Kauri (Agathis Australis) Ethnobotany: Identity, Conservation and Connection in New Zealand

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Introduction

Forests play a central role in safeguarding the natural, climatic, and cultural processes on which life depends. Natural ecosystems are also home to people, thus it is imperative that the ecological and cultural significance of forests are recognized as working together. People's connection to the forest expressed through their practices and beliefs contribute to conservation (Hermann 2006; Kato 2008), and in some cases actually enhance the local biodiversity (e.g. Gagdil et al. 1993; Posey 1985). Attachment to place and specific aspects of nature, encourages actions that in turn care for the area in question (Cosgrove 2000). Some advocate that a spiritual connection to place results in a better environmental ethic, reinforcing the idea that people belong to the land as much as the land belongs to people (Plumwood 2002). The connection to the forest can be utilitarian, however, it is often more powerful when the connection is grounded in ethical, spiritual and cultural values (Hermann 2006; McCreanor et al. 2006).

Being discussed in the human-nature relationship dialogue is the concept that true connection with a place includes the realm of the intangible (Berg and Dasmann 1990). As opposed to just nominating a place as sacred, depth of connection to place can best be generated through ordinary and ongoing human interaction in that space (Thayler 2003). In order to create and maintain this connection, ritual and custom help people identify with their natural surroundings (Relph 1976). This connectivity and commitment are essential ingredients for conservation however they are often undervalued in nature conservation (Kato 2006). Knowledge about, and practices that interact with nature are transmitted from generation to generation providing people with a sense of identity and continuity, which results in a sense of place, and therefore leads to

protection of that place. People need to feel connected to nature in order to maintain the integrity of their natural surrounding (Kato 2008).
Numerous studies have revealed the importance of local cooperation in the conservation process (e.g.Brown 2003; Moller et al. 2004). Around the globe sacred trees are protected, and in many religions, trees are considered to have omnipotent powers that can carry out miracles. This belief system is not limited to those who have polytheistic beliefs (Bechaman 1990). People who practice monotheistic religions, such as the Muslims in Israel respect the sacred trees, giving these vegetative organisims supernatural dimensions. For both pagan and monotheistic tree worship, appropriate punishment is meted out to any who harm the trees (Dafni 2007).

In Tibet, researchers have found that sacred sites contain a higher proportion of old growth trees than secular areas. Thus, Tibetan sacred sites are ecologically unique (Salick et al. 2007), which tends to be a universal phenomena with religiously important tracts of land (Berkes 1999). Many of these sites are in natural settings and the interrelatedness of sanctity and the environment is a frequent theme. Sacred sites play an important role in habitat and biodiversity conservation (Salick et al. 2007). Attachment to a specific tree can especially play an active role in conservation. For example, the endemic tree of the Chilean Andes, Araucaria araucana (Mol.) C. Koch, the monkey-puzzle tree, is important to the Mapuche Pewenche people for the physical attributes, such as the collection of the nut, but also for spiritual reasons. In Chile, the Indigenous people and their knowledge contribute to the sustainable management of the forest (Herrmann 2006).

Included in this paper are examples of how a spiritual connection with large trees results in active conservation. New Zealand is losing biodiversity while working toward better conservation. In an effort to stem the loss, about 30%-40% of the land has been made into protected areas (Craig et al. 2000). An element with which government bodies and environmental groups are struggling, is the concept that the current legislation and much of public opinion is based on preservationist ideals. In this paradigm, humans are excluded as part of the environmental dynamic (McCreanor et al. 2006). However, concepts are now moving forward in terms of sustainability and conservation that include the

participation of people, particularly the indigenous group, the Maori (Craig et al. 2000). The Maori sense of place which includes mythology, tradition, and histories all contribute to the group's attachment to land (Walker 1990).

