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The Guardian Forest

– sacred trees and ceremonial forestry in Japan

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Abstract

Forests have played a major role in the development of human society across the world. It is therefore no surprise that a natural resource which is such an integral part of human life gave rise to religious beliefs, superstition and notions of the supernatural in connection to trees. In the Shinto religion in Japan it is believed that *kami* ("spirits" or "gods") reside within forests and in nature in general, therefore almost every Shinto shrine has a forest surrounding it.

The overarching aim of this project was to study forests and forest management at Shinto shrines in Japan, both in detail but also in a broader comparative perspective. For this study I interviewed three researchers who work with shrine forests and two Shinto priests who work at shrines through questionnaires. A comparative analysis method was used to compare the answers from the four study sites to discuss and draw conclusions.

Forests are an integral part of a Shinto shrine. The term *Chinju no Mori* (lit. "guardian forest") pertains to the sacred forest within and surrounding the shrine complex. Closeness to nature ensures closeness to the divine, hence why nature is so important in Shinto. Shrine forests are generally well preserved as they are objects of worship in which the *kami* dwell, and thus cutting such trees is avoided. Forests at shrines are often protected via designation as natural heritage or national treasures, and trees are often designated as historic monuments.

It was found that the most important aspect of the shrine forest is that it provides a sacred ambience which emanates from the feeling of closeness to nature. Forest management at the studied shrines was light (influenced by the forest's location, an urban shrine forest has more intensive management), and the main goal was to keep the forest safe for visitors and for nearby infrastructure.

Planting was found to be done for restorative purposes where parts of the forest has been destroyed by fires or similar. Recently management and planting has begun to be done for increasing biodiversity in the forest and directing it to a natural old-growth state.

In was found that since shrine forests are exempt from cutting, are either left to grow undisturbed and/or are lightly managed, they tend to have much higher biodiversity than other non-shrine forests. Shrines also keep large old trees which have been shown to be important repositories of biodiversity by providing refugia for many insect and bird species.

While many Japanese visit shrines, many visit not out of faith in the *kami* but rather for tradition. Many visitors also cite the natural environments at shrines at the most important reason for visiting a shrine. I conclude that Japanese Shinto shrine forest has three distinct values: 1) Religious value as sacred forests for the religion, 2) Culturo-historical value as a focal point for the local community and cultural traditions, and for preserving old buildings and art, 3) Ecological value for preserving old large trees, high biodiversity, rare species and being part of the larger ecological landscape, both urban and rural.

Finally, I discuss the results and what the future could look like for shrine forests. In a broader international perspective, I think there is a lot to learn from the management of Shinto shrine forests, and it is possible that the management approach utilised in Japan could be partially applied in other countries to create old-growth forests with high ecological and cultural values.

Keywords: sacred forests, shrine, Japan, religion, forest management

Sammanfattning

Skogen har spelat en betydande roll i utvecklingen av samhällen världen över. Det är därför icke förvånande att en naturresurs som är en sådan vital del av mänskligt uppehälle givit upphov till religiösa idéer, vidskepelse och föreställningar om det övernaturliga kopplade till träd. I den japanska religionen shinto tror man att *kami* (”andar” eller ”gudar”) dväljer i träd och naturen, därför har i stort sett alla shintohelgedomar en skog runtom sig.

Målet med detta projekt var att studera skogen och skogsskötseln vid shintohelgedomar i Japan, både i detalj men också i ett bredare komparativt perspektiv. För denna studie intervjuade jag tre forskare som arbetar med helgedomsskog och två shintopräster som arbetar vid helgedomar genom frågeformulär.

Skog är en integral del av en shintohelgedom. Termen *Chinju no Mori* (”beskyddarskogen”) avser den heliga skog som finns inom och runtom helgedomskomplexet. Närhet till naturen skapar närhet till det gudomliga, därav är naturen viktig inom shinto. Helgedomsskogar är generellt sett mycket väl bevarade då de är föremål för tillbedjan i vilka *kami* uppehåller sig. Man undviker därför att hugga ner sådana träd. Skogar vid helgedomar är ofta skyddade via lag genom kulturmärkning och genom sin status som nationalskatter. Speciella träd är ofta utsedda till historiska monument.

I den här studien fann jag att den viktigaste aspekten av helgedomsskogar är att de skapar en slags helig atmosfär som kommer ur känslan av närhet till naturen. Skogsskötseln vid de studerade helgedomarna var begränsad till lätt skötsel, det huvudsakliga målet var bevara skogarna i ett naturligt tillstånd, och att hålla skogarna säkra för besökare och kringliggande infrastruktur. Nyligen har man börjat med skötsel och plantering för att öka skogarnas biodiversitet och för att utveckla dem mot ett mer naturskogsliknande tillstånd.

I studien bekräftades det också att eftersom helgedomsskogar är undantagna från trädfällning, lämnade att växa ostört och minimalt skötta (eller inte skötta alls), tenderar de att ha högre biodiversitet än andra skogar. Helgedomar bevarar också stora gamla träd vilka har bevisats vara viktiga för biodiversitet genom att tillhandahålla kontinuerlig tillgång till substrat, föda och boplatser för många insekt- och fågelarter.

Även om många japaner besöker helgedomar gör många det inte av religiös tro utan av tradition. Många besökare säger att det är omgivningarna vid helgedomen som framförallt motiverat besöket. Jag drar slutsatsen att japanska shintohelgedomsskogar har tre distinkta värden: 1) Religiöst värde som helig skog för religionen, 2) Kulturhistoriskt värde som en central punkt för det lokala samhället och för kulturella traditioner, och för att de bevarar gamla byggnader och konst, 3) Ekologiskt värde för att de bevarar gamla stora träd och hög biodiversitet och är en del av det större ekologiska landskapet.

Slutligen diskuterar jag resultaten och hur framtiden skulle kunna se ut för helgedomsskogar. I ett bredare internationellt perspektiv tror jag att det finns mycket att lära sig från skötseln av shintohelgedomsskogar, och det är möjligt att den japanska skötselstrategin delvis skulle kunna appliceras i andra länder för att skapa gammelskog med höga ekologiska och kulturella värden.

Nyckelord: heliga skogar, helgedom, Japan, religion, skogsskötsel

Preface

This master's thesis was written as a part of the Master of Science in Forestry programme (Jägmästarprogrammet) at the Swedish University of Agricultural Sciences (SLU) in Umeå during 2020. The master's thesis encompasses 40 weeks of work which equals 60 Swedish university credits.

For a very long time, probably since I was in second grade, I have been interested in Japanese traditional culture and history. My interest was probably sparked when I was a kid by old samurai movies which I was surely too young to watch. This interest resulted in me becoming an avid practitioner of Japanese martial arts (mainly Japanese sword-fencing, *kendo* and *iaido*) throughout my life, which only helped to further increase my interest for most things Japanese. In addition, I have a massive interest in history and philosophy. So, when I found that I could combine many of my interests with my love for forests and nature in this thesis, I was very happy. The result is this thesis on the interaction between nature, religion and culture in Japan.

Firstly, I would like to extend a great thank you to Dr. Hiroaki Ishii of the GSAS at Kobe University in Japan who helped me come in contact with the interviewees, and being interviewed himself and sharing his extensive knowledge on Japanese shrine forests. Without his help this project would not have been possible.

Thank you to all my interviewees; Dr. Tohru Manabe, Dr. Keizo Tabata, Mr. Yoshiyuki Yoshii, and Mr. Yoshiyuki Wada for participating and taking your time to answer all my questions about shrines and shrine forests.

I would also like to thank my supervisor Lars Östlund for his excellent guidance and input during my work with this thesis.

Any and all mistakes are my own.

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Glossary

Shinto - the indigenous religion of Japan
kami – the spirits, natural phenomena or holy powers venerated in Shinto. Can be translated as "god"
jinja – a general word for Shinto shrine
jingu – a word for a Shinto shrine of higher status, often connected to the royal family
taisha – a word for Shinto shrine, originally only referring to *Izumo-taisha* in Izumo, means "grand shrine"
-gu – a word for Shinto shrine, slightly archaic often connected to the royal family
torii – traditional Japanese gate found at the entrance of Shinto shrines and sacred spaces
chinju no mori – sacred shrine forest (lit. "guardian forest")
tera (dera) – word for Buddhist temple
-ji – word for Buddhist temple
-in – word for Buddhist temple
jinja-ji – a "shrine-temple" where there is both Shinto and Buddhist structures and activity
yorishiro – an object capable of attracting and housing *kami*
shintai – a *yorishiro* which is currently housing *kami*
shimenawa – hemp rope used to designated and enclose sacred spaces or objects
himorogi – enclosed sacred space for worship such as altars (lit. "divine fence")
mori – Japanese word for forest
hinoki – Japanese cypress (*Chamaecyparis obtusa*)
sugi – Japanese cedar (*Cryptomeria japonica*)
sakaki - *Cleyera japonica*
matsu – pine
akamatsu -Japanese red pine (*Pinus densiflora*)
kuromatsu – black pine (*Pinus thunbergii*)

A note on the usage of Japanese language

In Japan, names are written family name first, personal name afterwards. However, in this study I have decided to use the western format with personal name first followed by family name.

Japanese words are written in italics, followed by a translation in brackets the first time the word is introduced. Example: *jinja* (shrine).

If it is a literal translation the Japanese word is written in italics followed by translation in brackets with quotation marks and “lit.”. Example: *jinja* (lit. “god dwelling”)

On occasion I will translate the Japanese word even if it has been translated earlier in the text. This is done to assist the reader, or if the translation is needed to explain a concept.

1. Introduction

1.1. Sacred Forests

Forests have played a major role in the development of human society across the world (Hughes and Thirgood, 1982; Perlin, 1989). It can be argued that access to forest resources (wood, wild animals and plants) has been the single most important factor in development of stationary human societies. Wood as construction material enabled creation of the first tools and with them, the first human dwellings. As a fuel; burning wood made cold climates habitable, made inedible grain into bread, and made it possible to extract metals from the earth (Perlin, 1989). Wood also enabled transportation of both people and goods as it was shaped into wheels, sleighs, carts and ships which gave rise to trade (and conflict) across cultures. (Perlin, 1989). It is therefore no surprise that a natural resource which is such an integral part of human life gave rise to religious beliefs, superstition and notions of the supernatural in connection to trees.

The belief that trees have magic or mystical properties probably emerged around the end of the last ice age when warmer climates returned to Earth, and plant life once again became abundant. With the advent of agriculture humans took an even greater interest in plants, which is apparent in religious symbolism where plants often feature prominently (Hosoi, 1976).

Forest and tree spirit worship is a common worldwide phenomenon in religious history (Matsui, 2014). Religion scholar Mircea Eliade has shown that tree symbolism is highly diverse and varies greatly between cultures as tree worship takes many different forms (Eliade, 1960; Matsui, 2014). There are many examples from several cultures of how trees are used in a religious context.

One of the earliest written accounts of sacred forests is the Sumerian Epic of Gilgamesh (ca 1800 BC), in which a forest is described as holy and the home of the gods. In the 5th tablet of the epic poem, King Gilgamesh sets out to further his own fame and glory by finding and cutting down the cedars of the Cedar Forest. A forest of extraordinary beauty said to be the seat of the gods. When Gilgamesh arrives at

the forest he marvels at its beauty, and is initially deterred from proceeding into the forest by its guardian demigod (George, 1999). Forests and trees as the dwelling place of the divine, and of trees being sacred is a recurring motif which is found in many cultures across the world (Perlin, 1989).

The tree as a representation of the cosmos, and as the supporter of the universe (an *axis mundi*), appears in many cultures. A well-known example is the Norse world tree Yggdrasil, a great ash tree which supports the universe and whose branches grow between the different cosmic realms (Gilmore, 2016). The *axis mundi* idea is found in other cultures as well, such as the Sami culture of northern Scandinavia, where the Sami *axis mundi*, known as *maylmen stytto*, connects heaven and earth (Bergman *et al.*, 2008). The Mayan culture in Mesoamerica had a similar world tree known as the *Yax Cheel Cab* (Taube, 2003), indicating how cultures great distances apart have had similar ideas regarding of how the universe is supported by a tree.

Forests have had an important religious role in both pastoralist societies and in nomadic societies as trees symbolises the cyclic nature of life and the natural world. In the autumn leaves fall to the ground only to be "reborn" again next spring, while the tree continuously grows towards the heavens. Trees also often symbolise longevity and strength due to how they can live for hundreds of years (Matsui, 2014; Starling, 2018).

According to Mircea Eliade, sacred trees, stones and other natural features are not worshipped for what they are, "a tree", but for what they represent and can reveal to a religiously minded person. They are worshipped because they are *hierophanies*[1] (Eliade, 1960; Long, 1960), meaning that they reveal something sacred (Eliade, 1960; Long, 1960). A common feature in animistic religions and belief is that trees and natural phenomena act as intermediaries between humans and the divine (Gilmore, 1919; Vaitkevičius, 2009).

Since a tree can be either a medium to the gods or the dwelling for something divine, it is a common practise to leave offerings at trees. The Sami people had a tradition of leaving offerings at sacred trees and rocks known as *sejtar* (swed. sing. *sejte*, from Northern Sami *sieidi*). Occasionally, one still finds offerings at old *sejtar* (Virdi Kroik, no date b). A similar tradition continues to this day in Britain where a small votive offering, often a coin, is made to a special tree in exchange for good luck or the fulfilment of one's wish. Though, this practise is rooted in old tradition rather than in modern religiosity (Houlbrook, 2015).

[1] *Hierophany*, from Ancient Greek ἱερός (hierós, "sacred, holy sign") + φαίνω (phaínō, "show, appear"). Used by Romanian religious historian and philosopher Mircea Eliade (1907–1986) in his book The Sacred and the Profane (1959), possibly also coined by him.

Sacred trees are not only found in distant sacred forests like in the story of Gilgamesh, but also closer to civilisation. They are often grouped together into sacred groves, a small group of trees that are considered to have religious significance (Cusack, 1998). Sacred groves are often, and been have historically, the centre of religious practises for a community (Frazer, 1998).

At Uppsala in Sweden, there used to be a sacred grove in pre-Christian times where every tree was considered divine, and which was an important site of worship in pre-Christian Swedish society (Frazer, 1998). Likewise, the Celts (Cusack, 1998; Frazer, 1998), the Greeks and Romans (Hughes and Thirgood, 1982), the Balts (Vaitkevičius, 2009), the Hindus (Gadgil and Chandran, 1992) and the Japanese (Ono, 1962) conducted worship in sacred groves. In Japan and India (among others) worship in sacred groves have continued until this day. Sacred groves and trees are often exempt from commercial logging operations due to the belief that the divine dwell in the trees. It is one of the earliest forms of forest conservation and protection measures (Totman, 1989).

Because felling in sacred groves and forests is usually prohibited or limited, biodiversity tends to be high. Old-growth sacred trees provide refugia for many animals and insect, and often retain rare species (Gadgil and Chandran, 1992; Vaitkevičius, 2009; Ishii *et al.*, 2010, 2018; Oishi and Tabata, 2015). When located near urban areas, old sacred groves make up an important part of the urban forest landscape by providing habitat for wildlife (Ishii *et al.*, 2010).

In the Shinto religion in Japan it is believed that *kami* ("spirits" or "gods") reside within forests and in nature in general, this is why almost every Shinto shrine has a forest surrounding it (Matsui, 1996). This forest might just be a little patch of woods within the precincts of the shrine, or a massive forested area such as the 5320-hectare forest belonging to Ise grand shrine in Ise, Japan (Alban and Berwick, 2004). Forests belonging to Shinto shrines today are often very lightly managed, or not at all. It is believed at many shrines that the forest should be kept as natural as possible (Cali and Dougill, 2012). There are several sites at which forests have been preserved for a very long time due to their sacredness (Ishii *et al.*, 2010).

