apart? Firefly villages are spread fairly evenly throughout the country, with a sparser amount in Hokkaido and Okinawa and a larger amount in Kyushu, but with the largest amount located in central Honshu in prefectures such as Gunma, Aichi and Nagano. The fact that I did not have the opportunity to travel before mid-June also limited the places I could visit. Further south in the country, fireflies can be seen as early as May, and starting earlier would have increased the possible locations to which I could travel. Another criteria I used when selecting locations was accessibility. As firefly villages are located in rural areas, they are not always easy to access by way of public transportation – in fact, many of them are located about a twenty minute drive from the nearest train station. It was therefore important to me to have relatively easy access in getting to these places, and also to have accommodation for the duration of my stays.

In the end, I chose to visit Tatsuno, a town of around 20,000 inhabitants located in the upper Ina valley of central Nagano prefecture. The town is encircled by mountains, with the Tenryū river flowing through it. The town’s main industry is the production of camera lenses, and local specialty products include sake, apples and matsutake mushrooms. They also hold a week-long firefly festival in mid-June that attracts visitors from the entire country. During my stay in Tatsuno I stayed at a guesthouse located very close to the train station and about fifteen minutes from the Hotaru dōyō park, which is the location to which most people go to view fireflies. I was very fortunate to come into contact with a key informant, Harumi-san (whose name is pseudonymised in this thesis), several months before I arrived. She runs the

guesthouse in which I was staying, and was extremely helpful in supplying me with information about the town and introducing me to several potential informants through e-mail. Once I arrived, she served as a constant support for me, going so far as driving me to interviews and other events. She had many contacts in the local community, including people working at the town hall, local journalists and TV reporters, the local *chiikiokoshi kyōryokutai* (“regional revitalisation cooperation squad”; a program to promote regional revitalisation), a local school teacher engaging her 4<sup>th</sup> grade students in raising bait for fireflies, a group of elderly women engaged in exercising and cooking healthy meals together, as well as several other people who had been or were involved in firefly protection activities.

After my stay in Tatsuno, I travelled to Minakami in northern Gunma prefecture. Minakami is a hot spring town located in the mountains of Gunma prefecture, close to the Niigata border. Like Tatsuno, the town has around 20,000 inhabitants. The second longest river in Japan, the Tone river, flows through the town. The hot springs are an important tourist attraction, but people also come here for outdoor activities such as rafting and hiking. Their annual firefly event is held at the Tsukiyono firefly park, located right next to a bullet train station. Whilst in Minakami I also stayed at a guesthouse, located somewhat far from the firefly park. Surprisingly, the guesthouse manager, Harunobu-san (also a pseudonym), had a great interest in fireflies, and became another important informant. His kindness was also striking, as he would drive all the guests at the guesthouse to the firefly park to view fireflies each night – a serendipitous factor I had not anticipated.

I worried I might miss out on possible regional differences by visiting places in relatively close proximity to each other, but on the other hand this proximity also lent itself to comparison within a region. There are several similarities between the two towns, but there are also differences. Whereas they are similar with regards to population and scenery, as well as both relying on tourism, they differ in the amount of emphasis they place on their fireflies. I stayed for a longer amount of time in Tatsuno, and I was able to experience their firefly festival in its entirety, which I was not able to in Minakami. The main focus of my analysis will therefore be on Tatsuno, whereas I will use Minakami as a basis for comparison.

This thesis is based on formal and informal qualitative interviews as well as, in the case of Tatsuno, participant observation in the form of taking part in various activities and daily

happenings as the town geared up to its week-long firefly festival. My data is based on these interviews, which consist of five recorded formal interviews (all between 45 minutes and 90 minutes), three unrecorded formal interviews, and dozens of informal conversations. I also engaged in non-participant observation, which included listening to people's conversations while viewing fireflies. While engaging in fieldwork I paid several visits to the local library in Tatsuno and picked up several resources on fireflies, which I have incorporated into my research and analysis. During my stay, I went to view fireflies fifteen times in seven different locations – three of them designated firefly viewing spots (*hotaru no sato*), and four of them in less controlled areas (what could more closely be defined as a natural habitat).

The internet has also been an important source of data for me as, while I have not been able to visit many firefly villages, I have been able to visit their websites online and read about their activities and motivations. Part of my methodology for this thesis has therefore included looking into several of the numerous existing firefly organisations and reading what they write about themselves. This includes non-profit organisations such as NPO *Hotaru no Kai*, an educational organisation working to raise awareness about issues regarding fireflies, whose website contains a lot of information about their beliefs and activities. Chapter five will include a more in-depth analysis of these statements.

My fieldwork also led me to finding new connections and angles to my research, as well as new opportunities for more fieldwork. After my stay in Gunma prefecture, I travelled to several locations further south in the country, and my research would often come up as a topic of conversation. I have therefore been able to glean some insights from people from various other parts of the country as well. This includes spending a few days with a group of people working on creating *takeakari*<sup>2</sup> as a form of regional revitalisation (more on this in chapter 3). I coincidentally met these people when they were in Tatsuno creating bamboo lights for the firefly festival and was invited to their base in Kumamoto. Such experiences served as proof that the right mindset – of being flexible and willing to go wherever the research takes you – can often lead to exciting opportunities.

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<sup>2</sup> *Takeakari*, or bamboo lights, are installations made out of bamboo stems with patterns drilled into them – placing lights inside the bamboo creates a spectacular visual effect.

### *Note on Anonymisation and Language*

During my fieldwork, I was fortunate to meet many generous and enthusiastic people who were willing to talk to me about their activities with fireflies and regional revitalisation. My informants are a varied group of people, including people working as a school teacher, biologist, fisherman, journalist, farmer, bamboo artisan, as well as fourth graders, high school students, elderly women, and the mayor of Tatsuno. Out of respect for their privacy, I have created pseudonyms for my informants, presented along with the suffix –san (e.g. ‘Harumi-san’). ‘San’ is a gender neutral equivalent of Mr./Mrs./Ms., and thus works to further conceal identity. The only times I have not pseudonymised names are when the person in question is a public person, well-known in the community and easily searchable. In these cases, I have kept their name and title (e.g. Mr. Iguchi Yutaka). I have also decided to render Japanese names in Japanese order, with surname first and given name second. With regards to citations, all citations from interviews have been translated by me. Further, I have chosen to italicise most Japanese words when introducing them for the first time. Any translation of such words is mine unless stated otherwise.

## **1.7 Discussion of Reflexivity and Limitations**

Ethnography is a methodology based on systematically observing and studying people and cultures. It is, in other words, the study of life outside of a controlled environment (Murchison 2010, 4). The most common way of conducting fieldwork is through participant observation. There is, however, an apparent paradox in this term, as an observer is usually seen as more detached from the situation than a participant is (Murchison 2010, 85). One of the most distinctive problems with ethnography as a methodology is the fact that it relies so heavily on the researcher’s own interpretations of what is being observed. It is thus vulnerable to many kinds of bias on account of the researcher’s own expectations. A concept which lies at the centre of ethnography is thus the issue of reflexivity, which is something all practitioners of social scientific qualitative methods should strive for.

The term reflexivity is defined by Davies (2008, 4) as a process of self-reference, and awareness of “the ways in which the products of research are affected by the personnel and process of doing research”. In other words, a researcher’s involvement with the topic of research will inevitably influence, act upon and inform this research. It should therefore be an aim for researchers to explore the ways in which they themselves are implicated in their own

research. As a researcher, particularly in the context of participant observation, one is both an insider and outsider at the same time. One is also simultaneously a researcher and a regular person. How does one consolidate these two roles? Is it even possible? Can the researcher ever truly separate herself as a person from the research situation? The process of reflexivity is a form of self-evaluation, then, in which the researcher examines his or her own behaviour to determine whether anything that could potentially affect the research in a negative way is going unnoticed (Davies 2008, 3).

Throughout the research and writing of this thesis, I have tried to focus on staying reflexive. Reflexivity can be used as an important method for self-checking throughout the research process, of how one's worldview and sociocultural context necessarily and subconsciously affects every part of this process. Whilst writing my fieldnotes, I had a section dedicated to reflecting on my actions and presumptions, and negotiating my role as anthropologist. Though perhaps unavoidable, I believe there are many limitations affecting my work. These include my inexperience going into the field, the all too short length of time I spent there, and the exhaustion from being in the field combined with the pressure to write detailed fieldnotes every day eventually causing me to rush through writing them. My language abilities, while enough to be able to prepare and conduct interviews in Japanese, sometimes held me back from being able to ask more sensitive, complicated or spontaneous questions in the interview situation.

As for the role of the anthropologist, there were times I felt particularly conspicuous, especially whenever I had my notebook out in a public setting. I was not quite sure how to present myself – whether it would suffice to say that I am a student who is interested in firefly protection, or if I would have to introduce the aims and motivations for my research at each turn. Additionally, as I am not an anthropologist and this is my first experience with fieldwork, this might have taken away some credibility and authority for me, but might also have helped others open up to me. I typically introduced myself as a student who is writing a thesis about firefly villages. As mentioned above, although I did bring my voice recorder for most interviews, I did not always use it, particularly in situations where it felt inappropriate to do so (such as times where the 'interview' was more like an informal conversation that went off on many tangents). In my second location in Gunma prefecture, I regret not being more proactive in searching out informants beforehand – as it were, I was left with few contacts in this area, though I was fortunate to meet Harunobu-san, the host where I stayed, who

generously drove all of his guests to see fireflies each night during the season. He was also extremely knowledgeable about fireflies and had no qualms about sharing his knowledge.

Some of these limitations, such as inexperience and language, are inevitable, but some might have been avoided with more extensive planning before departure. Another issue is that of achieving objectivity in one's work, as the researcher's preconceived notions and assumptions may affect the way she interprets different phenomena and situations. The data collection process is thus selective and may be based on what the researcher deems to be important or relevant. In regards to my own research, this has meant acknowledging the existence of preconceived notions or biases I had regarding the research topic, as well as thinking critically about any hypotheses I might have regarding my findings. For instance, hypotheses I had beforehand were influenced by Moon and her claim that firefly festivals (and the like) are akin to exploitation and commodification of fireflies, but I tried to not let this affect the way I interacted with people in the field. Further, Moon (1997, 230) makes the observation that it is largely women who are interested in firefly protection – though this is not necessarily an impression I got while in the field. Due to aforementioned limitations there may thus be many things missing from my account of firefly villages, but by utilising updated material from many different sources I have attempted to gain and present as clear a picture of the situation as possible.

## **Layout of Chapters**

This first chapter has introduced the topic of this thesis as well as the main goals, theory and methodology of my research. Chapter two will focus on the firefly itself, examining its biology and life cycle as well as its historical and cultural significance for Japanese people. Using the firefly festival in Tatsuno as a case study, chapter three will then look at nature tourism and firefly festivals, and discuss the issue of exploiting and commodifying nature in the name of tourism and town-building. I will here examine the conflict between economy and ecology, while also considering the impacts non-native species of firefly may have on native populations. In chapter four I will discuss the origins of firefly protection, including how and why it started and what it looks like today, combined with a look at the various town-building activities occurring in Tatsuno. Chapter five then examines the importance of nostalgia and emotion in people's relations to fireflies, as well as considers the myth that fireflies only live where there is 'clean water'. The chapter will include an analysis of various



discourses on fireflies and nostalgia by different firefly villages, and will also discuss the role of children. The final chapter will focus on the concept of satoyama and consider its usage in discourse on nature conservation. I conclude the thesis with a discussion of several issues of firefly festivals and tourism, as well as an emphasis on the importance of insect conservation.

## 2 Biology and Cultural Significance of Fireflies

The melancholy tune of “Light of the firefly” echoes in the assembly halls of high school graduations and in department stores at the end of the day; poignant lines about glowing, ephemeral bugs are found dotted throughout haiku poetry books; young children sing “Firefly, come” while skimming for lime-green lights in the darkness – fireflies have flashed and glowed their way into the symbolic imagination of Japanese culture. Before I move on to an analysis of the entwinement of fireflies and regional revitalisation, I would in this chapter like to give a brief introduction to the biology of the firefly, as well as several aspects of its cultural and aesthetic significance, including its appearances in art, literature, and film. It is my hope that this will help solidify a picture of the firefly and its way of life, as well as illuminate some of the reasons for its popularity in Japanese culture. I believe such information to be useful, not only as background knowledge for the remaining chapters, but also as a basis for many of the viewpoints explored later in the thesis, especially what regards the historical affection for fireflies in Japanese culture.

### 2.1 Biology of the Firefly

The firefly is, contrary to what one might expect, not a type of fly, but a type of beetle of the *Coleoptera* order. This order encompasses all beetle species, and is also the largest order of insects; with about 400,000 species, beetles constitute about 25% of all known animals (Stork et al 2015). Characteristic of all species that constitute *Coleoptera* are hardened front wings (*elytra*) and going through a process of metamorphosis in their development (*holometabolism*). The fireflies are a family of beetles with the Latin name *Lampyridae*, which incorporates more than 2,000 species of firefly. Fireflies are typically soft-bodied, with hardened elytra (though there are species in which the female does not have wings) and, like all beetles, undergo a complete metamorphosis in their development from egg to adult. In Japan, there are more than 40 species of firefly, and the most common and popular of these is the Genji firefly (*Luciola cruciata*). The word ‘firefly’ (*hotaru*) is, I find, often used as a synonym for the Genji firefly (*genjibotaru*), which is the species people typically think of

when fireflies are mentioned. In this thesis, too, I am mostly concerned with Genji, and when I use the word firefly I will mostly be referring to this species.

Another common and distinctive species is the Heike firefly (*Aquatica lateralis*). One special characteristic sets these two species apart from all other species of firefly in the world, namely that Genji and Heike are the only firefly species that are aquatic at the larval stage. Of the two, the Genji firefly is largest and has the strongest glow, which is perhaps why it is so beloved. The naming of Genji and Heike is ambiguous – it may have been inspired by the Heian period literary works *Tale of Genji* and *Tale of Heike*, or perhaps by the two eponymous historical clans who were at war against each other in the 12<sup>th</sup> century. Known as the Genpei war, the naming of the largest firefly as Genji may be reflective of the Genji clan's eventual victory (Corkill 2008). Other types of Japanese firefly include the Hime firefly (*Luciola parvula*), the Mado firefly (*Pyrocoelia*) and the Oba firefly (*Lucidina biplagiata*). These fireflies are not as large or as popular as Genji or Heike and their glow is also not as strong, some glowing only at the larval and pupal stage.

Fireflies are nocturnal animals, though an even more accurate term would be crepuscular, meaning active around twilight, or even vespertine, meaning active after dusk. They display sexual dimorphism, with the female being larger in size and possessing only one light-emitting section on its abdomen, whereas the male has two. Thus, female fireflies do not emit as much light and typically do not fly as much or as high as males, who do most of the work in attempting to attract a mate. According to one of my informants in Gunma prefecture, Harunobu-san, fireflies cannot hear and are thus not bothered by sound, but they are vulnerable to artificial lighting. If exposed to too much artificial light, they will die. This is part of the reason why flashlights are forbidden at firefly viewing events, but also because they will disturb the mating flashes of the fireflies themselves. However, apparently they cannot see LED lights, so it is no problem to use LED. Harunobu-san was willing to show me what he meant by this. After viewing fireflies one evening, he drove to a non-LED streetlight and showed me how it was swarming with all kinds of flies and insects. Next, he drove to a different area with LED streetlights, and demonstrated the striking difference in the amount of insects, there being far less at the LED streetlight.<sup>3</sup> Harunobu-san claimed that it was the same for fireflies. He told me about an experiment he had carried out with the Heike firefly,

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<sup>3</sup> This is supported by other sources (University of Bristol 2016, Parsons 2016).

in which he turned on the hazard lights on a parked car, thereby attracting Heike males, who perceived the flashing lights as the mating flashes from a female firefly and came flocking towards it. He tested this with several cars, and found that it only worked on older cars that do not have LED.<sup>4</sup>

## Life Cycle

Fireflies, like all beetles, go through several stages of metamorphosis before they reach their adult stage. They hatch from eggs and live underwater as larvae, then move onto land to pupate in a cocoon. They then hatch from this cocoon as a fully formed adult. This section will briefly describe the various stages of development of a Genji firefly.

### *Egg*

Adult fireflies communicate by way of flashing bioluminescent light in order to seek a mate. After mating, the female will lay eggs in moist moss near the water around the end of June. Firefly eggs are about 0.5 mm in size, and a female will lay between 500 and 1,000 of them. Yūma (1993) researched this in a laboratory setting, and found that the larger the female, the more eggs she will produce – though there may also be a difference between the amount of eggs laid by a female raised in a laboratory compared to a wild firefly. At first, the eggs are soft and a pale orange colour, but they gradually turn hard and yellow in hue (Tokyo Genji Firefly Research Institute, n.d. a). One can also observe a faint glow of the eggs during this



stage. The eggs will hatch after about thirty days, around the end of July. The hatching process starts around midnight and begins by the larvae tearing off a part of the egg's surface, and coming out. The grubs then crawl into the water, and the life of the larvae begins.

Fig. 2.1: Genji firefly eggs in moss.

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<sup>4</sup> Harunobu-san was convinced that he was the only one in Japan who had done this, and said he wants to keep this a secret from other Japanese people. However, Suzuki-san in Tatsuno also knew about this, and I found a blog post talking about the same phenomenon (Fukui 2018).

### *Larva (Larval Stage)*

The larvae live underwater and subsist mainly on a type of freshwater snail known as *kawanina* (*Semisulcospira libertina*). Whereas Genji firefly larvae only eat *kawanina*, Heike larvae eat several other types of snail, such as pond and mud snails. They are nocturnal, as are adult fireflies, and are also able to emit light, presumably to fend off predators. They are less active in winter, staying at the bottom of the river, whereas they become more active in the spring. The soft-bodied larvae grow by shedding their skin (exoskeleton) several times, and then finally make their way to the shore in spring and bury themselves several centimetres underneath the ground to pupate. However, if a larva cannot get enough nutrition, it will spend another year as a larva. The shedding of skin is also called moulting, and the different stages between each moult are known as instars, in which the larvae grow larger with each stage of development. The Genji firefly larva needs to shed its skin at least six times before it is fully grown (Tokyo Genji Firefly Research Institute, n.d. b). This is part of the importance of *kawanina* (further discussed in the next chapter) as, without enough food, the larvae cannot grow into adults.



Fig. 2.2: Genji firefly larva.

### *Pupa (Pupal Stage)*

On a spring night, usually around the end of April, the larvae emerge from the water and come up onto the shore to begin the next phase of their development. With glowing bodies, they dig down into the moist dirt and release a liquid from their mouth that causes the earth around them to harden, creating a small room known as a dirt cocoon (Tokyo Genji Firefly Research Institute, n.d. c). In the dirt cocoon, the larva eventually sheds its skin after five weeks and becomes a pupa. During its pupal stage, the firefly does not feed, nor does it move, but it will glow a lot at this stage, stronger than before. At first, it is pale cream in colour, and eventually gets darker in colour, to yellow and orange. After spending ten to

fourteen days as pupae, the firefly then prepares to *eclose* (emerge): now, its colour gradually changes to black in a span of about three hours, the wings harden and, after three or four days, it will break the dirt cocoon and emerge into open air, typically on a night after it has rained (Tokyo Genji Firefly Research Institute, n.d. c).

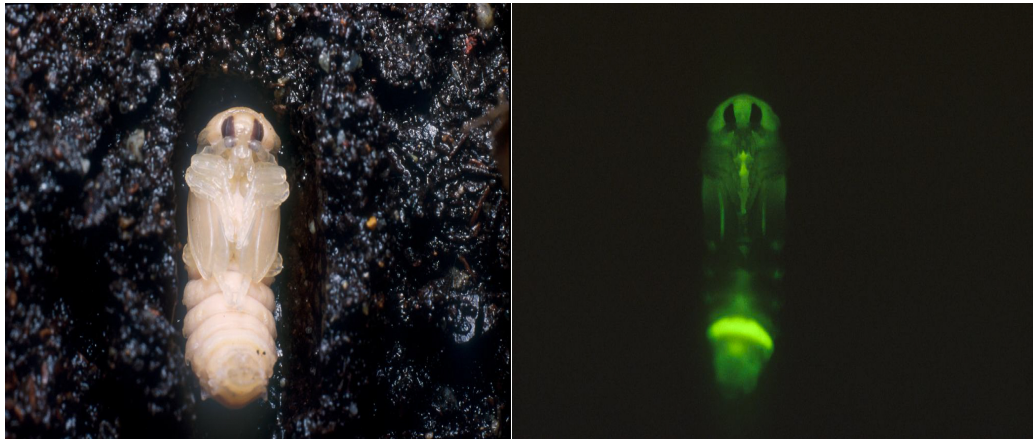


Fig. 2.3: Genji firefly pupa. Right: Glowing pupa.

### *Adult (Imaginal Stage)*

It is the adult, or *imago* form of the firefly that is most recognised and loved by Japanese people. The Genji firefly is between 1 and 2 centimetres in length (the female is larger than the male), with shiny black elytra, and has a characteristic bright red *pronotum* (the foremost part of the thorax), separated by a black or brown line in the middle. As an adult, the Genji firefly only has a life span of about ten days on average, during which time it has to find a mate and procreate.

Fireflies find a mate through bioluminescent flashing. This works by chemical properties in their bodies reacting with each other to emit energy in the form of light. Specifically, these properties consist of the compound luciferin, and luciferase enzymes (oxygen and adenosine triphosphate (ATP) are also required). Luciferases react with luciferin, causing it to oxidise and convert to oxyluciferin, thereby producing a bright, green-yellow bioluminescent light (Baldwin 1996). The light produced is a so-called ‘cold light’, with no infrared or ultraviolet properties. Several reasons for the bioluminescence of fireflies have been suggested, including fending off predators (*aposematism*). The most prevalent theory, however, is that they use their light to communicate with each other, particularly in order to attract a mate. This communication is not fully understood, however. In Genji fireflies, males light up while

in flight, whereas females do not typically fly when they give off light, instead sending answering flashes from where they perch. According to Harunobu-san, females do not light up and are thus harder to see, and they do not fly. Harunobu-san also asserted that males use their lights to attract females, but females only respond to “cool light” (*kakkoi hikari*).

Different species of firefly have different ways of communicating with each other (Ōba 2004, Iguchi 2009). Even within the same species, there are geographical differences with regards to flash communication systems. For Genji fireflies, flashes happen every four seconds in eastern Japan, whereas in Western Japan they happen every two seconds. Tatsuno is in the middle of the country, which is reflected by the flashing of the fireflies, which happen about every three seconds.<sup>5</sup> In other species of firefly the flashes occur at a different rate. The Heike firefly, for instance, has more rapid flashes<sup>6</sup> (this is also the reason Heike falls for the above-mentioned trick with car hazard lights, whereas Genji does not).