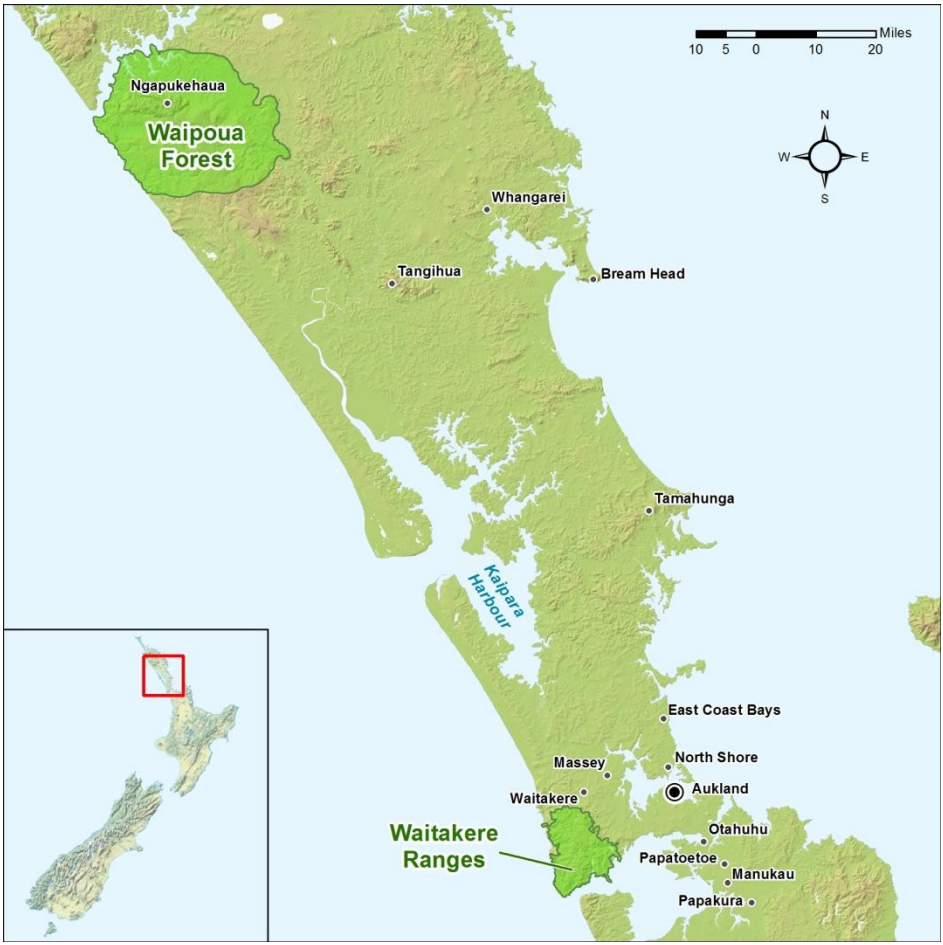
This paper addresses one of the most important trees in New Zealand, the kauri Agathis australis. The Maori cosmological vision about the kauri, aligns with the emphasis of single species protection central to New Zealand conservation (Craig et al. 2000). In fact, an entire agency was created for this purpose. Although one species may receive the conservation focus, in order for that species to survive, protection must include the ecosystem in which that specified plant lives. When working to protect one species the biodiversity in the area where the plants grows also benefits.

However, kauri forests have been significantly reduced. These forests are important ecosystems which were historically valuable for timber production and now for their non-wood values and benefits, such as aesthetic appeal, a tourism draw, spiritual connection and New Zealand nationalism. An increasing ecological awareness is growing in New Zealand, and kauri forests are now recognized as nationally important ecosystems (Fowler et al. 2004). Their relevance to people of New Zealand is demonstrated, by the fact that the New Zealand Forest Service specifically formed a kauri Management Unit to implement policy which protects the tree. The presence of kauri gives the forest of northern New Zealand a physiognomic distinctiveness. And, even when kauri is not the dominant tree, the stand of vegetation is still considered and termed a "Kauri Forest". The kauri forests are important for soil, water and have wide aesthetic appeal (Halkett 1983; Hutchins 1919). Through a case study of the kauri tree in New Zealand, this paper explores the concept that people's connection to place through a specific species of tree can encourage conservation.

Study Area and Kauri Description

New Zealand spans two tectonic plates resulting in a diverse landscape with mountains, volcanoes, rolling hills and river flats (Figure 1). Kauri forests of northern New Zealand have the highest biodiversity, averaging 18 species per hectare including many endemics (Craig et al. 2000). These forests grow well in temperatures that range from 50-100

Figure 1: Map of New Zealand with Waipoua Forest and the Waitakeri Range Highlighted.