Shinto shrines are found in every Japanese city and village, in total there are about 80 000 shrines in Japan (Rots, 2013). Many shrines are also located in remote locations on mountains and in forests. Shrines are recognized not only as focal points for religious practise and traditions, but also as centres for the preservation of ecological values. There is an increasing public interest in the incorporation of green spaces into urban planning and design, making it possible for the often-ancient shrine forests to be conserved for the future (Ishii *et al.*, 2010).

1.2. Aim & Research Questions

The overarching aim of this project is to study forests and forest management at Shinto shrines in Japan, both in detail but also in a broader comparative perspective. I will examine the role of trees and forests in the Shinto religion and how forests and trees are utilised in religious context by interviewing scientists and priests at four different shrines. I also analyse how religion has shaped the way forests are managed at religious sites; and what the underlying religious reasoning is.

The sites in this study are; Nishinomiya shrine in Nishinomiya, Hyogo prefecture, Shimogamo shrine in Kyoto, Kyoto prefecture, Hakusan-taga shrine in Kanda, Fukuoka prefecture, Kotohiki Hachiman shrine in Kan'onji, Kagawa prefecture.

The specific questions I want to answer are the following:

1. How is the forest utilised in a religious context, and why?
2. How is the forest currently managed?
3. How is current management affected by religious ideas?
4. What is the forest vegetation composition?
5. What is the importance of shrine forests for biodiversity and conservation of ecological values?

In addition, I want to discuss the religious and contemporary significance of forests and sacred groves in Japan and in an international perspective.

1.3. Background

1.3.1. Religion in Japan

Shinto (sometimes known as Shintoism) is the indigenous faith of the Japanese people and is centred around worship of the Japanese deities known as *kami* (a more detailed explanation of Shinto and its history and spiritual characteristics is available in *Supplementary materials 1.1 and 2*). Emerging from animistic nature worship in pre-historic Japan, Shinto was later codified as Japanese society developed (Ono, 1962). Shinto has also changed considerably over time, most notably by the influence of Buddhism which was imported to Japan in AD 538. With Buddhism came theology, doctrine and religious organisation which changed how Shinto was practised. Likewise, Japanese Buddhism was influenced by native beliefs which were partly absorbed into Buddhist practises (Frazer, 1998; Tamura, 2000). The two religions came to establish a syncretic relationship in which they

became almost indistinguishable from one another. The syncretism lasted until 1868 when the government officially split them into two separate entities (Cali and Dougill, 2012). Before the separation it was common to find Buddhist temple structures within the precincts of Shinto shrines (and vice versa), so called shrine-temples (*jinja-ji*) (Nakamaki, 1983).

Kami, the "gods", are the main subject of veneration in Shinto and are worshipped at Shinto shrines. The Japanese word *kami* is often translated as "god" but has a broader meaning than "god" as *kami* also entails nature spirits, natural forces, divine spiritual essence, deified historical persons and ancestral spirits (Ono, 1962). *Kami* are thought to dwell in nature, and it is believed that *kami* are attracted to places that are beautiful and awe-inspiring; such as waterfalls, forests, old and large trees, rivers, or the sea. An object which can attract and house *kami* is known in Japanese as *yorishiro*. A *yorishiro* currently holding a *kami* is known as *shintai* (Miyake, Yamamoto and Sekimori, 2009). A *shintai* is by necessity also a *yorishiro* (Ono, 1962).

Shintai (and by extension *yorishiro*) are central to Shinto worship and is the focal point of prayers and rituals, and *shintai* are usually housed within a special building on the shrine grounds called the *honden* (main hall). What object constitutes the shrine *shintai* differ from shrine to shrine, but some examples are mirrors, swords, jewels and sculptures (Shimazu, 2005). The *shintai* can also be a natural object such as a stone, a mountain, a tree or a waterfall (Ono, 1962; Cali and Dougill, 2012). At a few shrines there is no main hall for housing the *shintai*, but rather the mountain is considered to be the shrine's *shintai* (Matsui, 1996).

The shrine, *jinja* (lit. "god dwelling"), is where Shinto worship, prayers and rituals are conducted. The shrine and its precincts are considered sacred, and are often constructed in a ritualistic manner (Matsui, 1996), with traditionally acquisitioned materials and traditional carpentry techniques (Cohen *et al.*, 1996). The type of shrine that we see today, with a large worship hall and several structures, stems from the influence of Buddhism. Initially the shrines would have been a place in nature at which a sacred object capable of housing the *kami*, a *yorishiro*, would have been revered (Tamura, 2000).

Shrine location and distribution is highly random as each shrine usually is associated with a natural feature in the landscape, showing an emphasis on closeness to nature (Ishii *et al.*, 2010). Shrines consist of several structures (see Figure 1), the most important ones are the *honden* (main hall), the *haiden* (worship hall), and the *torii* (symbolic gateways signifying sacred space) (Ono, 1962; Cali and Dougill, 2012), (expanded information on shrine buildings are available in *Supplementary materials 3.1*). Surrounding the shrine complex is almost always a

forest. This shrine forest is known as *Chinju no Mori* (lit. "guardian forest") and is a part of the shrine complex, and is thus sacred. It is also common to find large trees on shrine grounds. These are sometimes known as *shinboku*, meaning "divine tree" and are thought to be the dwelling place of *kami*. *Shinboku* are often very old, and are marked with a straw rope (*shimenawa*) denoting their sacredness (Sakurai, 2005; Cali and Dougill, 2012).

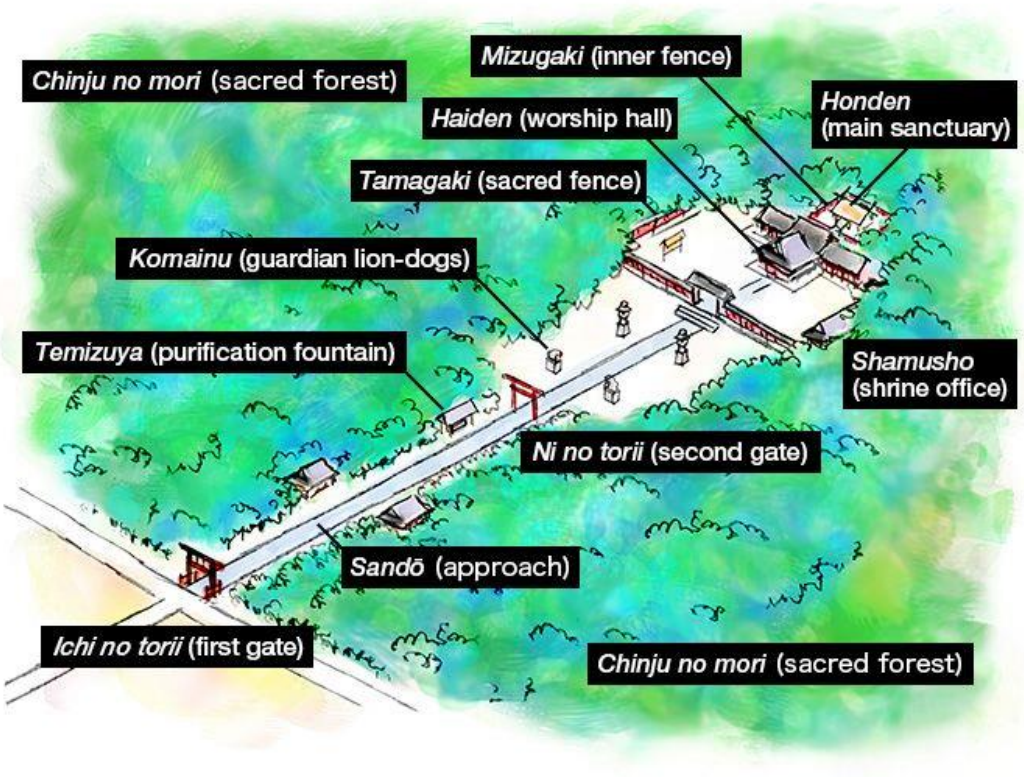

Figure 1. The layout of a typical Shinto shrine. Illustration by Izuka Takeshi.

Shrines are visited for religious occasions such as festivals (*matsuri*) or weddings, but also to pray to the enshrined deity for help or good fortune. However, many visit shrines without any special reason (Nelson, 1996). Shinto customs are deeply interwoven into Japanese culture and daily life to such a degree that many Japanese partake in Shinto rituals without reflecting on their religious meaning (Cali and Dougill, 2012). When interviewing shrine visitors at Kamigamo shrine in Kyoto, Nelson (1996) found that most visitors either did not have any special reason for visiting, or visited the shrine because of its beautiful surroundings. The majority of visitors (36%) cited the natural environments as the one characteristic which mostly motivated visiting the shrine.

In contrast to Shinto shrines, Buddhist temples are often situated in what is known as temple villages (*teramachi*) where several temples are clustered together. Temples are usually not associated with any specific natural features in the landscape the same way a Shinto shrine usually is. Temple villages tend to be found

on flat land at the foothills of mountains or at strategically significant locations, this is taken to be indicative of the fact that in Buddhism closeness to nature is not of the same importance like it is in Shinto (Ishii *et al.*, 2010).

In contemporary Japan there has also been an emergence of so-called "power spots", a New Age belief that one can go to certain locations to acquire spiritual "power" or "energy" (Carter, 2018). The phenomenon is known across the world and in Japan it has mostly been associated with natural features at Shinto shrines, such as large trees or rocks. The concept of power spots has also been criticised for mainly being a rebranding attempt by shrines and temples from the old religious milieu to fit into a new spiritual context (Reader, 2012).

1.3.2. Forests and trees at religious sites in Japan

Japanese climate

Japans wet monsoon climate is varied and diverse with four distinct seasons (FAO, 2007). The climate ranges from cool humid continental climate (Köppen designation Dfb) in the northern parts of the country (Hokkaido) to warm tropical rainforest climate (Köppen Af) in the south (Ryukyu Islands). The most dominant climate type is temperate humid subtropical climate (Köppen Cfa) which constitutes most of Honshu and the entirety of Shikoku and Kyushu islands (local climate may vary by topography influence) (Beck *et al.*, 2018).

The varying climate and topography of Japan has given rise to four main forest vegetation zones (see Figure 2); cool-temperate broadleaf forest, sub-alpine conifer forest, warm-temperate broadleaf forest, and subtropical forest (FAO, 2007).

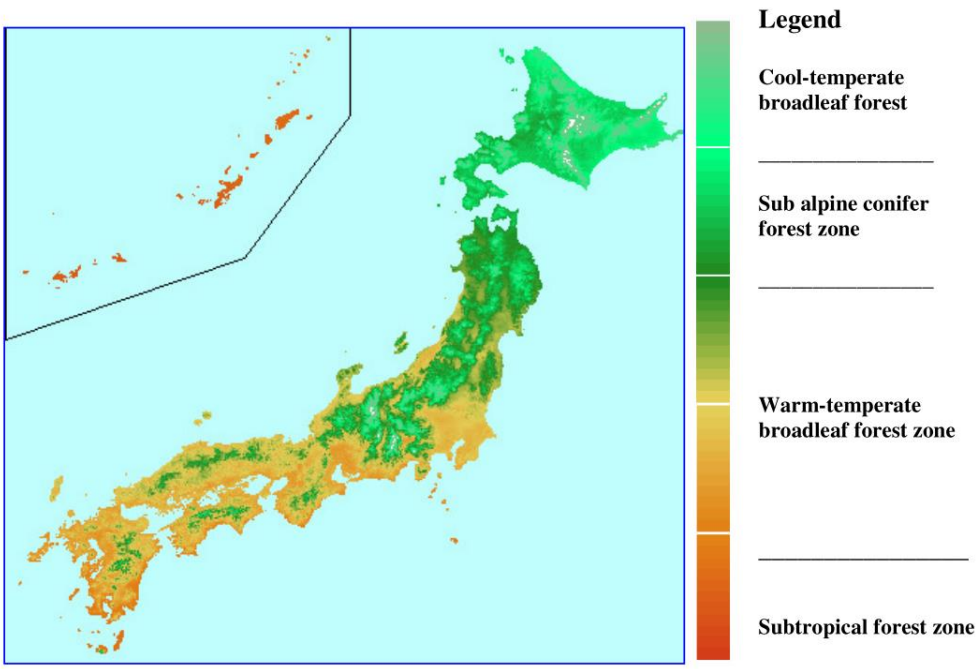

Figure 2. Vegetation zones of Japan (FAO, 2007).

Shrine forests

Forests are an integral part of a Shinto shrine. The term *Chinju no Mori* (lit. "guardian forest") pertains to the forest within and immediately surrounding the shrine complex (Ono, 1962). Shrine forests are considered sacred space, and entering them is akin to entering a church or other holy place of worship. In the Shinto creation myth, the land of Japan was created by the Shinto gods (Heldt, 2014), and all of nature is the domain, and abode, of the gods (Ono, 1962; Omura, 2004; Cali and Dougill, 2012). A natural old forest which is untouched for a long time, is then closer to the gods. Closeness to nature ensures closeness to the *kami*, hence why nature is so important in Shinto (Rusu, 2011).

Within the religious structure (see Figure 3) of a Japanese sacred forest, the shrine forest is only a small part of the larger "mountain forest" (the forest where the gods dwell) (Matsui, 2014).

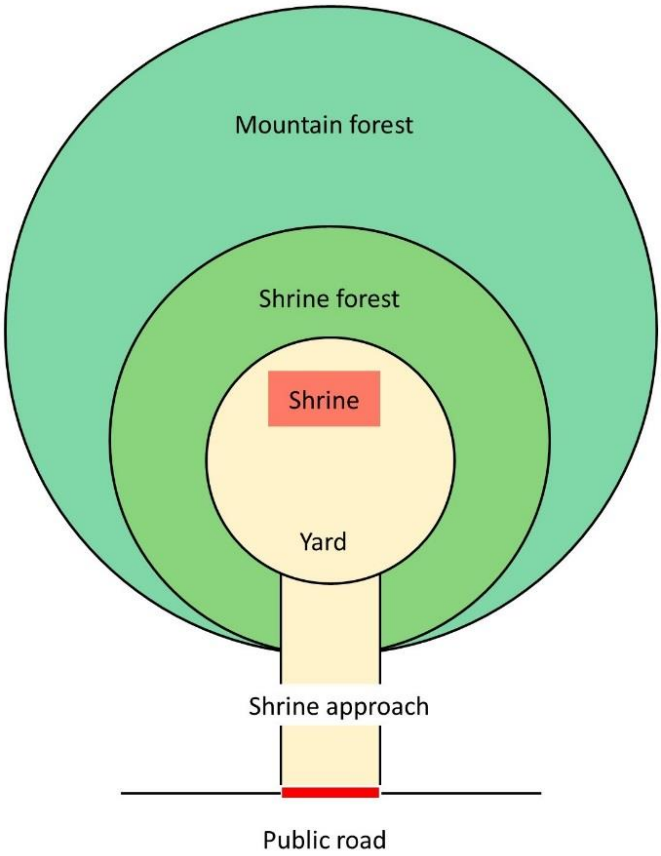

Figure 3. The religious structure of a Shinto shrine forest, redrawn from Matsui (2014).

Many shrines preside over large areas of woodland (Forestry Agency, 1981). The average shrine has a forested area of about 4.5 hectares (Iwai, 2002). Even in large cities there are shrines with large forested areas, such as the Meiji shrine in the centre of Tokyo (70 ha) (Matsui, 1996). There are 208 000 hectares of forest in Japan which is associated with either a Shinto shrine or Buddhist temple (Alban and Berwick, 2004). Not all shrines have forests surrounding them however, about half of all shrines do not have a proper grove surrounding the shrine precincts, but instead only have a few trees or a garden next to the shrine buildings (Iwai, 2002).

