

Influence of Shintoism on Environmental Management and Perceptions of Lake Biwa, Japan

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Abstract

Throughout history, Japan has been heavily influenced by one major religious philosophy: Shintoism. It is a philosophy centered around animism—the belief that all things, animate and inanimate, house a soul. What influence does Shintoism have on environmental management and perceptions? This research attempts to answer this question as it relates to Lake Biwa, Japan’s largest freshwater lake.

Lake Biwa supplies millions of individuals throughout Shiga Prefecture with freshwater. Home to hundreds of endemic species, the lake also serves as a hotspot of biodiversity. However, there are many different threats to the water body, including invasive species and urbanization.

Using literature review and first-hand observations, this research attempts to explore the way Shintoism affects people’s perceptions of Lake Biwa as they relate to sense of place, the Soap Movement of the 1970s, the Mother Lake 21 Plan, and management of invasive/nuisance species such as the largemouth bass and great cormorant.

In exploring the complex relationship between Shintoism and environmental management in Lake Biwa, this research helps add more dimensions to the influence Shintoism has had on people’s perceptions surrounding Lake Biwa and open avenues for future research.

Keywords: Shintoism, environmental management, Lake Biwa, sense of place, invasive species, place attachment

Shintoism

Shintoism has long since been the major religious philosophy of Japan. There are many other philosophies in Japan that shape Japanese culture in the modern day, namely Confucianism and Buddhism, but Shintoism is the most prominent (Herbert, 1967). Since the inception of this philosophy, it has held the belief that all living and non-living organisms descended from “kami”, or gods (Herbert, 1967). As Jean Herbert states,

“According to the Holy Scriptures, after some preliminary stages, when Creation came to the stage of solid matter, a pair of Kami, Izanagi and Izanami, procreated all the existing Universe, including both what we see and what we cannot perceive. Everything and everybody being Kami-born therefore has a Kami-nature and is a potential full-fledged Kami, which may come to be acknowledged as such” (Herbert, 1967, p. 21).

One of the most important elements in Shintoism is water. Since ancient times, water has been used in purification rituals in order to remove impurities or pollution from individuals, object, and even entire regions (Kasulis, 2004). As Kawanabe states, “Water itself has been sacred to the Japanese people from ancient times. Spring, stream, lake, river, wetland, underground water, etc. were believed to be the god itself rather than simply symbolic” (Kawanabe, 2003, p. 215).

It is thought that water itself has a distinct importance to Shintoism as a result of its passage through the heavens (Kasulis, 2004). As the heavens are known to be one of the many sites “kami” reside, water coming from this location must have incredible importance to Shintoism as a religious philosophy (Kasulis, 2004).

According to these principles, Japanese people who follow Shintoism in their daily lives feel a close connection to their environment and the organisms that live within it. It is this assumption that leads this research to question whether the Japanese people who follow

Shintoism react and perceive things within their environment as a result of their philosophical beliefs.

Despite Shintoism's influence on Japanese individuals, it has never been expressly stated that Japanese people who follow Shintoism react and perceive things within their environment as a result of their philosophical beliefs. Thus, this research asks, "What influence does Shintoism have on environmental management and perceptions?" In order to answer this question, this research will be focused on a particular case study surrounding Lake Biwa in order to determine Shintoism's effect on the Japanese people and subsequently their environmental management and perceptions.

Lake Biwa: Sense of Place

Lake Biwa is the largest and oldest freshwater lake in Japan (Kitagawa, 2011). The creation of the basin that is now known as Lake Biwa dates back to around 1.5 million years ago when the Philippine Sea plate subducted beneath the Eurasian plate (Takemura et al., 2013).



Figure 1: Lake Biwa.

Nestled comfortably in the middle of Shiga Prefecture, the lake supplies water to over 14 million people and is also home to numerous endemic species, making it a major biodiversity hotspot for Japan (Kitagawa, 2011; Kamai et al., 2008).

It is one of the many places throughout the world where “sense-of-place” plays a major role in how local individuals treat and perceive it. “Sense-of-place”, as defined by the State of Washington Department of Commerce, is

“a place comes into existence when humans give meaning to a part of the larger, undifferentiated space. Any time a location is identified or given a name, it is separated from the undefined space that surrounds it. Some places, however, have been given stronger meanings, names or definitions by society than others. Places said to have a strong “sense of place” have a strong identity and character that is deeply felt by local inhabitants and by many visitors” (State of Washington Department of Commerce, p. 2).