Source: FAU Center for Geo-Information Science

degrees Fahrenheit with a mean of 60-70 degrees. They require a certain amount of moisture, and where they grow the average annual rainfall varies from 50 inches to 90 inches, distributed evenly throughout the year. They do not withstand extreme weather, thus they grow well in generally mild climates with only occasional light frosts (Sando 1936).
The kauri is a New Zealand canopy emergent noted for its longevity and size (2). Mature adults can reach up to 30 m, with trunks often greater than 2 m in diameter (Fowler et al. 2004). Trees live to be 600 or more years old and some as much as 1000 years old (Ahmed and Ogden 1987). Kauri is the only member of the genus Agathis (Araucariaceae) occurring naturally in New Zealand. It is the southernmost species extending no lower than latitude 38 degrees South (Whitmore 1979). Kauri is found mostly in lowland forests but also at altitudes greater than

Figure 2: Kauri Tree

Source: Author

500m in the east of the upper north Island. Ridge tops are the most favored growth locations, although the trees can grow next to streams and estuaries (Fowler et al. 2004). Before European colonization in the early 19th century, there were around 1.5 million hectares of forest containing kauri. Today, most kauri stands are just a few hectares (Sando 1936).

Methods

The purpose of the research is to understand people's connection to the kauri, and how this leads to better conservation of not only the tree, but the ecosystem in which it lives. Interviews were conducted with five Maori, two New Zealand professors of European descent and eight New Zealand residents who reside near kauri forests, also of European descent. Although the study group is small, the data reflects trends that can be further examined with a larger set of informants. Names of individuals have been changed to protect their privacy. Research was conducted in April 2009. The informants were purposefully non-random, choosing individuals who specifically worked in ethnobotany (how plants are used) and/or were connected to the kauri tree as part of their belief system. Most interviews were semidirective, with the researcher asking each informant similar questions in a conversation format that did not involve a structured set of questions, a method described by Bernard (2005).

Each discussion began with outlining the objectives and procedures of the interview, as recommended by Fraser et al. (2006). Areas covered in the interview included: 1) general ethnobotany 2) what tree is most important 2) rituals surrounding this tree 3) connection to place, and 4) conservation concepts. Interviews could last from 1-3 hours, or could informally last a whole day as informants led the researcher through the forest. All interviews were conducted with informed consent.

Results

Material Uses

Universally the response from all informants to an enquiry about what plant most characterizes the land, and to which they felt most connected, was the kauri tree. In looking at the history of the material uses of the tree, initially it was prized for its wood (Halkett 1983). The Maori had used the tree for their structures, and later kauri timber trade developed between Australia, New Zealand and the United Kingdom, becoming one of New Zealand's major exports. The wood was primarily used for buildings, furniture, ship bodies and mast poles (Sando 1936). The timber was so desirable due to the fact that the trunk grows particularly straight and the bottom section of the adult tree is branchless. The kauri sheds it lower branches while maturing, leaving a straight grain with few knots.

Another material used from the tree was kauri Gum, the fossilized resin of the tree collected for varnish and linoleum (Božić-Vrbančić 2005). Most gum came from fallen trees, while for others, the resin would come through the bark, fall to the ground where the dirt would cover it and start the fossilization process. Gum diggers would look for the buried lumps. In the 1840's kauri gum became a major export to London and America as 70% of varnish was made from kauri gum. This became a lucrative export for New Zealand, becoming another major export item and playing an important role in the New Zealand economy. Interestingly, gum digging also fostered ethnic mixing. The Maori were the first gum diggers (Firth 1922). Because gum digging generated so much income, from 1860-1930 people migrated from other parts of the world to work in the gum fields. As part of this influx, a particularly large population came from Croatia, many of whom married Maori, learned the language and raised biracial families. In 1882, because of the economic depression in New Zealand, many New Zealanders of European descent, including British, were forced to find work in the gumfields. However, this latter group maintained their separate identity and did not mix with the Maori or the other groups from Europe. Because the Karui gum fields attracted so many workers, in1898 the New Zealand government made the kauri

Gum Industry Bill to restrain the flow of new people attracted to the fields. The demand for kauri gum later diminished when in the 1930s synthetic varnish became popular (Božić-Vrbančić 2005).

The realization of the large scale loss of kauri, and because of the importance of the tree beyond just timber to the New Zealanders, the government passed a decree in 1972 making it illegal to fell any kauri. About 4% of the original kauri population is now currently standing and protected (Craig et al. 2000). The physical utilization of the kauri today involves the use of the old buried material. Those kauri that fell in swamps were preserved, and some have been buried for 50,000 years. The uncovered trees are called Swamp Kauri, and artisans now make expensive furniture, clocks and other items out of the wood gathered from these submerged trees (Ancient Kauri 2010).