Shrine forests are generally well preserved as they are objects of worship in which the *kami* dwell, and thus cutting or "polluting" (*kegare*, see *Supplementary materials 2.4*) such trees is avoided (Sakurai, 2005). In Shinto (and in Japanese Buddhism) nature is seen as something in which the sacred resides (Alban and Berwick, 2004), and entering a shrine forest is seen as entering a sacred space where closeness to nature also ensures closeness to the *kami* (Rusu, 2011). Thus there is a tradition of preserving forests at religious sites (Ishii *et al.*, 2010). Historically, cutting trees on shrine and temple grounds have been discouraged. The establishment of new shrines and temples was occasionally also used as a mean to protect forests from overexploitation (Totman, 1989).

Today, forests at shrines are often protected via designation as natural heritage or national treasures. In the past, shrines and temples were protected and maintained by the aristocracy who often acted as patrons of certain temples and shrine. However, when the Meiji Restoration (1868) fundamentally changed Japanese society many old shrines and temples were left in disrepair. The Meiji government therefore enacted the "Ancient Temples and Shrines Preservation Law" in 1897 in order to preserve and protect important shrines, temples and other works of art (Agency for Cultural Affairs of Japan, 2006). This law was later expanded to include natural, historical and archaeological sites with the "Law for the Preservation of Historic Sites, Places of Scenic Beauty, and Natural Monuments" passed in 1919. The law came as a response to rapid industrialisation which had quickly transformed the natural and historic Japanese landscape (Robertson, 2005).

The current law for protecting important cultural, historical, archaeological and natural assets, "Law for the Protection of Cultural Properties", was enacted in 1950. It has been amended continuously up until as recently as 2018. Under this law many shrines, temples and other sites that are considered sacred have been designated National Treasures and received governmental protection and sponsorship (Agency for Cultural Affairs of Japan, 2019).

Trees are often designated as historic monuments, and protected by law (Alban and Berwick, 2004). On shrine grounds it is common to find large exceptional trees (*shinboku*) which are objects of reverence (Sakurai, 2005). In addition to being important from a religious and historical perspective, old large trees are also highly beneficial for ecological values and biodiversity as they provide a food source and habitat for arboreal animals (Ishii *et al.*, 2018).

There are several tree species which are considered important within Shinto (see *Supplementary materials 4.1* for expanded information on important trees), and below follows a short description of a few which are commonly found at Shinto shrines.

Sakaki (*Cleyera japonica*) is an essential a plant for Shinto worship as it is used in a wide variety of circumstances as an offering to the *kami* and as ritual instruments (Carr, 1995; Inoue, 2005; Rusu, 2011). Sakaki sprigs are often carried by shrine maidens when performing sacred dances (*kagura*), and in many different rituals sakaki sprigs have an important role as offerings or mediums between the priest and the *kami* (Kuly, 2003). A notable example of such use is a common purification ritual, known as *harae*, in which sakaki sprigs are used as purification wands (Ono, 1962).

Sakaki is also used to decorate the shrine, and to delimitate sacred spaces (Ellwood, 1968). The kanji (Sino-Japanese logographs) used to write the word *sakaki* is a

fusion of the kanji for “divine” and for “tree” further emphasising its importance in religion. The etymological meaning of *sakaki* can be understood as “divine boundary tree” (Carr, 1995), which is concurrent with the Shinto tradition of encircling the shrine grounds and other sacred spaces with sakaki trees or sprigs. Sakaki also appears in several Japanese myths, cementing its place in Japanese tradition and history (Rusu, 2011; Heldt, 2014). However, occasionally the sakaki sprig might be replaced in rituals by other plants including oak (*Quercus.*), Japanese cedar (*Cryptomeria japonica*), Japanese boxwood (*Buxus microphylla*), and momi fir (*Abies firma*) (Inoue, 2005). (Further information on *Cleyera japonica* is available in *Supplementary materials 4.2*).

Another important tree species known as *sugi* in Japanese, is the Japanese cedar (*Cryptomeria japonica*). It is one of the most common tree species in Japan due to how it is widely planted and harvested as a timber-tree for the Japanese forestry industry (JFTA, 1964). Historically, Japanese cedar has been an important construction material and has been actively planted and cultivated since at least the Edo period (ca.1604 – 1868) (Iwai, 2002). It can grow very old and cedars found at shrines are often hundreds or even thousands of years old; the oldest one, found on Yakushima island is estimated to be at least 2000 years (Pakenham, 2003). Large Japanese cedars are important for ecological values and biodiversity as they provide food source and habitat for many arboreal animals (Ishii *et al.*, 2018).

Japanese cedars, when they are considered sacred are sometimes known as *kansugi* in Japanese to signify their status as sacred trees. Such cedars are often found surrounding shrine complexes (Carr, 1995) as it is believed that planting *sugi* around the shrine will help protect it (Ishii *et al.*, 2010). The reverence of cedars at shrines is historically attested as early as the Nara period (AD 710 – 794), and today many *shinboku* are old large cedars (Sakurai, 2005).

Another important tree in the cypress family (*Cupressaceae*) is the Japanese cypress (*Chamaecyparis obtusa, hinoki* in Japanese). It is the most important wood for traditional construction in Japan. It is extensively used in, for example, shrines, temples, and castles as the main construction material due to its excellent timber quality (Cohen *et al.*, 1996).

Japanese cypress wood is used in the ritualistic rebuilding of Ise grand shrine every 20 years (Ellwood, 1968). This practise of rebuilding a shrine was somewhat widespread before the Meiji era (1868 - 1912), an example of another shrine which practised the same kind of ritual is the Kasuga grand shrine in Nara (Cali and Dougill, 2012). In this ritual, traditional forestry and carpentry techniques are utilised when harvesting the cypress wood and constructing the new shrine buildings. The ritual is a way to pass on old traditions and techniques to a new

generation (Ellwood, 1968; Rots, 2015). Japanese carpentry traditions are closely related to religious ideas. When visiting and interviewing traditional carpenters in Japan, Cohen et al. (1996) found that if a tree is cut for the purpose of shrine or temple construction it is often thought the *kami* still dwell within the wood of the tree, and thus the carpenter has a moral obligation to see to it that the wood is used properly and in a manner which continues its existence as something beautiful.

There are several other trees that can be found at Shinto shrines. The two Japanese pines *Pinus thunbergii* (*kuromatsu*, black pine) and *Pinus densiflora* (*akamatsu*, Japanese red pine) which represent longevity and are said to invite *kami* and bring good luck (Omura, 2004). A common custom involving pines is the practise of putting a *kadomatsu* (lit. "gate pine") at the gate of one's home and at shrines around the New Year's celebration in order to attract fortune for the coming year (Starling, 2018). There are other pine species as well, such as *Pinus parviflora* (*goyomatsu*, Japanese white pine), which are used extensively as bonsai and as decorative trees in Japanese gardens.

Other tree species which can be found in a religious context at shrines and temples include (but not limited to) *Prunus serrulata*, *Cinnamomum camphora*, *Magnolia compressa*, *Nageia nagi*, *Prunus persica*, *Ficus religiosa*), *Illicium anisatum*, *Shorea robusta*, *Gingko biloba*, and *Phyllostachys bambusoides* (Ono, 1962; JFTA, 1964; Carr, 1995; Omura, 2004; Sakurai, 2005; Rusu, 2011; Cali and Dougill, 2012). In addition to religiously significant trees species, it is also common to find trees and plants at shrine/temple forests which are kept purely for aesthetic reasons.

1.3.3. Forest management and biodiversity at shrines

Generally, shrine forest management is minimal and public access into the forests is discouraged (Ishii *et al.*, 2010). Shrine forest management is mainly based on what the priests who run the shrine consider to be appropriate management approaches. In a study which investigated management at shrines in Kitakyushu City it was found that priests believed that the forest would be preserved in a near-natural state if human intervention was minimised (Hashimoto, Ito and Iijima, 2007).

The practise of planting trees when establishing shrines has been common throughout Japanese history (Totman, 1989). *Cryptomeria japonica*, *Chamaecyparis obtusa*, and *Cleyera japonica* are often planted around and within the shrine precinct as it is believed to protect the shrine (Ishii *et al.*, 2010).

Shrine forests have been proven to contribute to the conservation of biodiversity (Ishii *et al.*, 2010), and to conserve important rare species such as certain bryophytes (Oishi and Tabata, 2015). In urban landscapes, a network of greenery is

important for maintaining metapopulations in a fragmented forest landscape (Ishii *et al.*, 2010).

In a rapidly urbanising country like Japan there are conservation issues facing urban shrine forests. Biodiversity in shrine forests has significant correlation with forest size as demonstrated by Ishida et al. (1998), see Figure 4. With decreasing shrine forest size, there is a linear decline in species richness (Ishida *et al.*, 1998). Many of the disappearing species are ferns, mosses and orchids which require a moist environment which is only found in the interior of larger forested areas (Ishii *et al.*, 2010).

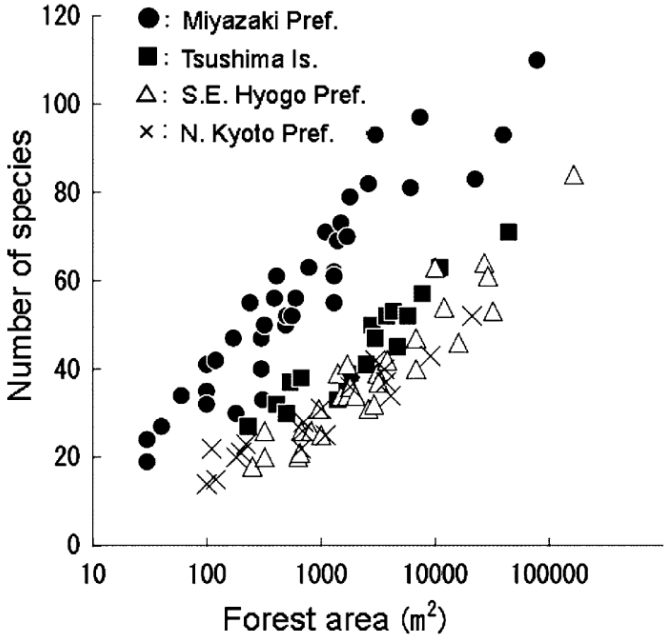

Figure 4. The linear relationship between shrine forest area and species richness, from Ishii et al. (2010) after Ishida et al (2005). Used with permission.

While the relationship demonstrated by Ishida et al. (1998) indicates that larger shrine forests are better at conserving biodiversity, small forest patches may also be important since rare species on occasion will inhabit them. Thus, they contribute to sustaining the urban metapopulation of rare species (Ishii *et al.*, 2010). While biodiversity increases with forest age, it is also important to point out that at a late-successional stage biodiversity decreases due to loss of shade-intolerant species. Though, a late-successional stage forest with large trees also provides habitat for certain rare species which are not found in cultivated forests with mostly small trees (cf. Ishii *et al.*, 2010, 2018; Le Roux *et al.*, 2015). To summarise, a small old-growth forest is important from an ecological point of view as it can support rare species that are not found in large early-succession forests, even if total biodiversity decreases at the climax stage.

The first researchers to connect old-growth natural forests and biodiversity to Shinto were Miyawaki Akira and Ueda Atsushi, during the 1970s. Their research drew attention to the ecological values of shrine and temple forests, and how conservation of shrine and temple forests could be connected to religious ideas. They also showed how forests preserved by shrines and temples constituted patches of old-growth vegetation. The connection between shrine forests, religion and biodiversity has led to shrines and temples sometimes backing nature conservation efforts (Rots, 2015).

2. Methods

2.1. Study area

Figure 5. Study area and study sites in Japan. Study sites are marked with numbers: 1) Shimogamo shrine, 2) Nishinomiya shrine, 3) Kotohiki Hachiman shrine, 4) Hakusan-taga shrine

For this study I interviewed three researchers who work with shrine forests, and two Shinto priests who work at shrines by using questionnaires. Questionnaires were sent to researchers and Shinto priests who were, at the time of this study (2020) working or had worked, at shrines in Japan. Nishinomiya shrine and

Shimogamo shrine are located on Honshu, the largest of the Japanese islands. Hakusan-taga shrine is located on Kyushu and Kotohiki Hachiman shrine on Shikoku (see Figure 5.). All shrines in this study were in the warm-temperate broadleaf forest vegetation zone (see Figure 2.).

Nishinomiya shrine, Nishinomiya, Hyogo prefecture

Nishinomiya shrine is located in the city of Nishinomiya in Hyogo prefecture. It is the head shrine of the Ebisu sect and is dedicated to the deity Ebisu. The shrine is known colloquially as "Ebessan".

Ebisu is often pictured as an old fisherman and is the guardian of all fishermen and a god of good luck, business and wealth. The shrine is surrounded by a small urban forest. It is unclear when the shrine was founded, but it is recorded that during the Heian period (AD 794 – 1185) there was already a shrine at the site (Hyogo Tourism Bureau, 2018).

Shimogamo shrine, Kyoto, Kyoto prefecture

Shimogamo shrine is located in Kyoto on the banks of where the Kamo river joins the Takeno river. The shrine is dedicated to the deities Kamo Taketsunumi-no-Mikoto and his daughter Tamayorihime-no-mikoto, both associated with thunder (Cali and Dougill, 2012). Shimogamo shrine is one of the most famous shrines in Japan, and also one of the oldest. It was founded in the seventh year of the reign of Emperor Sujin (97 – 37 BC) according to shrine tradition (Cali and Dougill, 2012).

Shimogamo shrine is surrounded by a sacred grove known as *Tadasu-no-mori*. The name literally translates to "Forest of Justice", but is also often translated as "The Forest Where Lies are Revealed" (Cali and Dougill, 2012). The "*tadasu*" in its name can possibly also be translated as "delta" referring to its position on the Kamo river delta (Shimogamo-jinja, 2010).

"Shimogamo-jinja" is the common name for the shrine, its formal name is "Kamo-mioya-jinja" and is together with its sister shrine, Kamigamo-jinja, known as the Kamo-jinja complex. The two shrines are located at the north-east corner of the old capital in order to protect it from malevolent forces, it was believed that the north-east corner brought misfortune (Shimogamo-jinja, 2010; Cali and Dougill, 2012). The Kamo-jinja complex along with its sacred forest is recognised as a World Heritage by UNESCO (1994).

The forest comprises 12.4 hectares and is largely deciduous. It has been shown to be oldest patch of forest in Kyoto (Cali and Dougill, 2012). Since cutting is usually

forbidden in shrine forests, this forest has been protected since ancient times (Tabata, Hashimoto and Morimoto, 2016).

Hakusan-taga shrine, Kanda-machi, Fukuoka prefecture

Hakusan-taga shrine is a small shrine on a hill in the countryside near Kanda village in Fukuoka prefecture, on northern Kyushu. There is an annual festival like is the custom at Shinto shrines. Most shrines hold one or several festivals each year.

Like is often the case with small rural shrines, there is very little information available in English on Hakusan-taga shrine. It is unknown to me what deity the shrine is dedicated to.

Kotohiki Hachiman shrine, Kan'onji, Kagawa prefecture

Kotohiki Hachiman shrine is located in the city of Kan'onji in Kagawa prefecture on Shikoku. The shrine is situated on a hill near where the Saita river reaches the Seto inland sea. The shrine is dedicated to the syncretic deity Hachiman (translates to "Lord of Eight Banners"), to whom visitors pray for protection from danger and for success in business. Hachiman worship is of note as it is the earliest example of Shinto Buddhist syncretism. Before the Meiji restoration, Hachiman was the patron deity of the warrior aristocracy (the samurai), and was considered a god of war, archery and the protector of the nation (Cali and Dougill, 2012).