Fireflies have several natural enemies. They may be killed by rain or wind, or preyed upon by spiders, frogs or bats. When caught by a predator, a firefly will release a milky white liquid from its stomach – a defensive steroid known as lucibufagin (Yūma 1993, 87). This liquid is odorous and is poisonous to animals such as birds and lizards. Therefore, animals with taste buds do not eat fireflies and will spit them out after attempting to swallow them. Minami (1961, 255) mentions how fireflies taste extremely bitter when put inside one’s mouth, recounting a story of a firefly catcher who would put the fireflies he caught in his mouth and then spit them out into a bag.

As for the feeding habits of adult fireflies themselves, a popular belief among scientists and laypeople has been that they do not consume anything once they emerge from their pupae. This is what is maintained in most of the literature and by most of my informants, including Iguchi Yutaka, a biologist specialising in fireflies. However, Tsuchiya-sensei, a retired professor of erosion control who now works with raising firefly larvae and kawanina in

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<sup>5</sup> There is also another implication of this that has to do with the importation of foreign firefly species, which will be further discussed in the next chapter. Native fireflies in Tatsuno have been affected by the importation of foreign species, causing introgression, or hybridisation of species.

<sup>6</sup> The difference between the flashing of Genji and Heike is often described using onomatopoeia: pika- pika- for Genji, and chika-chika-chika for Heike. Additionally, the flying pattern is different – while Genji flies in a meandering, up-and-down motion, Heike flies more in a curved upward line.

Tatsuno, was able to tell me that, very recently, some researchers from Hachiōji in Tokyo have studied the firefly and its relation to the plant yamabōshi (*Cornus kousa*, Japanese flowering dogwood) – a small deciduous tree with white flowers. They have recently discovered that despite the popular notion that fireflies do not eat or drink anything after they become adults, they might actually drink the nectar from these flowers. This is still a very new discovery, however, and has not yet been confirmed. Tsuchiya-sensei went on to explain that there really is a lot we do not yet know about fireflies and that he had a hope that the children of Tatsuno would take an interest in studying these insects, so that one of them could perhaps be the first to take a picture of fireflies drinking nectar. He also mentioned that because this is the first discovery of this in Japan, it means it is also the first in the world (referring to the fact that Genji fireflies are only found in Japan). He emphasised the importance of young researchers questioning established knowledge as a way to make scientific progress.

### *Habitat*

In the discourse on fireflies in Japan, many people express the view that fireflies can only live in environments where there is clean water (Kada 1992; Yūma 1993). However, this is not true of all species of firefly, as there are only two species in the world that are aquatic, namely Genji and Heike. In chapter 5 I will say more about the implications of the belief that fireflies can only survive where there is clean water, and what this has meant for the relations between fireflies and humans. Here, however, it will suffice to say that Genji firefly larvae live in flowing rivers in rural areas with low light pollution (however, the flow of the river cannot be too strong, or else they will be carried away by the current), whereas Heike can live in both rivers and other damp areas such as rice paddy fields. Despite their smaller size, it would thus seem that Heike is the more sturdy species, also being more resistant to water pollution.



Fig. 2.4: Adult Genji firefly. The glow from its light emitter is faintly visible on the end of its abdomen.

Harunobu-san explained to me about how fireflies are special because they need three environments to live: water, earth and sky.



Hardly any creatures have the same requirements, and they are therefore very delicate creatures (other people I spoke to also used the word *delicate* when describing the environmental requirements of fireflies). Another common idea is that they also need a lot of clean air and greenery around them (Tatsuno firefly village revitalisation promotion convention 2005). This is why fireflies are a perfect flagship species for environmental protection, which I will discuss at the end of this chapter. First, I will briefly discuss some key aspects of the cultural significance of fireflies in Japan.

## 2.2 History and Cultural Significance of the Firefly in Japan

Certain insects enjoy an amount of popularity and admiration by Japanese people, mostly for their aesthetic beauty (such as butterflies or dragonflies) or their song (such as crickets or cicadas). Although a cultural fascination with certain insects is by no means a uniquely Japanese phenomenon (such as the significance of scarab beetles in Ancient Egypt, or similar aesthetic affinities in China and Korea), insects have arguably held a larger place in Japanese culture than in many other cultures of the world (such as that of Norway, for instance). One possible translation of a poetic old name for Japan, 秋津島 ‘Akitsushima’ (used in *Kojiki* and *Man’yōshū*), is ‘Island of Dragonflies’ (as *aki* was an old word for dragonfly – though there are other, perhaps more obvious interpretations, such as ‘autumn island’) (Frédéric 2002, 20). ‘Charismatic’ insects such as dragonflies, cicadas, and more recently, rhinoceros and stag beetles, are seen as aesthetically pleasing (and in the case of the latter two, loved by children for their ‘coolness’ (Raffles 2010)). Fireflies have also long been valued in Japan for their luminous beauty, featuring in poems, paintings and songs since the Nara period (710-794 AD). They have thus gained a repertoire of symbolism over the ages and evoke feelings of nostalgia. The non-profit organisation “NPO hotaru no kai” (NPO Firefly Association) write that when they show fireflies to school classes of young children, they hold their breath and sit very still, while elderly people in old people’s homes get teary-eyed (NPO Hotaru no kai n.d. a). What sort of meaning does the firefly have for Japanese people? In this section I will attempt to describe some aspects of the cultural and historical significance of fireflies in Japanese culture.

### *Early Art and Literature*

Fireflies are often described as a *fūbutsushi* (‘thing that reminds one of a particular season’) denoting early summer. Such symbolism makes them a potent poetic subject, and they have

indeed appeared in many poems (which often require a seasonal word) throughout history. According to firefly research pioneer Kanda Sakyo (cited in Kada 1992, 41), the oldest mention of fireflies comes from the *Nihon Shoki* (one of the two earliest pieces of literature from Japan, written in 720 AD), and they also appear in the *Man'yōshū*, a seminal collection of poetry from the 8th century (and the earliest such collection), though are only mentioned in one of its 4,500 poems. However, it was in the Heian period (794-1185 AD) that fireflies first came to be used as a symbol in art and literature, a development deeply entwined with the rise of aristocratic culture. There are at least 2,000 poems about fireflies from this period, and they also appear in such ancient Heian works of literature as *The Tales of Ise* (a poetry collection) and *the Tale of Genji* written by Murasaki Shikibu in the early 11<sup>th</sup> century. In fact, the title of one of the latter's chapters is 'Fireflies' ('Hotaru'). In it, the shrewd protagonist Genji is on a mission to marry his adopted daughter to a well-to-do man and arranges a meeting at night between her and a prince, incidentally named Hotaru. In order for the prince to see his daughter's face, Genji gathers some fireflies in a cloth bag and releases them, letting them light up the room. Such a connection between the light of fireflies and feelings of love is a recurring theme in poems and literature from this time (Kada 1992, 41).

The very naming of the Genji and Heike fireflies seems to aptly reflect their early literary presence. However, as firefly researcher Tsukamoto Manabu stresses, such ancient culture is not representative of the wider Japanese population at the time, as such works of art only came from aristocrats at the court (cited in Kada 1992, 40). He stipulates that the upper class may have had a fascination with insects simply because they were so far removed from them in daily life, whereas peasants working in the fields would be much more intimately familiar with them. Separated from a life of production, aristocrats had the leisure to cultivate a culture of appreciation of various insects, animals and other natural phenomena.

By the Edo period (1600-1868) however, firefly viewing and catching had become a popular activity among the urban middle class. Far removed from nature in their own sense, perhaps people sought to find ways to become more connected to it – or what Kada (1992, 42) refers to as 'pseudo-nature'. Around this time an industry of selling fireflies emerged, and certain places were designated as *hotaru meisho*, famous places to view fireflies. Perhaps this was the beginning of an exploitative relationship between people and fireflies. The aesthetic beauty of fireflies, however, continued to be appreciated – for instance, there are more than 1,000 verses about fireflies in haiku poetry from the Edo period (Kada 1992, 42). Fireflies

were popular poetic subjects due to their ephemeral nature and strong symbolism (described in more detail below). Included here is an example of such a poem, by haiku poet Tan Taigi (1709-1771):

*Utsusu te ni*  
*Hikaru hotaru ya*  
*Yubi no mata*

Passed to a new hand  
The firefly shines its light  
Between fingers

(Translated by Carter (1991))

Additionally, there are many *ukiyo-e* woodblock prints from this period depicting people (particularly women and children) catching fireflies with tools such as mosquito nets, traps and cages made of bamboo grass, and fans.



Fig. 2.5: An Edo period woodblock print of women catching fireflies: “Beauties viewing fireflies” by Toyokuni III, ca. 1848.

### *Symbolism and Seasonality*

The firefly is highly enshrouded in symbolism. For instance, Laurent and Ono (1999, 151) write: “As a symbol (for example, in poetry and songs), it is always associated with water, rivers and ricefields. ... The firefly belongs to summer esthetics, often associated with fire (of passion as well), night (and mystery), souls of the deceased, melancholy and ephemerality, in a vast symbolic complex”. As mentioned above, the light of the firefly would be compared to feelings of love in many poems. Fireflies were a symbol of romantic longing, as their

glowing lights were linked associatively to a burning passion within. According to Gill (2009, 200), “*burning* within was linked to desire by a pun: *hi*, or “fire,” is part of the conjugation of the verb for longing, *omohi*, and continued to be so long after the “*hi*” in the longing came to be pronounced *i*”.<sup>7</sup> Consider a famous Heian period waka poem by Izumi Shikibu (ca. 970-1030):

*Mono omoeba*

*Sawa no hotaru mo*

*Waga mi yori akugare izuru*

*tama ka tozo miru*

Remembering you

The fireflies of this marsh

seem like sparks that rise

from my body's longing

(Translated by Hirshfield and Aratani (1990))

Due to their short life span after emerging from their pupae, fireflies often evoke an image of fleetingness, of being transitory. This concept of impermanence, borrowed from Buddhist thought, teaches that all things are ephemeral and perishable, including human life. Finding beauty as well as sadness in the short life of a firefly or the brief blossoming of cherry blossoms is an integral part of the philosophy known as *mono no aware* – acknowledging the wistfulness of the reality that all life must come to pass.

The link between fireflies and the souls of the dead is a curious one, based on an old belief that the lights of fireflies represented the souls of the dead. It is most likely closely related to the phenomenon of *hitodama* – will-o’-the-wisp, or a floating ball of light or fire. These were thought to be the souls of the dead, separated from their bodies (Kōjien 1998). There are several theories as to the origin of *hitodama*, including that the lights people could see were actually fireflies. Additionally, there are old folk beliefs about people turning into fireflies after their death. For instance, some children are told by their parents or grandparents to be gentle with fireflies, because they are the souls of dead people (Lacrima 2017). Another such story tells of a kamikaze pilot coming back as a glowing bug (Hiroi 1995).

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<sup>7</sup> Another type of joke is related to the firefly having a light on the lower part of its anatomy (Gill 2009, 200). These types of jokes often had sexual connotations that referred to male homosexuality, such as the saying ‘*hotaruzamurai*’ (firefly warrior/samurai), signifying men who would offer themselves to their commanders for a promotion. A more modern play on words is the use of ‘*hotarubi*’ (firefly flame/light) to describe people smoking on a balcony at night, the glow of the cigarette resembling the light of a firefly.

Laurent (2000, 68) emphasises how insects serve as an important part of children's education, for instance teaching them about life and death, as well as how different insects related to different seasons and even times of the day. One of my informants, a farmer in Nagano, told me how the evening cicada (*higurashi*) would always start singing in the evening in summer, and it was by this signal that he knew it was time to go home. One study (Takada 2012) found that interest in insects such as fireflies and rhinoceros beetles corresponds with their seasonality: in the summer, interest in fireflies flares up, while during winter it is generally very low. This is due to the fact that fireflies are a prominent symbol of summer and acknowledged as a *fūbutsushi*, a thing that reminds one of a certain season. During my stay in Japan, I spotted fireflies featured on several seasonal greeting cards (*shochūmimai*) in department stores, and they are common on uchiwa fans as well – I even spotted a woman wearing a yukata featuring a firefly pattern at a shrine festival in Kyoto. As well as a symbol of summer, the firefly may also serve as a nostalgic reminder of better days, in which they were more abundant and closer to people. The mention of fireflies is, for many, an open portal to childhood nostalgia. Many older people I spoke with would speak fondly of how they used to catch fireflies and release them in mosquito nets (*kaya*) inside their houses. This seems to have been a popular activity during summer – even though some were scolded by their parents for doing so. Chapter five will include a more thorough discussion on fireflies and childhood nostalgia.

### *Children, Songs and Folk Beliefs*

Erick Laurent (2000) argues that children have a special relationship with insects in Japanese culture. The term *konchū shōnen* (bug-loving youth, lit. 'insect boy') refers to young children (especially boys) who are enthusiastic about bugs, and has positive connotations. Especially in rural areas, a popular childhood pastime has been to go into the woods with a net and a box, look for insects such as rhinoceros beetles, and catch them. It is not uncommon, especially in rural areas, for children to be assigned summer tasks of bug catching and observation (Laurent 2000, 61), and until recently it was neither uncommon to keep insects as pets. Therefore, it is unsurprising that there are many children's songs about insects, more specifically about calling and catching them. Most of these, according to Laurent (2000, 76), are related to fireflies. The most well-known of these is called *Hotaru koi* (Firefly come). Rendered here are lyrics of the standard version:

*Ho, ho, hotaru koi*

*Acchi no mizu wa nigai zo*

*Kocchi no mizu wa amai zo*

*Ho, ho, hotaru koi*

Fi, fi, firefly come

The water over there is bitter

The water over here is sweet

Fi, fi, firefly come

Minami Kiichirō, in his seminal work “Firefly research” (1961, 270), has identified 72 different regional versions of this nursery rhyme. Lyric variations include ‘the water over there’ being salty or spicy (though ‘the water over here’ is always described as sweet), or similar, such as ‘that river over there is deep, the river over here is shallow’. Another variation is offering water, milk or tea to the firefly to lure it over, or offering it comfort as it ‘has no home’. Two similar versions from Kyoto: ‘Firefly come / I’ll give you water / you don’t have parents, so come here / you don’t have a home, so come here’, and ‘Firefly come / I’ll give you sweet water / if you don’t have a home, come over here / if you don’t have a place to sleep, come here’ (Minami 1961, 281).

Another very well known song that explicitly relates to fireflies, is *Hotaru no hikari* (Light of the firefly). Sung to the tune of Auld Lang Syne, this song is often sung by students at school graduations, and is also used by many businesses to usher customers out of the store at the end of the day. The song is from 1881, and the lyrics originally had a rather nationalistic tone, although these verses are typically not sung anymore<sup>8</sup> (Everything2 2001). In fact, fireflies are only mentioned in the first line of the song: ‘*hotaru no hikari, mado no yuki*’ (the light of fireflies, snow on the window). This imagery evokes the expression 蛍雪 *keisetsu*, used to mean diligent study. Utilising the characters for firefly and snow, respectively, it refers to students of old diligently continuing their studies by the light of fireflies in summer, and the reflection of moonlight on snow in winter, after all other light sources have disappeared. Though the song is not about fireflies per se, according to one of my informants (Mari-san) it evokes a sad feeling. The lyrics themselves evoke this feeling, with lines such as ‘this morning we part’. Something is coming to an end, be it school or something else, which may remind one of the fleeting lives of fireflies, along with the melancholy of a good thing coming to an end.

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<sup>8</sup> Including lines such as “contribute to our great country”, the second half of the song has clear militaristic associations.

Minami (1961) writes about superstitions and folk stories people have told about fireflies. He identifies several superstitious beliefs people have had about fireflies, and which regions they are specific to. For instance, in Shizuoka prefecture it was believed that it was bad luck if a firefly entered a house (more specifically, it was believed it would cause a fire), whereas in Okayama it was believed that it would rain if a firefly entered a house (Minami 1961, 243). In Niigata, it was believed fireflies can shapeshift. Additionally, the Heike firefly seems to have been thought of as a ‘sick’ creature, with the ability to make someone sick. Kada (1992) surveyed people in Shiga prefecture and found three main superstitions regarding fireflies: if one tried to catch a perching firefly one would be bitten by a snake, if one catches fireflies after the o-bon holiday one will be cursed or punished, and a firefly indoors will cause a fire. She comments on the curious idea of superstitions warning against catching fireflies at a time when firefly catching was ingrained in rural culture.

### *Popular Culture*

Examples of use of fireflies in popular culture include *Hotarugawa*, a 1977 novel by Teru Miyamoto, *Hotaru*, a 2001 movie about a love story taking place in the Second World War, and the 2004 film *Hotaru no hoshi*, about a teacher and his school class raising fireflies. Perhaps most famously, fireflies featured in an animated film about the Second World War; *Grave of the Fireflies* (*Hotaru no haka*) directed by Takahata Isao (1988). The story is based on the semi-autobiographical short story of the same name by Nosaka Akiyuki, published in 1967. The plot of the film surrounds fourteen year old Seita and his four year old sister Setsuko as their home town of Kobe is targeted in an air raid, and chronicles their attempts to survive after being orphaned. Its young protagonists and tragic end makes the film a poignant take on the innocent victims of war.

The title of the film utilises a non-traditional way of spelling the word firefly – instead of the typical 螢, 火垂る is used, which incorporates the character for fire and for ‘drooping/hanging/dripping’.<sup>9</sup> This interpretation gives the sense of ‘hanging or dripping fire’, which also creates a clearer association with destruction. In the film’s poster, lights from fireflies intermingle with the flames of bombs from fighter jets. It is not immediately

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<sup>9</sup> Another way of spelling *hotaru* is 螢 – using two ‘fire’ characters on top, of which 螢 is most likely a simplification. This association with fire bears a close similarity to the English etymology.

obvious, but if one brightens the colours of the original poster, the silhouette of a B29 becomes visible at the top of it.

Fireflies are utilised symbolically throughout the film. In one scene, Setsuko compares a kamikaze plane to a firefly, thus drawing a parallel between fireflies and bomber planes. Perhaps this is a simple comparison of their fire, as in the poster, or perhaps it is to say something of the fleetingness of the lives of the firefly and the bomber pilot. Wendy Goldberg (2009, 49-50) writes: “The fireflies are a multivalent symbol, signifying the children’s deaths and their spirits; the fires that burned the towns; Japanese soldiers and the machinery of war; and the hopeful regeneration of life through nature — something pure and untouched by grief and war”. At the end of the film, the ghosts of Seita and Setsuko sit on a bench in a field of fireflies overlooking a modern cityscape. This creates a sense of them being stuck in time, unable to move on, together with the fireflies. The firefly thus serves as a highly complex and powerful symbol within the film, but also outside the film’s context. A



Fig. 2.6: A fighter plane is faintly visible in the background of the poster for *Grave of the Fireflies*.

### *On Flagship Species*

Earlier in this chapter, I mentioned that fireflies work well as a flagship species for environmental protection, because of the idea that they need clean water and a clean, green environment to survive. Flagship species are species that are charismatic (having lovable qualities, such as the sweet face of the giant panda and the magical light of the firefly) and



thus able to serve as the head of a movement (most often a biological conservation movement), stirring people's emotions and motivations to protect the habitat of that species (Verissimo et al. 2011). Two well-known examples are the giant panda, which serves as the logo for the World Wide Fund for Nature (WWF), and the whale, which is heavily associated with the environmental organisation Greenpeace. These species have symbolic value and thus enjoy widespread popular appeal. This is often to the detriment of other, perhaps more important species in the context of the ecosystem, as less lovable species are ignored in favour of the attention given to charismatic flagship species (although paradoxically, charismatic species are often targets of hunting, and are often critically endangered themselves). As for insects, beetles such as ladybirds and fireflies have a much more positive image than weevils, for instance, who are better known as pests. Beetle conservation is important, as these animals form a huge part of the world's biodiversity (25% of all life forms). Everything is interconnected in nature, and the extinction of one species impacts many other species. We are now in a period of mass-extinction in which countless species of insects are dying out due to global warming and habitat destruction (see for instance Carrington 2018), and we still do not know the consequences of this. For successful biodiversity conservation to take place, organisations often depend on effective awareness and fundraising campaigns (Verissimo et al. 2011, 2), and flagship species are important to this end.

As I have shown in this chapter, the firefly is a creature with symbolic value. In addition to being a specific symbol of the summer season as well as connoting traditional art and poetry, the firefly is connected with both nature and water, and is believed by many to be a symbol of a clean water environment.<sup>10</sup> These elements likely facilitated its rise to the status of flagship species for water environment protection. Fireflies are regarded as an 'environment indicator' (or biodiversity indicator) – a species whose presence indicates the quality of the habitat, in this case the cleanness of the river. The choice of flagship species may be explained by the so-called Bambi effect – people are more attracted to traits shared by human babies, such as big eyes and a large forehead, thus being more willing to support the cause of animals with such traits. The firefly is not a cuddly animal, but has large eyes that may look somewhat cute when examined close-up, and is often made into an adorable mascot by many firefly villages. However, the most important quality of the firefly is its light. This mystical, magical light is

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<sup>10</sup> However, the idea of fireflies only being able to live in clean water is disputed by Kada (1992) and Yūma (1993), further discussed in chapter five.

what gives people a strong nostalgic connection to the firefly, and this nostalgia becomes perhaps the largest motivation for firefly protection as well. When we see how the elite of Heian wrote elegant poems about fireflies, how the middle class of Edo went out catching and viewing them, and how people in the present age use them as a symbol of regional revitalisation and the regeneration of the water environment, we can understand that fireflies have always been creatures that are easy to give symbolic value in Japanese daily life. The next chapter will show what a modern-day celebration of fireflies looks like, through an analysis of the firefly festival in Tatsuno.

# 3 Economy or Ecology? Japanese Firefly Festivals

There are many popular insect-related festivals and events around the world. For instance, the Hampyeong butterfly festival in South Korea and the migrations of the Monarch butterfly in Mexico attract 11,000 (Kim et al 2008, 83) and 250,000 (Hosaka et al 2016, 228) tourists per year, respectively. In Australia and New Zealand, 50,000 people come to watch glowworms (Hosaka et al 2016, 228), and as many as 100,000 people congregate at the Woollybear Festival in Ohio to celebrate the fluffy ‘woolly bear’ caterpillars of the Arctiinae moth family (Hvenegaard 2016, 235). Even more people gather to view fireflies at the Muju firefly festival in South Korea, in Kuala Selangor, Malaysia, in firefly parks in Wuhan and Chengdu, China, and the Great Smoky Mountains National Park in the United States. Insect-related events and festivals are a facet of what is called *entomotourism*, a subsector of ecotourism in which people go places to experience and enjoy insects. In many cases, activities like these are becoming increasingly popular (Hvenegaard 2016, 235).

The focus of this chapter will be on Japanese firefly festivals. I begin by considering the nature of Japan’s nature tourism industry. Then, using the week-long festivities in Tatsuno as a case study, I will examine benefits as well as potential negative impacts of entomotourism. Finally, a comparison with other firefly festivals in the country will be made.

