

## **Pigs in Hawai‘i, from Traditional to Modern**

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It is well documented that feral pigs ranging through Hawaii’s upland forests today bear little physical or cultural resemblance to the smaller, domesticated pigs brought to the islands by voyaging Polynesians. It remains a popular misconception that pigs are native to Hawaiian forests and that pig hunting was a common practice in ancient Hawai‘i. This paper will briefly compare the traditional role of pigs in Hawaiian culture with the largely western practice of hunting feral swine in modern Hawai‘i today.

### **Origins and traditional relationships**

Pigs are not native to Hawai‘i. The first pigs were brought to the Hawaiian Islands by Polynesians as early as the fourth century A.D.<sup>i</sup> Skeletal remains of pigs and recorded traditional knowledge sources indicate that *pua‘a* (the Polynesian pig) was a much smaller animal than the feral pigs of today.<sup>ii</sup> Historical evidence and genetic studies trace the ancestry of these animals to wild Asiatic swine (*Sus scrofa* subsp. *vittatus*).<sup>iii</sup>

Originally, *pua‘a* enjoyed a close relationship with their human families and rarely strayed far from the *kauhale* (family compound).<sup>iv</sup> Well developed taro and sweet potato agriculture in ancient Hawai‘i was incompatible with uncontrolled pigs, and there is every indication that pigs were both highly valued and carefully managed sources of protein. *Pua‘a* were an integrated part of Hawaiian households, and the common presence of *pa pua‘a* (pig pens) reflects the controlled, physically compartmentalized nature of pig management in traditional Hawai‘i.<sup>v</sup>

Notwithstanding, small populations of loosely controlled and free-roaming animals existed in ancient times. Traditional and historic evidence indicates that these animals remained largely domesticated, living mainly on the periphery of *kauhale* and extending into lowland forests. They continued to rely largely on the food and shelter provided by the *kauhale*.<sup>vi</sup> This is because in pre-contact times, native Hawaiian forests were devoid of large alien fruits such as mangos and guava, and major protein sources, such as non-native earthworms, that would eventually support the large feral populations of pigs today. Without such fodder, these early roaming populations would have been chiefly dependant on people for their survival.

### **Western introductions and spread of feral pigs**

In contrast, current feral pigs are largely derived from animals introduced after western contact. Cook, for example, brought European pigs during his first voyage to Hawai‘i, and many other introductions of European and Asian swine followed.<sup>vii</sup> Over time, the Polynesian *pua‘a* interbred with and were mostly displaced by these larger animals.<sup>viii</sup>

As feral pig populations grew on all islands, they began ranging more freely in the forests. Concurrent but independent introductions of earthworms and introduced plant species, such as mango and guava, provided reliable protein and carbohydrate food sources and helped expand their range.<sup>ix</sup> Omnivorous and without any non-human predators, pigs began to thrive in the native forest and successfully established large populations. Within only a few generations, any

escaped domesticated pigs reverted to a feral form, retaining the large body size of European swine, but severing their dependence on human beings.<sup>x</sup>

With the advent of large-scale cattle ranching and sugarcane agriculture in the 19<sup>th</sup> century, much of Hawaii's lowland forests were converted into canefields or pasture, and feral pigs began moving further upslope.<sup>xi</sup> Expanding development and agriculture throughout the 20<sup>th</sup> century further accelerated this process, reducing mid-elevation habitat and forcing feral animals into the pristine upland forests. Some areas, like the high elevation forests of the West Maui mountains, remained pig-free until as recently as the 1960s. Today, however, feral pigs are found throughout the main islands, including most of the remote native forests of Kaua'i, O'ahu, Maui, Moloka'i, and Hawai'i.<sup>xii</sup>

### **Cultural implications**

Clearly, domesticated *pua'a* carried strong cultural value in traditional Hawai'i. Aside from being an important possession and food source, a oral tradition describes the adventures of *Kamapua'a* (the pig child), a powerful demi-god who ranged over the islands and into the sea.<sup>xiii</sup> Even the name of the traditional land management system, *ahupua'a*, refers directly to the *pua'a* and highlights the animal's importance among the variety of resources that were collected and offered during the annual *mahakiki* tributes.<sup>xiv</sup>

However, pigs were never hunted game for ancient Hawaiians. The Polynesian interaction with these animals was one of near-complete domestication. Despite references to hunting rats with bow and arrow, no historic or traditional knowledge sources describe ancient Hawaiians hunting pigs for either food or recreation.<sup>xv</sup> Even in the legend of *Kamapua'a* where the demi-god is pursued by man, he is sought so that he might be punished for his mischievous actions, not for sport or sustenance.<sup>xvi</sup>