The shrine at Kan'onji was initially a *jinja-ji*, a shrine-temple, with both Shinto and Buddhist structures. Like is the case with Hakusan-taga shrine, there is little information on the shrine available in English. However, it is known that there is an annual festival.

2.2. Interviews

2.2.1. Interview technique

For the interviews I used the method outlined by Jacob & Furgerson (2012) to create a uniform questions protocol, i.e. a questionnaire. Usually when creating a questionnaire, one begins with asking about general information about the interviewee. The following questions were connected to the aim and research questions, followed by deeper questions relating to the subject (McCracken, 1988). It is important to have the interviewee speak freely on the subject, something which can be achieved by asking open-ended questions (Guion, Diehl and McDonald, 2006; Jacob and Furgerson, 2012). By open-ended questions is meant questions which are worded in such a way that the interviewee cannot answer just "yes" or

"no". Many open-ended questions start with "how" or "why" (Guion, Diehl and McDonald, 2006).

The list of questions usually ends with allowing the interviewee to leave some additional information which they think is relevant to the subject but was not explicitly asked about in the list of questions (Norén, 2019).

According to McCracken (1988) it is important to establish trust between the interviewer and the interviewee, as this makes it easier for the interviewee to give personal and on-point answers. As was discussed by Norén (2019), developing trust is easier if the interviewer and interviewee have something in common, such as being from the same geographical area, speaking the same dialect etc. In my case, the interviewees were from a different country than myself. While the issue was partially circumvented by using written questions and answers, there is bound to be nuances and depth which are lost in translation. By interviewing in a second language (English), individual language proficiency can also influence the questions' and answers' quality.

2.2.2. Interviewing

Initially I contacted Dr. Hiroaki Ishii, whose article on integrating ecological and cultural values (see Ishii et al. (2010)) was the original source of inspiration for this study, via e-mail. With the assistance of Dr. Ishii we contacted individuals relevant to my study, three researchers and two Shinto priests. The priests and researchers received separate questionnaires with questions pertaining to their expertise. The researcher's questionnaire put the focus on the ecological aspect of the forests, and the priest's questionnaire had greater focus on the religious aspects of the forests. However, both questionnaires included questions on both subjects. Three main topics were covered in the questionnaires:

Shrine forest management

Questions in this topic concerned the current and historical management of the shrine forest. If there had been any felling of trees, pruning, planting or similar. Also questions about organisation and how decisions on forest management are made at the shrine.

Biodiversity and conservation

In this topic I asked about forest vegetation composition, vegetation dynamics and if there are any ecological values present in the forest and what constitutes these values (old trees, high biodiversity, rare species etc.), and if there is any current conservation work being done to preserve them.

Ceremonies and religion

The questions under this topic concerned the religious aspects of the shrine forest. Such as what the role of the forest is within the religion, if there are any trees that are especially important from a religious perspective (both individual trees and tree species). If there are any ceremonies centred on trees, forest or plants.

Dr. Ishii helped with translating the priest's questionnaire to Japanese (and the subsequent answers from Japanese to English), the researcher's questionnaire was sent in English.

As pointed out by Jacob & Furgerson (2012) it is important to follow up the initial set of questions with an additional interview, hence why I also conducted one follow-up interview with one researcher via digital video link. Likewise, the two other researchers also answered a second questionnaire with follow-up questions. For additional clarification on certain topics, I also had some minor e-mail correspondence with the researchers.

The interview which was conducted via video link was recorded (with permission from the interviewee) to ease the workload and enable me to listen attentively to the answers given (Trost, 2010).

The questionnaires are shown in Appendix A.

The following individuals were interviewed:

Dr. Hiroaki Ishii, Dr. Ishii is an ecologist and tree eco-physiologist currently employed as Associate Professor at the Graduate School of Agricultural Sciences at Kobe University in Kobe. His main areas of study are tree and forest function, and restoration of forest ecosystems; especially in urban areas. Dr. Ishii has been conducting research on the shrine forest at Nishinomiya shrine for about 15 years.

Dr. Keizo Tabata, Dr. Tabata is an ecologist and researcher currently employed as a part-time lecturer at Kindai University in Osaka, Japan. He has done several studies on the Shimogamo shrine forest (Tadasu-no-Mori) in Kyoto.

Dr. Tohru Manabe, Dr. Manabe is a researcher and curator at the Kitakyushu Museum of Natural History and Human History in Kitakyushu. His main research interests are structural and dynamic aspects of plant communities in old-growth evergreen broad-leaved forest and ecological functions of secondary forests in and around urban areas.

Yoshiyuki Yoshii, Mr. Yoshii is the senior priest at Nishinomiya shrine in Nishinomiya where he has been working for 3 years as head of the general affairs section.

Yoshiyuki Wada, Mr. Wada is the senior priest at Kotohiki Hachiman shrine in Kan'onji, a position he has held for 16 years.

2.2.3. Analysis of the interview source material

The raw data from the interview questionnaires, the oral interview and correspondence were compiled into text segments. The text was divided into sections depending on which study site the interviewee was associated with. I also corrected for linguistic errors before displaying it. The interview was not transcribed.

A comparative analysis method was used to compare the answers from the different study sites and draw conclusions. In the comparative method it is assumed that if several respondents give the same answer independent of each other, it is probably true (Norén, 2019). The results data were divided into five categories for each study site: Forest characteristics, Spiritual aspects, Forest management, Forest regeneration, Biodiversity and conservation. The results were then discussed in each category, with a separate section where the results were comparatively analysed.

3. Results & Discussion

3.1. Nishinomiya shrine

Figure 6. Aerial photo of Nishinomiya shrine. The shrine forest is in a highly urbanised setting. Photo provided by Hiroaki Ishii, by Nishinomiya City.

3.1.1. Forest characteristics

The forest at Nishinomiya shrine (Figure 6) is thought to be as old as the shrine itself, the earliest written source concerning the shrine dates from 1128. The entire shrine encompasses 4.2 hectares, the forested area makes up 2.6 ha out of which 1.3 ha are designated as prefectural natural heritage[2]. It is quite large for its urban location (see Figure 6). The forest was quite open until about 300 years ago when

2 Questionnaire Dr. Hiroaki Ishii

Cinnamomum camphora trees were planted[3]. The average size of a shrine forest is 4.5 hectares. However, many urban shrine forests are a lot smaller (Iwai, 2002). Nishinomiya shrine is, when compared to other urban shrines, quite large. The choice of *Cinnamomum camphora* as planting material in the 1700s I assume to be due to by its status as a sacred species to the shrine.

On the shrine grounds there are two tree species which stand out, *Nageia* (previously *Podocarpus*) *nagi* and *Cinnamomum camphora*. *Nageia nagi* has its origin in China and is often found planted at shrines. The oldest example in Japan is a tree at Kasuga grand shrine in Nara. The *Nageia nagi* at Nishinomiya shrine is probably planted as well. *Cinnamomum camphora* is cultivated in southern Japan (Li, Li and van der Werf, 2013), but it seems to not be found in natural Japanese forests. It is unclear if *Cinnamomum camphora* is native to Japan or not. It is however common in urban and peri-urban forests[4]. Due to it mainly being found in urban and peri-urban areas, *Cinnamomum camphora* distribution appears to be connected to human activity. *Cinnamomum camphora* is a source of the camphor, a product which has a long history of human use. It is valued for its medicinal properties (Hamidpour *et al.*, 2013), and for its use in producing smokeless gunpowder (Durham, 1932). Its distribution in human dominated areas I assume to stem from its commercial and medicinal importance.

3.1.2. Spiritual aspects

The forests main role in the daily life of the shrine is to create and maintain a holy or sacred ambiance as *Chinju-no-mori*. The forest also helps preserve the shrine grounds as a sacred place for worship. Since the gods reside in nature, nature is itself an object of worship[5]. Additionally, evergreens are preferred to deciduous trees since the former do not lose their green leaves during winter. Loss of green diminishes the sacred ambiance, and the feeling of closeness to nature[6].

At Nishinomiya shrine, *Cinnamomum camphora* is believed to be the tree of Ebisu, the god of prosperity who is enshrined there. According to the story, a boat made from *Cinnamomum camphora* drifted onto the beach near where the shrine is located today. The people who lived in the area found the boat and thought that it must have belonged to Ebisu, and thus decided to build a shrine in his honour there. Since *Cinnamomum camphora* is the sacred tree species of Nishinomiya shrine it has been planted within the shine precincts on several occasions[7].

[3] Questionnaire senior priest Yoshiyuki Yoshii, senior priest at Nishinomiya shrine

[4] Questionnaire Dr. Hiroaki Ishii

[5] Questionnaire Yoshiyuki Yoshii. Supported by questionnaire Dr. Hiroaki Ishii, and oral information Dr. Hiroaki Ishii.

[6] Oral information Dr. Hiroaki Ishii

[7] Oral information Dr. Hiroaki Ishii

According to the senior priest at Nishinomiya there are no trees within the shrine precincts that he considers to be *shinboku* (divine tree), or to be more special than any other within the shrine grounds[8]. Extraordinary trees are sometimes referred to as *shinboku* in Japanese, meaning "god tree" (Ono, 1962; Sakurai, 2005). However, it was not referred to as such by the priest at Nishinomiya shrine. This could be due to a differing definition of the word itself, or miscommunication between myself and the priest. It could also be that *shinboku* is not a term that is in common use. Large trees are sometimes encircled by a sacred rope, designating the tree as sacred, as a *yorishiro* (Ono, 1962; Sakurai, 2005). Occasionally you can find small shrines (*hokora*) in front of sacred trees at which prayers can be made.

3.1.3. Forest management

Forest management at Nishinomiya shrine is mostly concerned with maintaining forest aesthetics and directing it towards an old-growth state. The current main issue is how the shrine forest is supposed to coexist with the surrounding city, especially since the weather is getting more severe[9]. There has been a noticeable increase in extreme weather over Japan, with projected future increase in heavy rains and storms (Case and Tidwell, 2017). Changes in the Japanese climate and weather will directly affect shrine forests and how they will have to be managed in the future.

Tree branches that potentially could fall outside the shrine premises are pruned regularly (every 2-3 years) for safety reasons. Likewise, trees that could potentially fall on cultural heritage buildings (the shrine buildings) or on private property outside the shrine premises are removed or pruned. Typhoon blowdowns are removed unless they fall into the forest where they are not a safety hazard[10]. Extra care is also taken when managing the outer trees in order to make them look aesthetically pleasing to the public[11].

There is a forestry management plan being drafted for Nishinomiya shrine forest based on research from the past 15 years by Dr. Ishii and his associates. It is still rare for shrines to have an official forestry management plan, and usually management is left to the discretion of the people responsible for shrine affairs. While the management plan at Nishinomiya shrine is not yet finalised, one of the main planned objectives is to create a four-metre buffer zone along the shrine forest outskirts for safety reasons. Forestry management is decided upon by the shrine staff together with a committee of experts and the Council for Preservation of Cultural Heritage of Nishinomiya City. An important feature of the management

[8] Questionnaire senior priest Yoshiyuki Yoshii

[9] Oral information Dr. Hiroaki Ishii

[10] Oral Information Dr. Hiroaki Ishii

[11] Questionnaire Dr. Hiroaki Ishii & oral information Dr. Hiroaki Ishii

plan is that it makes it possible for the people working with the shrine forest to make quick decisions regarding forest management without having to wait for permission from the city council[12].

The head priest is ultimately the one who approves management operations, but since he does not have any education in forest ecology or other relevant field, details regarding the management of shrine forests are left to a gardening company. At Nishinomiya shrine, the same private family gardening company has been tending the forests and gardens at the shrine for about 300 years. Recently the shrine has enlisted the help of ecologists to help guide the forest towards a natural late-successional state[13]. According to Hashimoto et al. (2007) the priests believe that leaving the forest to grow without intervention will result in conservation of natural conditions. However, I suppose that it is possible that leaving management decisions to the priesthood could result in unscientific approaches to forest management. Limited knowledge of ecology may lead to invasive species and non-native vegetation dominating the shrine forests, the priests and the gardeners at a shrine may not realise that the forest is not actually representative of a true natural forest. This may defeat the purpose of keeping a forest around the shrine, as a forest dominated by exotic species would not be a shrine to the wild nature of Japan.

3.1.4. Forest regeneration

Planting in this shrine forest is done for restorative and conservation purposes. Since 2004 native species already present in the forest have been planted in order to restore the forest to a natural state. Planting has historically been done in the shrine forest, some of the historical planting events are recorded in shrine documents[14].

After the Second World War, planting was done to replace trees that had been destroyed in bombing raids and the following fires[15]. When establishing a new shrine, it is common to plant trees such as *Cryptomeria japonica* and *Cleyera japonica*. However, at Nishinomiya shrine planting is mostly done with species not generally described as religiously important (cf. Omura, 2004; Rusu, 2011; Starling, 2018). Instead, the purpose is to increase biodiversity.

Recently when a donation was made to the shrine for planting trees, the priests at Nishinomiya shrine held a ceremony where the trees to be planted were purified in a religious ritual (see Figure 7.). But for ordinary forest management such as

[12] Questionnaire Dr. Hiroaki Ishii & oral information Dr. Hiroaki Ishii

[13] Questionnaire Dr. Hiroaki Ishii & oral information Dr. Hiroaki Ishii

[14] Questionnaire Dr. Hiroaki Ishii

[15] Questionnaire senior priest Yoshiyuki Yoshii, supported by questionnaire Dr. Hiroaki Ishii

pruning, cutting, and minor planting etc. the priests do not participate[16]. Purification rituals are one of the most important and common practises in Shinto. By performing a purification ritual (*harae*) for the plants to be planted, spiritual impurities are removed. Similarly, a worshipper usually purifies themselves with water when entering the shrine grounds in order to not bring with them spiritual impurity (Ono, 1962; Nishioka, 2007). However, the priest usually does not perform these kinds of rituals for plants except on special occasions. I assume that the shrine/priest does not have time to, or find it necessary, to perform elaborate rituals for minor forest management operations.

The end goal of forest management at Nishinomiya shrine is to create a natural old-growth forest which is representative of natural forests in the area. In 2015 and 2016 *Cinnamomum camphora* seedlings were planted. Recently (in 2020) *Ilex chinensis*, *Neolitsea sericea* and *Eurya japonica* were planted to increase biodiversity[17].

While the shrine uses sakaki sprigs (*Cleyera japonica*) in their rituals, they do not grow their own sakaki; but instead buy them from an outside source. There is a flower shop near every shrine and temple that supplies visitors with leaves and flowers, it is possible Nishinomiya shrine gets their sakaki from the nearby flower shop[18]. It is unknown to me if the sakaki sprigs bought from the flower shop are produced in a manner which differ from other plants/flowers due to their religious significance.

Figure 7. Planting ceremony at Nishinomiya shrine. Photo by Hiroaki Ishii.

[16] Questionnaire Dr. Hiroaki Ishii & oral information Dr. Hiroaki Ishii

[17] Questionnaire senior priest Yoshiyuki Yoshii, supported by questionnaire Dr. Hiroaki Ishii

[18] Questionnaire Dr. Hiroaki Ishii & oral information Dr. Hiroaki Ishii

3.1.5. Biodiversity and conservation

This forest acts as refugia for many bird and insect species in a highly urbanized landscape. The large *Cinnamomum camphora* trees provide habitat for owls to nest. Although its plant diversity is low compared to a natural late-successional forest, it is considerably higher than an urban park or secondary forest[19]. Shrine forests can be used as steppingstones in the fragmented urban forest landscape, as such they are instrumental in preserving a sustainable urban forest network (Ishii *et al.*, 2010).