## 3.1 Why Nature Tourism?

Tourism to natural areas, known as nature tourism or ecotourism,<sup>11</sup> has been an increasingly important part of the economy of developing countries for several decades. The following definition of nature tourism is given by Ceballos-Lascurain, cited in Boo (1990, 2): “tourism that consists in traveling to relatively undisturbed or uncontaminated natural areas with the

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<sup>11</sup> Nature tourism and ecotourism are just two of the many terms that fall under the rather broad category of ‘nature-based tourism’ – and these terms do not all share the same meaning. Ecotourism should for instance not be confused with terms such as ‘green travel’, ‘ethical tourism’ or ‘wildlife tourism’, which each have different main goals. For example, while ethical tourism has ethical concerns such as social injustice and human rights as its main goals, it does not focus on education or the environment in particular. Such terms are often used loosely, but may cause confusion if conflated with each other.

specific objective of studying, admiring, and enjoying the scenery and its wild plants and animals, as well as any existing cultural manifestations (both past and present) found in these areas”. The International Ecotourism Society defines ecotourism as “responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education” (International Ecotourism Society, 2019). They are thus overlapping terms that emphasise responsibility, sustainability and education. As it is supposedly the beauty of the natural area in its clean, undisturbed state that people typically wish to experience, it follows that maintenance and conservation is also a significant part of this industry. Ecotourism is thus also important for the conservation of natural areas, as its stated purpose is to minimise ecological impact and the success of the attraction in a large part depends on its pristineness.

### *Nature Tourism in Japan*

Nature tourism has become one of the fastest growing sectors of the tourism industry (Jones and Ohsawa 2016, 25). What does such tourism look like in Japan?

Domestic travel to rural areas increased in the 1980s, partly due to a thriving bubble economy, and feelings of nostalgia for the countryside as a result of postwar urbanisation. In 1987, the government passed the General Recreation Area Establishment Law, designed to stimulate large-scale resort developments in the regions (Knight 1996, 167). This facilitated the creation of numerous theme parks, golf courses and ski resorts in rural and mountainous areas. In 1994, the government introduced the Green Tourism Law, which promoted activities such as farm stays and agricultural experiences (Hasan 2017, 141). In the 1990s, ‘green tourism’ became a key part of rural revitalisation movements. As noted by Moon (1997), nature tourism is often linked with regional revitalisation movements, as local governments strive to promote the natural beauty of their towns, thereby increasing the flow of money and people to depopulated rural areas. As Moon (1997, 222) describes, “promotion of nature tourism as part of the *muraokoshi* movement has (...) become almost a moral obligation both for urbanites and villagers”. In her article, Moon (1997, 225) lists several examples of nature tourism, including parks, deer farms, flower gardens, chestnut farms, woodwork villages, and mountain vegetable farms. Such tourism also includes experiencing rural lifestyles, such as farming and forestry (Knight 1996, 176).

The success of nature tourism in Japan may have to do with marketing strategies that appeal to nostalgia and romantic nationalism. City dwellers that live their lives separated from nature may harbour nostalgic or romantic feelings toward natural environments, which are then exploited in marketing through the use of words such as *fureai* (connection). Urbanites are told that by visiting nature in rural areas they will feel connected to that nature. However, the nature that is being sold is not of the wild, ‘raw’ variety. As exemplified above by the many parks and farms, the nature being presented is ‘cooked’ (Kalland and Asquith 1997). In this sense, Japanese nature tourism becomes a blend of nostalgia, consumerism and appropriation of nature. Within this framework, firefly festivals are but one of numerous ways in which a part of nature is marketed to be visited and admired.

As shown above, events related to insects are found throughout the world and vary culturally in their forms and approaches. Such events are perhaps especially abundant in Japan – and the majority of these seem to be dedicated to fireflies. Hosaka et al (2016) give an overview of insect-related events that took place in Japan in 2013. They focus their search on eight insects (firefly, rhinoceros beetle, cicada, butterfly, dragonfly, honeybee, silkworm and orthopterans such as the cricket). In their results, they found that the number of events dedicated to fireflies far outnumbered the amount of events for the other insects:

Our website survey identified a total of 911 insect-related events held in 2013. The number of events was greatest for fireflies (542 events), followed by rhinoceros beetles (158 events). There were far fewer events related to other insect groups, ranging from nine to 60. Similarly, the median number of participants per event was greatest for fireflies (3,608 people), followed by rhinoceros beetles (175 people). Participant numbers were also much lower for other insect groups, ranging from 25 to 38 people per event. These results clearly indicate that fireflies are the most popularly celebrated insect group in modern Japan, followed by rhinoceros beetles (Hosaka et al 2016, 230).

This says something not only about the popularity of fireflies in Japan, but also other insects such as the rhinoceros beetle. These numbers may be compared with Hvenegaard’s (2016) study of insect festivals in North America, of which 81 were found for 2015. Of these, “49% focused on all insects, 31% focused on butterflies, 4% on dragonflies, 4% on honeybees, 3% on caterpillars, 3% on blackflies, and 1% each on butterflies and dragonflies together, fireflies, ants, ladybugs, cockroaches, and mosquitoes” (Hvenegaard 2016, 237). Attendance varied from 100 to 100,000 people. Here, the amount of firefly festivals comprised only one percent of the events – a much less significant amount than in Japan. The basis for

comparison may not be entirely justified, however, as what constitutes an ‘insect festival’ versus ‘insect-related event’ may be rather different – and it is fair to say that if other events such as observation tours and exhibitions were included in Hvenegaard’s study, the numbers would look different.

Hosaka et al (2016, 228) argue that an understanding of how insects are viewed and presented in recreation and tourism events in a variety of cultures may be useful for the promotion of insect conservation. Additionally, holding events that celebrate insects is important with regard to changing the public’s emotional response toward insects. One positive outcome of events dedicated to insects is that they may foster positive interactions between insects and people, and may encourage public appreciation of insects, which may thus contribute to changing the public opinion of bugs. I now move to a discussion of the contents of one Japanese firefly festival, utilising findings and observations from my fieldwork. As there are so many firefly festivals across Japan, it is also useful to compare and see how they differ in content and scale, and in their utilisation of local crafts and products. Therefore, I will also discuss the content and promotion of other firefly festivals in the country, based on data gathered mainly from web-based searches.

### **3.2 Case Study: The Firefly Festival in Tatsuno**

From June 16<sup>th</sup> to June 24<sup>th</sup> 2018 I had the opportunity to participate in the 70<sup>th</sup> annual firefly festival in Tatsuno (*Shinshū Tatsuno hotaru matsuri*). It is the town’s largest annual event, and brings more than 100,000 tourists each year (the number was 157,700 in 2017 and 120,000 in 2018, according to the town’s annual report (Tatsuno chōsei yōran 2019)). Held in June during the peak of the firefly season, its main attraction is, unsurprisingly, the chance to see the mystical glow of fireflies in the designated location of the town’s firefly park (*hotaru dōyō kōen* – firefly nursery rhyme park). Another highly popular feature of the festival are the numerous food stalls (*yatai*) stretching about eight hundred meters along the town’s main street – about 130 of them. Preparations for the festival start early, as the date is decided as early as October of the previous year. As I arrived in town about a week before the festival commenced, I was able to observe a few such preparations.

One thing I wish to make clear before moving on is the largely secular nature of the festival. It is categorised as a *matsuri*, which traditionally means a festival or celebration centred

around the deity of a shrine being paraded through the community via a portable shrine (Plutschow 1996). In recent years, however, the definition has expanded to include many types of festivities – it thus no longer needs to be a religious event. There is a temple in Tatsuno, the Kudokuzan Denpukuji, known colloquially as Hotaru-dera (Firefly temple), located centrally between the train station and the firefly park. Although there were several religious events held at the temple during the festival, including Buddhist memorial services and recitations (Sightseeing Tatsuno n.d. b), the temple did not play a large role in the festival itself. Significantly, there were no shrine rituals involved, and it is therefore my impression that the festival itself does not hold a large religious significance – though it bears many similarities to a traditional summer festival (*natsumatsuri*) with food stalls, yukata and the like. According to Harumi-san, there used to be a ceremony at the start of the festival in which a young girl and boy would parade down the main street from different directions, meeting in the middle and “getting married”, in an imitation of the story from the *Tale of Genji* about Genji’s niece and the prince. The ceremony was, however, only practised until last year – it had now been replaced by children holding lamps parading down the street.

## **Preparations Before the Festival**

### *The Fourth Graders and Pikkari-chan*

On the 13<sup>th</sup>, three days before the start of the festival, I went to observe the festival preparations of a class of fourth grade students from a local primary school. The children were decorating Café Top, in actuality an abandoned café in need of renovation. For the firefly festival, this building was to be transformed into an exhibition space in which the fourth graders could display the work they had done raising kawanina snails in the past year. The children were put to work soon after they arrived with their teacher; washing windows, sweeping floors and hanging up posters they had drawn. They had also brought some small water tanks containing kawanina snails to be put on display. When they were finished, there was also a surprise waiting for them: a visit from the town’s firefly mascot (*yuru kyara*), Pikkari-chan (fig. 3.1).

Several of the children exclaimed, “I knew it!” (*yappari*) when Pikkari-chan came waddling out, with its big, fluffy head and body, shiny tights-clad legs, and golden bobbled backside. However, they all seemed excited at the mascot’s appearance and happily posed for a photo (depicted to the left below is the “Pikkari-chan pose”: holding one’s cheeks and saying “ho”).

The adults present were happy to inform me that “everybody loves Pikkari-chan, both children and adults”. Certainly, the mascot is to be found everywhere, from appearing on the town’s website and promotional material to appearing in person at numerous events and happenings throughout the year. The mascot, created in 1998, even has its own Twitter account where one can read about events happening in Tatsuno all year round.



Fig. 3.1: Pikkari-chan.

The use of mascots as marketing tools for regional revitalisation is not unique to Tatsuno – cute, lovable characters are to be found in declining towns and communities all across the country. The term *yuru kyara* (lit. ‘loose characters’) was coined in 2004 by the popular culture critic Miura Jun, who defined them as “characters designed for PR of local governing bodies, events, and local goods” (cited in Occhi 2014, 8). Mascot characters personify local foods, products, historical figures or animals and are used as a symbol of the place in question.<sup>12</sup> Pikkari-chan is an example of the latter – an anthropomorphic firefly symbolising the town of Tatsuno.

After the children were finished at the café, I had an appointment with Pikkari-chan. Or rather, the woman behind Pikkari-chan, namely Kitagawa-san: a cheerful woman in her fifties, always with a notebook in hand and camera around her neck. She is in charge of all

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<sup>12</sup> A famous example is Kumamon, the mascot for Kumamoto prefecture, who has been working hard to bring more attention and relief to the region after the devastating 2016 Kumamoto earthquakes.



things Pikkari-chan – including managing the Twitter account, taking photos and writing reports about events Pikkari-chan goes to, editing the monthly Tatsuno journal, et cetera. She is employed in the Tatsuno town hall revitalisation policy section (*yakuba machizukuri seisakuka*), a section dedicated to town revitalisation activities, in which Pikkari-chan plays a large part. Outside the firefly season, Pikkari-chan is asked to go to many different events and festivals in other areas in the region, as well as appearing at the coming of age ceremony for twenty year olds, events at kindergartens, and so on. Additionally, people ask to borrow Pikkari-chan's costume for all kinds of events, so naturally the person inside changes from one event to another.

The day before the start of the festival I joined the fourth grade children again. This time, it was to watch them release the kawanina they had raised in the river by the firefly park. On the way there I spoke with their teacher, Kageyama-sensei, about her work with the children and fireflies (further discussed in chapter 5). At the park, we met Tsuchiya-sensei, dressed in khaki from head to toe, who explained to the children how to handle the kawanina. He then helped them release the fully-grown snails (though much smaller than a garden snail) into the river. Afterwards, the children spent some time looking for fireflies and kawanina. They were a lively group, splashing about and gazing intently into the river. The river was murky, and the children were a lot better at spotting kawanina than I was. Some of the children found fireflies, and one boy even found a pair that was mating. Before they all left to go back to school, Tsuchiya-sensei showed them a picture of fireflies on the flowers of the yamabōshi tree and talked about the new research on whether adult fireflies eat (discussed in chapter two).

### *Bamboo Lights*

Perhaps because this year was the 70<sup>th</sup> anniversary of the festival, a lot of effort had been put into the decorations of the firefly park. This year, the park featured a sizable display of *takeakari*, or bamboo lights. The path down to the park was lined with bamboo, the glittering patterns drilled into their stems providing a well-lit path leading down to an arch made from bamboo marking the entrance to the park.



Fig. 3.2: Part of the takeakari display in the firefly park.

Commissioned to create this installation was Chikaken, a small company based in Kumamoto, specialising in bamboo art. The company had been founded partly to deal with a local bamboo problem: in Kumamoto, and many other places, some species of bamboo are aggressive, as they grow and spread fast enough to overtake the habitat of other species such as cedar trees.<sup>13</sup> Therefore, making use of bamboo as art is a good way to control the plant's growth, and Chikaken take on commissions throughout the country. Their slogan is "To make bamboo lights a new Japanese culture" (*takeakari wo arata na nihon no bunka ni*). Their hope is to create a new cultural tradition focusing on the environment, sustainable use and regional revitalisation, using bamboo lights to "light up our town with our own hands". In Tatsuno, starting about a week before the beginning of the festival, they worked to create and assemble their installation in the park. They also held a workshop where local people could try their hand at making their own bamboo lights, which were also put on display at the festival.

Another illumination, unrelated to Chikaken, was a light-up LED firefly on the side of the mountain. It was activated a certain time prior to the festival and lit up each night during the festivities. Although my informants from Chikaken joked that it looked rather more like a cockroach than a firefly, I found it quite impressive.

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<sup>13</sup> However, cedar trees (*sugi*) are generally not considered a popular species either (e.g. Knight 1997, Rots forthcoming), as these are typically part of the coniferous tree plantations created after the war. These plantations cause trouble for residents of mountain villages, as they represent an elevated risk of landslides, a source of unwanted shade and darkness, as well as transforming the environment around the villages.

## **The Events of the Festival**

The festival opened at five in the evening, signaled by several cannons going off. By this time, there was already a significant amount of people standing in the open space in front of the station: groups of young people waiting around for friends, families with excited young children, people waiting alone, and so on. There were people wearing yukata, others seemingly having dressed up, and several children wearing jinbei, light summer clothes similar to a yukata. One could hear drums and music in the distance (from the festival parade approaching) which, combined with the murmur of the crowd, lent itself to a feeling of excitement in the air. By six o'clock, the main street was already thick with people making their way through to look at the stalls, such that it was almost difficult to move forward. The transformation of the town since the previous day, in which hardly a soul could be seen around the station area, was striking.

There was a stage set up in an open space about fifty meters from the station, where there were performances by local children. There were a lot of people standing by the stage at five o'clock, watching middle and high school students play taiko drums. When they were finished, a middle-aged lady MC in a kimono told us all to give them an applause, and asked a few of the children on stage what they thought of the experience, receiving a few shy replies. Throughout the festival, several events and performances were held on this stage, including the opening ceremony on the first day. This was a formal event, with the mayor of Tatsuno as well as several local politicians sitting in chairs on the stage, each giving speeches. The ceremony ended with their officially declaring the festival opened.

### *The Stalls*

The food stalls were not different from those seen at any typical summer festival in Japan, and the types of food sold were also typical summer fast foods: yakisoba, takoyaki, crepes, fried chicken, skewered fruit, pickled cucumber, shaved ice, and so on. In addition to the stalls selling food, there were stalls selling toys and balloons, as well as a vendor selling live insects – one could for instance purchase a rhinoceros beetle for 500 yen, and there was even an enormous Hercules beetle for sale. The vendor caught me looking at the beetles in their plastic cages, and commented, “It’s unusual, isn’t it?” (*mezurashii desho?*), to which I could only nod in agreement.

While the stalls are set up and managed by people from outside the town, the firefly festival is also a chance for local businesses to sell their products. There was, for instance, a tent in which one could sample and buy local alcoholic beverages, such as *Yoake mae*, a cloudy rice wine. The sweets shop near the station was selling their *hotaru manjū*, sweet buns filled with red bean paste, and a local restaurant was selling *hotarudon*, a bowl of rice, fried chicken, and an egg (the yolk symbolising the light of a firefly). There was also a stall selling Tatsuno merchandise, much of which featuring the mascot, Pikkari-chan: there were T-shirts, key rings, small dolls and tote bags, to name a few. Inside the building known as the “Future Centre” beside the station (a building meant to be a meeting place and event space for locals to come together to discuss ideas to revitalise and activate the town), there was a café concept created and manned by local high school students, with dishes made from (mostly) local ingredients. There was also the abandoned Café Top, manned by the local *chiiki-okoshi kyōryokutai* (regional revitalisation cooperation squad), now transformed into a resting place, exhibition space for the 4<sup>th</sup> graders’ posters, and sales space for local products such as oil, honey and spices.

Needless to say, the food stalls are one of the largest draws of the festival. One of the days, I conducted a small survey amongst people waiting around the station area in order to investigate their reason for visiting. I asked thirty people where they had come from, where they had heard about the festival and whether they were going to view fireflies that night, and wrote down their answers. Surprisingly, many replied that they had come only for the food stalls, and were not going to see the fireflies. Additionally, the majority of those I talked to had not come from very far off (mostly from other places within the prefecture), though a few had come from Niigata and Tokyo. The food stalls only operate on the weekends, however, so there are not as many visitors during the week.

### *The Fireflies*

Among those who were going to see the fireflies, it seemed common to rendezvous at around six o’clock and meander around the stalls to find something to eat before moving toward the park at around seven thirty. It is said that between eight and nine is the optimal time for firefly viewing, as this is when they are most active. It takes between ten and fifteen minutes to walk from the station to the park – typically closer to ten, but as the crowd is dense during the festival it takes up to twenty minutes to reach the park. There are guides in reflective

vests along the road showing the way and ushering people along, and the road is also lit up by red lanterns. There is a general excited buzz amongst the crowd moving up to the park; an air of anticipation. The croaking of frogs in the rice fields along the way is a prominent sound. The park itself is rather sizable, with graveled paths winding through it. In the daytime it is muggy and dominated by flies, but at night it is cool and open and quiet. The best conditions to view fireflies are on cloudy or moonless nights, as this makes the space darker, and on nights with little wind. Several people also mentioned that there are more fireflies on days that are humid during the day.

Coming into the park, one has to pay an entrance fee of five hundred yen, which goes to firefly protection work (in fact, the fee is called *kyōryokukin* – cooperation fee). There are ticket vending machines by the entrance, as well as two volunteers who check tickets and let people into the park. One then moves into the park itself, following the crowd. Moving along in the darkness, small spots of light eventually start appearing in the grass, or flying overhead. People will excitedly point out the first firefly they see, exclaiming with delight that there are fireflies. As one reaches the large, open, grassy area of the park, a whole group of lights blinking in unison becomes apparent. It is a strangely enchanting sight, the twinkling little lights moving about in the trees and the grass – several times I caught myself thinking of it as nature’s own illumination show. People stand all along the fence of the enclosed area and watch as if entranced, before gradually moving on to the next good viewing spot. There is also a loudspeaker in the park, from which cautions are given periodically (for instance, informing that flashlights, flash photography and catching of fireflies are forbidden<sup>14</sup>). One thing that is hard not to notice is the vocal nature of firefly appreciation. Though it might seem like the setting for a peaceful moment of contemplation, it is hardly a silent affair – in fact, I found it interesting how vocally people expressed their wonder and enjoyment at seeing the glowing insects. There was always a lot of talking, exclaiming, and commenting – among the most commonly heard interjections were ‘*kirei*’ (pretty) and ‘*sugoi*’ (amazing). There would be never-ending exclamations of delight from children and adults alike. Some small children even expressed fear of the beetles, calling them creepy (*kimochi warui*) and scary (*kowai*). Many people would also mention facts they know about fireflies to each other, or speculate why they light up. Another thing I noticed is that there was hardly

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<sup>14</sup> Here, it was emphasised that doing so would cause trouble (*meiwaku*) for other people. Thus, forbidding flashlights is not just to shield the fireflies from disturbing sources of light, but also to ensure an optimal viewing experience for the people who have come to see them.

anyone walking alone – in the crowd were mostly couples, groups of elderly people, and families with children. Many would futilely try to take pictures on their phones, and everyone – young children and elderly alike – would stretch out their hands to try and catch a firefly flying by, despite the warnings from the loudspeaker.

The amount of fireflies seemed to dwindle during the week – in places where there had been dazzling numbers at the beginning of the week, it seemed there were only a few left by the end, flying sluggishly from A to B. This was due to the fact that the predicted peak day for the amount of fireflies was on the 12<sup>th</sup> of June (before the start of the festival). Therefore, many fireflies had already died by the time the festival came to a close. The number of fireflies was also not as large as the previous year. Many people would tell me about how last year the number was quite astonishing – peaking at more than twenty thousand, according to the town’s annual report (Tatsuno chōsei yōran 2019, 9). I went to the park on the peak day, and it was extremely crowded and hard to find parking, even though the festival had not yet started. The peak amount for 2018 was only six and a half thousand (Ibid), but the sight was still mesmerising. Lots of people had set up cameras and chairs – such that the red light from cameras oftentimes mingled with the light from the fireflies.

### *The Festival Stage*

During the opening of the festival there was a parade in which several schools participated, along with marching bands playing popular songs. Pikkari-chan also made an appearance in the parade. The stage was also home to many different performances, mainly by groups of school students such as taiko groups, dance clubs, choirs, martial arts and cheerleading. The fourth graders I had followed for a few days also got their shining moment on the second day of the festival, in which they presented their work with kawanina to the audience. This involved a presentation of what kawanina are and how they are important for the growth of firefly larvae, in which each student would stand up and say a sentence. They also had a quiz, a song, and a dance, to great applause and demands for an encore from the audience (consisting mostly of parents).

During the week, when the food stalls were not operating and there were not too many tourists, there were concerts each night under the name of *Hotaru live*. These concerts would feature a range of performers, such as local artists, school choir clubs, and citizens who

wanted to try their hand at singing a tune. There would be a few different artists each night, who would take to the stage and sing a few songs each. The audience was rather sparse on the two nights I went to see the live show, only filling a few of the benches in front of the stage. The space in front of the stage was not too large, but there were about six long benches on which the audience sat. For most of the performances during the weekend, the crowd was large enough that a lot of people were standing behind the benches to watch.