To understand the relationship between Hawaiians and pigs further, it is useful to examine the relationship between ancestral Hawaiians and their environment. Far more important than domesticated *pua'a* were the thousands of native plants and animals who represent the *kinolau* (physical forms) of the *'aumakua* (ancestral deities). Ancient Hawaiians believed they were the familial descendents of the *akua*. The upland forest, or *wao akua* (realm of the gods), was held sacred, considered inhabited by the *kini akua* (myriad gods). As a result, these forests were kept religiously and physically distinct from the lowlands, or *wao kanaka* (the realm of people). In the *wao akua* dwelled such storied deities as Hina-ka-uluhe-nui-hihi-kolo-i-u-ka (Hina the great tangled mats of uluhe ferns crawling in the uplands), Hina-ulu-'ōhi'a (Hina-'ōhi'a-grove), Lono-i-ka-'owāli'i (Lono-in-the-'owāli'i -fern), Kumu-hea, (the caterpillar god of Ka'ū), Kū-'ōhi'a-Laka (Kū-of-Laka's-'ōhi'a-tree), Kū-pulupulu-i-ka-nahele (Ku-treefern-wool-in-the-forest), and Kū-'ālana-wao (Kū-[of the]-upland-offering), among the myriad *akua*.<sup>xvii</sup>

As intensely sacred places, the forests of the *wao akua* were not entered except for very specific purposes, and then only by small groups of spiritually and culturally prepared individuals. Following strict traditional protocol, these groups would enter the forest for specific purposes, as to gather medicinal plants, fell carefully selected trees for voyaging canoes, or capture forest birds to harvest ceremonial feathers. In the native Hawaiian experience, human-reared *pua'a*

were considered denizens of the *wao kanaka* and alien to the sacred upland forests. Until the last 150 years, they were also largely absent from them.

### Other ungulate introductions and impacts

Goats were introduced in Hawai‘i nearly simultaneously with the European pig, followed shortly thereafter by sheep, cattle, horses and donkeys. Introduction of this working stock accelerated the spread of western agriculture in the islands.

This change, along with a growing westernization of traditional concepts of property rights and the decline of the Hawaiian population helped contribute to the collapse of traditional Hawaiian land management systems.<sup>xviii</sup>

Other non-native ungulates were to follow. Axis deer were introduced on Moloka‘i in the mid-19<sup>th</sup> century and reproduced so rapidly that, by 1898, the population of axis deer on Moloka‘i was estimated at 7000 animals and hunters were brought in from California to cull the herd.<sup>xix</sup> On

Moloka‘i and elsewhere, Hawai‘i residents soon began to note the deleterious effects of large populations of cattle, pigs, goats, and deer. These introduced animals browsed, trampled, and rooted up sensitive native plant species, converting rich native forest into pasture land or worse. Together with unsustainable *‘iliahi* (sandalwood) harvests, this animal-induced degradation of native forests took its toll and predicated the watershed crisis of the late 19<sup>th</sup> century.

Widespread fencing, feral animal control and forest restoration were undertaken in an attempt to reverse the damage. On June 22, 1878, King Kalākaua himself led a party to the headwaters of Nu‘uanu Stream to plant trees.<sup>xx</sup> Surprisingly, despite these visionary early control efforts, state-sponsored game animal introduction resumed in the mid-20<sup>th</sup> century when the Department of Forestry was reorganized to create a game management division. Soon thereafter, mule deer, pronghorn antelope, and mouflon sheep were introduced for recreational hunting. Today there are six introduced species of game mammals.

### Modern hunting: Incorporating western traditions

The custom of recreational hunting evolved over the last hundred fifty years as native Hawaiians assimilated western traditions in the context of these introduced game animals. The earliest descriptions of western-style hunting occur in the opening decades of the 19<sup>th</sup> century, when outings were organized to control wild herds of cattle that threatened agriculture, residences, and forest resources.<sup>xxi</sup> The practice increased in frequency and in popularity, with island hunters playing a key role in the state’s response to the watershed crisis of the late 19<sup>th</sup> century. These state-sponsored control efforts resulted in the removal of over 170,000 introduced mammals in the first half of the 20<sup>th</sup> century.