Deadwood (often from typhoon blowdowns) is left in the shrine forest unless the fallen trees constitute a safety hazard[20]. This is beneficial to the biodiversity of the shrine forest since deadwood is known as a major indicator of biodiversity in forests. It is an important component of the nutrient cycle for many plants, insects, fungi and animals (Rondeux and Sanchez, 2010).

3.2. Shimogamo shrine

Figure 8. Gate and trees at Shimogamo shrine. Photo by Keizo Tabata.

[19] Questionnaire Dr. Hiroaki Ishii

20 Oral information Dr. Hiroaki Ishii

3.2.1. Forest characteristics

The forest at Shimogamo shrine (Figure 8), known as Tadasu-no-Mori, has a total area of 12.4 hectares. Tadasu-No-Mori is a riparian forest dominated by three species of deciduous broad-leaved trees, *Aphananthe aspera*, *Celtis sinensis* and *Zelkova serrata*. The most abundant species is *Quercus glauca*, but the largest trees in the forest are *Cinnamomum camphora*. *Cinnamomum camphora* also has the greatest basal area of all species. The forest contains 59 woody species with a diameter greater than 10 centimetres (measured in 2010). The vegetation is a mixture of deciduous broad-leaved trees, evergreen broad-leaved trees and evergreen coniferous trees[21]. Like at Nishinomiya shrine, *Cinnamomum camphora* is present in this shrine forest as well. *Cinnamomum camphora* is commonly found in urban and peri-urban forests, but usually not in natural forests[22].

The three dominating species (*Aphananthe aspera, Celtis sinensis*, *Zelkova serrata*) are deciduous. This conflicts with the idea that evergreens are preferred in order to preserve the green colour of foliage during the winter months[23].

While the exact age of Tadasu-no-Mori is unknown, it is believed to be at least 2000 years old[24]. Since the shrine is said to have been founded sometime between 97 BC and 37 BC, the forest is probably even older. There are records of the forest burning on several occasions throughout history. It was also decreased to its current size by a government edict in the Meiji era (Shimogamo-jinja, 2010). By fossil pollen analysis, it was estimated that deciduous broad-leaved forests dominated by *Aphananthe aspera*, *Celtis sinensis*, and *Zelkova serrata* covered the Kyoto basin approximately 8,500–5,000 years ago. One of the most important aspects of Tadasu-no-Mori is that it preserves the original vegetation of the Kyoto basin[25]. Preserving the natural original vegetation of the area in which the shrine is located, I think would be not only concurrent with Shinto ideals, but also the most important ecological aspect of a shrine forest.

Due its location in the alluvial fan formed by the Kamo and Takano rivers flowing through the city of Kyoto, water flows through Tadasu-no-Mori (Figure 9) and as such it has experienced several periods of massive flooding. The disturbance caused by flooding continuously affect the vegetation in Tadasu-no-Mori, keeping it in a mid-successional state dominated by deciduous broadleaves. This makes the

[21] Questionnaire Dr. Keizo Tabata 1

[22] Questionnaire Dr. Hiroaki Ishii

[23] Oral information Dr. Hiroaki Ishii

[24] Questionnaire Dr. Keizo Tabata 1

[25] Questionnaire Dr. Keizo Tabata 1

vegetation of this forest quite different from other shrine forests[26] where the vegetation is usually in a late-successional state.

Figure 9. Brook in Tadasu-no-Mori. Photo by Keizo Tabata.

Flooding has created gaps in the canopy when parts of the forest was destroyed or displaced by water. The age of the stands varies depending on the time when the canopy gap was formed, the size of the canopy gap, and the status of regeneration[27].

3.2.2. Spiritual aspects

That the forest is representative of the original vegetation of the Kyoto basin area, which has been revered as sacred since ancient times, is an important aspect to preserve according to the interviewee. One of the potential origins of the name Tadasu-no-Mori is "*Kami-No-Tatazumu-mori*" which translates to "the forest where sacred deities stand". For ancient people, this forest was a sacred space where sacred deities existed[28].

The shrine's most important festival, "Aoi matsuri" (or Kamo matsuri), takes place on the 15th of May each year. During this festival a grand parade of people in historical costume travels from the Kyoto Imperial Palace to Shimogamo shrine. Their costumes are adorned with *Asarum caulescens*. The name of the festival "Aoi

[26] Questionnaire Dr. Keizo Tabata 2

[27] Questionnaire Dr. Keizo Tabata 1

[28] Questionnaire Keizo Tabata 2

Matsuri", translates to "hollyhock festival". While the festival is named for hollyhock (*Alcea*), the leaves of *Asarum caulescens* have similar appearance to hollyhock and thus are used in the festival. The Japanese common name *aoi* includes several species which have similar leaves to hollyhock.

There is also a ceremony known as "Juge Shinji", which is a sacred ritual that is held in Tadasu-No-Mori. The priests sit for prayer under an *Ilex latifolia* which grows near the Mitarashi pond[29]. The ritual takes place on the 12th of May during the Mikage Festival. While it was unknown to the interviewee if the there was any specific reason for the priests to sit under the *Ilex latifolia* during their prayer, the tree species is known to be used in fortune telling and for writing Buddhist sutras (the leaves can be written upon if scratched). Hence why it was often planted at shrines and temples. *Ilex latifolia* is also known as "the post office tree" in Japan due to how leaves can be used for writing messages on (Narita Public Library, 2011).

3.2.3. Forest management

Forest management in Tadasu-no-Mori is light. Trees are not cut, felling of trees is basically forbidden[30], but branches that reach outside the shrine's premises are pruned[31]. According to Cali & Dougill (2012) no forest management at all (including pruning and planting) is allowed in Tadasu-no-Mori. That is not entirely true, tree branches are pruned for safety reason and trees are planted. I find that it is not unusual for safety concerns and the ordinary life of people to infringe on the elevated status of shrine forests.

The purpose of forest management at Shimogamo shrine is to maintain the original vegetation dominated by three species of deciduous broad-leaved trees, *Aphananthe aspera, Celtis sinensis* and *Zelkova serrata*; and to prevent danger to visitors caused by falling branches[32].

Forest management policies are decided upon at a vegetation management meeting which is held annually[33]. Several forest ecology experts give advice on what management policies to implement[34]. The staff at the shrine, the priests etc., are responsible for management of the forest, while the actual forestry work is left to a private gardening company[35]. Since Shimogamo shrine is a large and very famous

[29] Questionnaire Dr. Keizo Tabata 1
[30] Questionnaire Dr. Keizo Tabata 2
[31] Questionnaire Dr. Keizo Tabata 2
[32] Questionnaire Dr. Keizo Tabata 1
[33] Questionnaire Dr. Keizo Tabata 1
[34] Questionnaire Dr. Keizo Tabata 2
[35] Questionnaire Dr. Keizo Tabata 1

shrine in Kyoto (one of the most visited cities in Japan) vegetation management that ensures that no branches fall on visitors can be assumed to be of great import to the shrine officials, while simultaneously preserving the original vegetation of the forest.

3.2.4. Forest regeneration

Each year, on the 29th of April, there is a tree planting event in which the public participates. During this event, seedlings of deciduous broad-leaved trees, *Aphananthe aspera*, *Celtis sinensis, Zelkova serrata, Acer palmatum* and *Cercidiphyllum japonicum* are planted[36]. The reason for planting these tree species is that they constitute the dominant species of the original vegetation. Before the annual planting event begins, a Shinto ritual is held by the priests[37].

3.2.5. Biodiversity and conservation

Biodiversity in Tadasu-no-Mori is affected by the flooding of the Kamo and Takano rivers, which makes the forest stay in a non-equilibrium state where the continuous flooding has prevented late-successional species from dominating[38]. However, after modifications were made to the rivers during 1936-1947 flooding frequency has decreased drastically. Less flooding has disrupted the disturbance regime in Tadasu-no-Mori, promoting the regeneration of *Aphananthe aspera*, *Celtis sinensis,* and *Zelkova serrata* (Tabata, Hashimoto and Morimoto, 2016).

Though it is not a woody species, the rare saprophytic orchid *Epipogium roseum* occurs in Tadasu-no-Mori[39]. A recurring aspect of shrine forests is that they act as refugia for rare species (Ishii *et al.*, 2010). This trait (acting as refugia) is an important part of supporting high biodiversity in shrine forests, which in turn is seen as important from a religious perspective. Since there is a tradition of seeing animals at Shinto shrines as the messengers or servants of the gods (Suzuki, 2005), it is often in the interest of shrines to preserve a rich fauna in the shrine forests. Preserving the animal life is inextricably linked to biodiversity, and to promote biodiversity is partially connected to preserving the original vegetation.

Asarum caulescens, one of the plants used in ceremonies during the Aoi festival, is a plant that prefers a moist environment. *Asarum caulescens* has decreased sharply in Tadasu-no-Mori since the Kyoto area has become drier from increasing

[36] Questionnaire Dr. Keizo Tabata 1

[37] Questionnaire Dr. Keizo Tabata 2

[38] Oral information Dr. Hiroaki Ishii

[39] Questionnaire Dr. Keizo Tabata 1

urbanisation. There is an urgent need to conserve *Asarum caulescens* in Tadasu-no-Mori[40].

3.3. Hakusan-taga shrine

Figure 10. Prayer hall surrounded by forest at Hakusan-taga shrine. Photo by Tohru Manabe.

3.3.1. Forest characteristics

The forest at Hakusan-taga shrine (Figure 11) is located on a hill and comprises about 4 hectares (its size was calculated from aerial photography in 1989). The forest is dominated by broad-leaved evergreens mixed with some deciduous broad-leaved trees. In 1995, 63 woody species were observed in the forest (excluding woody vines)[41]. In terms of size the forest at Hakusan-taga is quite normal, as the average shrine forest is about 4.5 hectares (Iwai, 2002).

The most abundant species is *Symplocos lucida*, followed by *Castanopsis cuspidata*, *Persea thunbergii* (*Machilus thunbergii*), *Camellia japonica* and *Distylium racemosum*. *Castanopsis cuspidata* had the largest basal area, followed by *Distylium racemosum*, *Persea thumbergii* and *Symplocos lucida*[42]. The forest is

[40] Questionnaire Dr. Keizo Tabata 2

[41] Questionnaire Dr. Tohru Manabe 1

[42] Questionnaire Dr. Tohru Manabe 1

classified as a lucidophyllous (laurel-type) forest (Figure 11)[43]. Lucidophyllous forests dominate the southern Japanese islands of Kyushu and Shikoku.

Figure 11. Lucidophyllous forest vegetation at Hakusan-taga shrine. Photo by Tohru Manabe.

Forest data was collected in 1994 and 1995. Stem diameter at breast height was measured for all woody species above 5 cm. Study plots totalling 430 m^2 (one 50m x 50m and two 30m x 30m plots) were established from which data was collected in November 1994 and in May 1995. A total inventory of all vascular plants was made in 1994[44].

This shrine forest is thought to have some structural differences compared to other similar climax forests. For example, the abundance of sakaki (*Cleyera japonica*) is unexpectedly low[45]. It is possible that the difference in structure, when compared to other forests in the area, is due not only to modern fragmentation of the forest landscape but also to past human disturbance (Manabe *et al.*, 2007).

The age of the forest is unknown, but it is much older than other forests in the surrounding area. According to shrine documents the forest and the shrine were burned down in 1587 during the wars of the feudal lords. Beyond those documents,

[43] Correspondence Dr. Tohru Manabe

[44] Questionnaire Dr. Tohru Manabe 1

[45] Correspondence Dr. Tohru Manabe

there are no useful records in order to determine the forest's age[46]. Many shrines are very old, and several have semi-legendary foundation dates and stories meaning it can often be hard to establish the actual founding date of a shrine.

3.3.2. Spiritual aspects

Hakusan-taga shrine was initially a shrine-temple known as Tokaku-ji, (a *jinja-ji*, where there are both Shinto shrine buildings and Buddhist temple buildings) for the mountain religion Shugendo. Shugendo incorporates both Shinto and Buddhist concepts (as well as Taoism and *onmyodo* (Swanson, 1981)) into its mountain shamanistic-ascetic practises. With the splitting of Shinto and Buddhism in the Meiji era (AD 1868 – 1912), the Buddhist temple part of the shrine-temple was abandoned. Today only the Shinto part remains, and is known as Hakusan-taga shrine. The old name, "Tokaku-ji", remains as a name for the area however[47]. Most Shugendo shrine-temples, along with ordinary shrine-temples, were converted into pure Shinto shrines with the Shinto-Buddhist separation during the Meiji period. Mountain temples whose main subject of worship had been syncretic deities (*gongen*, Shinto-Buddhist combinatory deities) were considered by the separation order to automatically be Shinto shrines (Miyake, Yamamoto and Sekimori, 2009).

This shrine was an important training place for the Shugendo monks. The majestic and sacred atmosphere created by the old-growth forest has been important for enhancing the effectiveness of their training[48].

A famous festival known as "Tokakuji-no-Matsue" is held every year in April to pray for a good harvest[49]. In the annual festival *Cleyera japonica* is used as a ritual implement in several ceremonies, as is common in Shinto (ふくおかインターネットテレビ, 2015).

During the festival the participators raise a large pine pillar called *matsuri bashira* (lit. "festival pillar"). Pine (*Pinus.*) is used due to its evergreen needles symbolising longevity and vitality. The pillar is a male symbol and the ground is a female symbol. Ritual cleaning and sowing of rice seeds are done beneath the pillar, after which a person in ceremonial clothing climbs the pillar carrying a sword and large bamboo sticks (known as *hei*) with sacred paper streamers (*shide*). When the climber reaches the top of the pillar (which is several metres tall) he prays to the deities calling the spirit into the *hei*. He then proceeds to cut the *hei* and the paper streamers, scattering the gods' spirit upon the newly sown rice to bring a good future harvest. This ritual represents (according to the interviewee) both "that which

[46] Questionnaire Dr. Tohru Manabe 1

[47] Questionnaire Dr. Tohru Manabe 2

[48] Questionnaire Dr. Tohru Manabe 2

[49] Questionnaire Dr. Tohru Manabe 2

springs out from the male symbol overlaps with the female symbol and a new life is born" and that "God's Sprit poured from heaven dwells in the seed of rice and brings abundant rice"[50]. The festival is a fertility ritual to pray for good harvests, the pillar representing the male scattering fertility over the female which is represented by the ground. Erecting pillars for fertility rituals has been archaeologically attested to have been practised in Japan since the middle Jomon period (c. 2500–1500 BC) (Hosoi, 1976). From the same time period there are also many archaeological findings of (clay figurines) with exaggerated genitals, emphasising the importance of fertility rituals (Miyake, Yamamoto and Sekimori, 2009).

Though pine is used for the pillar, it is unknown if pine or any other tree species hold any special importance to the shrine[51].

This shrine does not have any fulltime priest, attendants or shrine maidens. The shrine is taken care of by volunteers living in the nearby area[52].

3.3.3. Forest management

There is no currently known forest management, and it seems to be decades since any trees were cut. An aerial photograph from 1947 shows the shrine forest to already be well developed at that time. The forest is very well developed and preserved compared to other forests in the area[53]. The Hakusan-taga shrine forest has been exempt from cutting, which is similar to other shrine forests. The main difference between the forest at Hakusan-taga and other shrines is that, it does not appear to have been managed at all for a long time.

It is unclear who is responsible for management of the forest at Hakusan-taga shrine, it may be under the jurisdiction of the Kanda-machi Board of Education since they manage the shrine itself as a cultural asset[54]. Most shrines, though privately owned, tend to be regulated by some public council or board in the municipality where they are located. Many shrines and shrine forests are designated as cultural heritage in some way or another (Japan has several designations for cultural heritage, scenic and historical sites) (Agency for Cultural Affairs of Japan, 2006).