### *Hotaru-odori*

I had the privilege of being invited to participate in the parade of the second to last day of the festival, in which a special dance (*hotaru-odori*) would be performed. Each district would wear their own costumes and form a group dancing together, though the dance was the same throughout the town. We met several days prior in the district's community centre to learn the dance. There were perhaps about thirty people present, consisting almost entirely of elderly people. We each received an *uchiwa* fan to use as a prop during the dance. The dance teachers were four elderly women in kimono, who stood at the front and told everyone to get in lines, and then they demonstrated the dance without music first. Then they put the music on, and we all formed a circle and practised the dance over and over. There were two different songs and dances, both involving fireflies in some way. The teachers explained how some of the moves were inspired by fireflies: for instance, one move involved a clapping motion with the *uchiwa*, which is actually a simulation of catching a firefly ('Catch the firefly!' the dance teachers called out), while another in which we brought our fan low signified a firefly flying low. There were mixed feelings amongst the attendees – some danced with a spring in their step, while others were dragging their feet (there were a few men in particular who complained that it was too difficult and they could not remember the moves – whereas another man was dancing very enthusiastically, to the point where the others wondered if something good had happened to him).

On 23<sup>rd</sup> June at five in the evening, we all gathered at the community centre again and donned happi (typical festival wear) and raincoats, as it was spitting with rain. Then we all walked to the main street, where everyone was gathering and lining up for the parade. It seemed like a significant number of people were joining the parade; each district had their own group, and school clubs and certain companies (such as Honda and the local bank) also formed their own groups (some of the groups more enthusiastic than others). The uniforms

were different as well – in addition to our blue and orange happi, there were green ones, pink ones, children in orange t-shirts, et cetera. There was no real sense of rivalry between the groups, although there were prizes given for several categories – for instance, the district I danced with received a prize for having the largest number of participants. Even the mayor of the town joined in the festivities, sitting in a chair in the middle of the street. There were also quite a number of spectators on the sides of the street, as well as journalists and reporters from the local TV station. After some waiting, the music started playing, and we started dancing, slowly moving forward in the street. We danced the two dances in turn, moving around in a sort of circle instead of walking down the entire street, repeatedly for about half an hour, until it was over and we all went back to the community centre to have an ‘after-party’ (*uchiage*).

### **3.3 Economic Significance of the Festival**

I will in this section shed some light on the economic importance of the festival. Tatsuno’s firefly festival is the town’s largest event, and also the most economically significant one – bringing in important revenue not just for the town itself, but also for the rest of Nagano prefecture. Akiyoshi Ichirō (2016) looks at the economic effects the Tatsuno firefly festival had on the rest of Nagano prefecture for the year 2014. Every year, the town spends 46 million yen on the festival: 16 million for festival management (*matsuri un’ei*), and 30 million for environmental conservation (*kankyō hozen*) (Akiyoshi 2016, 198). Further, for 2016 there was an income of 37.6 million yen from entrance fees, parking lots and sales from town-owned stores. Akiyoshi estimates, based on data about amount of attendees as well as industries in Nagano prefecture, that the total amount of tourist consumption was 1.5 billion yen (2016, 195). He contends that the festival causes an economic ripple effect for Nagano prefecture as many festival attendees who come to see the festival stay in hotels outside of Tatsuno and thus bring in revenue for other towns as well.

One of my informants, Shinobu-san, explained that there are new voices saying that they should change how they arrange the festival. Those who arrange the festival currently are the people at the town hall, and they are bad at (*nigate*) handling money matters or changing the way things are. I asked him what sort of changes, and he said since so many people (over 100,000) come to see the festival, people are thinking they could let a company that arranges festivals arrange this one too, for the benefit of both visitors and inhabitants. For instance,



arranging shuttle buses to take people to and from nearby cities, taking more money from parking, and gaining more control over the food stalls. This would according to Shinobu-san lead to more economic gains for the town, something he stressed as important as this is a major income for the town and its largest annual event. In his opinion, they could be doing a lot more to maximise the town's profit from the festival.

During another conversation with Shinobu-san and two other informants, all expressed the opinion that the festival is not good enough as it is now – that it is 'a waste' (*mottainai*) because the town is not earning enough. They discussed how they should get more hotels, as that would bring in more earnings, as well as increase the town's capacity during the festival. As it is now, visitors do not stay the night as there are no options, and there are many hotels around Suwa (a nearby city). In their opinion, it would be far more efficient if they had one person or entity in charge of the festival as a whole – as of now, the people who run the stalls and the people who do the festival planning and promotion come from completely different groups, with no system of hierarchy or overarching leadership. There is a leader of the stall vendors but, according to one informant, this person is 'like a yakuza' (*yakuza mitai na hito*). Many of the people who run the stalls are not from Tatsuno; they come from elsewhere just for the festival and rake in huge sums during the festival period. Shinobu-san equates this to lost profit for the town. My informants expressed the opinion that they are of bad character (*gara no warui*), possibly connected to the yakuza – and that they do not really want such people coming to the town. Visitors love the stalls, but many people in town dislike the people who run them. Shinobu-san expressed the opinion that the mayor should be the one in charge.

The festival was not a large event to begin with; it started after the war and, according to Harumi-san, people did not have that much enjoyment (*tanoshii koto*) and so they viewed fireflies to have some fun. It used to be an event similar to cherry blossom viewing, in which people would sit down together with food and drink and watch the fireflies. According to Shinobu-san it was not until the dawn of the Internet that it became this big thing with many visitors from outside, as being able to advertise online allowed for marketing to a much wider audience.

### 3.4 Criticism of the Festival: Views of a Biologist

It would seem that the festival is economically successful, and beneficial to the town and its people. There are, however, people who oppose the firefly festival. One of the main oppositions comes from biologist Iguchi Yutaka, who has written several articles and blog posts criticising the Tatsuno government for neglecting to make public the fact that the fireflies one can see at the festival are in fact not native fireflies, but imported ones.

The Genji firefly is especially noteworthy for its geographical variation in flash pattern. This species is classified into the three ecological types; the fast-flash, slow-flash, and intermediate types (Iguchi 2001, 2010). They are distributed in western Japan, eastern Japan and central Japan, respectively. According to Iguchi, the fast-flashing Genji firefly is well known for its magnificent flashing and therefore was intentionally introduced to Matsuōkyō in Tatsuno. Several thousand adult fireflies of this fast-flashing variety were bought from the city of Moriyama in Shiga prefecture in the 1960s and made to mate and lay eggs. Consequently, these introduced fireflies have become invasive alien species in Nagano Prefecture.

In a 2009 article, Iguchi writes about the differing flashing rates of fireflies in Matsuōkyō compared with other Tatsuno fireflies. The fireflies of Matsuōkyō have the same flash rate as ones from Lake Biwa (i.e. the fast-flashing variety). The emission cycle of Matsuōkyō's Genji firefly is about 2 seconds, but the emission cycle of the native Genji firefly remaining in the surrounding area is about 3 seconds (Iguchi 2009). He contends that this implies a strong influence of imported fireflies (*gairaishu*) on native ones (*zairaishu*), which has led to the possible extinction of the native fireflies. In other words, Tatsuno managed to increase their amount of fireflies, but the problem was that the new fireflies overtook the native population. This contributes to the loss of biological diversity, by mixing genes and diluting the genes of the firefly genus that already existed in the area (in the best-case scenario), or by eliminating the native genus entirely (in the worst-case scenario).<sup>15</sup>

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<sup>15</sup> Another issue involving invasive species is the importation of *komochi kawatsubo*, a type of snail that looks just like *kawanina* but is originally from New Zealand. Firefly larvae do eat these snails, but a higher death rate has been reported among larvae that have eaten *komochi kawatsubo* instead of *kawanina*. The Nagano government has warned against releasing these rapidly reproducing snails in rivers, thinking them to be *kawanina*, as they are thought to have an adverse effect on the river ecosystem (Nagano Prefectural Office Nature Conservation Section n.d.).

I met Iguchi-san in the firefly park one morning, and we walked through the park together while batting at small flies going into our eyes. He enthusiastically explained to me about fireflies' life cycle, and how the concrete built into the riverbank in the 1960s made it impossible for fireflies to live in that environment, as the larvae need to be able to get up on land to create a cocoon.

We talked about the festival and about how fireflies have changed since he was young, from being something people just enjoyed seeing by themselves, to a big event with food stalls and illuminations. In his words, it has changed into a thing where you don't just enjoy it, but you make people pay money to come and see it. This is what he is against – before, it used to be free, but now that they are taking money it has changed into a festival mainly for tourism and machiokoshi. In general, he is against people creating an artificial environment in which fireflies can be enjoyed (such as theme parks and the like), as he wants people to see them in their natural environment. According to Iguchi, Matsuōkyō has gone from being a hotaru meisho and firefly sanctuary, to becoming the largest breeding site for foreign fireflies in Japan.

In Iguchi's words, the town government has concealed the destruction of ecological systems and has pretended to protect native fireflies for a long time. In his view, the problem is that in advertisements for the firefly festival the government emphasises that the fireflies of Tatsuno are native and that they have been protecting the local fireflies, while in reality they are not native. Although he contends that the town does not mention this importation on their website, there is in fact a section of their website that mentions in detail how the firefly purchase happened (Sightseeing Tatsuno n.d. b).

Iguchi's argument is that the town is destroying its ecosystem for economic profit – through prioritising the town's economy by holding yearly firefly festivals that might be damaging to fireflies. He writes:

Recent research suggests that non-native fireflies are spreading into other areas. However, the town government has not yet tried to protect native fireflies. It does not matter to Tatsuno town officials and politicians whether fireflies are native or not. What is important for them is only to gain tourism income from the fireflies (Iguchi 2018).

He thus accuses the local government of only thinking about the economic aspect, and for practising what he deems an irresponsible destruction of biological diversity in favour of economic profit.

Iguchi is critical of whether the festival is helping biodiversity. Regarding the festival, he also expressed concern about its scale – in previous times, the festival would be celebrated by local people (as a local thing), whereas now it has become a major tourist attraction. On being asked whether he attends the festival, he replied that he does not go, because the government has been unwilling to do anything about the issue. What can be done, then, about this issue? According to Iguchi, the local government should incorporate fireflies into their machizukuri all year round (so that people are not coming only during the festival period) – for instance by arranging tours to watch firefly larvae in the river during the winter, as well as providing better opportunities for people to view the native fireflies of Tatsuno in areas such as Kawashima.

On his blog, Laboratory of Biology, Iguchi seems to be running an active defamatory campaign against the local government of Tatsuno. It is therefore perhaps not so strange that they do not seem so enthused to cooperate with him. Iguchi, however, says he wants people to know the truth (that the fireflies they come to see are not native) and think about whether they still want to come. Tatsuno does not exactly advertise this fact, but Iguchi says he is only telling the truth with his blog posts, and he wants people to think about what kind of fireflies they are seeing.

When asked about this issue, Shinobu-san seemed like he did not mind too much about it – saying it could not be helped (*shikata ga nai*), that the people at the time did not know that it would have any consequences and there is nothing to be done about it now. Tsuchiya-sensei also expressed this view – that there was simply not enough knowledge about fireflies at the time. This may be seen as an attempt at downplaying or justifying the issue, but may perhaps also be because there is not much that effectively can be done to reverse the damage at this point. However, a dialogue between Iguchi and the government to discuss more eco-friendly town-building would perhaps be a step in the right direction.

### 3.5 Comparison with Other Firefly Festivals

Tatsuno is only one of several hundred firefly festivals and events throughout Japan. What does a typical firefly festival look like in other parts of Japan? Hosaka et al (2016, 230) give an overview of the contents of such festivals:

Of the 542 firefly events, 210 events included firefly festivals that involved street stalls, music concerts, Japanese poetry competitions (haiku and senryu), fireworks, and dance festivals. (...) The greatest number of participants for a single event was 147,000 people; they attended a firefly festival in the town of Tatsuno in Nagano. Buses, trains, and boats specially operated for watching fireflies were also available at several sites. For example, Akita Nairiku Jukan Railway operates a “firefly train” (Hotarugo), which stops at viewing points so that passengers can view the fireflies. Passengers also learn about the biology of fireflies during the train ride. One can also enjoy firefly watching at hotels and Japanese restaurants in urban areas. Chinzanso, a hotel in Tokyo, holds a special dinner including firefly watching in the garden every year. The hotel has kept fireflies in the garden since 1954.

As we have seen, the festival in Tatsuno has street stalls, music concerts and several other events. How does this compare to other firefly festivals in Japan?

After staying in Tatsuno, I traveled to Minakami in Gunma prefecture, which has an annual firefly-viewing event known as *Tsukiyono hotaru kanshō no yūbe* (Tsukiyono firefly viewing evening). This event is held one night in June each year, in the designated firefly park of a place known as Tsukiyono. I did not have the opportunity to go to the event itself, but viewed fireflies in the park several times and also went there in the daytime. I was, however, able to view the pamphlet advertising the event, from which I was able to gather information. The park itself has a walking course of about 1.9 kilometers and has rice fields beside the river, from which Heike fireflies also appear in July. Admittance is free, but there is a spot inside the park where one can donate money to firefly work, manned by volunteer guides from *Tsukiyono hotaru wo mamoru kai* (Tsukiyono firefly protection club), who also stand by to answer questions about fireflies. The event is organised by the Minakami sightseeing association and was organised for the 12<sup>th</sup> time in 2018. Thus, it does not have as long a tradition as Tatsuno, but the variety in its activities makes up for it.

The firefly viewing event in Minakami in 2018 had a stage and several different family activities. Activities on stage included a pop concert, singing performances, a taiko drum performance and a presentation talking about experiences with raising kawanina (very similar

to Tatsuno's fourth graders). Other activities included an 'experience corner' with glass painting, uchiwa fan painting and making of firefly merchandise; a yukata photo corner; an 'event corner' with an award ceremony for the winner of the uchiwa design competition (for the free uchiwa handed out to visitors to the park); and a refreshment booth manned by a local organisation with crepes, hamburgers, ice cream and coffee. They also had several events aimed at children, including a raffle, a wanko-sōmen eating contest, a rock-paper-scissors contest and a concert. Additionally, there was a show and a meet-and-greet with several local mascots (*yurukyara*) such as Oide-chan and Gunma-chan. In other words, it seems like a well-rounded summer festival packed full of different activities. It seems like there are more activities than the whole week of Tatsuno's festival – all in one day. It seems more family-oriented too, with more things for children to do, such as different competitions and crafting activities. They also have a shuttle bus, to and from the bullet train station and the car park – something Shinobu-san expressed a desire to see in Tatsuno.

Instead of a bus, the firefly festival of Toyota (Yamaguchi prefecture) has a firefly boat (*hotaru-bune*), which was an old tradition they have brought back<sup>16</sup> in which tourists set out onto the river in a boat from which they view the fireflies (Toyota Tourism Association n.d.). Additionally, they use firefly cages (*hotarukago*) as a “new symbol for the town” (Shimonoseki city 2017). A firefly cage is a small cage or box made from straw inside which one used to put fireflies and have them light up the room like a lamp (these cages, however, fortunately use LED lights). The Hotarukago Project, a group aiming to revive the tradition of making firefly cages (a slowly dying practice), was started in 2016, the 50<sup>th</sup> anniversary of the town's firefly festival. The group arranged to learn how to make the cages from elderly people, and then arranged workshops in which local people could make their own cages in different shapes and sizes, which were then exhibited at the festival. This sort of project is similar to Chikaken and the bamboo lights, which also involves light decorations and local participation.

Offering activities for children at insect festivals is not just a Japanese thing – for instance, Hvenegaard (2016, 237) writes about the content of insect festivals in North America:

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<sup>16</sup> Apparently, they used to have a *hotaru-bune* in Tatsuno, too, but there are hardly any records on this left.

The festivals offered many different types of children's activities, such as crafts, face painting, puppet shows, and treasure hunts. Other activities and offerings to all age groups include guided walks, workshops, crafts, films, music, presentations, tagging, identification, pond dipping, insect cooking, demonstrations, and trade shows.

Here, we find many similar events to Japanese firefly festivals, although things like ‘insect cooking’ differ. ‘Insect festivals’ can refer to a wide range of events dedicated to a wide range of insects, but it seems as though many are marketed as family-oriented events, with an emphasis on having many different activities that both children and adults can enjoy. Also, in the case of Japanese firefly festivals, which are often used for machiokoshi, there seems often to be an attempt to showcase local crafts and products, such as the hotarukago in Toyota, or the local sake, sweets and spices being sold in Tatsuno. Minakami’s firefly festival is a much smaller local event, perhaps directed more toward local people, but it still has a wide variety of activities for people of all ages to enjoy.

### **3.6 Insect Festivals and Conservation**

Hosaka et al (2016, 233) give a rough estimate of the total number of participants for firefly events: about two million during 2016. This is not taking into account the firefly-related events that do not have websites and therefore do not appear in searches. One can therefore conclude that fireflies play a significant role in leisure and tourism in Japan. Additionally, insect festivals may be useful for fostering positive attitudes toward insect conservation. Hosaka et al (2016, 233) discuss the popularity of conservation activities in Japan and mention firefly villages and maintenance of satoyama forests as examples – both increasingly popular in the country. Such activities also provide a good educational opportunity for children to interact with and learn about insects and nature (further discussed in chapter 5). Hvenegaard (2016, 238) mentions several ways wildlife festivals in North America contribute to insect conservation. Outcomes of such festivals include:

... incentives to designate protected areas for insects, collection of citizen-science data, revenue to enhance management for insects and their habitats, local support among residents for insect conservation due to the economic benefits provided in nearby communities, and increased education among visitors and local residents.

Further, the author mentions several positive attributes and goals of festivals in general:

... festivals accomplish many goals, such as enhancing the profile of a community, improving a sense of community in the local area, generating political interest to support local development, producing local economic impacts, offering local recreational opportunities, and conserving natural and cultural features (Hvenegaard 2016, 239).

Japanese firefly festivals seem to seek similar goals. As we have seen in this chapter, firefly villages often appeal not only to the beauty of fireflies, but also typical local characteristics (such as the area's natural beauty and the town's local products), in order to attract tourists. Firefly festivals certainly serve to benefit the local community, especially in a town such as Tatsuno, which prides itself on being a firefly town. The festival is the town's single largest annual event, and there is a sense of excitement around the festival from at least a week beforehand. Although the majority of the attendees come from outside the town, there are several events that serve to tie the residents together, such as the stage performances in which parents watch their children sing, dance or play an instrument. Likewise, the festival dancing is likely one of the most important community events during the festival, and the gathering after the dancing further strengthens community bonds among people in the different districts.

As with most things, there are positive and negative sides to ecotourism. While there certainly are many good outcomes of firefly festivals, such as strengthening the local community and economic benefits that go toward protecting fireflies and citizens, there may also be undesirable outcomes, such as littering, noise, and damage to the natural area. Additionally, the damage done by some firefly protection groups when trying to increase fireflies in their area must be addressed. The introduction of a foreign firefly species to Tatsuno, as well as its potential consequences, will be discussed in more detail in the next chapter, as the next chapter will focus more on specific conservation activities, including a brief history of firefly protection.



# 4 Firefly Protection Activities and Their Origins

There was a strange stillness. The birds, for example — where had they gone? (...) The few birds seen anywhere were moribund; they trembled violently and could not fly. It was a spring without voices. On the mornings that had once throbbed with the dawn chorus of robins, catbirds, doves, jays, wrens, and scores of other bird voices there was now no sound; only silence lay over the fields and woods and marsh. (Carson 1962, 2)

Rachel Carson created a huge wave when she published *Silent Spring* in 1962. In it, she detailed the environmental impacts of agricultural chemicals, specifically pesticides such as DDT. A highly influential work, *Silent Spring* is according to many the ‘founding text of modern environmentalism’ (Garrard 2012, 2). Quoted above is an excerpt from “A Fable for Tomorrow”, which prefaces the book, and tells of a hypothetical situation in the near future in which the nature around us has been so thoroughly polluted and deteriorated that there are no longer any chickens, sheep, or cattle, nor any birds to be heard, resulting in a ‘silent spring’.

A few years later, a similar sentiment was expressed by Harada Kazumi in his 1971 book “Hotaru no uta” (Song of the firefly). He writes:

Humanity has certainly progressed. This is an age in which we have bullet trains and supersonic aircraft, and in which every home is equipped with colour televisions and automobiles. However, let us calmly survey our surroundings once more. Haven’t the red dragonflies, which were so abundant before, disappeared? Where did the tadpoles, flies, carp, and rice fish go? Have we not started hearing less and less each year of the sweet cries of skylarks, white-eyes, and sparrows? When these small insects and fish and birds disappeared from our sight one after the other, what was it that came instead? “Itai-itai disease”, “Yokkaichi asthma”, and “Minamata disease: a large number of dreadful diseases we had neither heard of nor even imagined before (Harada 1971, 193, my translation).

Here, Harada offers an actual account of nature’s eerie silence, in contrast with Carson’s fictional one. Contrasting with the silence is the pain of pollution diseases, of which several broke out between 1912 and 1961, a period in which the country was still in the process of industrialising. This period, during which the government sought to make Japan ‘catch up’ to

Western powers in terms of industry and technology, had a huge impact on the environment. Along with leaps in technological development, there was also severe environmental degradation in the form of pollution, deforestation and habitat destruction of many different species. Harada (1971, 193) goes on to say that such developments do not represent progress, but rather a retrogression, thus putting forth the view that it is unacceptable to sacrifice the lives of animals, insects and plants in order for humans to lead more comfortable ones. In the same way people were seeing less tadpoles, dragonflies and sparrows, there were also less yellow-green lights to be seen at night. While there had been an abundance of fireflies in the Edo and Meiji periods, by the 1930s more and more people were starting to notice their absence on dark summer nights. What had happened?

#### **4.1 Events Leading to the Endangerment of Fireflies**

As mentioned in chapter two, the catching and viewing of fireflies was a popular pastime for the common class of Edo. It was also in this period that hotaru meisho started appearing, as well as *mushiuri*, an industry of selling insects, including fireflies.<sup>17</sup> Insect merchants would set up stalls along the street and sell insects in small cages, from June to the Obon holiday in mid-August. In addition to fireflies, they also sold bell crickets, grasshoppers (katydids), pine crickets and jewel beetles (Kada 1992, 42). This business created an opening for young men to catch insects and sell them either to wholesalers or directly in city centres. According to Laurent and Ono (1999, 151) catching fireflies was seasonal work, performed from May to September every day from sunset until sunrise, during which one person could catch more than 3,000 fireflies in one night (mainly in Western Japan). Some children would also catch and sell fireflies to earn pocket money.

Around this time, a tourist industry also developed around fireflies, involving “chartering special trains, opening souvenir shops (to sell fireflies and all the implements to catch and breed them), organising ‘firefly parties’ in well-known restaurants and hotels, and providing rooms for tourists” (Laurent and Ono 1999, 151). These ‘firefly parties’ mainly involved releasing fireflies into luxurious hotel and restaurant gardens so wealthy city-dwellers could be privy to their luminous glow.

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<sup>17</sup> There had been a similar insect-selling business earlier, but it had been banned in 1687 due to the Buddhist code of empathy with living creatures.



Fig. 4.1: Insect-selling in art and real life. The character on the cart reads ‘insect’.