Chikubu-Shima Island

Chikubu-Shima Island is a small island situated in the northern reaches of Lake Biwa.



Figure 2: Chikubu-Shima Island.

It is one of the few places throughout Japan where both Shintoism and Buddhism mix in such a drastic manner that a clear line can be seen between the two philosophies. Back in ancient times, it was a tradition for local individuals that lived around the lake to pilgrimage there (Kawanabe, 2003). Today, the island still holds status as a pilgrimage site, but is now perhaps more of a tourist destination rather than a philosophical one.

Regional cuisine

One of the unique traditions associated with Japanese culture is regional cuisine. Given that there are many prefectures throughout Japan, having a regional cuisine allows individuals within a prefecture to hold onto a distinct sense of place attachment. This is no different for Shiga Prefecture.

Many of the ingredients used within regional dishes throughout Shiga Prefecture are supplied by Lake Biwa. Some of these dishes include: “amenoio-gohan (cooked rice with Biwa salmon), ebimame (cooked shrimp with soybeans), ayu-tsukudani (cooked Biwa ayu with soy sauce and Japanese peppers), isaza mame (cooked Biwa goby with soybeans), and shijimi-jiru (Seta shijimi clam soup)” (Horikoshi, 2012, p.345-346). All of these dishes help express the uniqueness and individuality of Shiga Prefecture through the use of local ingredients.

However, while each of these dishes has its own place in the hearts of Shiga residents, the most important regional dish to Shiga Prefecture is funazushi.

Funazushi is a traditional fermented sushi that is made from crucian carp (Horikoshi, 2012). The process of making the sushi is relatively simple. First, crucian carp are caught with trawl nets within Lake Biwa. Next, they are brought to an area where they can then be killed and gutted. Once gutted, sushi rice is prepared and allowed to cool before being stuffed into the

cavity of the fish. The bones are left within the fish to keep its structure. A fermenting barrel is then lined at the base with sushi rice. One layer of crucian carp is then laid down on this rice and covered with salt in order to dry them out. Then the process repeats until all crucian carp are covered in salt and rice and the barrel is full. This barrel is then covered tightly and placed in a relatively cool, dry place for a few months to allow the fish to ferment.

When the fish are finished fermenting, they are taken out of the barrel and sliced up for special holidays or occasions, such as New Year's Day (Horikoshi, 2012). The rice that the fish has been fermenting in is also eaten as a delicacy alongside the funazushi. To say the least, the fish has a rather "unique" flavor that cannot be compared to any other food unless tested personally. Unfortunately, there has been a recent lack of crucian carp within Lake Biwa due to invasive species eating their eggs and larvae. As such, this traditional cuisine could be potentially lost if these invasive species continue to seek out crucian carp as a main food source.

Given that Lake Biwa has existed for millions of years, there is a distinct traditional culture associated with it. The Shiga Prefectural Government notes,

"For tens of thousands of years, humans have been a part of that ecosystem. While enjoying the bounty of the lake, they developed a distinctive culture of wary respect for the occasional dangers it presented, such as floods. It was a culture of coexistence with the lake, of living in the embrace of the cycles and rhythms of nature...Lake Biwa embodies a confluence of many diverse values, a composite living culture forged over the eons through symbiosis between man and nature" (Shiga Prefecture, p. 1; p. 13).

In extrapolating this belief, the hypothesis can be made that local individuals all feel some sense of symbiosis with the lake. As such, Lake Biwa is perceived as having great value to local people, both for its traditional and aesthetic values.

Unfortunately, modern issues such as urbanization along the shoreline, pollution, and invasive species are currently threatening the lake. With these issues comes a need for new management strategies to combat growing concerns surrounding Lake Biwa.

Local Perspectives on Environmental Management

Numerous local perspectives help demonstrate the importance of Lake Biwa to Shiga Prefecture and the culture of individuals living nearby. These include, but are not limited to: the Soap Movement of the 1970s, Lake Biwa Day, and the Mother Lake 21 Plan.

The Soap Movement of the 1970s:

The Soap Movement of the 1970s was a movement predominantly created by housewives in Japan after the appearance of red tides within Lake Biwa (Takao, 2013). These tides were blooms of red algae caused by synthetic detergents that people often used at the time (Takao, 2013). Many of these synthetic detergents had high phosphorus levels associated with them, which eventually caused eutrophication to occur within the lake (Takao, 2013).

