Project Summary

People love Hawaii, people love strawberry guavas, and quite often, people love to eat strawberry guavas in Hawaii. Who doesn't? Its red and looks like a delicious round bulbous baseball. Contrary to the deceptive popular perception of strawberry guava's in Hawaii, including all the trivial sunsets and fruit smoothies, the plant is a major invasive species, that not only threatens biodiversity in the Hawaiian Islands, but also threatens several ecosystem services. Hopefully, through the visual image supplied, a combination of drawing and digital collage, I will bring attention not only to the ecological risks associated with invasive species like the strawberry guava, but also to the possible solutions needed to combat the negative implications.

The Hawaiian Islands are said to be distinct in their extreme susceptibility toward the effects of invasive species. Presently, there are over 4600 non-native plant species in Hawaii, approximately 800 of which are spreading and reproducing outside of human intervention. 86 of these species are invasive and are believed to represent serious threats to native ecosystems [1]. Specifically, the strawberry guava, which is native to southeastern Brazil, was brought to Hawaii in 1825. The harm to plant biodiversity is caused by the rapid invasion of native species, and due to the thick, crowding nature of the plant, it is extremely hard to cut down. Adding to this, the guava is without any natural predators in the islands and grows with exceeding impunity [2].

The threat to ecosystem services grows out of the eventual stunting of possible agricultural land, something that the Hawaiian Islands are in desperate need of. The roots of the strawberry guava are so deep and tough, that the ability to remove them requires an amount of physical labor that is almost unrealistic. The roots, once cut, fragment, and if the fragment is accidentally untouched, the species will continue to grow. [3]. Land use for agriculture is therefore impaired by this problematic species.

Another ecosystem service threatened by this invasive species is the guava's effect on Hawaii's water supply. Research done by the University of Hawaii in the Hawaii Volcanoes national park showed that the invaded site had "much higher evapotranspiration" than usual. The study goes onto explain the stated term as meaning that more water was lost to the atmosphere, compared to sites that remained uninfected by the guava. The average was said to be 27% higher [4]. This is a huge loss of ecosystem resources in the area that will harm both the Hawaiian economy and the environment.

The rise of the strawberry guava is also connected to Hawaii's problem of the ecological effects of feral animals. A feral pig, for instance, will feed on the fruit of the guava as an abundant resource. According to David Littschwager, the pig will then spend its remaining energy disturbing the native vegetation and biodiversity throughout the forest. Along with this, the feral pig will spread the seed of the guava in a way that expedites invasion. Other non-native invasive species such as birds also contribute towards further ecological problems. According to Littschwager, any type of ecological recovery of biodiversity "depends on the collection of genetic material, propagation, and reintroduction to protected area. Several greenhouses specializing in rare and endangered plants are in operation" [5].

Through the presented drawing collage, which juxtaposes drawn images with altered digital images, an aesthetic of disaster is intended. The scanned hand-drawn images are meant to interject a personal function toward what ideally would be a widely disseminated image across

the internet, rather than a physical presentation in an exhibition space. This responds to a fairly contemporary trend within art to show images to the public rather than though institutions. The internet is anarchic, therefore the work's intention is to be thrown into the chaos, as a strange and somewhat juvenile gesture, at drawing attention toward these particular ecological concepts.

Bibliography

1.Baruch , Z, and G Goldstein. "Z. Baruch \cdot G. Goldstein Leaf construction cost, nutrient concentration, and net CO 2 assimilation of native and invasive species in Hawaii." *Oecologia* 121 (1999): n. pag. *Brynmawr*. Web. 23 Apr. 2013.

The information aquired in this source shows the number of plant species present in the Hawaiian Islands. It then goes onto breakdown the number of species which are invasive among them, and the amount of species which are endangered. I thought this would be a useful introduction to set the stage for how the strawberry guava would affect Hawaii's ecosystems. Considering this, I incorporated an intricacy to my collage that is metaphorically supposed to represent the biodiversity of the Hawaiian Islands and the subsequent takeover by the guava. The immediate placement of the various forces of invasion in the foreground is supposed to show the influence of such invasive species on an ecosystem.

2. "Pacific Southwest Research Station." Strawberry Guava Details. US Forest Service, 5 Feb. 2003. Web. 23 Apr. 2013.

The information aquired in this source shows a history of the introduction of the particular invasive species, the strawberry guava, to Hawaii, as well as an emphasis on how the spreading of the plant has overtaken endangered plants that are native to the land. The source also explains that the guava has no natural predators and is extremely hard to destroy. I illustrate this though the drawings of various endangered and rare plants in Hawaii who are running away from the sinister guava. I illustrate the invasion metaphorically by showing the guava ejaculating over everything in its path.

3. Vaughan MacCaughey, The Guavas of the Hawaiian Islands.Bulletin of the Torrey Botanical Club

Vol. 44, No. 11 (Nov., 1917), pp. 513-524 Published by: Torrey Botanical Society Stable URL: <u>http://www.jstor.org/stable/247950</u>.

The information aquired in this source shows the negative impacts on the specific ecosystem resource of Hawaiian farmland by the strawberry guava. The source explains that the roots are difficult to cut and that the land is often unable to be used for farmland because of the infestation. I illustrated this by showing various figures attempting to cut the guava down, but their attempts at the malicious creature are gravely unsuccessful.

4. Giambelluca, Thomas. *Impact of Strawberry Guava on Water Supply in Hawai'i.* <u>Http://</u> <u>www.hear.org</u>. University of Hawaii, 22 July 2008. Web. 23 Apr. 2013.

The information aquired in this source shows the effect of the strawberry guava on water ecosystem resources in Hawaii. According to the article, the resources have been diminished by

27% compared to ecosystems without the strawberry guava. The article goes onto say that this will have drastic effects on Hawaii's economic and environmental well-being. I illustrated this by showing the guava sucking the water out of the atmosphere, providing a straightforward and narrative visual representation to this phenomenon.

5. Littschwager, David, and Susan Middleton. *Remains of a Rainbow: Rare Plants and Animals of Hawaii*. Washington, D.C.: National Geographic Society, 2001. Print.

The information aquired in this source, which is a book in the Pratt Institute Library, demonstrates the influence the strawberry guava has on another invasive species in Hawaii, the feral pig. The pig will survive long after eating the guava, allowing it to pillage and destroy the surrounding ecosystem, already a problem caused by feral pigs. The pigs also spread the guava seed around the ecosystem, furthering its invasive process. I illustrate this through the placement of several rabid guava-headed pigs who are causing destruction in the environment throughout.

Images used on Drawing Collage:

http://www.shallenbergerphoto.com/pages/nastelia.htm

http://www.hawaiireporter.com/feds-plan-bio-warfare-experiment-on-hawaiis-strawberry-guava/ 123

http://www.fs.fed.us/psw/topics/biocontrol/strawberryguava/native_forests.shtml

http://www.wallcoo.net/nature/Sz_216_Hawaii_Sky_and_Sea_Aquamarine_1920x1200/html/ wallpaper20.html

http://tastyislandhawaii.com/2008/05/18/strawberry-guavas-by-the-buckets/

http://www.akusociety.org/nitisinone

http://www.ifa.hawaii.edu/info/vis/natural-history.html