One of the most significant hotaru meisho that emerged during this period was the district of Moriyama in Shiga prefecture.<sup>18</sup> Kada (1992, 43) writes about the central role Moriyama played as a hot spot for tourists and firefly hunters alike. In Moriyama it is said that they started selling fireflies at shrine fairs (*ennichi*) in 1892, but come 1902, expert firefly catchers had arrived on the scene, with several wholesalers setting up shop and hiring a small team of catchers. Supposedly, these catchers would receive many large orders from clients in Osaka and Kyoto, amounting to several hundred thousand fireflies in a single day.

Moriyama soon became famous for its fireflies – in 1910, Moriyama fireflies were presented to the imperial household and in 1921, a Firefly Day was established as part of the town’s tourism enterprise. On this day, they had a special firefly viewing train depart to Moriyama from the nearby large cities of Osaka, Kobe and Kyoto. In 1924, Moriyama’s fireflies were designated a ‘natural monument’ (*tennen kinenbutsu*) by the government, for the first time in Japan (Kada 1992, 43). A natural monument is a term for a type of cultural property, determined by the government’s Agency for Cultural Affairs under the Law for the Protection of Cultural Properties. Natural monuments include ‘animals, plants, minerals, and geological features that possess a high scientific value for Japan’ (Agency for Cultural

<sup>18</sup> Moriyama appeared as a ‘substitute’ for Ishiyama temple, a hotaru meisho which saw a great loss of fireflies after a flood in 1896 (Kada 1992, 43). The fireflies of Ishiyama were kept in a large cage, which was made to open and let out fireflies now and again.

Affairs, 2013). In the case of the Genji firefly, this designation provided legal protection for its habitat, at which point a ban on catching and selling them was enacted.

In the beginning of the Shōwa period (which started in 1926), orders came in from largely Kyoto, Osaka and Kobe, but also further afield such as Hokkaido. Fireflies were sold and enjoyed at parties, dance halls, department stores, night stores (*yaten*), et cetera, in many locations throughout the country. Mirroring this large demand for live fireflies, firefly populations started decreasing in the 1920s. The reason for this decrease is disputed, but is likely a combination of several factors. One of these was overharvesting. As Sara Lewis (2016) puts it, fireflies were ‘loved to death’. In other words, so many fireflies were harvested each day of each May and June that it was not sustainable – mainly because they also gathered egg-laying females before they had a chance to mate. Minami (1961, 223) lists six reasons for the diminished firefly populations. These include overharvesting of fireflies due to the demands of the firefly catching and viewing industry, water pollution due to industrial effluent, agricultural runoff and household sewage flowing freely into rivers, refurbishment of riverbanks (increase of concrete riverbeds and embankments), changes in the geological features of the riverbed, and changes in the condition of the riverbanks. Changes in the water and river environment severely affected the kawanina snail population, which cannot tolerate any degree of water pollution, which again caused the death of firefly larvae, who needed them to live.

Laurent and Ono (1991, 151) also mention the expansion of public lights in the countryside at night, as well as the decline of the surface of rice fields, rivers, and water-related areas as reasons for the decline of firefly populations. Kada (1992, 43) asserts that, rather than water quality and changes in the environment, the largest reason for the decrease might have been overharvesting. However, she makes the point that it is hard to put any blame on the many children who would catch fireflies as a way to earn some pocket money and buy school supplies at a time when there was a shortage of income.

The aforementioned issues are not isolated events, and the decrease in fireflies is highly likely to have been due to a mixture of all of them. An unforeseen consequence of rapid industrialisation, the death of glowing bugs was perhaps not at the forefront of people’s minds at the time. Minami (1961, 224) acknowledges, for instance, the benefits of using agricultural chemicals, as well as the importance factories had in rural areas. Moreover, the

condition of the riverbed and riverbanks was something that changed gradually over time and was hard to notice. Hindsight is, however, 20/20. Regardless of who was to blame, there was no way to magically undo what had been done. However, when people saw what was and had been happening, action was taken in many places to reverse the changes.

### **4.3 Early Origins of Firefly Protection**

According to Laurent and Ono (1999, 151), the firefly protection movement spread in two waves: first in the late 1920s for the forerunners (mainly biologists and amateurs), and then from the 1960s, but mainly in the late 1980s, for the general public. In Tatsuno, awareness of the issue spread as early as 1918 (further discussed below).

The first groups for the protection of fireflies appeared in Western Japan in the 1930s, but their activities only concerned specialists (Laurent and Ono 1999, 151). Genji fireflies were then officially protected at the national level from 1935. Minami Kiichirō, a young man who lived in Moriyama, was one of the early pioneers of firefly research in Japan. Their decline prompted him to go out and study their habitat and life cycle, which led to him eventually attempting to raise captive fireflies and re-release them into the river in order to increase the population (Lewis 2017, Minami 1961). In 1961, he published 'Firefly research', a sizable compilation of all the knowledge he had gathered over the years.

In 1966, a primary school teacher in Tokushima prefecture started studying fireflies with his class of students, eventually gaining nationwide attention for their efforts. The teacher published a book that told the story about their efforts in attempting to raise kawanina and fireflies. The book was *Hotaru no uta* by Harada Kazumi, and led to, among other things, the fireflies in their village being designated a national natural monument. Little was known scientifically about the firefly at that time, and few attempts had been made to raise them. According to my informant, Harunobu-san, this was the beginning of firefly protection in Japan. He himself had apparently read the book over a hundred times, and cited it as the reason for why he became interested in fireflies.

Laurent and Ono (1999, 151) write that, while the first national conference about the protection of fireflies took place in 1968, an awareness of these problems only reached the general public in the 1980s, through drastic legal and social policies, partly influenced by

Western environmentalism. As for Moriyama, the town relinquished its position as a natural monument for firefly protection in 1952. After this, the decrease in groundwater and spring water, as well as water pollution due to the spread of factories, became a problem. In 1960, Moriyama lost its reputation as a hotaru meisho, and fireflies did not come up again until 1975 (Kada 1992, 44). In 1975, there was an increase in people's interest in the water environment, due to environmental problems in Lake Biwa gaining attention in the media. Around this time, regional revitalisation (*machizukuri*) became a talking point, and in Moriyama, people started getting involved in firefly protection. In 1979, Moriyama started a revitalisation project under the slogan '*hotaru ga tobikau machi moriyama*' ('Moriyama, a town where fireflies fly about'). Several new facilities were created, such as a firefly park and firefly forest resource centre, which caused a renewed interest in fireflies among people.

The protection of fireflies has thus been entwined with concerns about the water environment. Even on a national scale, when people started becoming aware of water environment issues, they also started to become interested in fireflies as indicators of the water environment – as their presence might indicate a healthy environment. This caused various associations for the protection of fireflies to mushroom at the local level from the 1980s (Laurent and Ono 1999, 151). Additionally, the Ministry for the Environment initiated the program *Furusato no ikimono no sato* in 1989, in which 119 locations were designated as protected areas for different species. The purposes for the program cited by the Ministry are as such:

To honour the efforts of the citizens who strive for the protection and restoration of the living environments of the small animals that symbolise the restoration of nature close to us, and additionally, in order to rediscover the worth of the small animals once so familiar to us that we have lost from sight, selecting activities from various places and introducing them widely to people, deepening people's awareness of small animals through public awareness, to contribute to proactively protecting and creating the nature close to us (Kada 1992, 44, my translation).

Here, there is an emphasis placed on the relation between humans and 'small animals', in this case insects and amphibians. There is also a sense of a need to protect a nature that is 'close to us' (and the animals symbolise the restoration of this nature), but has somehow been lost – who has done this is not mentioned, however, nor how this loss came about. As mentioned in chapter 1, most of the locations are dedicated to protecting fireflies. 64 of the 119 sites have the name "... *hotaru no sato*" or "... *hotaru seisokuchi* ('... firefly habitat')". 17 of the sites

had firefly protection as their main goal, without their name being related to fireflies, and six places had firefly protection as an auxiliary goal. In total, 87 of the 119 places are conscious of firefly protection – which might be an indication of how important the issue of firefly protection was seen to be at the time (compared to other species).

Laurent and Ono (1999, 151) characterise some typical activities of firefly protection groups during the 1980s, including

spreading awareness in schools and cultural centers (through exhibitions, conferences, videos, etc.), firefly festivals, firefly breeding, ecological research (on the causes of the decline in the fireflies' population), repairing and development of rivers, and the construction of 'firefly riverbeds.'

The cleaning of rivers was a particularly prevalent activity (as this is something easily done in the local community), and is still popular today. Following Minami, people would attempt to raise fireflies in captivity and then reintroduce them into rivers. During the 1980s, tourism became an important part of regional revitalisation movements (Moon 1997, 221), which may have been a factor in the proliferation of firefly villages. Thus, a combination of national, local and private efforts turned the story of the Genji firefly from what could have been a miserable tale into a “conservation success story” (Lewis 2016b) – now, the glowing bugs have become symbols of environmentalism and rural town-making.

### *Firefly Endangerment and Protection in Tatsuno*

In Tatsuno, the whole Tenryū river was known as a hotaru meisho until the beginning of Meiji (Sightseeing Tatsuno n.d. b). According to Tatsuno's town website, an early version of the firefly festival was held in the form of firefly-viewing parties, in which people would sit by the river with a drink in hand and enjoy chatting and watching the fireflies. By the end of Meiji however, the river had become polluted due to the growth of the silk industry, as a large silk factory was built in the area. Fireflies eventually stopped being seen in the Kawagishi area, in which they used to be abundant, and started appearing more frequently further downstream by Hiraide. At this time, due to the opening of the railroad, Shimotatsuno (the area around the train station) became a lively area, especially around the firefly season in June, as more people were now able to travel here. Both locals and tourists would catch fireflies, and there were also people who would come to catch fireflies to sell in the cities.

This, combined with the pollution of the river, drastically lowered the firefly population, as fireflies would be caught before they could mate and lay eggs.

Oguchi Uzuhiko, a local school teacher, sought to protect fireflies in 1918. Thinking that at this rate they would become extinct, he wrote an educational pamphlet and taught children about fireflies and the importance of not collecting them. The children would then walk around the riverside in the evening and ask people to not catch them, as well as ask people not to use hotarukago (firefly cages). This movement spread to wider parts of the region (with several junior societies (*shōnenkai*) joining in), eventually raising the population of fireflies. In order to further this development, Nagano prefecture designated the habitat of fireflies in Tatsuno a natural monument (*tennen kinenbutsu*) in 1925 (Tatsuno firefly village revitalisation promotion convention 2005, 57).

After the war, the firefly festival was revived and became a grand event for the town with the commerce department releasing two songs related to fireflies: “Tatsuno ondo” and “Hotaru kouta”. However, around this time firefly populations were decreasing again, as the postwar rebuilding of the economy (and improvement of people’s lifestyles) also took its toll on the environment. This time, besides factory waste, the river was mainly polluted by household waste such as laundry detergent, but also agricultural chemicals (Tatsuno firefly village revitalisation promotion convention 2005, 57). As a consequence of this, the living creatures club of Tatsuno high school, led by biology professor Katsuno Shigemi (Katsuno-sensei), started studying fireflies on request by the local government in 1955. Katsuno-sensei went on to become somewhat of a local legend in the town of Tatsuno – he is still talked about as a very important figure to the town with regard to firefly protection. He had moved to Tatsuno from Iida, and is said to have been amazed at the fireflies he saw in Tatsuno. He started studying fireflies together with his students and it turned into a passion he kept for the remainder of his life.

In 1961, Katsuno-sensei bought 4,000 adult Genji fireflies from Moriyama in Shiga prefecture, made them lay eggs indoors, and subsequently released the hatched larvae in Matsuōkyō (in what is now the firefly park). From 1963 until 1967, with cooperation from hotel Chinzanso in Tokyo, which was famous for having fireflies in its garden, he installed moss in the hotel garden in which the fireflies could lay their eggs. He then collected these eggs and raised the larvae in Tatsuno, releasing them in the river (Sightseeing Tatsuno n.d.



b). By the late 1960s however, fireflies had decreased even more due to increased pollution of the river. Thus, they became in danger of extinction once again – and this time it was serious. Hardly any fireflies could be seen anymore, to the point where people realised they would become extinct if something was not done.

In 1970, Katsuno-sensei then had the idea of creating irrigation channels through which they would let clean mountain water flow and thus curb the firefly death rate. In the area that is now the firefly park, Katsuno-sensei constructed meandering channels, utilising earth that had formerly been rice paddies. This had the advantage of moderating the water flow, raising the water temperature, and keeping it constant. Additionally, the water channels made it easier for firefly larvae and eggs to establish themselves and facilitated mating and spawning behaviour in adults as well. Together with his team, Katsuno-sensei created several different waterways, expanding the park and making the firefly nursery rhyme park (*hotaru dōyō kōen*). The waterways were successful, and fireflies once again began increasing.

During the 1970s, Katsuno-sensei and his team did more maintenance work, including recreating the first channel, as well as making more channels (there is a total of six channels today), cutting the grass, and removing mud and leaves from the river. Their efforts to create a good environment for fireflies paid off as by 1975, large numbers of fireflies could be seen again in Tatsuno. After Katsuno-sensei retired, river maintenance work was continued by employees at the town hall.

As discussed in the previous chapter, Katsuno-sensei may have unwittingly caused some damage to the native population of fireflies in Tatsuno by buying and releasing foreign fireflies. Iguchi-san is of the opinion that this has caused the native population to become extinct. Tsuchiya-sensei, when asked about this issue, asserted that no-one can say that what Katsuno-sensei did was wrong. At the time, it was thought to be a good thing to bring non-native fireflies to increase them in another location, and it is only very recently that scientists have been able to analyse the DNA of fireflies and recognise the genetic differences between fireflies from different regions. In any case, whether we see the consequences of Katsuno-sensei's endeavours as harmful or benevolent, one cannot say that he acted with ill intent.

## 4.4 Current Activities of Firefly Villages

The 1990s represented a new stage in firefly protection activities, in which more emphasis is placed on the aspect of tourism and regional revitalisation. This might be described as a process during which the firefly went from being a creature people enjoyed to catch and watch, to becoming a “symbol, a pretext and an orientating stimulus inside vast programs entangled in a criss-cross of interests involving environmental concerns, urban renewal policies and the revival of depopulated rural areas” (Laurent and Ono 1999, 151).

Today, as noted by Hosaka et al (2016, 233), there are 650 groups that call themselves firefly villages, distributed throughout the country (though most heavily in Honshu, followed by Kyushu). Their main activities are concentrated around preserving the habitat of fireflies, so as to provide an environment in which fireflies can thrive and reproduce. Additionally, there are several non-governmental and non-profit organisations that work with disseminating information and spreading public awareness.

Tatsuno is still thriving as a firefly village, and the local government is still continuing steadily with both firefly protection work and town promotion. The firefly festival has been arranged seventy consecutive years after the war, and there are efforts to record and research the fireflies throughout the year. There is a weather station in the firefly park that measures humidity as well as air, water, and earth temperature. This is used to help regulate the conditions for the fireflies by keeping track of the correlation between temperature and amount of fireflies. A publication containing research on predictions and measurements of the amount of fireflies in several of the water channels of Matsuōkyō has been published each year since 1989, and continues to be made today. A group of volunteers also does the work of counting fireflies (with a tally counter) each night of the season. Additionally, there are several groups and associations in the town dedicated to the protection and promotion of fireflies, such as ‘*Hotaru wo sodateru kai*’ (firefly raising club), ‘*Hotaru dōyō kōen aikōkai*’ (firefly park lovers club), and the ‘*Hotarumatsuri jikkō iinkai*’ (firefly festival implementation committee). The latter group, consisting of people employed at the town hall, does all the work in planning and facilitating the firefly festival.

Another rather new feature of Tatsuno is ‘Alapa’ – a brand-new establishment dedicated to sports, leisure and education. The name is an abbreviation of ‘Activity Laboratory Park’ – ‘ala’ also uses the same character as Kōjinyama, one of the mountains in Tatsuno. Just

opened a few weeks before I arrived, the facility has a bouldering wall and several spacious activity rooms. They also have the firefly laboratory (*hotaru shiiku kenkyūshitsu*), a room that houses several (about 9-10) medium-sized water tanks dedicated to raising kawanina. This is where Tsuchiya-sensei spent his time, working steadily on research and tending to the kawanina (mainly feeding them with magnolia leaves), as well as several firefly larvae. Tsuchiya-sensei also taught the fourth-graders about kawanina and larvae in the lab, and went with them on several fieldtrips out to the firefly park. On the second floor was the 'Firefly Museum', which featured an exhibition about Katsuno-sensei's life and work as well as informational posters about fireflies (also featuring drawings made by local school children). There was also a reading corner with several books and resources about fireflies, and, of course, a life-size cutout of Pikkari-chan in the corner.

Stories like that of Tatsuno are found all over the country – a similar one is found in Minakami. The Tone river that flows through Minakami was heavily polluted in the early 1970s, due to household wastewater and the spread of agricultural chemicals, which led to fireflies almost becoming extinct (Ministry of the Environment 1989, 40). However, this situation prompted people to start protecting the few fireflies that were left, by cleaning the river, raising and releasing kawanina, and asking farmers not to use polluting chemicals. Today, local people flock to the annual firefly-viewing event in Tsukiyono park. The entrance to the park is free, with a complimentary uchiwa fan. However, there is a donation box inside the park where one can donate however much one wishes to firefly protection work. The event is only for one evening, however, and as such almost certainly does not have as much of an impact on the local community and economy as the festival in Tatsuno.

### *Fireflies as Regional Revitalisation*

There are many 'buzzwords' related to regional revitalisation, such as machizukuri, machiokoshi, chiikiokoshi, and furusato-zukuri – all of which refer in some way to activating or 'creating' a town, area, or 'homeplace'. One particular project, known as *chiikiokoshi kyōryokutai*, is notable for working all over the country to 'revive' undermanned towns. Chiikiokoshi kyōryokutai might be translated as 'regional revitalisation cooperation squad', and is a project first organised by the Ministry of Internal Affairs and Communications in 2009. Since the 1990s, there have been projects implemented by the state or NPOs sending people from outside the community into mountainous farming regions in order to support the

locals there. Chiikiokoshi kyōryokutai takes inspiration from this, and sends employees to regions affected by decreasing population due to urban migration and a predominantly elderly population, in order to devise ways to ‘liven up’ such areas. These municipalities appoint people from outside these regions, also hoping to secure more people settling down in these areas. The number of employees has greatly increased since the project began – while in 2009 it was implemented in 31 municipalities with just 89 employees, in 2015 the number of municipalities had risen to 673, with a total of 2,625 employees. In 2018, this number had increased to 1,061 municipalities and 5,359 squad members (Ministry of Internal Affairs and Communications n.d.). Additionally, in 2018, 38 per cent of employees were female, while almost 70 per cent were in their twenties and thirties (Ministry of Internal Affairs and Communications 2019). In Tatsuno, I was fortunate to be able to witness the work of such a regional revitalisation group first-hand.

The chiiki-okoshi kyōryokutai in Tatsuno consists of a team of enthusiastic, motivated, innovative people who seem to constantly be thinking of new ideas for town promotion and revitalisation. The members keep a diary on the website Tatsuno Kurashi (n.d. b) in which they document their activities, such as the recent ‘domannaka’-project (*domannaka sakusen*, lit. smack-in-the-middle strategy), in which Tatsuno is marketed as being right in the middle of the country. Tatsuno is located on 36 degrees latitude and 0 degrees longitude, a point considered “the geographical centre of Japan” (Town Tatsuno n.d. b). Started in 2018, this project aims to enhance Tatsuno being centered in the middle of Japan as a point of charm worth visiting the area for. Among other things, the chiiki-okoshi kyōryokutai have created a ‘domannaka’ package selling sweets from five sweets shops in Tatsuno together in one, and a restaurant concept that sells ‘domannaka’ curry and ramen, with each ingredient representing a tourist site of Tatsuno (Tatsuno kurashi n.d. c). They also sell ramen dishes invented by 6<sup>th</sup> graders at one of Tatsuno’s primary schools. Additionally, they hold events such as mushroom gathering, refurbishing train stations on the Tatsuno line, and refurbishing abandoned homes and turning them into cafés, secondhand shops, and so on. During the firefly festival, they manned Café Top, selling various local products.

Tatsuno, like many firefly villages, is a town affected by rural depopulation. In the town’s annual report, the information about the town’s population shows a decrease from year to year. For instance, the population consisted of 21,801 people in 2005, 19,770 in 2015, and 19,384 in 2018 (Tatsuno chōsei yōran 2018, 4). One effect of this is that the amount of young

people moving out and starting families elsewhere leaves the people who stay in a precarious position, as valuable resources are lost. For instance, on a drive out to an area of Tatsuno called Kawashima, Harumi-san was telling me about how this area was especially affected, and how the only primary school was in danger of being shut down due to lack of students. I asked Kageyama-sensei, the schoolteacher of the 4<sup>th</sup> grade students at a primary school in central Tatsuno, how many children there were at the school, and she said there were almost 500, but that the number is getting smaller – the 4<sup>th</sup> graders used to have four classes, whereas now they only have two.



Fig. 4.2: A promotional picture found on Tatsuno’s website ‘Tatsuno kurashi (Tatsuno life)’ (n.d.). The text reads “Let’s live in firefly village Tatsuno”.

An important part of regional revitalisation is marketing and branding. One example of such branding is town slogans, of which Tatsuno has several. A much-used slogan, particularly when advertising for the firefly festival, is “Town of light and green and fireflies, where people, the town and nature shine” (*hito mo machi mo shizen mo kagayaku, hikari to midori to hotaru no machi*) (Tatsuno kurashi n.d. a). Another slogan more geared toward attracting new residents is “Tatsuno – a town you want to keep living in, want to go back to, want to try living in” (*sumitsuzuketai, kaeritai, sundemitai machi tatsuno*) (Town Tatsuno n.d. a). It seems the town is rather focused on making it easier for people to move there. For instance, they have a website dedicated to work in Tatsuno, including information about vacant positions and how to start one’s own business (Tatsuno Shigoto n.d.). They also have pamphlets for childrearing support, as well as for buying or building a house, in which they are quite proactive in promoting the positive things about living in Tatsuno. The fact that Tatsuno is a famous firefly village is perhaps the most widely used form of promotion. However, there are also other important tourist sites in Tatsuno the residents are proud of, such as the 0-degree point, the weeping chestnut trees (*shidarekuri*), and the *jaishi*, a stone

resembling a serpent. The town mascot Pikkari-chan also plays an active and important role as promoter of the town – perhaps the most important one of all, as the mascot largely serves as the face of the town and is responsible for much of its PR.