Given that these red tides could be easily seen due to their colored nature and caused health issues for individuals that used synthetic detergents, they became a more immediately pressing environmental issue to the Japanese people living around Lake Biwa (Takao, 2013; Makino, 2012). The health issue that was created from the use of synthetic detergents was commonly referred to as “housewives’ eczema”, a skin condition that is associated with the hands of individuals that clean items such as clothing and dishes (Nanko, 2002). Thus, the housewives within the region decided to create the Women’s Organization Liaison Committee of

Shiga Prefecture in order to prevent these health issues associated with both the people using synthetic detergents and the lake itself (Takao, 2013).

This committee was intent on restricting the use of synthetic detergents within the region (Takao, 2013). As an alternative, they began to push for powdered soap to be used instead to wash clothes as it reduced both the health effects associated with synthetic detergents and contained far less phosphorus (Makino, 2012). This would prevent eutrophication within the lake and would also reduce “housewives’ eczema” within the region (Makino, 2012). As Makino states, “Witnessing the eutrophication of Lake Biwa, people became aware that everyday activities could directly affect the lake environment, and developed a deeper feeling of being connected to the lake than before” (Makino, 2012, p. 431).

Lake Biwa Day

Lake Biwa Day is a day dedicated to clearing the lake of pollution (Shiga Prefectural Government). It came about as a result of the Soap Movement during the 1970s after local individuals began to notice blooms of red algae causing eutrophication throughout the lake (Shiga Prefectural Government; Takao, 2013). Typically, the day is held on July 1st and has become a day for individuals to remember the importance of the lake for both its traditional and aesthetic value (Shiga Prefectural Government).

One way to know that Lake Biwa Day is approaching is by viewing the posters that begin to appear around the end of June in supermarkets and schools. There is a lot of importance placed on informing the public that Lake Biwa Day is approaching.

Local individuals are not the only ones to help clear the lake of pollution either. There are many local companies that take time during July 1st to help with the cleanup as well. One

notable company that participates in this yearly cleaning of Lake Biwa is Yanmar Agricultural Machinery Manufacturing Co., Ltd. (Yanmar). As their website notes,

“In Shiga Prefecture, home to the Ibuki Plant, an annual beautification initiative called Lake Biwa Day is held around Japan’s largest lake. Yanmar employees take part in this event on a voluntary basis, diligently picking up garbage washed up on the shore and litter in the surrounding areas, and taking the opportunity to build camaraderie with members of the local community” (Yanmar).

Mother Lake 21 Plan

The Mother Lake 21 Plan is an ongoing adaptive management plan associated with helping protect and preserve Lake Biwa (Kitagawa, 2011). It was originally implemented in two stages: one began in 1999 and ended in 2010, while the other began in 2010 and will end in 2020 (Shiga Prefecture). The goal of this plan is to bring Lake Biwa back to the healthy ecosystem that was associated with it before industrial pollution caused its decline (Shiga Prefecture). As the Shiga Prefectural Government states,

“The people of Shiga Prefecture have never abandoned their love for their lake or their concern for its health. Nonetheless, they have also been concerned with their livelihoods, and in particular with keeping pace with the prosperous urbanized areas of the Kinki region. The touchstone of prefectural policy has been “regional development” for many decades. Now that Shiga is one of the most prosperous areas in Japan, both the people and the government have increasingly seen the imperative for environmental protection” (Shiga Prefecture, p. 13).

One of the many benefits of the Mother Lake 21 Plan is that it is a cross-generational plan that will bring parents and children together to help preserve the lake (Shiga Prefecture). Another benefit of the Mother Lake 21 Plan is that this plan is associated with bringing the citizens, the local government, and the national government together to help protect and preserve Lake Biwa (Shiga Prefecture). This rarely is ever seen within environmental management strategies in Japan, and was only seen once before in Shiga Prefecture during the Soap Movement of the 1970s (Shiga Prefecture; Makino, 2012).

Aside from bringing Lake Biwa's ecosystem back to a healthy state, another end goal to the Mother Lake 21 Plan is to create an adaptive management plan for lakes throughout the world (Shiga Prefecture). While Lake Biwa is incredibly important to the Japanese people who live around it and rely on it, the Shiga Prefectural Government understands that there is place attachment associated with other lakes in separate countries (Shiga Prefecture). Place attachment, as defined by the University of Washington, is "a personal identification with a location or landscape on an emotional level as an individual or as a member of a community" (University of Washington).

Invasive/Nuisance Species

One of the worst issues associated with Lake Biwa are its invasive and nuisance species. These invasive and nuisance species include the largemouth bass, bluegill, and great cormorant.