Cultural Connection

The importance of kauri extends beyond the physical uses, and the intangible utilization relates more specifically to the conservation sentiment. The tree has been important culturally for the Maori since before European colonization, and has since become a symbol of New Zealand nature for a range of ethnic groups living on the islands. As cited earlier, a stand of trees, forest and preserves in which the kauri may not be dominant, are still called "Kauri Forest", in recognition of their importance. In addition to being the name of groups of trees, there are also highly recognized and revered individual speimens. The most famous single organism is Tane Mahuta (Lord of the Forest) in the Waipoua Forest (Northland) (Figure 1). Specialists consider this tree to be around 4,000 years old, 150 feet tall and 6 feet in girth (Pakenham 2002). This particular tree has turned into an outdoor education area and a popular and lucrative tourist destination. The simple act of seeing this one organism, has turned the forest in which it grows into a protected space to which people from across the globe put into their tourist plans as a "must see" place (Brown 2008). The act of being appreciated for its visual effect becomes a "use" of the tree. Although that which people glean from the experience cannot be measured quantitatively, the sentiment inspired continues to draw people from all over the world. Even those for whom the tree is not part of their own history or previous

Figure 3: Kauri Tree with protection sign

Source: Author

experience, the kauri inspires them to travel great distances in order to merely lay eyes on the organism. Thus, because of this attention from foreigners and nationals alike, the forest and the surrounding area earn tourist dollars, acting as an economic incentive to protect the individual and the ecosystem in which it grows.

This impressive individual draws people partly because of its enormity, and thus specifically because it is unlike other trees witnessed. However, just as important in terms of conservation, are the trees that are part of people's every day experience. There are kauri forests that do not draw huge crowds, and are equally valued by the locals in terms of conservation. There are many less well known smaller kauri trees growing in parks and other government sanctioned areas. All of these are equally protected by the New Zealand government (Figure 3).

The ecological awareness of the species is exemplified in the care that is taken to ensure the protection of the tree. In addition to the legal protection from logging, people are reminded to be careful of the roots around the bottom of the tree. Furthermore, there is the danger of a new form of kauri dieback disease called kauri collar rot caused by a soil pathogen known as phytophthora taxon agathis (Gregory 2008). At the entrance of numerous kauri stands, a foot spraying station is located (Figure 4). As kauri dieback is spread through the movement of soil and mud, these stations provide the opportunity for people to take their own personal actions in protecting the trees from themselves. No one monitors these stations, and it is assumed that anyone, regardless of nationality or ethnicity, will take the care necessary to protect these

Figure 4: Foot spraying for people to clean their feet before entering Kauri forest.

Source: Author

trees. Awareness and protection coupled with trust in people's compliance, indicates the importance of this species. Thus, as people have to be extra conscious when entering the forest, they take extra care with the ecosystem as a whole.

Beginning with the New Zealand indigenous group of Maori, this paper will highlight a few specific examples of the cultural connect that people feel at the local level with the kauri, and how this is expressed in terms of the "ordinary and everyday activities" as described by (Kato 2006). Etera, is a Maori man who works as a spiritual leader with New Zealanders of Maori and European descent. When interviewed about the tree, he indicted that in order to express the importance, power and relevance of the kauri, he would need more than words. He was clear that one needed to go to the trees to "feel" the explanation. Thus, in the Waitakeri Range, close to Auckland, Etera took the researcher to a kauri forest (Figure 1). Upon entering the forest, Etera changed his normal upright gait suddenly to a slow, bent kneed, soft walk, later explained as movements of reverence. This walk was maintained until arrival at a particularly large kauri. He stopped at the tree and stood at the base looking up towards the crown. He then began the ritual.

Etera drew forth a bottle of water and silently sprinkled droplets on the roots. He then brought out a small bag of rice and gently placed grains onto the tree and the surrounding ground. Etera then placed his forehead against the tree, in same the way the Maori traditionally do the Hongi, the breath of life exchange. Two people put their foreheads together and exchange breath. Removing his forehead, Etera looked up and indicated that now it was the time to "ask the tree". Whatever question one has, it can be put it to the kauri tree, and it will answer. He placed both hands on the tree and stood concentrating. Eventually he separated himself from the tree, and invited the researcher to ask.

This was how the importance of the tree was explained by someone who regards the tree as an integral part of his culture and his land's ecology. Etera said "we work with the trees, so we need to protect them." Conservation is clearly connected to the reverence and appreciation the Maori have for the tree. As the trees are regarded as spiritual entities it follows that their safety becomes a priority. The kauri's role in the Maori worldview takes on an even larger meaning. In

discussing their cosmology in relation to the universe, Etera drew the tree of life, his rendition of a kauri. Etera is Maori, and he drove to the kauri stand in his SUV. The water he sprinkled came from a used coke bottle and the rice was kept in a zip lock bag. Many Maori who have a ritualistic and spiritual relationship with the trees, are urban and westernized. Modern day Maori are clearly inextricably connected to the kauri.