### *Local Efforts, Individual Stories*

As many of my experiences in Tatsuno seem to reflect, regional revitalisation is often entwined with firefly protection. The figure of Pikkari-chan, for instance, might be described as the ultimate example of this entwinement, as the mascot embodies fireflies and the need to protect them, as well as being heavily present in the town’s self-promotion as a tourist attraction (as well as documenting various events and happenings on Twitter). Another example is the local primary school children who have been mobilised to raise kawanina for the firefly larvae, partially to protect fireflies and partially in order to create good memories of their hometown (further discussed in the next chapter). Additionally worth mentioning are the ‘bamboo rangers’ Chikaken, who use bamboo crafts as a form of regional revitalisation (although they are not from Tatsuno). Participation from local people certainly also seems to be an explicit goal for the activities of the chiiki-okoshi kyōryokutai in Tatsuno – such as the domannaka project, which encourages children and adults alike to think of new ways to promote the good parts of Tatsuno. Although the chiiki-okoshi kyōryokutai is a project created by the government, the way in which its members actively encourage local citizens to participate in their activities feels authentic and fruitful. The same goes for Shinshu Future Centre by the station, a café and meeting place for people to come and hold events and discuss projects for the town. According to the people who run the centre, a man and woman in their thirties, it is a space that is designed for locals to be proactive in doing things for themselves and coming up with their own solutions for how to make their town a better place for people to live. Such local, participatory efforts are surely important in order to foster a sense of local identity and pride in one’s local community.

When it comes to the firefly festival, as discussed in the previous chapter, it has significant importance for the town, both with regards to economic benefits as well as local identity. Additionally, firefly festivals are important, as raising public interest in nature is crucial in achieving effective conservation of biodiversity (Hosaka et al 2016). As mentioned in the preceding chapter, insect festivals are one way in which interest and enthusiasm for species that are normally underappreciated by the public may be celebrated and encouraged. Further, conservational organisations (such as firefly protection groups) may change people’s

perception of insects by promoting flagship species with high social interest, such as the firefly.

I would like to end this chapter with an anecdote of one individual's experience with fireflies, based on a rather unexpected interview opportunity. One morning in Tatsuno, I joined two members of the *chiiki-okoshi kyōryokutai* to go and see water lilies at a location in the mountains known as Shippochian. We were a bit early for the lilies to have opened completely, so we went to have some coffee at a tiny old tea house by the lily pond – and this was where we met a very interesting figure, namely the man who owned the tea house (my companions affectionately dubbed him 'Master' (*masutā*)). He was a tan, sprightly man with a moustache and greying hair, and he poured us some coffee made with spring water from the pond while we sat down on cushions in front of the traditional *irori* sunken hearth. He explained how he had been making the coffee the same way since he was in high school – having lived by the pond his entire life.

He brought out a box and showed us some of the fresh fish he had caught the same morning, as he is a fisherman by profession.<sup>19</sup> After I explained to him what I was doing in Tatsuno, Master started talking about fireflies. Apparently there are fireflies in the pond that come out in summer - but it has not always been that way. He asserted that fireflies never leave the place they are born - he said that he had tried before to catch some fireflies and then release them at the pond - but then before he knew it, they were gone, back where they came from. But then, he said, about thirteen years ago, he caught some fireflies and 'made them lay eggs' (*sanran saseta*) in the moss by the pond (that is, he caught some fireflies that were finished mating and then put them by the pond so they laid their eggs there). The fireflies did not come out for a while, perhaps due to insufficient sustenance, but one night Master was out by the pond, drinking with some friends, and then suddenly the fireflies started flying out, all around them.

He showed us on one of the pictures of fireflies taken there – there was a central spot in which they were mostly concentrated, and he explained that that was where a female would

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<sup>19</sup> He is also a butterfly expert and has written a book about Nagano's butterflies. He brought out a case containing several butterflies he had caught and pinned, and told us about how global warming is affecting butterflies (apparently, one can now see butterflies that previously only lived south of there - so their habitat is moving further north).

fly up, and all the males would swarm around her, hoping to mate. He then went on to say that the fireflies in Matsuōkyō are all cultivated (*yōshoku*) - and that they therefore do not have reproductive abilities (*seishoku nōryoku*) – that only one or two per cent of them did. This statement seems rather faulty, as Matsuōkyō does in fact see a significant number of fireflies every year. Further, Master said he did not want to see the fireflies in Matsuōkyō, because they were cultivated, and he would rather see the naturally occurring ones where he lives. This also struck me as a curious statement, as he had minutes before explained how he himself had managed to move fireflies from one habitat to another. With this view, he is imposing a value judgement on fireflies based on whether they are native or ‘outsiders’, even though his own fireflies might be considered outsiders by the same token. While the fireflies by his pond are, in a sense, just as ‘foreign’ as the ones in Matsuōkyō, Master clearly sees them as more ‘natural’. This demonstrates the ambiguities inherent in ideas of nature and purity, as will be discussed in the next chapter.

### *Conclusion*

Through this chapter, I have attempted to trace the origins of firefly protection, as well as the role of fireflies in regional revitalisation projects. Fireflies have had a significant economic importance in Japan, due to their catching and selling during and after the Edo period, as well as today’s firefly festivals, which bring in profit for rural towns. Other insects, such as crickets (sold every summer in post offices) and certain beetles (sold as pets), have also been exploited and commodified, and even sold in vending machines (Watts 1999). Certain insects, most notably the locust and cricket, have also served as food in hard times, especially after the war. Entomophagy (the practice of eating insects) is slowly stretching its feelers into the food market, with a vending machine selling snacks made from insects appearing in Kumamoto in 2018 (Ruide 2019).

Although the efforts of firefly protection groups have been instrumental, fireflies are still being exploited, not just in Japan. In Korea, the Muju firefly festival is held every year, bringing hundreds of thousands of tourists with unknowable consequences for the fireflies. In China, wild-harvested fireflies have started selling online in great numbers in recent years, mirroring the Edo period *mushiuri* industry. New worries about overharvesting, in addition to the threats still faced by many firefly populations, including urbanisation, habitat loss, light pollution, and ecotourism, all mean the fight against species extinction is far from over.



Despite the efforts that have been made to protect and revive fireflies, the fact that they once disappeared from people's sight, along with other species such as the tadpole and the skylark, is symptomatic of a larger environmental problem in Japan. Disregard towards nature in favour of developing economy and infrastructure is a deep-rooted problem, and this is why local action and organisation is crucial in exacting change. After *Silent Spring* was published in 1962, significant criticism was leveled toward companies producing DDT, eventually leading to a ban on the pesticide in America. In Japan, people banded together to fight pollution and species extinction. What were the motivations behind such action? Chapter five will consider nature, nostalgia, and feelings with regards to relations between people and fireflies.

# 5 Nature and Nostalgia, Fireflies and Furusato

As we have seen, fireflies have symbolic value in Japanese culture. The aesthetic image of their lime green glow in the dusk of early summer is part of a romantic, nostalgic view of nature that informs the discourses of firefly protection groups. For instance, the non-profit organisation “NPO hotaru no kai” states on their website that fireflies are Japanese people’s “homeplace of the heart” (*kokoro no furusato*). When viewing fireflies one day in Gunma prefecture, my friend Sawami-san said, “When I see so many fireflies flying like this, I think ‘I want to make the water clean’ (*mizu wo kirei ni shitai na*)”. What kind of ideology lies behind these statements? In this chapter, I will examine how the firefly fits into discourses of nature and nostalgia, particularly with regards to the ideologies of furusato and satoyama. Through looking at the websites of various firefly villages and NGOs for firefly protection, I will attempt to analyse the way they conceptualise fireflies, as well as themselves. Finally, I will consider the role of children, memory and emotion in nature conservation activities.

## 5.1 ‘Nature’ in the Japanese Context

Many scholars have pointed out the apparent contradiction between claims that Japanese people are uniquely connected to nature, and the sombre reality of pollution and environmental degradation that were an important facet of the country’s modernisation, and still define today’s society.<sup>20</sup> This includes the overexploitation of natural resources and industrial pollution that became factors in the endangerment of fireflies.

The myth that Japanese people have always lived in harmony with nature is a pervasive one both within Japan and outside of it. Its roots may lie in aesthetics, as well as in religion (Kalland and Asquith 1997, 2). The Shinto religion has commonly been attributed as strongly influencing Japanese views of nature – although this view has been challenged (e.g. Rots 2017). One of Shinto’s main components is a view of the natural world that sees inanimate objects imbued with divine power or spirit. For instance, even wind can be conceived as a

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<sup>20</sup> See, for instance, Hudson (2010); Kalland and Asquith (1997); Morris-Suzuki (1998); Kirby (2011); Rambelli (2007); and Rots (2017).

divine being, thus blurring the lines between animate and inanimate, sentient and insentient. The introduction of Buddhism via China and Korea in the 5<sup>th</sup> and 6<sup>th</sup> centuries brought new ways of thinking about nature – of particular importance here was the concept of the interconnectedness, as well as the transience, of all things (*mujō*). Beauty, youth, and life itself: all must come to an end, and one must learn to let go of any attachment to vanity and greed if one is to achieve enlightenment. This idea had a profound impact on art and poetry from the Heian period onwards, as poets and artists sought to capture the melancholic beauty within the impermanence. An example of the celebration of impermanence includes the firefly itself – as their short adult lives span a mere ten days on average, there is a sort of sadness to be found within the beauty of their glowing lights.

The term ‘nature’ is in itself a highly complex, dynamic concept. In Japan, there seems to be a proclivity for taming and domesticating nature, as discussed in the introduction chapter (and briefly in chapter 3). In Kalland and Asquith’s view, ‘nature’ in the Japanese sense can be conceptualised as moving along a continuum of dichotomies: tame and wild, pure and impure, cooked and raw, wrapped and unwrapped. Hence, Kalland and Asquith (1997, 15) observe: “artifice and nature are not opposed in Japanese culture”. The focal example of this would be *satoyama*, a type of landscape in which nature has been ‘wrapped’ by humans. As explained in the introductory chapter, *satoyama* describes a form of “encultured” nature (in Knight (2010)’s term), characterised by a form of coexistence of humans and nature. *Satoyama* may be described as a semi-cultivated area of land close to human settlements, which traditionally provided resources such as wood for fuel. *Satoyama* landscapes are thought to be the embodiment of ideal, idyllic images of rural life, and represent an intersection of nature and culture. This way of living, of changing but not overexploiting the nature around oneself, appeals to the idea of Japanese people living in harmony with nature, thus perpetuating the myth of a uniquely Japanese love of nature. This way of interacting with the landscape constitutes what we might describe as a taming of wild nature, mirroring Kalland and Asquith. Kitamura Masami (cited in Knight 2010, 436) argues that it is precisely this interaction with half-cultivated nature that has been instrumental in shaping the Japanese view of nature, and has in itself led to the much-vaunted Japanese ‘love of nature’.

A term that is closely connected to *satoyama* and thus shares many of its connotations is *furusato*. As described in the first chapter, this term refers to an ‘old village’ or homeplace, and calls to mind a ‘traditional’ rural landscape. It is a highly nostalgic term with strong

positive connotations, such as compassion, camaraderie, tradition, and even motherly love (Robertson 1988, 503) – in short, it is imagined as the antithesis of a cramped and draining urban lifestyle. The positive connotations of furusato may be viewed in contrast with the term ‘inaka’, which means ‘countryside’ and is imbued with negative connotations such as ‘middle of nowhere/out in the sticks’ (esp. *doinaka*) and backwards thinking. Compared to inaka, furusato is a highly romanticised concept, a symbol of the ‘quintessential Japanese’. For instance, the children’s song *Furusato* is widely (perhaps universally) known and sung throughout the country, and might be considered by some the epitome of nostalgia. The song’s lyrics reference parents, old friends and the natural environment (animals, green mountains and clear water), and are imbued with a sense of longing for one’s hometown.

As Robertson (1988, 504) writes, “nostalgia is provoked by a dissatisfaction with the present on the grounds of a remembered, or imaged, past plenitude”. The roots of nostalgia for furusato may therefore lie in the troubles and concerns of modern society. One aspect of this is the current condition of rural landscapes across Japan. Postwar economic growth affected rural landscapes mainly in two ways: firstly, suburban development projects encroached on satoyama and thereby eroded the traditional landscape, and secondly, rural depopulation due to urbanisation caused such landscapes to be left unattended, thus growing back into wilderness. In both cases, this constituted the disappearance of the imagined ‘old village’ for many people. This situation has led to what Robertson (1988, 497) describes as a ‘sense of homelessness’. There is no ‘old village’ to go home to – and for an increasing amount of people, there has been no such home in the first place, due to widespread urbanisation.

Additionally, furusato is one of the most popular symbols used by politicians, city planners and advertisers (Robertson 1988, 494). Robertson goes on to discuss *furusato-zukuri*, or hometown-building projects – a policy and a political process “by which culture, as a collectively constructed and shared system of symbols, customs and beliefs, is socially reproduced”. Furusato-zukuri aims to create a feeling of ‘furusato’ in cities, many of whose residents do not have a rural homeplace, but also in rural towns. Here, it is implemented as a strategy to curb depopulation, with incentives such as the “honorary villager” (Ibid, 509), in which people from the cities can come and live in a village and experience a rural lifestyle. These projects can be said to be motivated by a “nostalgia for nostalgia”, based on a dissatisfaction with the present, but they may also thus be useful for town revitalisation.

## 5.2. Furusato, Fireflies and Nostalgia

The link between furusato and satoyama is the idea of a curated, idealised natural landscape, connoting home, family and rural quaintness – an ideology with the ability to generate powerful feelings of nostalgia. Knight (2010, 436) makes this distinction between the two overlapping terms: “whereas the idea of furusato appeals to the Japanese sense of ‘belonging’ and having a place of comfort and peacefulness to return to, satoyama appeals to the Japanese conviction that they are a people that have traditionally lived in harmony with nature”. How do fireflies fit into this narrative?

Fireflies are a prevalent example of the nostalgia expressed through the ideologies of furusato and satoyama, and the link between fireflies and traditional, rural landscapes is a strong one. For urban people in particular, fireflies are strongly connected to furusato, as the luminous glow of fireflies forms part of the backdrop to the nostalgic, romanticised rural hometown of one’s parents. A common idea in the mythical history of fireflies is that they have lived close to humans, in the rivers and rice paddies of the satoyama landscape. As Yūma Masahide, an expert on firefly ecology, writes in the introduction to his book on the relations between fireflies, people and water, fireflies are creatures that have been dependent on the lifestyle of people, and are memorable to people precisely because they have existed around humans (1993, 3). In this sense, one might argue that humans and fireflies have coexisted to a certain degree, and have thus shaped and influenced each other in a form of ‘becoming with’ (Haraway, 2008). People have long interfered with the habitat of fireflies, namely the river and the environment around the river. *Satogawa* (‘hamlet rivers’) – the rivers of satoyama – are a human creation, as people planted bamboo to reinforce dikes and embankments, used spur dikes to slow the current and diverted floodwater, all of which created ecological niches that allowed biodiversity to flourish (Williams 2010a, 32). Fireflies may well have taken advantage of such human transformations of the natural environment to support their own living environment. We may thus talk of a form of symbiotic relationship between humans and fireflies, in which fireflies laid their eggs and lived as larvae in the managed water of the satogawa, and people gained pleasure from seeing the beauty of their bioluminescent light shows each summer.

A common belief among people is that fireflies can only live in clean water, or clear streams (*seiryū*). Many people have considered fireflies as an indicator species of a healthy water

environment – that is, as fireflies are widely taken to live only in clean water, their presence indicates that the water is clean. This belief is dispersed by many firefly villages, for instance Isumi firefly village in Chiba prefecture. Their website states that fireflies are “an insect that favours clear streams in a good natural environment” (Isumi Kankō 2014). But what is meant by clean water?

Kada (1992) conducted research around Lake Biwa, asking the residents about the water environment. Concrete had been laid down over a belt of reeds, and the residents said that this was beautiful – as the concrete made it nice to look at, whereas the reeds were more like a pest that no one wanted. They also liked not having to do weeding so often. Also, they reminisced about fireflies – before, there were many of them, but they said that ‘fireflies don’t live in beautiful (*utsukushii*) mountain water’ (Kada 1992, 36). As the idea that ‘fireflies are a symbol of clean water’ was so prevalent at the time (Kada 1992, 37) she wondered why the residents of Lake Biwa said that fireflies do not live in beautiful water. Which statement was true?

She consulted with Yūma, who stated that people have too simple an understanding of the environment of fireflies. He said: “Many fireflies live in places with moderately dirty water. If it’s too clean, fireflies don’t live there. They don’t live in the mountain. There are many fireflies around human habitation, in rivers flowing into human habitation” (cited in Kada 1992, 37). What constitutes a firefly’s living environment is a combination of not just the water quality, but the condition of the waterside, whether there is concrete or stone, what the bottom of the river looks like, whether there are trees and grass, the level of light pollution, et cetera. It seems one cannot simply say that fireflies are a symbol of pure water. So why are they talked about this way? According to Yūma, this is perhaps a ‘social image’ (*shakaiteki na imēji*) that was created via hearsay, a characteristic of our modern society (Ibid). For urban people who are detached from real nature, fireflies become suitable symbols of what Kada (1992, 37) calls ‘pseudo-nature’. In Kada and Yūma’s sense, a clean river would not mean a river contaminated by agricultural chemicals or factory waste, but neither would it mean a crystal-clear body of water. Instead, they assert that the idea that fireflies live in pristine, clear water is incorrect, as there is always some form of organic matter (constituting a variety of organisms) in a healthy body of water. In the popular imagination, fireflies are deemed to be in the ‘pure’ category of a pure/impure dichotomy, where clean water is seen as pure and

pollution as impure. Yūma and Kada's observation that fireflies do in fact need some 'pollution' (in the form of organic matter) challenges this dichotomy.

On the other hand, criticism has been leveled at firefly protection groups that think they protect fireflies by 'cleaning' the river, by cutting grass near the riverbed and washing away mud (Blue Stars 2015). This type of cleaning, though, creates a 'cleanness' that is beneficial only to humans. While performing such activities makes the area around the river 'clean' and 'nice' to human eyes, to fireflies the grass and the mud are essential parts of their existence. The grass is where adults spend their day in the daytime, while at night the females stay in the grass while the males fly about – it is therefore an important hiding place. As for the mud, *kawanina* live in the mud of the river, so to clear the mud away means flushing out the *kawanina* as well. This type of 'cleaning' is practised in Tatsuno amongst other places. Such 'protection' activities might, however, be more accurately described as misguided attempts at transforming nature that does not benefit from being changed.

Do firefly festivals represent a form of 'cooked' nature? In many ways, yes. A firefly festival is a staged event and setting, even though the fireflies are there 'naturally' (that is, in cases in which they have not been brought to the area by humans), and the event around the firefly viewing itself is designed to make it an attractive and palatable event in order to attract tourists. There are many places to view fireflies, after all – just by driving in the countryside at night one is likely to see them – so why should people come to this particular place to view them? This element of competition fuels the need for firefly villages to advertise and promote their own town – the need to make it a big, attractive event. Some places seem to rely more on this than others – for instance, for Tatsuno, the firefly event is the town's largest annual event, whereas in Minakami it is a smaller event on a more local scale (even though it is advertised for people from all over the country, and perhaps it is no coincidence that the firefly park is located right next to a bullet train station, or vice versa).

Another thing to note is the artificiality of the firefly park in Tatsuno. From the park itself to the water channels in it – it is all artificial, constructed and man-made. Can we still call this a 'natural habitat of fireflies'? Or is this merely tamed, domesticated nature? According to Kalland and Asquith (1997, 15), "nature in its wrapped, idealised form is the most appreciated by the Japanese". It would indeed seem, when considering the prevalence of aesthetic, packaged forms of nature such as elaborate parks and gardens, that nature tourists

prefer appreciating nature from a ‘healthy distance’. However, the popularity of *konchū shōnen* (‘insect boys’) and the encouraging of children to go outside and catch insects and be immersed in nature undermines Kalland and Asquith’s statement slightly. One may view such an interest in catching insects as a simple wish to gain an intimate knowledge of the natural world. Then again, one might add that in 1999 rhinoceros beetles were being sold in vending machines (Watts 1999). Catching insects and putting them in cages to keep as pets may be a sign of a budding curiosity about nature, but may also be a sign of a wish to procure and own parts of nature. Can the elaborate creation of firefly parks, and the breeding and releasing of fireflies for human appreciation, be seen as a similar phenomenon?

The dichotomy between ‘artificial’ and ‘real’ nature must be contested, however, as all parts of nature have been more or less affected by human activity. In this view, what is ‘real’ or ‘fake’ nature is not easily determinable, as it would be just as plausible to name *satoyama* landscapes (the ‘natural habitat’ of fireflies) as an example of artificial, constructed nature. What would constitute ‘real nature’ in this case? Kalland and Asquith (1997, 16) discuss how wilderness has been viewed in Japan as a threatening and dangerous place (rather than an exciting place to venture into, as in Western literary tradition). Because it is seen as a threat, there is a need to cultivate wild nature, and transform it so it is closer to the human realm and thus easier for us to connect with. In this groomed state, nature is seen as safe and harmless, and it is this state that is seen as the true nature. Thus, in the film *Only Yesterday* (directed by Takahata Isao, 1991), protagonist Taeko is surprised to learn that her cherished *satoyama* landscape is in fact ‘artificial’ (as she had believed it to have been that way naturally). Such landscapes are, however, neither natural nor artificial, but rather products of a longstanding interaction of nature and culture. In other words, the entangled nature-culture of these landscapes transcends the artificial-natural dichotomy. The loss of such nature-culture zones, however, gives way to confrontations between the two. Historically, *satoyama* has served as a buffer zone between humans and wilderness. With *satoyama* landscapes being abandoned and left to grow uninhibitedly, it has led to more encounters between humans and wildlife, often in the form of wild animal attacks or crop raids (Knight 2003).

### **5.3 Firefly Villages and Furusato Nostalgia**

I now move on to a discussion of how various firefly villages and NPOs that work with firefly protection present themselves, and whether they appeal to *furusato* nostalgia. Many



firefly villages do not write anything in particular about their goals on their websites (sticking instead to informing about fireflies and how to view them), but I found several groups who do state something about their goals, often imbuing them with value statements about fireflies and nature. For instance, Suzuka firefly village in Mie prefecture hopes to provide an opportunity for visitors to remember the importance of nature. They write:

While our lifestyle is getting wealthier, on the other hand we are starting to lose nature, including fireflies. How about watching fireflies, for an opportunity to remember the importance of nature by interacting with nature on an early summer night? (Suzuka firefly village 2017, my translation).

Moreover, they encourage tourists to come and “spend a peaceful time enveloped by the light of fireflies in a quiet satoyama landscape”. Here, they make an appeal to nostalgia for satoyama, while providing a chance for urbanites to escape from a presumably stressful and noisy urban landscape to a peaceful, quiet landscape. In this firefly village, they do not actively protect fireflies or provide kawanina for the larvae – they state that the only thing they have actively done for them is to have farmers refrain from using pesticides as much as possible. Komaki Park in Aichi prefecture, however, states that the purpose of the park is both for firefly protection *and* a chance for people to come into contact with nature (Komaki city 2017). Their website states that at the park “you can see a landscape of fireflies flying about, a sight which is becoming more and more rare”.