Due to how there is no full-time priest working at this shrine, forest management is not influenced by the priest's sensibilities regarding forest management in the same

[50] Correspondence Dr. Tohru Manabe

[51] Questionnaire Dr. Tohru Manabe 2

[52] Questionnaire Dr. Tohru Manabe 2

[53] Questionnaire Dr. Tohru Manabe 1

[54] Questionnaire Dr. Tohru Manabe 1&2

way as it would be at a shrine where a full-time priest is responsible for the shrine and its property.

3.3.4. Forest regeneration

There is currently no planting being done in the shrine forest at Hakusan-taga, but *Cryptomeria japonica* has been planted previously[55]. Recently there was a mid-sized gap created in the forest canopy by a typhoon. There may be future planting conducted in order to restore that part of the forest. In the case of future planting, it is possible that there will be a Shinto ceremony in conjunction with that planting occasion[56]. Interestingly, *Cryptomeria japonica* has been planted in this shrine forest. Since this forest is located on Kyushu in the temperate broadleaf vegetation zone, *Cryptomeria japonica* is not one of the species commonly found in that area. The natural forests in this area are usually evergreen broad-leaved forests, unless in mountainous areas (cf. Sato *et al.*, 1999). *Cryptomeria japonica* is often planted at shrines due to its sacredness (Carr, 1995), and due to the belief that it will help protect the shrine (Ishii *et al.*, 2010). It is possible that *Cryptomeria japonica* was planted here for religious purposes, but it is more probable that it was planted for purely economic reasons. *Cryptomeria japonica* is one of the most widely planted tree species in Japan since the Edo period and continues to be planted regularly in all areas of Japan (Iwai, 2002).

3.3.5. Biodiversity and conservation

The priests do not pay any particular attention to biodiversity. However, the solemn atmosphere created by a natural forest is important to the religion and the believers who visit the shrine[57].

There are no records of any uncommon species being present in this shrine forest[58], but since it has not been affected by anthropogenic influence for a long time it is a suitable habitat for late-successional species[59]. Due to how there is no human interference other than the occasional visitor (the shrine is remote so there are few tourists) and the yearly festival, there are probably several lucidophyllous-type late succession species in this shrine forest. Large old-growth trees are known to be supporting communities of several species, and thus to be indicators of high biodiversity (Ishii *et al.*, 2018).

[55] Questionnaire Dr. Tohru Manabe 1

[56] Questionnaire Dr. Tohru Manabe 2

[57] Questionnaire Dr. Tohru Manabe 2

[58] Questionnaire Dr. Tohru Manabe 1

[59] Questionnaire Dr. Tohru Manabe 2

3.4. Kotohiki Hachiman shrine

3.4.1. Forest characteristics

The forest that surrounds Kotohiki Hachiman shrine is about 20 hectares (measured by me in Google Maps). It is unclear how much of this area constitutes the actual sacred grove. Regardless, the forest that surrounds this shrine is larger than most shrine forests in Japan (cf. Iwai, 2002). Like the Meiji shrine in Tokyo (Matsui, 1996), the forest at Kotohiki Hachiman shrine is adjacent to/part of a recreational park (Kotohiki Park).

At the shrine there is an old *Cinnamomum camphora*, which is considered holy. The head priest thought the tree was revered due to its age, although he was not entirely sure; he stated that the previous priest may have known. There are also many old pine trees (*Pinus.*) surrounding the shrine. Beyond that, the priest was not aware if there were any uncommon species growing the shrine forest, but he did not think there were any[60]. *Cinnamomum camphora* is commonly found planted at shrines and around human settlements. It is probably due to how it has medicinal properties (Hamidpour *et al.*, 2013), and the fact that it grows very old and large. Its age and size are appreciated in Shinto where old large trees are thought to harbour the *kami* (Sakurai, 2005).

Pine trees (*Pinus.*) are valued in Shinto due to how they symbolise longevity and their ability to attract good fortune (Omura, 2004). It is thought that the gods descend to earth on pine trees, giving pines the ability to attract *kami* and dispel evil spirits. Hence why it is common to both have pines at home and at shrines. Some shrines use them to surround their premises (Starling, 2018).

When looking at photographs of Kotohiki Hachiman shrine, the main shrine buildings appear to be surrounded by the pines described by the head priest[61], which would be in line with what was described by Starling (2018).

3.4.2. Spiritual aspects

According to the head priest at the shrine, the most important aspect of the forest is that is has religious value and is a sacred forest, *Chinju-no-Mori*[62]. The sacred forest, he thinks, is a place where everyone would feel at home. Like returning to your childhood home. The forest is where your heart and spirit would come to rest[63].

[60] Questionnaire senior priest Yoshiyuki Wada, senior priest at Kotohiki Hachiman-gu

[61] Supported by Questionnaire senior priest Yoshiyuki Wada

[62] Questionnaire senior priest Yoshiyuki Wada

[63] Questionnaire senior priest Yoshiyuki Wada

The shrine grounds are, according to the priest, only a small part of the mountain (a forest) and is not the same as a "mountain" in large respect, i.e., mountain worship[64]. Mountain worship is very common in Japan. There are many small shrines on mountaintops across the entire country where the mountain spirit is petitioned to keep people on the mountain safe[65]. In this instance however, the priest referred to how the shrine forest is part of the "mountain forest" but which is not the same as general mountain worship. The religious structure of Kotohiki Hachiman shrine described by the priest is in line with the structure that was shown by Matsui (2014) (Figure 3). The shrine and its buildings are enclosed by a forest which is itself a small part of the much larger "mountain forest" (see Figure 3.). The "mountain forest" is the distant mountain forests where humans usually do not go, the place where gods and spirits dwell[66].

While *yama* can mean literal mountains, the word can also be used to mean the forest or area on or around the mountain depending on context. An example of this is the word *satoyama*. *Satoyama* is the forested boundary area between the village and the mountains (Matsui, 2014), made up from semi-natural secondary forests used by villagers for agricultural purposes (Hotta *et al.*, 2015). To clarify, while the word *satoyama* literally means "village mountain", it refers to the forest at the edge of the village rather than a literal mountain.

3.4.3. Forest management

Forest management is limited to pruning some of the trees within the shrine forest, they do not cut any trees. The head priest is not involved in the management of the forest[67]. As with most shrines, the forest at Kotohiki Hachiman shrine is only lightly managed. It is reasonable to assume that management here is conducted with safety of the visitors and aesthetics in mind[68].

3.4.4. Forest regeneration

Sakaki (*Cleyera japonica*) has been planted at the shrine for use in religious ceremonies. This plant is used in all Shinto rituals and for *harae* (ritual purification)[69]. Contrasting with the other shrines in this study, Kotohiki Hachiman shrine is the only shrine where sakaki has been planted with the express purpose of using the planted sakaki in rituals. This is in line with the idea that sakaki is planted

[64] Questionnaire senior priest Yoshiyuki Wada

[65] Correspondence Dr. Hiroaki Ishii

[66] Oral information Dr. Hiroaki Ishii

[67] Questionnaire senior priest Yoshiyuki Wada

[68] Supported by oral information Dr. Hiroaki Ishii

[69] Questionnaire senior priest Yoshiyuki Wada

at shrines as described by Ishii et al. (2010) and Carr (1995). There does not seem to be any other plants being planted at this shrine currently.

3.4.5. Biodiversity and conservation

Ecological values in the shrine forest is not something that the shrine priest finds especially important[70]. Not considering ecological values in shrine forests is common at Shinto shrines in Japan. Few, if any, of the people working at shrines have any ecological knowledge or education in relevant fields[71]. However, the shrine does care for, and venerate, an old *Cinnamomum camphora*. The old large tree is likely to be conducive to high biodiversity as old large trees are known to provide habitat for several species (Ishii *et al.*, 2018).

In addition to the large *Cinnamomum camphora*, the shrine forest is old and exempt from tree cutting, as such the forest probably has several old trees and hence it can be assumed that the shrine forest at Kotohiki Hachiman shrine has higher biodiversity than nearby forests where anthropomorphic disturbance is much more prevalent. Since forest size has been found to correlate with high biodiversity (Ishida *et al.*, 1998), and Kotohiki Hachiman shrines forest is quite large (20 ha), it is reasonable to assume that the forest supports high biodiversity.

[70] Questionnaire senior priest Yoshiyuki Wada

[71] Oral information Dr. Hiroaki Ishii, supported by (Hashimoto, Ito and Iijima, 2007)

4. Concluding remarks

4.1. Forests and forest management at the studied shrines

All four study sites (shrines) were situated within the warm-temperate broadleaf forest, and have a similar vegetation type. All four shrine forests are older and have much higher ecological qualities compared to other forests in the region since they have been exempted from commercial logging operations for a long time[72].

Nishinomiya shrine, Shimogamo shrine, and Hakusantaga have all been subject to studies which aimed to investigate species composition, and biodiversity is well documented[73]. The Kotohiki Hachiman shrine has not been similarly investigated, but it also has a very old forest without commercial management[74].

Both Nishinomiya shrine and Shimogamo shrine are situated in highly urban environments. The shrine forest at Shimogamo shrine (Tadasu-no-Mori) differs from the other three shrines by being located on a river delta which influences vegetation composition. Flooding has kept the forest in a mid-successional state, which differs from the other study sites where the forest is reaching the late-succession stage[75].

At the two urban shrines (Nishinomiya, Shimogamo), and at the peri-urban shrine (Kotohiki Hachiman) there were old and large *Cinnamomum camphora* trees. *Cinnamomum camphora* is mostly found in urban and peri-urban forests but not in natural Japanese forests[76]. This is congruent with the fact that it was not found in the rural shrine forest at Hakusantaga.

[72] Supported by all respondents.

[73] Supported by questionnaire & oral information Dr. Hiroaki Ishii, questionnaire Dr. Keizo Tabata 1&2, questionnaire Dr. Tohru Manabe 1&2.

[74] Supported by questionnaire Yoshiyuki Wada

[75] Questionnaire Dr. Keizo Tabata 1&2

[76] Supported by oral information Dr. Hiroaki Ishii.

While cutting trees is discouraged and rare in shrine forests, trees that pose a safety hazard to shrine visitors and to buildings are removed or pruned. Nishinomiya shrine, Shimogamo shrine and Kotohiki Hachiman shrine all conduct minor forest management operations where the purpose is to prevent damage to people and buildings. Pruning for aesthetic reasons are also done, but only on trees that are visible to people[77]. Hakusantaga shrine differs due to how there is no current management at all[78]. Nishinomiya shrine stands out as it is the only one with a forest management plan in development[79]. Both Nishinomiya shrine and Shimogamo shrine have forest ecology experts advising on forest management[80]. The Shinto priests at the studied shrines are not especially involved with forest management, and have limited knowledge of forest ecology, or what constitutes a truly natural forest[81]. It is only recently that the shrines have started hiring experts to ensure that the forest they are worshipping is representative of a natural state.

The goal of management at Nishinomiya shrine and Shimogamo shrine is to direct the forest towards a desired state which is concurrent with forest ecology and with Shinto beliefs[82]. It was unclear if there were any goal with the management of the forest at Kotohiki Hachiman shrine[83].

Planting is done for restorative purposes at Nishinomiya shrine and Shimogamo shrine. The species that are planted are mostly selected from naturally occurring species in the area. At Nishinomiya shrine and Shimogamo shrine, planting events are sometimes preceded by a Shinto ritual[84]. Though these rituals are only done for special occasions and not for every forestry management operation. Rituals in conjunction with planting events are interesting as it is one of the occasions where religious practises intersect with forest management, creating a unique practise that can be defined as ceremonial forestry.

In conclusion, my interpretation of the forests and forest management at the studied shrines is that the most important aspect of the forest is that it provides a sacred ambience which emanates from the feeling of closeness to nature. Management is light, and the main goal is to keep the forest safe for visitors and for nearby infrastructure. Planting is done, and has been done historically, for restorative purposes where parts of the forest has been destroyed. Recently, management and

[77] Supported by questionnaire & oral information Dr. Hiroaki Ishii, questionnaire Dr. Keizo Tabata 1&2, questionnaire Yoshiyuki Yoshii, questionnaire Yoshiyuki Wada

[78] Questionnaire Dr. Tohru Manabe 1

[79] Questionnaire & oral information Dr. Hiroaki Ishii

[80] Supported by questionnaire & oral information Dr. Hiroaki Ishii, questionnaire Dr. Keizo Tabata 1&2

[81] Supported by questionnaire Yoshiyuki Yoshii & Yoshiyuki Wada

[82] Supported by questionnaire & oral information Dr. Hiroaki Ishii, questionnaire Dr. Keizo Tabata 1&2

[83] Supported by questionnaire Yoshiyuki Wada

[84] [84] Supported by questionnaire & oral information Dr. Hiroaki Ishii, questionnaire Dr. Keizo Tabata 1&2

planting has begun to be done for increasing biodiversity in the forest and directing it towards a natural old-growth state.

4.2. General features of Japanese shrine forests and shrine forest management

The way in which Shinto shrine forests are managed I consider to be a form of ceremonial forestry, as in forest management with the purpose of protecting, strengthening and furthering religious values. Management is focused on directing the forest towards a desired state (usually late-succession old growth forest) that can provide a sacred atmosphere where the visitor feels close to nature and to the deities[85]. However, at the same time it is important to accommodate visitors by pruning the forest trees to keep the shrine grounds safe from falling branches and to provide an aesthetically pleasing view[86].

Shrine forests are an important part of the fragmented urban forest landscape (Ishii *et al.*, 2010), and are quite unique in that they often have high biodiversity for their urban location. They also constitute preserved patches of the local areas' natural vegetation (Ishii *et al.*, 2010; Oishi and Tabata, 2015) (however, often with additional religiously significant planted species such as *Cleyera japonica*, *Cinnamomum camphora*, *Cryptomeria japonica*, *Magnolia compressa* and others (Omura, 2004; Rusu, 2011; Starling, 2018)).

At some shrines, the animals which live in the woods are also considered sacred. Such sacred animals are known as *shinshi* in Japanese (Suzuki, 2005). Keeping animals at shrines for religious purposes creates a dilemma for plant-life conservation. Animals affect their habitat by browsing, breeding etc. This has led to some species being threatened to extinction due to over consumption. At the same time the animals, which are considered sacred, cannot be hunted or removed due to the beliefs of the religion. A great example of this situation are the sika deer (*Cervus nippon*) at Kasuga Grand shrine in Nara. The deer at Kasuga are seen as messengers of the enshrined gods and hence roam freely on the shrine grounds (Suzuki, 2005; Cali and Dougill, 2012). Due to browsing the undergrowth composition of the shrine forest is selected for by deer feeding preferences. The deer do not eat *Triadica sebifera* which has been planted across shrine grounds and in Nara park for aesthetic reasons. This has led to *Triadica sebifera*, which has toxic properties and is highly invasive (Urbatsch and Skinner, 2017), spreading at a rate which is causing problems for the vegetation. This creates an interesting paradox

[85] Questionnaire Dr. Hiroaki Ishii & oral information Dr. Hiroaki Ishii, questionnaire Dr. Keizo Tabata 1&2

[86] Oral information Dr. Hiroaki Ishii

where keeping animals for religious reasons affects the religiously motivated vegetation management. The issue does not seem to have been addressed yet.

Planting trees and plants is common at shrines, often for restorative purposes but also for religious purposes[87]. Planting trees around shrines are thought to protect the shrine and to bring good fortune and other boons by providing a dwelling place for the gods (Omura, 2004; Ishii *et al.*, 2010).