Largemouth Bass

Largemouth bass, a native species within the United States, has recently become an invasive species within Lake Biwa (Uda, 2010).



Figure 3: Largemouth bass illustration.

This fish was first discovered as having been introduced from the United States by sport fishermen in Japan to Lake Biwa around the early 1970s, when fishermen caught them off the shores of Hikone in Shiga Prefecture (Uda, 2010). Concerns surrounding this species are well founded, as they can greatly impact both the ecosystem and the native endemic species that reside within the lake. Given that largemouth bass are incredibly aggressive and territorial, they can easily outcompete native species by both reducing their major food sources and by eating their eggs to reduce population sizes. As such, they are an incredibly important species to consider when noting management strategies to reduce their impact on Lake Biwa's ecosystem.

Bluegill

The origination of bluegill within Lake Biwa is difficult to discern. However, their discovery can be traced back to the fishermen that caught them in the lake in 1965 (Uda, 2010).

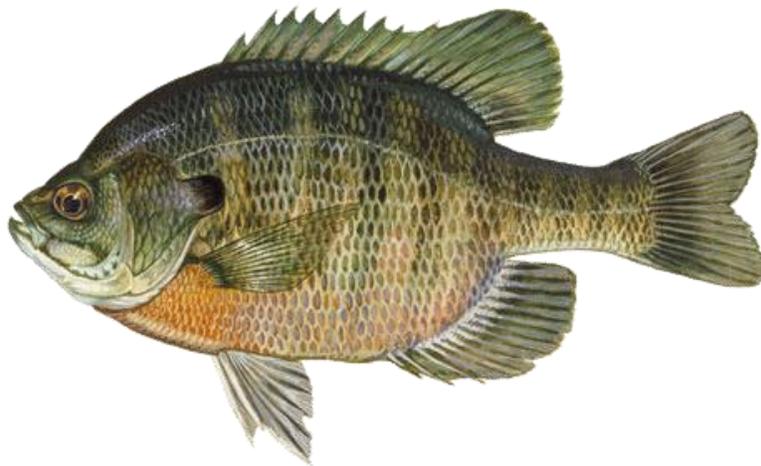


Figure 4: Bluegill illustration.

It is thought that they were imported from Chicago as a sport fish species in order to increase recreational fishing throughout Japan (Uda, 2010). According to a report made by Atsuhiko Ide and Shinsuke Seki, bluegill predominantly “feed on aquatic plants, zooplankton and insects, in

addition to fish eggs and shrimp” (Seki, 2009). Thus, they are dangerous to the ecosystem as a whole due to their diet as they are feeding on native endemic species.

Management Strategies - Largemouth Bass and Bluegill

Managing the reduction of aquatic invasive species such as the largemouth bass and bluegill has been difficult for Shiga Prefecture. The government has already implemented an ordinance (Ordinance of Normalization of Leisure Use of Lake Biwa, Shiga Prefecture) that would help reduce invasive species in Lake Biwa (Nishizawa et al., 2006). However, many sport fishermen are opposed to this ordinance, believing that invasive species such as the largemouth bass and bluegill have great economic benefits for the prefecture and that there is not enough evidence to support the idea that these species are harming the native ecosystem (Nishizawa et al., 2006). Despite the opposition, the Shiga Prefectural Government has been continuing to work on projects in order to eliminate invasive species within Lake Biwa (Nishizawa et al., 2006). Their target goal currently is 2018 as being the year when all aquatic invasive fish species are entirely removed from the lake (Nishizawa et al., 2006).

One of the predominant ways the Shiga Prefectural Government has been trying to eliminate invasive species has been to set them as an open resource for fishermen (Uda, 238). This means that any amount of invasive species can be caught and sold to the Shiga Prefectural Government for a fixed rate (Uda, 2010). If, as Uda states, a “*tragedy of open-access resources occurred, this project would be deemed successful*” (Uda, 2010, p. 238). This can be directly related to Garrett Hardin’s “Tragedy of the Commons”, though the total depletion of the “commons” is beneficial to Lake Biwa’s ecosystem instead of detrimental.

When these fish are given to the Shiga Prefectural Government, they are not simply thrown into a landfill to rot. Rather, they are broken down as compost for farms to use as fertilizer (Uda, 2010). Thus, despite the clearly harmful effects they have on the ecosystems they inhabit, their decomposed bodies can be a benefit in the end.

Great Cormorant

Although great cormorants are native to Japan, they are considered a nuisance species due to their feeding and nesting habits.



Figure 5: Great Cormorant drying its wings after hunting.