Other Maori are working to re-teach traditional culture and language to the younger generation. There is renewed interest amongst many Maori in their traditional customs. Two Maori, Ahurewa and Haimona, are working together with Maori groups to revitalize the Maori language and custums. As Ahurewa led the researcher on an ethnobotanical walk, explaining the uses of plants through the forest on Waiheke Island, she discussed various plants and their uses in a regular voice. Then upon entering the kauri grove, she paused and began to sing. Under a grove of kauri, she stopped walking and gazed up into the trees. She indicated that reverence and understanding for the kauri is tantamount to the younger generation's understanding of Maori connection to place in New Zealand. Furthermore, the trail to the grove was made of dirt, but under the kauri grove, a wooden platform had been constructed. This was the culmination of the trail ending in the kauri grove where the park service recognized that this place was important to comfortably appreciate the trees.

The reverence for the everyday kauri is not limited to Maori. Local New Zealanders of European descent are also connected to the trees. One example comes from the urban area of Christchurch on the South Island, outside of the kauri natural range. Keith, who does have some Maori heritage, but is mostly of European descent is well versed in New Zealand ethnobotany. His personal interest, coupled with a university education, has taught Murray about the New Zealand forest. He led the researcher on the wooden planks of the trail, academically discussing the ethnobotanical uses of the plants. When arriving at the planted kauri stand, Murray stopped. There were benches and a deck built beneath this part of the park. The structure marked this space as a place to stop and experience the plants in stillness, opposed to the rest of the park's boardwalk, made for movement. Here Keith and his wife

presented a green stone, a meaningful gift for New Zealanders, to the researchers. “It had to be given under the kauri trees” Keith explained. This is a park for urban people, for New Zealanders and foreigners to enjoy, and the kauri section differentiates itself from the rest of the park. Although the kauri trees are considered some of the highlights, the park’s protection is not limited to these trees, but preserving the biodiversity of the area as a whole. This experience of the urban kauri, mirror the opinions of young Maori women who live in a New Zealand suburb. When asked if they were happy, one of the first items that they mentioned was that they felt good to be close to Shepard’s park, and specifically mentioned the presence of the kauri in that park (McCreanor et al. 2006). Urban, rural, Maori or European, these examples, although limited, exemplify the appreciation of the kauri beyond its physical uses, and the care that is taken in protection.

Discussion and Conclusions

In terms of conservation, this case study of the kauri in New Zealand demonstrates the connection between ecology and culture, and how the importance of human connection with a species increases conservation. People protect that about which they care, and many communities care about the kauri. Protecting the kauri, inevitably protects the ecosystem in which the tree grows. The relevance of this connect protects large tracts of forest, rural parks, and urban greenery. This example lends relevance to how crucial it is to keep these cultural connections alive in order to encourage and maintain successful conservation. Understanding the human-ecological connection proves important both for the internal actors who have direct contact with the tree, and the external actors, such as forest managers and government policy makers. The case study in New Zealand, can act as an example of how paying attention to the spiritual regard for nature can result in sound scientific conservation.

The role of sanctity in environmental conservation is clear, and environmental organizations and government forest managers need to include local people in the conservation discussion (Salick et al. 2007). Most New Zealanders, about 85% live in towns and cities removed from natural ecosystems (MEP 1997). However, for many New Zealanders,

the presence of massive old trees, and the knowledge that there are "primeval" forest remains important to their cultural identity (Craig et al. 2000). Such connectivity is vital to maintaining the authentic integrity of a place that does not exclude humans, and some argue for a paradigm that would be more accepting of people in the landscape (Shech and Haggis 2000). For environmental and conservation groups to develop projects that make nature preserves and eco-tourism infrastructure, it is essential that the viewpoints, knowledge and wishes of the local inhabitant be considered (Salick et al. 2007). The challenge is then, how the spiritual connection may be maintained and communicated today (Kato 2006). People and institutions can build communities that recognize the distinct features of nature in a place with which they interact in their ordinary and everyday life which generates shared meaning in order to encourage conservation (Goin 1996). Seasonal rituals and ceremonies can be a powerful reminder of the connection with the natural world (Kato 2008). The theory of making a place ordinarily sacred, can locate people within the natural world and as active players in successful conservation (Clifford 1994; Thayler 2003). Thus, the case study of a connection with a certain tree species in New Zealand, and how the kauri is being protected adds to the ongoing dialogue looking at how the intangible connection to nature leads to biodiversity conservation.

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