Trees have a central role in Shinto as it is believed that the gods dwell in trees and forests (Ono, 1962; Omura, 2004; Rusu, 2011; Cali and Dougill, 2012). Old-growth natural forests are preferred as it is believed that old-growth awe-inspiring forests are closer to the gods[88]. There are two concepts which are applied to non-urban areas in Japan. One is *satoyama*, semi-natural rural forest traditionally used for agricultural purposes etc. (Hotta *et al.*, 2015), the other is *miyama* which pertains to the far and deep forest. *Miyama* is where humans usually do not go, the dangerous unexplored forests where you get lost. It is in the far *miyama* gods dwell, and thus it is seen as a holy place. Many shrines therefore wish to have a representation of *miyama* within their grounds[89], which is why a late-successional state forest is important to the shrine from a religious point of view.

The most important spiritual aspect of the shrine forests in this study is that they provide a sacred ambience and a feeling of closeness to nature[90]. At all shrines it is thought that the gods live in the trees of the forests and that all of nature is an object of worship since all of nature is the home of the gods. Forests are thought to transmit a feeling of divinity to the person who enters it. Though the shrines are dedicated to different deities, this does not appear to influence how the forests' role is perceived.

Several tree species are considered sacred, often dependant on local tradition. Evergreens trees are preferred since they do not lose their green during winter[91], something which is important to keep the sacred ambience the year round. However, large old trees, regardless of species, are considered especially sacred and are revered for their age and size. Sakaki (*Cleyera japonica*) has a central role as the sacred tree of the gods, and sprigs are used in almost all Shinto ceremonies as ritual instruments (Ono, 1962; Carr, 1995; Inoue, 2005; Rusu, 2011). It is the species which is most universal to Shinto in all regions of Japan, its importance stretching all the way back to the Kojiki (the oldest extant Japanese literary work AD 711–712, (Heldt, 2014)).

[87] Questionnaire Dr. Hiroaki Ishii & Questionnaire Dr. Keizo Tabata 1

[88] Questionnaire & oral information Dr. Hiroaki Ishii, supported by questionnaire Dr. Tohru Manabe 2 & correspondence Dr. Tohru Manabe

[89] Oral information Dr. Hiroaki Ishii

[90] Supported by all respondents

[91] Oral information Dr. Hiroaki Ishii

Since shrine forests are exempt from cutting, are left to grow undisturbed or are lightly managed[92], they tend to have much higher biodiversity than other non-shrine forests. Shrines also keep large old trees which have been shown to be important repositories of biodiversity by providing refugia for many insect and bird species (Ishii *et al.*, 2010, 2018; Oishi and Tabata, 2015). Three out of four shrines in this study had documented high biodiversity. The fourth shrine, while it does not have documented high biodiversity, has the same characteristic as the other three leading to the conclusion that the fourth shrine too has high biodiversity.

While many Japanese visit shrines, many do not do it out of faith in the *kami* but rather for tradition. There are yearly festivals in which most Japanese visit a shrine, and many of the important cultural events in Japan are strongly associated with Shinto shrines, including festivals and weddings (Ono, 1962; Cali and Dougill, 2012). Many visitors cite the natural environments at shrines as the most important reason for visiting a shrine (Nelson, 1996).

To summarise, the Japanese Shinto shrine forest has three distinct values: 1) Religious value as sacred forests for the religion, 2) Culturo-historical value as a focal point for the local community and cultural traditions, and for preserving old buildings and art, 3) Ecological value for preserving old large trees, high biodiversity and being part of the larger ecological landscape, both urban and rural.

Shinto shrine forests are also often located in or near cities and villages making them accessible to many people. I think shrine forests have an important place in modern Japan by providing a place where culture, history and spirituality is represented by a natural environment. I think it is important, especially in such an urbanised country as Japan, that these kinds of culturally laden natural environments exist as they give people the possibility to come into contact with nature that closely resembles natural old-growth forests, while at the same time getting to experience their own cultural heritage. Walking in old forests is often a soothing and pleasant, and sometimes spiritual, experience for many people. Shinto shrine forests can provide these kinds of experiences, and are managed in a way which promote these values.

The work which is currently being done at Nishinomiya shrine I conclude to be a model for working with sacred forests. The forest is maintained with the purpose of furthering its religious values by preserving and restoring high biodiversity, keeping the grounds accessible and safe for the general public, and protecting historical buildings. Nishinomiya shrine is also currently developing a management plan for the shrine forest, which is quite unique for shrine forests in Japan.

[92] Supported by all respondents

4.3. Shinto shrine forests from a Swedish perspective

Looking at the role of trees and forests in Japanese religion and society, I pose the question; can knowledge from Japan be utilised in a Swedish context? Could the Japanese shrine forests be used as a model for creating shrine-like forests in Sweden?

The idea that gods dwell in nature, and more specifically trees, is not unique to Shinto; rather it is a common characteristic of many religions, especially shamanistic religions with an animist worldview (Gilmore, 1919). The pre-Christian Sami of Northern Scandinavia held similar beliefs in where spirits were thought to reside in trees, lakes, and mountains (Bergman *et al.*, 2008). Sacred trees were both mediums and objects of sacrificial practise (Virdi Kroik, no date b, no date a; Bergman *et al.*, 2008). Some had faces of deities carved into them to mark them as sacred (Figure 12.), like how sacred trees in Shinto are marked with *shimenawa* (sacred straw ropes).

Figure 12. Sejte-tree with face carving near Arjeplog, Sweden. Photo by Lars Östlund.

While Japanese shrine forests have been protected by law and by rich patrons, the sacred forest sites of the Sami have instead for a long period of time been targeted for religious conversion. The governments of Sweden and Norway began actively converting the Sami populace to Christianity in the 17th century (Bergman *et al.*, 2008). They also destroyed Sami sacred sites, hence very few such sites and sacred trees still exist today (Östlund *et al.*, 2003). The Sami religion has partially survived, though many of its traditions and rites have been lost (Virdi Kroik, no date a). Likewise, most non-Christian sites of worship in southern Sweden were destroyed during the Christianisation of Scandinavia (8th to 12th century). The Norse

religion was entirely replaced with Christianity and today there are only a few traditions which have remained, such as keeping a guardian tree (Gilmore, 2016).

Today when seeking something spiritual or just a place for calm reflection, many Swedes venture out into nature instead of visiting a church. The spirituality of Swedes has been discussed extensively by religion scholar David Thurfjell. He purports in his lectures that while Swedish people rarely go to church (1-2% of the population regularly attend mass on Sundays) and few say that they believe there is a God (ca. 19%), many say that they believe in some higher power or transcendental "life force" (about 53%). Interestingly, as Thurfjell points out, if you combine the number of people who say they believe in something spiritual (both the literal God, and more vague descriptions of higher powers) constitutes about 70% of the Swedish population (Thurfjell, 2020a). There seem to exist a spiritual need in the Swedish people despite ongoing secularisation, which leads many to seek out spiritual experiences in nature. However as pointed out by Thurfjell (2020b), many Swedes do not like to talk about religiosity making it hard to discern what actions are religious in nature and what actions are cultural. There is a deep-seated cultural affinity for forests and nature in Sweden (Thurfjell, 2020b).

Though Swedish culture can be argued to have an affinity for nature, this affinity has been poorly realised in a way which is available to the common urban Swede. Bearing in mind that most Swedish forests are managed for timber production there are, in my opinion, mainly two types of non-production focused forests in Sweden.

The first type is the urban and peri-urban forests which are accessible to people in cities and towns. These forests have often been shaped into unnatural park-landscapes with no resemblance to natural forests or connection to Swedish cultural traditions. These park-like forests are common in southern Sweden are often advertised as "safe" and "family friendly" (Fälton and Hedrén, 2020).

The other type of non-production forest is the national park and nature reservation forests. The vegetation in this forest type resembles a Japanese sacred forest, often having high biodiversity and many old trees, but they are usually located in very remote areas which are basically inaccessible. These remote locations rarely take cultural aspects into account, merely conserving a far-off natural environment without considering the human aspect. The far-off nature reserves are often advertised as "adventurous" and "wild", giving the idea that they are only accessible to the most experienced of outdoorsmen. This type of marketing promotes the idea that humans are an opposite to nature, not a part of nature (Fälton and Hedrén, 2020). There are very few forests in Sweden (or none) that are "in between" which conserve natural vegetation and ecological values, and promote and preserve human cultural values.

The Swedish shrine-like forest would have to, like a Shinto shrine forest, have vegetation which is representative of the area's natural vegetation in a late-successional state. It does not necessarily have to be large old-growth trees, though that is preferred. Even without the belief that nature contains the divine, a natural old-growth forest has high ecological values, and cultural value as it represents Swedish nature and history.

While Shinto shrine forests enshrine a deity, the Swedish shrine-like forest could instead "enshrine" places with cultural and historical significance or historic remains. Management of the shrine-like forests would refrain from cutting the trees, only pruning trees which could pose a safety hazard to visitors or historic remains. Management could potentially also include traditional forestry techniques like coppicing and pollarding of select trees, but only where such techniques would have a cultural connection to the landscape. It is also important that the traditional techniques used does not to affect biodiversity and natural appearance. Restorative work has recently been highlighted in Japan to be important for shrine forests as many are filled with invasive species which threaten the native flora, one of the objectives with a Swedish shrine-like forest would be to ensure it only contains native species (with a few exceptions for culturally important trees).

The Japanese shrine forests have been shown to have exceptionally high biodiversity and ecological values, they are also important locations for expression of native culture and religious practise. The same, I propose, is true of the forests at the few extant Sami sacred sites. By preserving such sites, we preserve not only high biodiversity and ecological values but also cultural and historical values.

In northern Sweden there are still traces of Sami traditional practises and their pre-Christian religion in the landscape, such as *sejtar* (sacred trees or rocks). Other traces of Sami culture are culturally modified trees, such as trees with bark peelings and tree blazes. Such features could be the starting point around which to create a shrine-like forest.

In southern Sweden the historical remains are culturally different from the northern Sami landscape. Cultural remains such as runestones (Figure 13) or other historical remains could be the focal object of the shrine-like forest, or a special tree which has historical significance to the area. The ash tree (*Fraxinus excelsior*) is common at farms in southern Sweden, sometimes kept as a guardian tree. It also features in Norse mythology as the world tree Yggdrasil.

Figure 13. Two runestones near Norrköping, Sweden. Photo by author.

Traditionally, a farm in Sweden consisted of both agrarian fields and forests and many farmers also worked the nearby forests (Helmfrid, 1991). Thus, forests have long been utilised in an agrarian context which has affected vegetation composition via keeping forest grazing livestock and caring for certain trees which are characteristic for agrarian land-use. In a similar way to how Shinto shrines often keep trees for a religious or cultural reason, the Swedish shrine-like forest could incorporate tree species which would have been important to farmers in the local area from a traditional perspective. For example, the proportion of deciduous species would be much higher than in a production forest. Maybe it could even have live animals grazing there.

Japanese shrine forests are generally off-limits, people visiting must stay in designated areas and on paths through the forest. Keeping the forests inaccessible to the public has been beneficial for conserving the Japanese shrine forests' vegetation and fauna. Sweden however, has a long tradition of freedom to roam (swed. *allemansrätten*), and one of the main objectives with creating shrine like forests in Sweden would be to give people access to old-growth culture-bearing forests. Being able to fully immerse oneself in the forest landscape is an important aspect, hence why I am undecided on how accessible the Swedish shrine-like forest should be.

4.4. Japanese shrine forests in a comparative international perspective

Sacred trees and groves exist in all parts of the world (Gilmore, 1919; Frazer, 1998). They are found not only in Japan but also in India (Gadgil and Chandran, 1992),

Korea (Lee, 1973; 具美來, 2016), Ghana (Campbell, 2005), Tanzania (Sheridan, 2009), Lithuania (Vaitkevičius, 2009), Scandinavia (Görman, 1990; Östlund *et al.*, 2003; Bergman *et al.*, 2008; Gilmore, 2016), Britain (Görman, 1990; Webster, 1999; Houlbrook, 2015) Greece (Hughes and Thirgood, 1982; Loumou and Giourga, 2003), and Mexico (Knowlton and Vail, 2010) among many others, and have existed in almost every nation, especially if we consider a longer time perspective. Trees in religious symbolism is also very common and is found in most cultures (Eliade, 1960; Frazer, 1998). Sacred groves have certain characteristics which appear to be universal traits for these kinds of forests. I have identified five main characteristics of sacred forests:

1. The trees are dwellings for or mediums to the gods.
2. Exempt from cutting due to their sacredness.
3. Focal points for the local community and cultural expressions.
4. The trees are often very old, and the forests have high biodiversity, often sheltering rare species.
5. Usually connected to some sort of religious structure or to a special natural feature.

These are all characteristics which the Shinto shrines of Japan exhibit, and thus I consider Shinto shrine forests to be great examples of modern-day sacred groves. This fact makes them unique since many sacred trees and sacred forests have been cut by mistake or deliberately to supress religious practices in many countries.

4.4.1. Reflections on the future of sacred forests

In the industrialised world, religion seem to be declining. In Europe there is a movement away from organised religion towards non-belief, or an individual spirituality not tied to religious organisations (Kaufmann, Goujon and Skirbekk, 2012). Likewise, in Japan there is an ongoing secularisation of society (Reader, 2012). Urbanisation, in conjuncture with secularisation, is a concern for the preservation for sacred groves of all kinds in the world (The News Minute, 2017) including the Shinto shrine forests (Carter, 2018) of Japan. As the religious significance of sacred groves fades, their protected status might be waivered in favour of cutting them for urban development and financial gain.

The question is then what role does Shinto shrine forests, and other sacred forests have in society today?

As was shown by Nelson (1996), the majority of visitors to the shrine (in this case, Kamigamo-jinja in Kyoto) cite the beautiful environments as the main reason for

their visit. Even the non-religious can appreciate forests which are kept in a manner which is supposed to please the gods.

The appreciation of what is perceived as a natural forest I speculate is something which is intrinsic to the human condition. Even more so in cultures where there is an affinity for nature and a tradition of seeing nature as something divine. I believe that most people can get a sense of something otherworldly when walking through an old natural forest. It seems to me that this is the feeling which the forests at Shinto shrines try to capture. In my own opinion, there is a deep-seated need in all humans to feel a connection to the natural world. Being able to access a beautiful natural area which has been kept with the express purpose of enshrining a piece of "divine" nature can be immensely beneficial for human wellbeing, especially in highly urbanised areas.

If trees are valued for their hierophanic[93] traits (as Eliade (1960) proposes), their ability to reveal something sacred, the trees have a value beyond their ecological values and their production (monetary) values. I wish to expand upon Eliade's definition of hierophany and propose that what trees "reveal" does not necessarily have to be something supernatural. It could also be that trees "reveal" history, culture, and a wild aspect of nature which is rare to encounter in modern day society. Wildness should not be conflated with wilderness. "Wilderness" is a spatial dimension which can be reduced to the size of an area where humans and their traces are sparse (Chapman, 2006), while as "wildness" can be understood "as the autonomy of the more-than-human world where events such as animals moving about, plants growing, and rocks falling occur largely because of their own internal self-expression" (Woods, 2005). It follows then that wildness can be found even in human landscape as wildness can be experienced in things like looking at the stars of the night sky or seeing ants walking across your suburban back yard. The point being that keeping a forest "wild" does not necessarily mean that it is distant from human settlements. For a forest to attain wildness, it does not mean it has to be abandoned and void of humans (Prior and Brady, 2017).

The trees which are kept at Shinto shrines I think have a universal appeal to people, regardless of one's spiritual persuasions, as they represent wildness in addition to their ecological values. These kinds of forest also represent history and times past, old trees are a living reminder of what came before. People visit these places without religious conviction; that must mean, in my opinion, that the ambience created by shrine forests has great appeal. Keeping such forests in or near cities would give more people the opportunity to experience a form of nature which is

[93] *Hierophany*, from Ancient Greek ἱερός (hierós, "sacred, holy sign") + φαίνω (phaínō, "show, appear"). Used by Romanian religious historian and philosopher Mircea Eliade (1907–1986) in his book The Sacred and the Profane (1959), possibly also coined by him.

otherwise distant and rare. I see all the discussed aspects as strong arguments for keeping shrine-like forests both in and near all urban communities, and in more distant areas.

