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Maui Nui, Marine First Place

### Maui's Delicate Ecosystem

The Hawaiian Islands are one of the most remote places on earth, located exactly 2,741 miles from the nearest large landmass (California) and is in the middle of the Pacific Ocean. Within the Hawaiian Island chain there are eight main islands: Hawai'i, Maui, O'ahu, Kaua'i, Moloka'i, Lanai, Ni'ihau, and Kaho'olawe. People have been living in Hawai'i since 400 C.E. when the first Polynesians from the Marquesas Islands sailed to Hawai'i in large hand-made canoes and settled within the islands, over the many years since the first settlers the Hawaiian Islands delicate ecosystems have dramatically deteriorated. This change in the ecosystem has greatly changed Maui for the worse and has also had a great impact on the way people live today.

The beaches and animals that live and feed there have suffered changes both man-made and natural that have caused the beach environment to change leading to the death of many animals that are easily overlooked but are still very crucial to a healthy ecosystem. There are many animals that feed and live at beaches that depend on the sand as a source of shelter or food such as the ula ula (sand turtle), 'ōpala ke'oke'o (sand crabs) and other native birds such as the ae'o (Hawaiian Stilt) that depend on these crustaceans for food. I had the privilege to sit down and talk to the owner of Maui Sporting Goods, Brian Yoshikawa and in the time I had to sit down and talk with him he told me stories about a specific spot on the north shore of Maui called Camp 1 in the ahupua'a of Waiopua. In those stories he talked about the abundance of not only fish but sand turtles and sand crabs that he remembers there being, he stated "There used to be a

lot of sand turtles and sand crabs, and now there are very little to none.” After talking to him a little more he believes this change is due to the fact of over-harvesting by the homeless people who live in the area that catch them to eat, although they are taking what they need they harvest the same area every day which is not a sustainable practice and we are now seeing the effects of this at our local beaches. More fishermen should use commercial fishermen as an example because they display practical fishing practices by rotating spots to avoid exploiting a single specific spot, this way they are able to ensure there will always be a healthy population of fish. The problem with harvesting sand crabs and sand turtles every day from the same beach is that those species never get to fully mature or reproduce causing there to be a huge gap in the reproduction cycle of those animals, and if those animals don't make a comeback we will see other impacts on other species such as the ae‘o bird (Hawaiian stilt) and other fish that depend on them for a source of food.

The quality of our oceans are deteriorating a lot faster than many people think or can comprehend due to several different reasons such as global warming, blockage of streamflow, and overfishing. The delicate ecosystem Maui has can be greatly impacted by these things, within a matter of 10 years a place can go from being pristine and full of life to barren and lifeless. When talking to Brian Yoshikawa he specifically talked about the abundance of moi (Pacific threadfin), ama‘ama (native Hawaiian striped mullet), ‘ōpae (Halocaridina Rubra), and edible limu (seaweed) he remembers there being at Camp 1. We talked about some of the reasons he believes caused the reef at Camp 1 to become the lifeless and fishless reef people see today. He said: “The irrigation of water from native streams for the cane fields is the biggest cause of this change, but there are also other causes such as global warming, and overfishing.” I learned that having streams flow all the way into the ocean is crucial to having a thriving

ecosystem because it provides a food source for the fish in that area, and I also learned that Brian first noticed the life at Camp 1 to start to disappear when they completely irrigated and diverted the stream that flowed into the ocean at Baldwin Beach in the ahupua‘a of Hāmākuapoko which provided fresh water down the coast to Camp 1. Since the dirt at Camp 1 is a very dense clay type and with the oceans levels rising beaches are getting washed away, and when those beaches get washed away the waves come all the way up to the dirt parking lot they have there causing a bunch of mud and other shoreline debris to go into the ocean killing the corals and native fish species. Overfishing is also another cause for the fishless reef we see today, people not following sustainable practices and taking undersize fish, more than they need or is allowed, and people harvesting fish that aren't in season. The oceans are ever-changing and if we don't change something we will no longer have these valuable natural resources people take for granted every day.

The first settlers in Hawai‘i were very observant and realized that the streamflow provided food for the fish and caused a very balanced ecosystem that sustained itself for thousands of years. There is a strong relationship between the diversion of water and the quality of the coastal ecosystem, which is why Brian says: “A way we could restore or protect these resources would simply be to restore natural streamflow whether it be underground springs or surface stream water.” He also talked about how the dredging of offshore sand outside Camp 1 has left no sand to shift around within the reef which is crucial because the fish that live there depended on the movement of the sand to expose the crustaceans that they eat, and we should use this as an example so people will take more precaution when deciding to take natural resources such as that. Another way people can try to protect our precious natural resources that are on the verge of extinction is by minimizing the use of fossil fuels, which will help reduce the

amount of carbon in our atmosphere which is currently trapping the heat in our atmosphere causing global warming. I proceeded to ask Brian what he thinks the coast at Camp 1 will look like by 2070 and he said: “ I really think that some of these species will disappear forever” unless people realize this tragedy is occurring and be a little more sustainable to help conserve this place we are able to call home. To different people the term sustainability has different meanings, the word sustainability to me means to do what is right beyond the laws and having the conscious understanding of our ecosystem to know that “yes” I can keep that barely legal pāpio (trevally) that will feed me for a meal or I can let it go so it can reproduce several times within its life span to help produce a healthy stock of pāpio for future generations. The people that harvest resources from our coastline should realize that there are things they can do as well to help prevent the loss of our coastlines that have been thriving for thousands of years before the present day.

Hawai‘i is extremely remote causing it to have one of the most delicate ecosystems in the world with many species that are only found within the islands and these species are constantly going extinct and being categorized as endangered. There are more factors that are required to have a healthy ecosystem than people think, and the Hawaiians realized this so they made sure all parts of the ecosystem were healthy to ensure that there would be resources for the next generation. The marsh and streams play a crucial role in the survival and health of the oceans and coastal environments even though they don't seem to be connected at all, they rely on each other to provide nutrients for the things living within that certain area. The Hawaiians believed wai (water) was the same as life because it is needed to have any living plants or animals, which was what they depended on as a source of food for them and their families. The well-being of natural wildlife within the eight main Hawaiian Islands is dwindling mostly because of changes

made by humans and it's up to us to realize changes need to be made and hopefully it's before it's too late so the fish and ecosystems can make a full recovery and thrive like they once did.