Some places explicitly address the issue of foreign species importation. Ranzanmachi firefly village in Saitama prefecture, for instance, makes a point of emphasising that their fireflies are native, explicitly distancing themselves from other places whose fireflies are not:

Another thing we stress in regard to building a firefly village for Ranzanmachi is preserving the “hometown fireflies” that live in the Sugaya yakata ruins. Recently, improvements in technology have made it easier to cultivate fireflies, and the number of regions that release large numbers of adult fireflies and hold events is increasing. In most cases, this is occurring in places which fireflies previously did not inhabit, and it is common to rear and release successive generations of fireflies that have been harvested from another region. If such methods are performed at or near places inhabited by wild fireflies, it is possible that the wild fireflies may encounter captive-bred fireflies from another area released to the field. In the worst case, as a result, genetic purity cannot be maintained, and ecological changes may cause unexpected negative effects. For this reason, at this firefly village we do not bring in fireflies and kawanina from other areas, and aim to increase our local fireflies as naturally as possible (Ranzan Town 2017, my translation).

It seems they perceive local, ‘hometown’ fireflies as the ideal object of protection. Their main goal may be summed up as a wish to “arrange for a good living environment for the fireflies”, as cited on their website (Ranzan Town 2017). This may be seen as a purely ecocentric or environmentalist goal, in which humans are not necessarily implicated. Contrastingly, some places, such as Nagusa firefly village (Tochigi prefecture), are upfront about having introduced foreign fireflies to their town. On their website they state they have been involved in raising and releasing foreign fireflies for thirty years with the help of local primary school children. Despite this information, the headline on their website reads, “Let’s go and see natural fireflies (*tennen no hotaru*)” (Tochigi travel net 2019).

As for Tatsuno, there is a slight deceptiveness with regards to how they present information on their tourism website (Sightseeing Tatsuno). They have a page dedicated to the fireflies of Matsuōkyō on which they state that fireflies gradually decreased with the spread of pollution and agricultural chemicals (Sightseeing Tatsuno n.d. c). They then detail what the town did ‘in order to protect the fireflies’, including building water channels with clean water, from which many fireflies appeared two years later. They neglect to mention the fact that Katsuno-sensei brought in and released foreign fireflies in the river – only on a separate page detailing the history of firefly protection in Tatsuno does this come up (Sightseeing Tatsuno n.d. b). Thus, only people who care to investigate the history of firefly protection in Tatsuno will find out about this controversial fact.

Yet other organisations showcase rather romantic attitudes toward fireflies. As mentioned in the beginning of this chapter, the non-profit organisation “NPO hotaru no kai” states on its website that fireflies are Japanese people’s ‘homeplace of the heart’ (*kokoro no furusato*). Such a statement makes very explicit the connection between fireflies and traditional landscapes and lifestyles, by equating fireflies themselves with furusato (‘furusato of the heart’ might imply a quintessential image of an ideal rural landscape and lifestyle, as opposed to a real furusato). One of the goals stated on their website is for children to experience fireflies. They write that whereas middle-aged and old people have nostalgic memories of releasing fireflies from mosquito nets on summer nights, young people these days aren’t familiar with fireflies. On their website they state various protection activities they engage in, such as river maintenance, giving talks and lectures, supporting the activities of firefly villages, and teaching school children about fireflies and environmental protection. They

even list bringing fireflies into old people's homes as one of their activities – it is hard to think this may benefit the fireflies. In this case, fireflies become a sort of vehicle for human nostalgia. Further, they make the speculation that Japanese people's sensitivity towards nature, as well as their modest and gentle nature, are a 'gift' they have received from the fireflies (NPO hotaru no kai n.d. a). For what purpose do they utilise such highly romanticised language? Here, we might mention how use of *furusato* fosters in-group identification at both the local and national level (Robertson 1988, 494), and how nationalistic writers have made use of the *furusato* concept, tying it to an ethnocentric worldview of Japanese sensibilities and love of nature (in the school of writings known as *nihonjinron*, or theories about Japanese people). However, as of April 2019, Hotaru no kai's website is no longer accessible, which might mean that the group has dissolved for some reason.

Another NPO for firefly protection is "Nihon hotaru no kai". Their goal is for people to "perceive fireflies as a crystallisation of the natural environment and satoyama environment" (Nihon hotaru no kai 2019). They want to preserve and revive an environment in which fireflies can live, by lifting fireflies as a symbol of a satoyama environment (*satoyama kankyō*). They also seem to be focused on animals that live in satoyama landscapes, calling them 'creatures close to us' (*mijika na ikimono*). Listed among their activities, for instance, are researching and studying fireflies and other 'creatures close to us'; supporting activities that conserve and regenerate the environment of 'creatures close to us'; and gathering and dispatching information about fireflies, 'creatures close to us' and satoyama (Ibid). Exactly what kind of creatures is meant by this term is not clear, but most likely refers to creatures that live in satoyama landscapes, such as frogs, beetles, fireflies, and so on. For instance, Kada (1992, 45) lists several 'small animals' that Japanese people have been close to, including the rhinoceros beetle, locust, praying mantis, diving beetle and rice fish. This language use also calls to mind the Ministry of the Environment's goal for the promotion of *Furusato no ikimono no sato hyakusen* ('100 habitats of living creatures of our hometowns'), as cited in chapter 4, which spoke of 'the nature close to us' (*mijika na shizen*), referring to satoyama. It is evident from this wording that satoyama landscapes are still seen as being in close proximity to humans, even though this may not strictly be the case anymore.

An analysis of these statements reveals several facets of how Japanese people perceive fireflies, especially what regards nostalgia. There is an emphasis on the connection between

humans and fireflies as well as the importance of feeling close to nature. Besides the words ‘furusato’ and ‘satoyama’, there seems, in particular, to be a fixation on the word ‘*fureai*’, connectedness – people are meant to come and view fireflies to feel a connection with nature, as is the case for Komaki Park and Suzuka firefly village. There is also a clear dichotomy between fireflies raised by humans (*yōshoku*) and ‘naturally occurring’ fireflies (*shizen seisoku*), which some groups employ to define themselves as a place that has ‘natural fireflies’.

During fieldwork, I spoke with many people about fireflies, and sometimes heard interesting remarks that revealed something about their view of the relationship between fireflies and people. Several people evoked the myth that there used to be a close relationship between people and fireflies, which has now become distant. Others talked about the aesthetic value of fireflies. For instance, a young woman in her thirties explained to me about *wabi-sabi* while we were viewing fireflies one evening, which describes an aesthetic based on the acceptance of transience and impermanence. Similarly, a young man expressed the opinion that Japanese people’s love of fireflies comes from the old samurai code of honour *bushidō* – as samurai had to be loyal to their master and prepared to die at any time, they had to have an attitude of acceptance toward death and the fleetingness of life. Harumi-san, who runs the guest house where I stayed, was telling me about her experience with firefly viewing and the huge crowd of people who come to the firefly festival, and how having so many people come to the town for the festival (100,000 over the weekend, to a town of 20,000) ruins the *atmosphere* of seeing fireflies. She explained this to me by using the words *jōcho* and *fuzei*, which are both terms that signify atmosphere, mood, air and charm. Additionally, she told me how she prefers the atmosphere of seeing just a few fireflies fluttering about than seeing huge amounts. She compared it to putting a few fireflies in mosquito nets like people used to, and just enjoying the atmosphere. According to her, Japanese people tend to prefer things that are not too flashy or shiny (e.g. preferring the rustic atmosphere of the wooden Silver Pavilion in Kyoto to the more opulent Golden Pavilion). Atmosphere thus seems to be an important factor in one’s enjoyment of fireflies. On another occasion, Harumi-san was chatting with another guest at the guesthouse, and discussed how it’s not good with too few fireflies, but it’s not nice with too many either – too many fireflies is a bit ‘unpleasant’ (*kimochi warui*). However, they agreed that fireflies are always nice to see – “even though they are bugs (*mushi*)”!

## 5.4 Children, Memories and Nostalgia

The day before the start of the festival I joined the fourth grade children when they went to release the kawanina they had raised in the river. On the way there, I spoke with their teacher, Kageyama-sensei, about her work with the children and fireflies. Harumi-san had described her as a ‘strong woman’ who had some power in the community. She was born and raised in Tatsuno, having moved back after going to university in Gifu prefecture. She had now been a schoolteacher for twenty years. I asked her about how she started this project with the children, and she explained how she started teaching the children about fireflies and raising kawanina two years ago. The content of the children’s school classes is already decided by the state, but Kageyama-sensei was given some control over just one subject, ‘life studies’ (*seikatsu-ka*), so she decided to make it a subject about fireflies. She is of the opinion that if the children learn about fireflies and their hometown at a young age, those memories will stay with them when they grow up, and they will have fond memories of their hometown and may thus want to come back to it. She thus makes a connection between fireflies and rural depopulation, as her wish is that the children will use their fond memories of fireflies to want to move back to their hometown after leaving for university.

Another example of the connection between children and fireflies in Tatsuno is the naming of the firefly park ‘dōyō kōen’ – nursery rhyme park. This naming creates, or perhaps strengthens, a connection between children and fireflies. The newly established leisure centre ‘Alapa’ is also a welcome new addition to the town’s cultural landscape. Its many activities available for children, including a firefly lab, exhibition, and reading corner, is sure to foster even more good memories for the town’s youth. And the festival itself is also an important event for children. For instance, Harumi-san’s children, two boys aged 9 and 11, had saved their money all year to splurge on festival food and toys, and were very much looking forward to going out and experiencing the festival with their friends.

In Tatsuno and in other parts of Japan I talked to several older citizens about fireflies. One thing many of them would mention was having caught them as children, and subsequently bringing them back to their homes and releasing them under the mosquito net. Many of them had a smile on their face as they recalled such stories. Catching fireflies and releasing them in mosquito nets is not practised anymore (at least not in the same capacity), and so this particular memory lies within a realm of experience unattainable for children of today. For

elderly people who grew up in rural areas I would argue that it is such childhood nostalgia, rather than *furusato* nostalgia, that is dominant. This points to the importance of *feelings* in questions of nostalgia and hometown-making. Until now, I have discussed firefly villages from the perspectives of ecology and economy, however I have largely ignored the aspect of *affect*. People have good memories and strong feelings about fireflies, and that may be an important part of their feeling of belonging and connection to the place where they live. The symbiotic relationship between people and fireflies is thus also an affective one, significant for identity construction. Tatsuno being a firefly village is thus not just an important part of town promotion, but also important for the local identity of the residents.

Kada (1992) talks at length about the connection between fireflies and people and how they are ‘profoundly memorable’ for people, especially children. Her informants in Shiga prefecture would tell her about their childhood memories, for instance: “You could see infinite fireflies, like stars around the fields and river when going firefly catching as a child. All the children would go catching together” (Kada 1992, 51). Another said,

When I hear the word firefly I think fondly back to my childhood. I would put the fireflies I caught in a mosquito net and enjoy them all night, and seeing them dead the next morning, I tried putting leaves, grass and water inside the net so they wouldn’t die. And that smell is hard to forget (Kada 1992, 52, my translation).

People used items available to them in their daily lives and innovated them in order to catch fireflies – for instance, people would go out with ‘brooms’ made from bamboo or rapeseed stems. According to Harunobu-san in Gunma, since fireflies would ‘dry out’ and die if placed in a box or a cage, people would instead put them inside a spring onion to make them live longer (“Just like a lightsaber”, he joked). Kada (1992, 54) also mentions this occurring in Shiga prefecture, with one informant reminiscing that the fireflies lined up like prayer beads inside the green onion had the most beautiful glow. Another thing Kada (1992, 48) discusses is the ‘sociality’ (*shakaisei*) of fireflies, as they exist at the contact point between individual and social history. They inspire childhood nostalgia, and are also part of the collective memory of a place, inspiring legends and folklore. Additionally, when people talk about their memories of fireflies, they often also think about the people around them in their childhood, such as the people they went firefly catching with (friends, siblings) – people they remember fondly (Kada 1992, 59).

In this connection, the ban on catching fireflies needs to be revisited. For instance, Kada (1992, 56) heard a lot of voices expressing the wish to let children catch fireflies freely like in the old days. Laurent and Ono (1999, 151) also discuss how the relations between people and fireflies have changed with the spread of firefly protection groups. While the authors acknowledge that the efforts of firefly protection groups have in fact led to an increase of fireflies, they are critical of the way the movement has dealt with ‘the traditional role of fireflies’. They argue that imposing a ban on catching fireflies implies an objectification of the firefly, stating that this is akin to the firefly losing the ‘traditional place it had in Japanese culture’. Here, the authors seem to be professing an anthropocentric concern about the loss of an exploitative relationship in which humans catch and sell fireflies. One might pose the question as to why this loss is perceived to be a bad thing. One would assume that this is a development that serves to benefit the bugs – if it is for the benefit of the environment that they have destroyed in the first place, should humans not have a responsibility for putting the needs of nature before their own wants or needs? The authors argue that this amounts to a loss of cultural tradition, but does cultural tradition not change significantly over time, and not necessarily for the worse? Firefly catching may have been a large part of people’s relationship with and fond memories of the glowing bugs, but from the perspective of the firefly it is hard to argue for such a practice.

In any case, events such as firefly festivals (as well as firefly protection work) may provide a good educational opportunity for children to interact with and learn about insects and nature. Additionally, there are numerous other events related to insects and nature throughout Japan, such as ones in which people go out to look for rhinoceros beetles (Hosaka et al 2016). As Hosaka et al (2016, 233) write, such events, in which a parent might teach a child how to catch and take care of a rhinoceros beetle, can “enhance communication between generations and provide opportunities for children to learn traditional cultural practices and gain knowledge from parents or other elders”. Such experiences are particularly valuable in this era of “extinction of experience” (Pyle 1993), as interactions with nature, including insect collecting, are decreasing even among Japanese children. Further, the participation of children in nature conservation is a crucial step in teaching them about nature and how to treat it. As children are the ones who will have to steer our planet away from further ecological destruction in the future, the importance of starting early with instilling such values in children can therefore not be stressed enough.

## *Conclusion*

Nature is romanticised and sanitised in the Japanese context. As Kalland and Asquith (1997, 29) point out, though Buddhism and Shinto have contributed a lot to the development of an awareness of nature, they have not been concerned with its preservation and conservation. They question whether a close identification with nature is enough to generate a true love and empathy for its contents.

Hudson (2014, 952) writes:

By themselves, Buddhism, Shinto, or other Asian views of Nature cannot provide ready-made answers to the environmental crisis. The whole idea of Asian "harmony" with Nature was already being criticized in the 1970s. Perhaps the biggest objection was a practical one: even if the West really was able to adopt Asian environmentalist ideas on a broad scale, those ideas were clearly not enough to prevent wide-scale destruction of the environment in practice - however "pro-Nature" Asian religions and worldviews were in theory.

As Rambelli (2007, 129), writes, the idea of a uniquely Japanese 'love of nature' serves to mask "an increasing separation of the Japanese from their traditional natural environment as a consequence of massive urbanisation and industrial and technological development".

Furusato nostalgia is a symptom of this separation, but perhaps it is an ideology powerful enough to harness support and zeal for the protection of fireflies? Certainly, it carries within it strong elements of emotion and memory (whether imagined or real), which people utilise when talking about the glowing insects. The next chapter will employ these insights in a discussion of satoyama, sustainability, and nature conservation discourse.



## 6 Satoyama Sustainability

So far, I have discussed several aspects of the role of the firefly in today's Japanese society, including its symbolic value, its appropriation in firefly festivals, as well as its endangerment and subsequent protection efforts. The main issue discussed has been the implications of using fireflies as a tool for rural revitalisation. In this last chapter, I will attempt to conclude this discussion, and come back to my research question, "Is the wish to protect fireflies compatible with their use as tools for town revitalisation?" How can we find a balance between protecting both the social and economic needs of the nation, as well as its natural environment? I will begin by looking at the role of nature conservation movements in Japanese environmental policy-making, before examining more recent policies, namely the Basic Environment Plan, the National Biodiversity Strategy and the Satoyama Initiative. I will also address policy regarding regional revitalisation, focusing in particular on locality studies. Finally, I will return to fireflies and firefly villages for a more thorough discussion of ecology, economy and nature conservation.

### 6.1 Environmental Policy and Sustainability

The nature conservation movement in Japan has had a relatively slow start. There have been few measures for the protection of wildlife and natural habitats until recently, and Japan is still criticised for ongoing habitat destruction and the continued endangerment of many plants and animals that go against these measures (Knight 2010b, 350).

In examining Japan's national environmental policy-making from the 1970s until the 1990s, Takao Yasuo (2012) addresses the question of why Japan went from one of the world's leading nations within environmental policy in the 70s and 80s to falling behind in recent years. In the 70s and 80s, policy-making largely happened at the domestic level, whereas from the late 1980s, Japan's environmental policy-making shifted to accommodate foreign pressures (*gaiatsu*) from the West, as climate change was put on the global political agenda.

In the 1970s, environmental policy was strongly influenced by activists fighting against industrial pollution. Spearheading such activist groups were victims of the industrial

pollution diseases of the 1950s and 60s: Minamata disease and Yokkaichi asthma. Their efforts led to the government vastly improving on the 1967 Basic Law for Environmental Pollution Control, at the time setting the steepest goal for environmental pollutant reduction in the world (Takao 2012, 776).

However, when air quality improved after the drastic measures taken toward pollutant reduction, the policy environment shifted away from identifiable sources of industrial pollution, to vague sources of non-industrial pollution – which led a lot of the activist communities to lose momentum and public interest to fall considerably (Takao 2012, 776). Additionally, due to the failure of Japanese environmental movements to establish powerful national interest groups, the community of environmental and nature conservation groups across Japan was small and weakly organised by this time. Catherine Knight (2010b, 350) discusses several factors that contributed to this, including social constraints hindering wider participation, a tendency to see people as victim (as opposed to the environment itself), as well as a “relatively low awareness of the ecological thinking which forms the basis of effective nature conservation practice”. Regarding the last point, Knight (2010b, 352-3) elaborates:

Even when there is a high level of concern about a development project with significant environmental impacts such as the building of a dam or highway, environmental opposition tends to be based not on wider ecological premises, but specific impacts, such as the extinction of one species within a habitat, often focusing on its implications for humans also.

This also seems to ring true for firefly villages. Then again, the species being protected may serve as a symbol for the wider ecosystem (such as the river), and focusing on only one flagship species makes it easier to gather public awareness and support.

Other factors behind the lack of implementation of nature conservation policy include factors such as powerful development interests, the historical political weakness of the Ministry of the Environment and the lack of effective environmental impact assessment policy (Knight 2010b, 357). An imbalance in economic and political power that favours development interests means that, where forces of development and conservation are at odds, forces for development often prevail.

## 6.2 Environmental Plans and the Satoyama Initiative

Despite the above claims by Knight, the government has since made further attempts to create plans and strategies on measures to increase biodiversity and combat environmental degradation. For instance, the Ministry of the Environment has proposed a “Basic Environment Plan” as well as a “National Biodiversity Strategy of Japan”. What do these entail?

The Basic Environment Plan is based on Japan’s Basic Environmental Law, first drafted in 1993. The plan is designed to “engage all sectors of the society in a concerted effort to protect the environment” (Ministry of the Environment n.d.). The plan has been revised several times, and the fifth plan came in April 2018. The National Biodiversity Strategy is a national basic plan for the conservation of biodiversity and its sustainable use (Ministry of the Environment 2010). It was first formulated in 1995, as required by the Convention on Biological Diversity. The newest version spans the years 2012 to 2020 and has the subtitle “Roadmap towards the Establishment of an Enriching Society in Harmony with Nature” (Ministry of the Environment 2012). The strategy incorporates numerous measures to increase biodiversity conservation, including how to conserve satoyama areas. Among the main goals outlined here is to “achieve better harmony between humans and nature through the revitalization of sustainable agriculture and forestry” and to “promote the revitalization of rural districts through vigorous and effective utilization of local natural resources and the discovery and creation of new value, including the utilization of local areas for ecotours and the utilization of biomass resources” (Ministry of the Environment 2012, 68). By employing the term ‘harmony with nature’, the Ministry plays on furusato nostalgia and an old essentialist myth about Japanese people’s relationship with nature. We might ask ourselves, who is the document written for?

As for the Basic Environment Plan, the newest revision outlines several “future environmental policies to build a sustainable society”, including such broad statements as “creating innovations across all perspectives” (in socio-economic systems, lifestyles, and technologies) (Ministry of the Environment 2018, 2). One explicit goal of the plan is to create bridges between rural and urban areas. This includes creating city-country networks in order to rehabilitate depopulated rural areas. Another aim is to create a “regional circular and ecological sphere” aiming for decentralisation and self-reliance of each region, in the hope of

maximising the potential of each region. This seems like a good initiative that may well have positive outcomes, but it is hard to say how things will turn out in practice. The goals look very well and good on paper, but are they feasible? How are they being implemented? How much weight do they hold in state decision-making?

How does firefly protection relate to these goals? Another central goal of the Basic Environment Plan is promotion of the Satoyama Initiative, a global initiative based on the concept of satoyama. It promotes satoyama as a model of sustainable and efficient use of natural resources – not only in Japan, but also as a global measure for the rest of the world (Knight 2010a). The initiative has been supported and implemented by an international partnership of over 100 governments, civil society organisations and indigenous peoples. But how useful is it?

Catherine Knight (2010a) discusses the role of the term satoyama in the discourse on nature conservation in Japan. The term has been used by the government (the Ministry of the Environment) as an example of traditional Japanese agriculture, notably in 2010, during the Conference of Parties to the Convention on Biological Diversity. Here, the ‘satoyama method’ was promoted as a desirable form of sustainable agriculture. This discourse presents satoyama landscapes as a uniquely Japanese creation that the rest of the world should look up to and imitate, and additionally “supports a widely held view that the Japanese have traditionally lived in harmony with nature, and that recent decades of environmental degradation are an aberration caused by the Japanese desire to industrialise and Westernise at the expense of traditional culture and values” (Knight 2010a, 422). Further, Knight (2010a, 427) writes:

A report on a 2008 symposium on satoyama organised by the Ministry states: “They [participants in the symposium] also recognised that the key to the appropriate management of satoyama is the Asian view of nature which considers human beings as a component of the ecosystem”. It further states “... it is important to promote the conservation and sustainable use of natural resources such as seen in satoyama which has been developed and managed by interaction between nature and human in addition to the preservation of pristine natural environment” [sic].