4.5. Study limitations and future research

Ideally, a more focused study surveying management approaches at several shrines should be conducted. A compilation of management approaches at many shrines would shed light on current issues with forest management, and help to create a unified idea of what kind of management would be beneficial for preserving shrine forests. A major limitation of this study is that the number of interviewees (informants) were low, only five. Out of these five, there were two priests and three researchers. For future research the survey would ideally include many more interviewees across a wider area of Japan, and also fieldwork to collect tree and vegetation data from shrine forests.

My work with this project was done in 2020 during which a major pandemic affected the world (covid-19). This greatly impacted my work with this thesis. Initially, I was supposed to travel to Japan and conduct field work at several shrines and meet with the people working within the field of knowledge. The data would have been significantly larger if this had been possible, instead I had to dedicate a large part of my work to literature review. This also meant that the scope of my work expanded to a size which is not entirely suitable for a master's thesis.

Due to how all sites were located in the south of Japan, northern forest types were not represented in this study. This might be a reason why several species which I expected to be present in the studied shrine forests, such as *Cryptomeria japonica* and *Chamaecyparis obtusa*, where only sporadically present.

In this study I decided not to include any Buddhist temples as study sites. It would be interesting to do a similar study on Buddhist temple forest management and then do a comparative study with Shinto shrine forest management.

There are many similarities between the Korean folk religion and Shinto. Korea and Japan also have an interesting history together, which is why I think it would be interesting to a comparative study on Korean and Japanese sacred forests. Likewise, there are many similarities between Shinto shrine forests and Hindu *kavu* (sacred groves) which also could be of interest.

For the future preservation of shrine forests, I think it would be important to assess the public's attitude towards shrine-like forest. What motivates visiting? What are attractive characteristics? Is the spiritual aspect still important or is it diminishing?

For the international perspective, surveys of the general population's attitude towards these kinds of forests in other countries could be used a basis for ascertaining if shrine-like forests could be created and supported in other countries besides Japan.

There are many aspects of Japanese Shinto shrine forests and how their sacred trees interact with people that needs to be more fully understood. I hope that my work with this thesis will contribute to spreading the knowledge of Shinto shrine forests and their management to a wider community.

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5. Appendices

5.1. Appendix A. Interview questionnaires

5.1.1. Questions for the shrine official

What is your name and your title?

How long have you been working here and in what role?

What is your relationship to this particular shrine and to the shrine-forest?

What is the main role of the forest which surrounds this shrine?

Could your briefly describe the status and importance of this forest?

Is the entire forest that belongs to the shrine considered sacred, or just certain parts?

Could you please briefly explain the concept of *Chinju no Mori* and what it means to this shrine?

Do you use the forests or the trees at this shrine for any religious purposes, like ceremonies or rituals?

In that case, what kind of activities do you do? How is the forest used in religious circumstances?

What tree species do you consider to be the most important? What makes that tree species important from a religious/philosophical point of view?

Are there any things related to the forests that are unique for this shrine, and is not generally the same at other shrines?

Have any trees been planted at this shrine?

What species was planted? Why that/those specific species?

Is there a special way to plant shrine trees (or planting plants in general)? Any special ceremonies related to the planting of trees?

Do you have any special trees that are extra significant? Why are they special? Would they be considered *shinboku*?

When was the last time trees were cut at the shrine? Why was the tree cut?

Are there any special ceremonies done when a tree is to be cut?

Do you prune the shrine forest trees?

Are there any plants you that grow here that you know are otherwise uncommon in Japan?

Are ecological values in the forest (such as biodiversity, old-growth trees, deadwood, uncommon species etc.) something that you as a shrine official consider important for the shrine?

Is there anything else about the shrine forest, or the shrine in general, you would like to tell me about?

Thank you!

5.1.2. Questions for the researcher

With forest management is meant any kind of interference into the forest and its vegetation with the intent to change or affect the forest and trees; such as cutting, thinning, pruning, binding, harvesting and planting etc. But also, to a lesser extent hunting and foraging.

All questions which pertains to management assumes some kind of management is carried out.

How large is the forest (in hectares)?

What tree species are present in this shrine forest?

What tree species is the most common here?

Is there any data on the forest and its composition?

Are the different species of trees mixed, or are they growing in different parts of the forest?

How old is this forest?

Is the age different in different parts?

Is there any forest management undertaken in the shrine forest?

Are trees cut? Are trees pruned? Are trees planted? In that case, what species are planted?

What is the purpose of forest management undertaken in the shrine forest? What is the goal?

Is there an official management plan for the shrine forest?

Who is responsible for shrine forest management?

Who carries out the management? (a company? Individuals with appropriate skills? People from the shrine?)

Do you know what forest management been done historically?

Are there any species that grow here that are not present in ordinary woodlands?

Are there any ecological values in this shrine forest (such as biodiversity, old-growth trees, deadwood, refugia for endemic species etc.)?

Thank you!

5.2. Appendix B. Follow-up questionnaires

5.2.1. Expanded questions for Dr. Hiroaki Ishii

A. Shrine Forest Management

1. Do you have any pictures of forest management being conducted in the shrine forest? (Logging, thinning, planting, pruning, biodiversity, promotion of certain trees/species)

2. When did modern forest management techniques and equipment start being used in shrine forests? (Nishinomiya: in general).

3. You mentioned that you were working on developing a management plan for the shrine forest at Nishinomiya Shrine. Could you briefly summarise what the plan will consist of? (mapping, photography, time frame, how detailed is it? forest inventory - how? measuring every tree)

4. What are the major points of the management plan? What kind of operations will be carried out? What is the time scale for the management plan?

5. Is it common for shrines in general to have management plans? Or is it rare? (Why?)

6. What is the main goal of forest management in this shrine forest? How does that promote religious values?

7. Would it be possible for me to take a look at the management plan draft?

8. Is there a purpose to planting a specific species? How do you decide what species to plant?

9. Where do the plants come from? Is the source of the plants important? (Why?)

10. Has the shrine expressed any preferences for what plants should be planted? (What species?) If so, is there a reason for them wanting to plant a specific species? (biodiversity, religion, source location)

11. (Politely) What does the senior priest know about forest management/forest ecology? How does that influence management? How much authority does the senior priest have when it comes to forest management decisions?

12. How did you come to be involved in the forest management at this shrine? (When, why, who contacted you)?

13. You mentioned that there is a publication in Japanese and an MS thesis on the subject of historical management, is there any way I could get access to these publications?

14. In Ishii et al. (2010) you speak of the differences in forest management between Buddhist temples and Shinto shrines. Could you elaborate on the differences? (less/more management, aesthetics, religious importance).

B. Biodiversity and Conservation

Firstly, how do you define biodiversity? Is it a forest with many species, or many rare species? Some species are naturally rare, and would not have to be “rescued” or protected. As I have come to realise during my years at university, biodiversity

can be somewhat tricky to define. And it tends to have different meanings to different people.

1. Is biodiversity related to the religious aspects of shrine forests? How? (Why is biodiversity important?)

2. What is the priests' perception of biodiversity? Does it differ from a scientific metric of biodiversity? (subjective)

3. Is the desire for increased biodiversity grounded in religious beliefs, or is it influenced from outside the religious sphere (science, public perception).

4. Why is a late-successional state desirable? (biodiversity, aesthetic values, spiritual values, recreation)?

5. Why are blown down trees removed (safety, aesthetics, ignorance)? Are current ideas on biodiversity influencing management in shrine forests?

6. When did shrines start to value biodiversity? (recently?)

7. What is done to increase biodiversity? How does X increase biodiversity?

8. Are you familiar with two researchers named Miyawaki Akira and Ueda Atsushi? They were among the first who did research on the connection between nature conservation and the Shinto concept of Chinju-no-mori. Have their ideas influenced how shrines look upon biodiversity in their forests? (In what way?)

9. Since exotic or uncommon species are found at shrines and temple, do you think it is more likely that they were planted or that they are remnants of an ancient forest type which is not common anymore? Or something else?

10. Why do you think that exotic or uncommon species are found in shrine forests? (aesthetic, religious significance, conservation)

11. What is the place of shrine/temple forests in the Japanese forestry industry and other non-religious contexts like conservation, biodiversity, green spaces in urban areas, recreational values?

C. Ceremonies and Religion

1. Are there any ceremonies connected to trees or nature conducted at the shrine that you are aware of? Do you have any pictures of this?

2. You mentioned that the ceremony where the priest purified newly planted trees was unusually elaborate. Would the priests/attendants/shrine maidens etc.

commonly take part in forest management procedures? (purification, blessing, prayer or similar?) When do they do that (annually, monthly, every ten years)?

3. Was the planting of new trees entirely motivated by the will of the congregation, the public?

4. What do you think about the term "ceremonial forestry"? With this term ("ceremonial forestry") is meant forestry undertaken in a ceremonial or religious context where the purpose is to further the religious values of a forest. Could this term be applied to the management conducted in shrine forests in general? And specifically, at Nishinomiya shrine?

5. What do you know of the religious values of the forest at Nishinomiya shrine? Are these taken into consideration when developing the management plan? (What are these values? What is the most important thing about this forest?

6. What do you think of the future for these kinds of forests in today's secular society? Will they be look upon as holy for a long time or will they be secularised in parks etc.

Thank you!

5.2.2. Expanded questions for Dr. Keizo Tabata

A. Shrine Forest Management

1. Do you have any pictures of forest management being conducted in the shrine forest? (Logging, thinning, planting, pruning, biodiversity, promotion of certain trees/species)

2. You mentioned that there is an annual vegetation management meeting. Do you also have a forest management plan?

3. If there is a forest management plan, what are the main points of the plan? What operations are going to be carried out? What is the timeframe of the plan? (skip this question if there is no management plan)

4. Are there any other end-goals of forest management than retaining the original vegetation of the Kyoto basin?

5. You mentioned there is an annual planting event. For what purpose do you plant? (biodiversity reasons, religious reasons, or other reasons.)

6. Are there any species (trees or other plants) that are considered extra important to the shrine? For comparison: At Nishinomiya shrine, *Cinnamomum camphora is* considered to be a holy species as there is a mythological story connecting *Cinnamomum camphora* to the god Ebisu. Is there something similar at Shimogamo shrine?

7. How much authority does the senior priest have when it comes to forest management decisions? Does the senior priest have any background forest management/forest ecology? How does that influence management?

B. Biodiversity and Conservation

1. Firstly, how do you define biodiversity?

2. Is biodiversity related to the religious aspects of shrine forests? How? Is biodiversity important?

3. Does the shrine value biodiversity? Why?

4. What is the priests' perception of biodiversity? Does it differ from a scientific metric of biodiversity?

5. At many shrines, an old-growth late-successional forest is desirable. Does the same apply at Tadasu-no-Mori?

6. Are you familiar with two researchers named Miyawaki Akira and Ueda Atsushi? They were among the first who did research on the connection between nature conservation and the Shinto concept of Chinju-no-mori. Have their ideas influenced how shrines look upon biodiversity in their forests?

7. Sometimes exotic or uncommon species are found at shrines and temples; do you think it is more likely that they were planted or that they are remnants of an ancient forest type which is not common anymore? Or something else?

C. Ceremonies and Religion

1. Are there any ceremonies connected to trees or nature conducted at the shrine that you are aware of? Do you have any pictures of this?

2. At Nishinomiya shrine there was recently a ceremony conducted where the head priest ritually purified trees that were to be planted. Do you have anything similar at Shimogamo shrine?

3. What do you know of the religious values of Tadasu-no-Mori?

4. Is there a religious reason for wanting to preserve the original vegetation of the Kyoto basin?

5. Do the religious aspects of the forest affect management? In what way?

6. What do you think the future for these kinds of forests will be in today's secular society? Do you think they will they be preserved as sacred forests for a long time?

7. Me and my thesis supervisor have been talking about the term "ceremonial forestry". With "ceremonial forestry" we mean forestry management with the purpose of furthering the religious values of a forest. Would you say that this term could be applied to the forest management conducted in Tadasu-no-Mori?

5.2.3. Expanded questions for Dr. Tohru Manabe

A. Shrine Forest Management

1. Do you have any pictures of the forest at the shrine you could share with me?

2. Are you involved in forest management at the shrine forest?

3. Are there any tree species that are extra important to the shrine? For comparison: At Nishinomiya shrine, *Cinnamomum* is considered to be a holy species as there is a mythological story connecting *Cinnamomum* to the god Ebisu. Is there something similar at Hakusantaga shrine?

4. Does this shrine have fulltime attendants? Is there a priest that works here every day? Are there shrine maidens (*miko*)?

B. Biodiversity and Conservation

1. Is biodiversity related to the religious aspects of shrine forests? How in that case?

2. Is biodiversity important to the shrine?

3. At many shrines, an old-growth late-successional forest is desirable. Does the same apply at Hakusantaga shrine?

4. What do you think of the future for this forest in today's increasingly secular society?

C. Ceremonies and Religion

1. Are there any ceremonies connected to trees or nature conducted at the shrine that you are aware of? Do you have any pictures of this?

2. At Nishinomiya shrine there was recently a ceremony conducted where the head priest ritually purified trees that were to be planted. Are you aware of something similar at Hakusantaga shrine?

3. What do you know of the religious values of the forest at Hakusantaga?

4. Are there any festivals (*matsuri*) at this shrine?

5. Do you know what deity (*kami*) is enshrined at this shrine?

SENASTE UTGIVNA NUMMER

2019:4 Författare: Sofie Dahlén Sjöbergh
Skogskollo för tjejer – Vad hände sedan?

2019:5 Författare: Fredrik Ögren
Hantering av forn- och kulturlämningar inom SCA Norrbottens skogsförvaltning – Informationshantering från planering till markberedning

2019:6 Författare: Elias Hannus
Beslutsstöd för att finna diken och bedöma behov av dikesrensning

2019:7 Författare: Jan Lindblad
The future of retention forestry – the historical legacy in stands and its impact on retention in the next generation

2019:8 Författare: Hilda Mikaelsson
Alternative oxidase respiration in the mycorrhizal fungus *Laccaria bicolor*

2019:9 Författare: Joel Jensen
Above- and belowground carbon stocks and effects of enrichment planting in a tropical secondary lowland dipterocarp rainforest

2019:10 Författare: Josefin Runesson
Total carbon sequestration during an entire rotation period of oil palm in northern Borneo

2020:01 Författare: Mikaela Rosendahl
Fysiska och psykiska hälsoeffekter av att vistas i naturen – En pilotstudie utförd på Stora Fjäderägg, Västerbottens län

2020:02 Författare: Jessica Åström
Evaluating abundance of deciduous trees in production forests along small streams – can Sweden meet current policy goals without intensive management

2020:03 Författare: Brita Asplund
5§3 – en statlig storstädning av skogslandskapet

2020:04 Författare: Mikaela Casselgård
Effects of 100 years of drainage on peat properties in a drained peatland forest in northern Sweden

2020:05 Författare: Therese Prestberg
1900- talets skogsbruk i kronoparksskogar – En skogshistorisk studie om Håckren och Bjurfors kronoparker

2020:06 Författare: Nils Södermark
Inverkan av trädslagsval och plantstorlek på tall- och granbestånds anläggningskostnad, skadeutveckling och tillväxt i norra Sveriges kust- och inland

2021:01 Författare: Torben Svensson
Tallsåddens potential för återbeskogning av marker med tjocka humustäcken eller torv i norra Sverige.

2021:02 Författare: Therese Strömvall Nyberg
Vad betyder det att skydda natur? – En europeisk jämförelse av skyddade områden