Understanding the co-evolutionary relationships between Indigenous cultures and nonnative species can inform more effective approaches to conservation: the example of pigs (pua'a; *Sus scrofa*) in Hawai'i

Kūpaʻa K. Luat-Hūʻeu^{A,H}, Kawika B. Winter^{A,B,C,D}, Mehana B. Vaughan^{A,E,F}, Nicolai Barca^G and Melissa R. Price^A

^ANatural Resources and Environmental Management, University of Hawai'i at Mānoa

^BHawai'i Institute of Marine Biology, University of Hawai'i at Mānoa

^cNational Tropical Botanical Garden

^DHawai'i Conservation Alliance

^EUniversity of Hawai'i Sea Grant College Program

FHui 'Āina Momona, University of Hawai'i at Mānoa

^GThe Nature Conservancy Hawai'i

^HCorresponding author. Email: kupaalh@hawaii.edu

Supplementary Table 1

Article Title	Year Published	Newspaper Publication	Original Text Transcribed	Translation
Ka Ahaolelo: Hale Lunamakaainana	1853	Ka Elele Hawaii	E noa na kao a me na puaa hihiu ma kuahiwi, a me na na ululaau	Lift the taboo from the goats and wild pig in the mountains and the forests.
He Puaa Hihiu nui			kanaka e imi i na puaa hihiu ma na mauna o Niu, Oahu nei, loaa ia lakou kekahi puaa nui loa. Lalau ku ka ilio ka poe hahai, a paa ka puaa i ka ilio, a kokoke pilikia ka ilio no ka ikaika o ka puaa, alaila, lele aku la kekahi	A few days ago, some people went to look for wild pig on the mountains of Niu, Oahu. They got a large pig. The hunters' dogs ran off and took hold of the pig. The dogs almost got into trouble from the strength of the pig, but then, one of the men jumped out and cut the hindquarter tendon and it was quickly killed. It was a big pig indeed, here's how big: 9 foot lengths long – 3 1/2 foot lengths wide, and 4 foot lengths tall. Those hunters of wild animals are smart, and they are also fearless – because the wild boars are strong and aggressive, somewhat similar to the frightening bears of California.
loa	1858	Ka Hae Hawaii	a me ka huhu loa ka puaa kane hihiu, aneane	

			like kona ano me ko ka bea hoopuiwa o Kalifonia.	
Kanaka Make i Ka Puaa	1860	Ka Hae Hawaii	ma ke kano o ka lima akau, a moku; o ka lua ia. Olelo hou aku ka moopuna, "Ua oki ka puaa." Aole ona hoolohe mai, pepehi no kela i ka puaa me ka laau, a moku ae la ke kaula i paa'i, holo pololei mai la ka paiia ma ke alo o Aumai, a hina o Aumai i lalo, a hehi ka puaa maluna, a nahu ma ke kino a ma na uha; nui ke koko i kahe, nolaila, mauleule kela. Kau ia i ka laau Hawaii, aole nae i ola, ua make loa kela. Aloha ino. O keia puaa, he puaa hihiu no, a ke ola nei kela ma ka ululaau.	A letter from Waianae to Hilo about the death of Aumai. His pigs went inside the forest with his rope, then the rope got entangled there; afterwards Aumai got his pig, he grabbed the rope and immediately began beating the pig. He hit the pig's snout, head, and other areas with a stick until the stick was broken into tiny pieces, then at that time, the pig jumped close and bit his hand and severed it. The grandchild, Kawaikai, said "the pig is cut; answering back, "What would ever leave its food?" And then he continued to beat it up; the pig jumped again and bit him again on the bone of his lower right arm, and then severed it; this being the second time. The grandchild said again, "the pig is cut." But he didn't listen, so he beat the pig with the stick, and the rope broke. it ran straight towards the front the Aumai, then Aumai fell down, and the pig trampled on top, and bit his body and his groin, there was plenty of blood flowing, consequently, he fainted. They attempted to put Hawaiian medicine, but he didn't recover, and he died. So sad. This pig is indeed a wild pig, and it still lives in the forest.
Kao Momona	1860	Ka Hae Hawaii	Ua hai mai kekahi haole oiaio ma Kau, Hawaii, i kekahi kao momona loa malaila; ua pepehi kekahi kanaka i kao, i ai nana; a na 19 makahiki o kela kao mai kona hanau ana mai, a ua laweia ka aila no loko he 30 pauna. Nani ke kao momona o Kau! A oia no ka aina kaulana maoli no ka nui a me ka maikai o na kao, aole aina ma Hawaii nei e like me Kau no ka hanai kao. Eia kekahi :Ua pepehi ua kanaka nei 193 puaa hihiu ma ka nahelehele, a ua iki aku hoi i 500 puaa hihiu e holo pu ana; nani ka waiwai o Kau!	Some foreigners mentioned in Kau, Hawaii, about some really fat goats there; some people killed goats, and ate them, the fat was taken from within to weigh 30 pounds. The fat goats of Kau are beautiful. And yes that's so, really famous land for the plentiful and good goats, no other land in Hawaii is like kau for their domestic goats. Here's one: the aforementioned hawaiians killed 193 wild pigs in the wild, with less than 500 wild pigs running together. the wealth of kau is splendid!