Implicated here is an expectation that the rest of the world adopt an ‘Asian view of nature’, even though such a view has done nothing for the preservation of nature in Asia (as discussed in the previous chapter). The government thus appropriates and redefines the satoyama term

to achieve a goal of presenting Japan as a global contender within sustainable development. It is not just presented as a model for harmonious coexistence with nature; the satoyama model is promoted as a means to halt the decline of biodiversity around the world. Further, Knight (2010a, 435) argues that the discourse on satoyama represents it as an ideal relationship between humans and nature, and it is therefore this cultural importance that makes it such a hot topic for conservation, rather than any ecological importance. However, it has been noted that satoyama landscapes are the richest in biodiversity. The loss of satoyama thus means a loss of biodiversity, as Japan's humid climate turns untended coppiced woods into "choked, unstable tangles of vegetation, prone to wildly fluctuating species populations, contagions and other afflictions" (Williams 2010b, 29). Many birds, insects and amphibians depend on the maintenance of satoyama, such as the great purple emperor butterfly, which drinks the sap of young, coppiced oak (Tsing 2015, 182).

The term satoyama gained currency in postwar Japan (Knight 2010a, 421). In the first chapter, I outlined how changes in the environment affected the traditional satoyama landscapes. After reforestation and suburban development from the late 1960s eradicated many satoyama landscapes, conservation movements that work to protect and revive satoyama sprang up in the 80s and 90s. The movement is still going strong – Anna Tsing (2015, 263) notes that several thousand satoyama conservation groups had emerged across the country by the turn of the century. These groups have different goals, some of them relating to fireflies. As discussed in the previous chapter, there is a widespread idea that fireflies have long lived in satoyama landscapes, close to humans. Firefly protection thus goes hand in hand with satoyama conservation, as preserving satoyama means preserving the habitat of fireflies.

Themes recurrent in the discourse about satoyama include satoyama as a manifestation of coexistence or harmony with nature; satoyama as a model of sustainable use of natural resources; and satoyama as a cultural, as well as geographical, space (Knight 2010a, 426). Among other things, such discourse constructs 'local' people in the regions as being the keepers of 'ancient ecological knowledge' about how to live sustainably on the land (Rots 2017, 66). While the myth of satoyama tells of a people living in harmony with nature, Tsing (2015, 160) shows how such landscapes are more characterised by *disturbance*. The creation of satoyama woodlands, rice paddies and rivers necessitates deliberate disturbance, involving cutting back trees, planting new ones, creating spur dikes in rivers and irrigating rice crops.

In Tsing's view, such disturbance is not always bad – on the contrary, it is ordinary. For instance, the muddy, impure water fireflies inhabit is a sign of disturbance and co-habitation – a sign of the relation these insects share with humans. Tsing investigates 'disturbance-based ecologies', in which species may live together without either harmony or conquest (2015, 5) – such as that of the matsutake mushroom, which only grows where there is red pine, which again only grows out of the remains of disturbed, deforested areas. In this case, these species share a symbiotic relationship in which the matsutake is dependent on the red pine to grow, and the pine in turn is dependent on human coppicing methods. In satoyama conservation activities, humans entangle themselves with the forest, 'creating' the landscape together with it. Tsing did fieldwork with one such conservation group, whose slogan is "Let's revitalise the forest so we can all eat sukiyaki" (Tsing 2015, 258) – an anthropocentric wish indeed. Their activities involved a cleaning up of the forest, by means of removing roots and raking the ground – a practice reminiscent of firefly groups who 'clean' the river environments. In this case however, cleaning away roots gives space for new growths to sprout and thrive. In the same way, satoyama revitalisation creates a new space for people to come together and grow together through community bonding.

### **6.3 Regional Revitalisation as Sustainability**

Local action in regional revitalisation is an important element of today's policy on sustainability and battling rural decline. For instance, Love (2013) discusses 'locality studies' (*jimotogaku*) as a technique for sustainable development. Here, residents of declining rural areas are encouraged to reflect on the merits of their home place, and to find the charm hidden behind years of decline. Locality studies is based around a series of community-mapping workshops, in which residents and volunteers sit together and catalogue the features of their hometown surroundings to 'rediscover' dormant resources therein. They then venture outside to go 'treasure-hunting' for hidden gems in their local environment (Love 2013, 116). The main goal is for the residents to 'rediscover' their love for their hometown, in order to find ways to 'activate' it. Much the same as for the regional revitalisation cooperation corps (*chiikiokoshi kyōryokutai*), volunteers (often young people) come from outside the region to look upon the unique attractions and products the area has to offer with the eyes of an outsider.

Locality studies emerged at the turn of the 21<sup>st</sup> century, partly due to a pushback against top-down development strategies, and partly owing to a new emphasis on sustainability within administrative discourse and consumer culture:

Like other ecofriendly and heritage-themed place-making initiatives in rural Japan, locality studies reflects values of environmental awareness, regional diversity, and engaged local stewardship that circulate alongside sustainability as salient popular and policy priorities (Love 2013, 113).

However, Love criticises the movement for endorsing a neoliberal ideology that takes responsibility away from the government and puts it in the hands of rural inhabitants and local organisations. The regions are facing a host of problems, including outmigration, population aging, and economic decline – problems that are hard to fix just by treasure hunting for local gems. A parallel here can be made with firefly villages, as these are largely run by NGOs, local volunteers or local governments. This reflects Takao's (2012) claim that lack of national policy leaves it up to authorities, organisations and volunteers at the local level to bridge the gaps. We might also recall the goal of decentralisation and self-reliance of the regions stated in the Basic Environmental Plan outlined above. These nouns sound positive in theory, but in reality such policies come at the cost of lack of state support. In cases such as these, self-initiative is presented as a solution to structural issues, while in actuality representing a “cutting off and throwing away” of rural regions (Love 2013, 114).

In addition to locality studies, there are numerous local initiatives across the country aiming to revitalise local communities. This includes the activities of satoyama conservation groups, as well as various ‘community-building’ activities, such as reforestation projects in the Tohoku region (Rots, forthcoming). This active role of humans in nature conservation comes on the basis of volunteerism and local engagement, however, with no support from the state.

As mentioned in the previous chapter, the role of children should not be downplayed either. A child with powerful nostalgic childhood memories of her rural hometown may be more likely to remain there, or return there after finishing school. Experiences while growing up may foster feelings of belonging and community that may help create positive feelings about one's hometown. In this sense, nostalgia can be a powerful motivator. The construction of furusato on the local and national levels is a construction of nostalgia as well as of local and national identity. Love (2013, 115) argues that nostalgia should be understood as “a

conceptual framework deployed by officials, academics, and even rural inhabitants to make agreeable sense of the persistent downward spiral of villages and towns against the grain of national growth trends”. Similarly, for Robertson (1988, 508), nostalgia for nostalgia is used to “mask human responsibility for socio-ecological change”. The discourse on *furusato* and *satoyama*, based on longing for a distant, unattainable rural past, is also a way of masking the responsibility of the government and the people for creating the changes that caused the old landscapes to erode. Perhaps to some firefly protection groups, fireflies symbolise a hope for reattaining such landscapes.

## **6.4 Economy or Ecology? Problems with Firefly Villages**

In chapter 3, I discussed benefits firefly villages might receive from holding firefly festivals and other events. However, the entwining of environmentalism and village revitalisation projects is not always a thing to be celebrated – recall Iguchi Yutaka’s criticisms of the foreign firefly species in Tatsuno. Another example of a somewhat misguided effort to use fireflies in a revitalisation project is that of Numata-machi in Hokkaido. A Hokkaido travel website enthusiastically describes how the town has managed to raise Genji fireflies, despite this species not being native to Hokkaido (Pucchi.net 2008). Fireflies were received (*yuzuriuketa*) from Gifu prefecture in 1988 and survived the Hokkaido winter. Due to the efforts of the locals releasing them into the rivers, the number of fireflies in Numata-machi increased, and you can now see around 3,000 fireflies there (the article also praises the town for having free parking).

This situation has been criticised as environmental destruction (Tokyo Genji Firefly Research Institute n.d.d). As Genji fireflies are not typically found in Hokkaido, bringing them in and releasing them there is to completely ignore their ecology, as it is not known whether they will survive. One might add that releasing foreign or non-native fireflies into rivers is unwise due to the changes to the existing ecosystem this may pose – a problem not unique to Numata-machi. This is somewhat similar to the criticisms of protection groups who cut grass and clean mud in and near rivers, as cleaning the river by human standards does not help the ecosystem in which fireflies take part. The problem with importing fireflies to new areas is that they become a sort of currency for the imagined economic benefit of a town – which the fireflies themselves do not benefit from. This sort of hometown-building simply to attract



tourists is misguided and based on an erroneous idea that a region will be revitalised if they can make fireflies fly there.

Although events such as firefly festivals are often touted as ecologically beneficial, this is not necessarily always the case. For instance, the Korean Muju Firefly Festival (mentioned in chapter 4) is dedicated to the firefly and spreading awareness of environmental degradation, and is held every year around September. According to the festival homepage, it was appointed ‘Korea’s representative festival’ by the Ministry of Culture, Sports and Tourism in 2018, and is South Korea’s second largest festival (Muju Firefly Festival n.d.). Aside from a guided tour bus taking visitors to view the fireflies, the festival offers numerous activities, including catching trout with one’s bare hands, parades with cute mascots, K-pop idol appearances, and even a live exorcism performance according to one travel website (Tripzilla 2016). However, one of the featured events one year included sending sky lanterns (small hot air balloons) into the sky (Kimchi Teaching 2013), in itself an environmentally damaging practice.<sup>21</sup> There seems to be a level of cognitive dissonance involved in the promotion of such a practice at a festival supposedly all about awareness regarding environmental degradation. Does a preference for aesthetics in this case override any ecological concerns?

In China, commercial firefly harvesting is flaring up again, with the creation of several firefly-themed parks in recent years. In 2015, the Daily Mail reported on the “East Lake Peony Garden” in Wuhan city, where spectators could see 10,000 fireflies (imported from Jiangxi province) in captivity (Amey 2015). Sara Lewis (2016a) discusses the impacts of the “North First Park” in Chengdu, where 100,000 imported fireflies were released from a large glass box. There can be little doubt about the ecological impacts of such a scheme on the captured fireflies – once released, they live only for a few days, highly unlikely to be able to bring a new generation into the world. Theme park organisers purchase around 20,000 insects for a weekend show, at a cost of 1 to 1.2 yuan (15 to 18 cents) per bug – one estimate puts the collectively purchased number of fireflies during 2016 at six million. Sara Lewis (2017a) writes:

Alarmingly, all evidence points to a well-established supply chain that relies on harvesting massive numbers of fireflies from wild populations. Investigations by news media and conservation groups

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<sup>21</sup> Besides being a fire hazard, they contain metal wires that may harm animals (Hickman 2009).

have revealed the insects are harvested mainly from Ganzhou, Jiangxi Province; Tunchang County, Hainan Province; and Xishuangbanna, Yunnan Province. During mating season rural villagers collect wild fireflies from the countryside, selling them for 0.3 to 1 yuan each. Without any regulation, vendors can lie about selling “captive-bred” specimens, and most customers simply lack the motivation to probe more deeply.

This practice seems to resemble a modern-day version of the firefly-selling industry of the Edo period. Such a massive demand for fireflies provides a source of income for rural families, who collect hundreds each night during the season (Yi 2016). Additionally, up until 2017, fireflies were a hugely popular commodity sold over the internet in China. Live fireflies were sold on the online shopping site Taobao to be used for birthday, engagement and anniversary celebrations, wedding decorations and Valentine’s Day gifts – of which one quarter to one half were estimated to die in transit (Lewis 2017a). Those that did reach their destination alive were not likely to reproduce, due to unsuitable conditions for mating and egg-laying.

However, conservation activists in China are doing their part for fireflies. In May 2017, after receiving an appeal from the FEA (the Firefly Ecological Alliance, a conservation organisation), Taobao banned all sales of live fireflies. The FEA has also enlisted volunteers, the news media and local government to protest against commercial firefly shows, and many have been cancelled. In 2017, for instance, the shows at Wuhan’s East Lake Peony Garden began using laser lights instead of real insects (Bhandari 2017). At the same time, environmentalists are working to identify and protect the natural habitats of fireflies, encouraging people to go there to enjoy them – and not to visit the theme parks. As the FEA wrote in response to a firefly release event in Nanjing: “Don’t go to the grave of the fireflies” (Yi 2016).

One might see nature conservation as a problematic endeavour – as nature is dynamic and always changing, what is the point in attempting to preserve and protect it? However, changes in nature occurring today are hugely accelerated due to anthropogenic pressures on the environment, so today’s nature conservation may be more a question of attempting to control the forces that are threatening life on Earth. As we do not want the voices of skylarks and the tails of tadpoles to disappear, so do we not want the light of fireflies to be extinguished. At this point, such desires might be seen as mere human selfishness, as the aforementioned disappearances were anthropogenic in nature – but they may also be

perceived as a positive environmentalist stance. My arguments in this thesis position themselves in an environmentalist paradigm that sees the need to protect the world's ecosystems, not from an economic perspective but an ecocentric one. In an ecocentric view of nature, all life has intrinsic value – that is, value in and of itself, independent of human thought and action (as opposed to an anthropocentric view in which humans take centre stage). We are currently losing species at a rapid rate, and what we lose is of infinite value; with every single species lost, we are losing a piece of the beauty and richness of the world's biodiversity, something that can never be replaced. Additionally, each extinct species has a knock-on effect on the rest of the food chain, again leading to more extinction.

In May 2019, the UN Environment Programme launched the sixth global environmental outlook report (GEO-6). The report painted a dismal picture of an already well-known fact – that the world's animal species are being extinguished more rapidly than ever before (IPBES 2019). Among other things, the report estimates that one million species are currently threatened with extinction, and asserts that 'transformative changes' are needed to reverse this development. Clearly, it is no longer a possibility to remain dormant on this issue, and widespread structural changes must be made in policy, production and consumption.

This trend is also calamitous for the fate of insects, as they represent the dominant form of animal life. As outlined in the first chapter, insects are of great importance to the maintenance of healthy ecosystems, as when insects die out, so do larger animals who feed on them, and so on. However, there has already been reported a significant loss of insect species – for instance, scientists have warned of a 'total collapse' of insect populations in the Puerto Rico rainforest (Carrington 2018). Another example is the famous monarch butterfly in Mexico, whose annual migrations are a popular tourist attraction. In recent years, the butterflies have decreased dramatically in number, with more than a billion disappearing over the last two decades (Katz 2018). This decrease is due to milkweed – the only plant on which the butterflies can lay their eggs, as well as the only sustenance for the caterpillars – dwindling because of herbicide use.

What can be done to ensure the survival of insects? Hoff (2018) suggests that "strategies such as providing habitat corridors and 'stepping stones' and managing public lands in ecologically friendly ways" could help relieve stresses on insects as climate change adds challenges due to changing environmental conditions. Creating habitat corridors (which is a

way of connecting different habitats separated by human activity) is a way to combat habitat fragmentation that happens due to human development projects and the like. Additionally, further awareness needs to be spread on this issue. People who live in cities are detached from these issues and do not necessarily notice any effects of environmental degradation. With increased awareness, changes in lifestyle (such as an increase in ethical consumption) may eventually follow.

What about fireflies? Are firefly villages an important ‘institution’ for their protection? In Japan, the firefly is a creature that symbolises the water environment, and is seen by people as a ‘symbolic environmental good’ (Kada 1992, 40). Protecting fireflies means protecting their satoyama environment, which in turn is beneficial for biodiversity. Moon (1997, 222) argues that it is harmful when one specific element of nature (such as the firefly) gets lifted above the others as a symbol and a crowd puller, because it “disturbs the existing ecological balance” by virtue of ignoring the rest of the ecosystem. However, using a flagship species to gain support is not inherently wrong, as helping one species may have a similar positive effect on other species as well. Fireflies are creatures with symbolic value, and this fact is intrinsic to people’s motivation to protect them.

## **6.5 Conclusions**

In this thesis, I have aimed to investigate the entwinements of firefly protection, regional revitalisation, nature tourism and nostalgia. I have discovered that they are indeed tightly wound together, and not easily separated. The research question I have based this thesis on, is “Is the wish to protect fireflies compatible with their use as tools for town revitalisation?” Naturally, the answer is not a simple yes or no, but rather a complex intertwinement of the two. In Tatsuno, numerous groups of people work with fireflies – some with the ecological aspect (raising larvae and kawanina, counting the fireflies and doing river maintenance work), and some with the economical (marketing, tourism and business departments). Different agents within the same firefly village have different goals and priorities. The discourse around fireflies may often be heavily imbued with furusato and childhood nostalgia, but the heavy importance many firefly villages place on the firefly festival, an event designed to attract tourists rather than to protect the fireflies, leads me to think that what is being prioritised is not the welfare of the fireflies in themselves, but rather the welfare of the town. While this may be the case, the welfare and continued existence of the fireflies is

indeed important if a firefly village is to sustain itself – and so the two are not entirely incompatible, especially as holding festivals generates more funding for firefly protection activities. Is using fireflies as a tool for regional revitalisation any different, then, from a place showcasing the beauty of its natural scenery, such as a waterfall or a canyon? Could the firefly be seen as just another part of the ‘natural beauty’ of a place?

Moon (1997, 223) argues that it is precisely because of their symbolic value that fireflies are marketable and exploitable. This poses a dilemma, because to her, an attempt to sell nature will lead to its transformation or destruction. In this view, arranging festivals that exploit the natural habitat of fireflies as a tourist attraction is antithetical to satoyama and firefly protection movements that strive to keep these areas unpolluted. However, I would argue that there are ways to ‘sell’ fireflies without destroying their habitats. Most firefly villages are conscious of the environment fireflies need to survive, and make sure to inform people not to use flashlights or capture the fireflies (although these warnings are not always heeded, as we saw in chapter 3). The Chinese firefly parks introduced in this chapter, however, are an example of exploitation gone wrong – and cases such as Numata-machi, in which fireflies are imported to an area they were not found previously, cannot be said to have the best interest of the creatures in mind either.

The wish to protect fireflies does not need to hinder town-building and tourism efforts – likewise, revitalisation need not stand in the way of firefly protection. Both of these aspects are useful and necessary to the local communities in question. While I have so far argued that the preservation of ecology is urgent and indispensable, we must not forget about the people. In Japan today, the revitalisation of rural areas is of crucial importance, and firefly festivals can be an effective way of boosting local pride as well as business. While the main focus of firefly villages may be on tourism and the promotion of the town in question, I cannot fault anyone for attempting to ensure that their town remains economically secure and inhabited. Festivals foster local identity, and can be a powerful motivator to move back to one’s hometown or to attract new people. However, focusing on just the way humans may benefit from the festival would lead me to ignore the passion and effort of people such as Tsuchiya-sensei, who work year-long monitoring firefly larvae and their freshwater snail bait, writing reports, and educating children. In Tatsuno, some of the people I talked to were mostly interested in the economic benefits of the festival (such as Shinobu-san), whereas others, such as Tsuchiya-sensei and Iguchi-san, were passionate about the lives of fireflies themselves

(though in differing ways). As all signs point to the collapse of ecosystems due to mass extinctions on a worldwide basis, it is just as important, if not more, to think about issues of biodiversity conservation. The government needs to take steps toward more sustainable options – while steps have been made, such as the National Biodiversity Strategy and global SDG's, goals are still far from being reached. Passionate people who are dedicated to making a change are needed. Further, there should be more of a cooperation and integration of both economical and ecological aspects. For instance, Iguchi's proposals to create firefly events for tourists year-round instead of just the summer festival may represent a step on the way.

Additionally, the importance of the firefly to the economy of a firefly village varies between places. As for the two locations I visited during fieldwork, I think it is safe to say that one of them (Tatsuno) benefits a lot more from fireflies than the other, the reason being that Tatsuno puts so much stake in their fireflies, and they are important for the town's local identity. The firefly festival is an important social and economic resource for the town, as it lasts for a week and has the power to draw over a hundred thousand people. The event in Minakami is of a much smaller scale, even though they do arrange many activities on the day of the event and advertise for it widely. However, the town of Minakami is primarily known as a hot springs resort town that offers many varied outdoor activities. In this sense, the town has more legs to stand on than Tatsuno might have. In the case of Numata-machi in Hokkaido, it is quite clear that the main goal is tourism and revitalisation, as raising fireflies in a place they do not exist naturally is not an ecologically viable method of protection. Such projects are purely exploitative and do not represent nature conservation in any way. Projects focused solely on saving the town while sparing fireflies no thought delegitimise the firefly protection movement. Saving the regions is important, but are fireflies always a reasonable way to do it? Clearly not – but for a town that has fireflies 'naturally', there is nothing wrong with promoting their fireflies as long as they go about things mindfully.

Tatsuno is in an interesting position here as the town is renowned as one of the most famous firefly villages in the country, while simultaneously faces backlash for its intentional introduction of foreign species. I am of the opinion that the damage that has been done cannot be undone, and while the fireflies of Matsuōkyō in Tatsuno may no longer be the habitat's native fireflies, they do contribute something to the landscape as immigrant fireflies – and they certainly help the town. In Tatsuno's (and Katsuno-sensei's) defence, too little was known at the time about firefly biology – and early attempts to raise fireflies (such as those of

Minami and Katsuno-sensei) represented an admirable effort for firefly protection. However, towns such as Numata-machi, who have introduced fireflies from other regions in recent years, cannot be described in the same way. As such, I would argue that firefly villages are only appropriate if they incorporate protection of firefly ecology and habitat as a main goal.

In addition to focusing on economical and ecological aspects, I have spent some time considering the affective relationship between people and fireflies. People who live in firefly villages, and urban people who are nostalgic for the countryside and have a desire to see fireflies, all feel a connection to fireflies, through fond childhood memories or furusato nostalgia. Residents of firefly villages share a relationship with the little beetles, and being a firefly village forms part of their local identity. It is thus not just the town's branding at work – closeness to fireflies affects the lives of its inhabitants. Older people have nostalgia from childhood memories, whereas people who grew up in cities feel a sense of longing for a home they have never had, epitomised by the light of fireflies. The firefly is thus a powerful symbol to some (perhaps especially those who connect it to nature and furusato nostalgia), and perhaps hard to remove from the rural setting in which it belongs. The link between fireflies and clean water has been pervasive – and it has been functional if not entirely accurate; by prompting people to reduce water pollution. Because of this important entwinement with environmentalist concerns, the firefly works very well as a flagship species for the conservation of water quality and satoyama environments.

Fireflies are brilliant beetles with the power to harness people's emotions and efforts – they are even seen by some as a 'homeplace of the heart'. While the greatest purpose of a firefly festival might be regional activation by attracting tourists, to achieve this purpose it is necessary to protect the environment in order to provide a good living environment for the fireflies. In the introductory chapter, I mentioned the ambiguity of the term *hotaru no sato*, as it can mean 'firefly village' or 'firefly hometown'. The ambiguity of the latter, especially, serves to reinforce my point about fireflies and humans sharing the same environment. Having 'become with' each other in the rivers and rice paddies of many a satoyama environment, they have certainly shared the same hometown. The home of fireflies is also the home of people, and protecting them all – firefly, human and hometown – should be the ultimate goal.

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