Although hunting is not widely practiced in contemporary Hawaiian society – only two percent of the state’s residents obtain a hunting license – it is a visible and common occurrence across

#### Ungulate introductions to Hawai‘i (Tomich 1986)

- Polynesian pig – ca 400 AD
- European swine – 1778
- Goat – 1778
- Sheep – 1791
- Cattle – 1793
- Horse – 1803
- Donkey – 1825
- Axis deer – 1868
- Mouflon sheep – 1954
- Pronghorn – 1959\*
- Mule deer – 1961

\* Now extirpated

the state. Pig hunting, in particular, is a cherished modern practice for island sportsmen, including some whose subsistence depends to greater or lesser extent on wild game. Pig hunting in heavy cover is usually accomplished with the use of dogs, and the required training, feeding and care for these animals can be a difficult and expensive task. The dogs locate, chase, grab, or bay the game, which is then typically dispatched by the hunter with a gun or knife.<sup>xxii</sup> These techniques are derived directly from western and European pig hunting practices, incorporated over the last 150 years in Hawai'i, and passed down through family generations.

### **Striking a balance**

The *pua 'a* plays an important role in Hawaiian history; from their early position as a domesticated food source and important cultural symbol, to their more recent role in recreational and subsistence hunting, they have become part of local culture. As we move forward in conservation, it is important that we understand this historical and cultural context to maintain a proper place for the *pua 'a* in modern society. As with all resources, proper management and application is the key to maintaining balance.

Today we face the continued destruction of native forest, and risk losing an irreplaceable natural and cultural resource to uncontrolled feral animals. Feral pigs are widespread in the world, and in no danger of extinction. *Pua 'a* were valuable cultural resources, but in ancient times were kept away from the *wao akua*, which held so much more value to Hawaiians than a single species such as a pig. As we strive to strike a balance between protecting native Hawaiian plants and animals and our dwindling native forests and the more recent practice of game hunting, we need to reassert the value represented by the *wao akua* to protect it and the *kini akua* for the future generations.

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- <sup>i</sup> Kirch, 1981, p. XX
- <sup>ii</sup> Personal communication, SG reference
- <sup>iii</sup> Diong, p. 50-51; Clarke et al. p. 9; Giffen (1977)
- <sup>iv</sup> Maly, Kepa. 1998. Nā Ulu Lā‘au Hawai‘i (Hawaiian Forests), Kumu Pono Associates, p. 5.
- <sup>v</sup> Maly, p. X; Gon; but see “In the pre-European contact era, Polynesian man-pig interaction was essentially a loose one... pigs were never contained by any method. They were ‘never confined in sites, but range about in search of food’ (Ellis 1831, Vol. I p. 71). The pigs herded with dogs (Cook 1784, Vol. III p. 118) acted as scavengers, and were left unattended to roam freely and without restraint.” (Diong p. 70)
- <sup>vi</sup> Diong, p. 73; See also: “Cook observed that pigs were abundant, formed an important part of the natives’ culture, and ‘were sometimes found wild in the mountains.’” (Diong p. 61)
- <sup>vii</sup> Beaglehole, 1967, p.
- <sup>viii</sup> Tomich, p. 123; Stone, p. 143; Diong, p. 61
- <sup>ix</sup> Stone, C.P. 1990, Feral Pig (*Sus scrofa*) Research and Management in Hawaii, pub info
- <sup>x</sup> Need citation discussing reversion to feral status
- <sup>xi</sup> Stone, p. 142; Diong
- <sup>xii</sup> Hess?
- <sup>xiii</sup> Kamapua‘a lit.
- <sup>xiv</sup> Maly, Kepa. *‘Āina a me ke Kai: Hawaiian Land And Ocean Use Practices*, Kumu Pono Associates website: <http://www.kumupono.com/mahele.htm>, accessed 08 March 2007.
- <sup>xv</sup> Maly
- <sup>xvi</sup> Kamapua‘a publications by Kahiolo, Charlot, Kame‘eleihiwa, akana-Gooch, etc.
- <sup>xvii</sup> Maly, unpublished historical notes, Pukui & Elbert Glossary of Hawaiian Gods 1973.
- <sup>xviii</sup> Osorio 2002 Dismembering Lahui.
- <sup>xix</sup> Dorman, *History of Axis Deer in Hawaii*, 1996. University of Hawaii, website: <http://www.botany.hawaii.edu/bot350/1996/Dorman/dorman.htm>, accessed 11 March 2007.
- <sup>xx</sup> Cox, Thomas R. *The Birth Of Hawaiian Forestry: The Web Of Influences*, 1991, Hawai‘i State Division of Forestry and Wildlife website: <http://www.state.hi.us/dlnr/dofaw/pubs/history.html>, accessed 01 March 2007.
- <sup>xxi</sup> Maly, p. 4
- <sup>xxii</sup> State of Hawai‘i, Department of Land and Natural Resources, Division of Forestry and Wildlife. *Technical Report No. 07-0: Review of Methods and Approach for Control of Non-native Ungulates in Hawai‘i*, 01 March 2007.