Recently, they have caused the ayu count to drop significantly within Lake Biwa, which is rather concerning because Ayu are a major food source to local individuals that live around Lake Biwa and are a large resource within the prefectural economy (Kameda, 2012; Takahashi et al., 2006).



Figure 6: Ayu from Lake Biwa.

As the Lake Biwa Museum states, “Although small in size, the ko-ayu, or lake ayu, is one of the most abundant fish in Lake Biwa, and also comprises the highest-value fishery in the lake” (Lake Biwa Museum). As such, this damage to local fisheries from these cormorants combined with the reduction of native species as a result of invasive fish such as the largemouth bass and bluegill are putting fishermen’s livelihoods in jeopardy.

Another issue posed by great cormorants is their nesting habits, which are causing regions to become deforested (Kameda, 2012). Cormorant droppings are incredibly acidic and, as they nest in trees, the leaves become covered with fecal matter. These leaves subsequently fall to the ground and break down with the droppings to create a soil that cannot healthily sustain tree populations due to its acidity. Canopy organisms are also affected by these acidified soils as

many of them cannot survive in regions with lowered pH levels. As such, they are a species that are both a nuisance to the land and to the lake.

Management Strategies - Great Cormorant

Within recent years, the Shiga Prefectural Government has launched a plan titled the “Specified Shiga Wildlife Management Plan” in order to combat cormorants causing problems for both fisheries and forested areas (Kameda, 2013). Within this plan are ideas for controlling cormorant populations, including shooting a designated number in order to decrease their impact on the environment (Kameda, 2013). With a decreased population of great cormorants comes an increased population of Ayu within Lake Biwa and a reduction of acidic fecal matter being introduced to forested regions.

This plan relies heavily on adaptive management strategies, as the government’s end goal is not to completely eradicate this species (Kameda, 2012). Adaptive management, as stated by the Department of the Interior,

“involves exploring alternative ways to meet management objectives, predicting the outcomes of alternatives based on the current state of knowledge, implementing one or more of these alternatives, monitoring to learn about the impacts of management actions, and then using the results of update knowledge and adjust management actions” (United States Department of the Interior).

Discussion and Conclusion

Given that Shintoism is never directly expressed within literature as having an influence on the way individuals manage and perceive Lake Biwa, it cannot be said that the two directly correlate with one another. However, this research has brought to light a complex relationship between environmental management and Shintoism.

Different issues surrounding Lake Biwa have different responses to them (i.e. Mother Lake 21 Plan, Lake Biwa Day, etc.). However, many management strategies for both invasive and nuisance species directly defy Shinto beliefs. As Shintoism states, all living and non-living organisms are descended from gods, thus would not these management strategies go directly against this religious philosophy by killing off organisms that contain the soul of a god? Could this be an indication of some form of philosophical hierarchy within Shintoism where Japanese individuals are ranked higher than invasive and nuisance species? Is it possible that Lake Biwa itself is revered as a god and as such, protection is more important than the souls of gods housed within invasive and nuisance species? In any case, more research must be performed in order to understand this complex discovery.

Realistically, a number of things affect management strategies and perceptions surrounding Lake Biwa including, but not limited to: economic gains and losses, modernization and progress, current cultural beliefs, and western influences. As such, it cannot be said that Shintoism is the only potential influence in regards to managing the lake and perceiving it in a particular light.

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Figures:

Figure 1: *Lake Biwa*. Retrieved May 29, 2016, from <https://www.google.com/maps/@35.247461,135.7887845,10z>

Figure 2: Temple, G. (2015, May 27). *Chikubu-Shima Island* [Photograph]. Lake Biwa.

Figure 3: *Largemouth Bass* [Photograph found in Maine Department of Inland Fisheries and Wildlife]. Retrieved May 25, 2016, from <http://www.maine.gov/ifw/fishing/species/identification/image/largemouthbass.jpg>

Figure 4: *Bluegill* [Photograph found in Maryland Department of Natural Resources]. Retrieved from <http://dnr.maryland.gov/fisheries/fishfacts/bluegill.gif>

Figure 5: Ceki, C. (2013, February 13). *Great Cormorant Having Sun Bath in Dull Weather* [Photograph]. The Internet Bird Collection.

Figure 6: Ozeki, S. *Char-grilled Line-caught Ayu Cooked with Rice*. Retrieved from <http://www.shujiozeki.com/wp-content/uploads/2010/02/line-caught-ayu-sweet-fish-in-the-Nagaragawa.jpg> (Originally photographed 2009, November 02)