Olelo Hoolaha	1861	Ka Hae Hawaii	O wau ka mea nona ka inoa malalo, ke papa aku nei au i na haole a me na kanaka maoli, aole lakou e kua laau a oki wahie, aole hoi e hoa i ke ahi i ka mauu a me ka nahelehele, ma koʻu aina i kapaia o paauhau, ma hamakua, Hawaii. Ke hoole nei no hoi au i ke ki ana i ka pu, a me ka hoohei ana, a i ka hoopaa ana ma kekahi ano e aʻe, i na bipi e holo la ma ua aina la oʻu. A ke hoole nei no hoʻi au i ka poe hewa i ke alualu puaa, a hoa i na lio, me kuu lohe ole. A o ka mea i kue i keia papa ana, e hoopii ia o ia i mua o ka aha Kaukawai no ke komohewa.	I am the one whose name is below, I forbid any haole and native hawaiian, they will not cut trees and make firewood, should not burn grass and the undergrowth, on my land called paauhau, in hamakua, hawaii. I'm indeed denying the shooting of guns, and setting snares, to make something stuck nearby, if cattle walk through my land. And I'm indeed denying any wicked people from hunting pig, and herding horses, without me knowing. And if anything is protested in this prohibition, he/she will be sent to a legal complaint in front of the Kaukawai court for trespassing.
Olelo Hoolaha	1861	Ka Hae Hawaii	NO KA Poino pinepine o ka mea i kakauia ka inoa malalo iho, no ka hele o kekahi poe maluna o ko makou aina, he aihue me ka hoa i na Bipi a makou, Nolaila, ke papa aku nei makou i na mea a pau loa ke komo mai ma keia mau aina i hai ia malalo, ina no ka hoa Lio, pepehi, a i ole ia, hoohei Bipi, alualu Puaa paha me na hana e ae oia ano, me ko makou AE OLE AKU; a o ka mea kue i keia papa ana, e hoopii ana makou ia ia, e like me na Kanawai o ka aina. Eia ka inoa o ua mau aina la, "Ke Ahupuaa o Waimea," "Oule," "Puukapu," "Waikoekoe," "Kalopa," "Nahuina," "Kapulena," "Kaohe," "Kaholalele," "Kaala," "Humuula."	For the often misfortune of things the names are written below, for people going on our lands, thieves that herd our cattle, therefore, we are forbidding anyone from entering these lands that are mentioned below, if herding horses, killing, or anything negative, roping cattle, possibly hunting pigs with doing anything else of that kind, we do not give permission; and for anyone who opposes this taboo, we will file a legal complaint to them, similar to the laws of the land. Here are the names of the aforementioned lands, "Ke Ahupuaa o Waimea," "Oule," "Puukapu," "Waikoekoe," "Kalopa," "Nahuina," "Kapulena," "Kaohe," "Kaholalele," "Kaala," "Humuula."
Olelo Hoolaha	1869	Ke Au Koa	E ike auanei na kanaka pau loa, na haole, na pake, o kela a me keia ano, ke nana mai lakou i keia olelo hoolaha, Ke hookapu loa aku nei au, me ka papa ikaika loa aku i na kanaka a pau, e noho ana maluna o na aina o ka POE HUI HANAI HOLOHOLONA a me na kanaka o na wahi e ne, aole lakoi e hele wale maluna o keia mau aina, e huli lio ma ke kula, a alualu puaa, a ano e ae paha, e waiho la. MA WAIMEA, HAWAII, oia hoi keia mai Puukawawai a Puukapu, a ma laila aku ma na palena o waikoloa, ma kohala hema, a me ka aina o Humuula, ma Hilo, Hawaii, ua kapu loa, No ka mea, he nui ka poe hele kolohe	For every person to soon know, haole, chinese, and every kind, they look at this advertisement, I am prohibiting, with great prohibition to everyone, living on lands of farms and people of those places, they should not come on these lands, to look for horses in the fields, or hunt pigs, or possibly anything else, leave alone. AT WAIMEA, HAWAII, so this is from Puukawawai until Puukapu,a there up to the border of Waikoloa, to South Kohala, and the lands of Humuula, in Hilo, Hawai'i, are prohibited, because, there's plenty of mischievous wandering people, killing cattle in the field, so this remains for those people. So if any person is caught doing this, he/she will be arrested, and they will possibly be served a complaint in front of the judge, such as to the law. – Ashford Spencer, Manager.

			Ashford Spencer, Manager.	
			Ma ka la 22 o Feb i hala, ua pii aku la o	On the 22 day of February, Ieremiah and his older
			Ieremiah me kona kaikuaana i ke alualu puaa	brother walked upwards to pig hunt in the mountains
			ma ke kuahiwi o Waihee, maui, me ka laua	of waihee, maui, with their dogs. When they finally
			mau ilio. I ka hiki pono ana o laua i luna o ke	arrived at the top of the mountain, a pig was spotted,
			kuahiwi, ike ia ka puaa. a hoomaka laua e	they began to swear at the dogs, and the pig was stuck
			hoohiki aku i na ilio, a ua paa io aku la ka	by the dogs. Ieremiah thought the pig was stuck good,
			1-	he walked intensely, but, it suddenly released from the
			hemo hou mai la nae mai ka waha mai o na	mouth of the dogs, the aforementioned pig walked towards him and bit his left shoulder, and completely
			ilio, holo maila ua puaa nei a nanahu ma kona	cut it, and so they lost the pig, escaping alive, with
			poohiwi hema, a moku pu aku la, a nalowale	barely a scar.
Na Nu Hou		Ko Hawaii Pae	loa aku la ka puaa, Ua pakele mai ke ola, me	
Hawaii	1880	Aina	ke kau ana iho nae o ke alina mahunehune.	