

**Case Study Joint Base
Pearl Harbor-Hickam Base**

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Current Situation:

Pearl Harbor Naval Complex is the Navy's principal installation in the Pacific and arguably the most strategic U.S. naval installation. PHNC includes about 12,600 acres of land and 68,000 acres of water on the southern side of Hawaiian Island of O'ahu.

The complex has massive infrastructure and the land and aquatic range within it has twenty- eight endangered, threatened, or critical habitat species living within the region.

Areas of the complex have been deemed superfund and there is active cleanup on eighteen sites of the complex with the cooperation of the Environmental Protection Agency and State of Hawaii. There are no immediate threats to human health, but there are regular warnings to the community about high pcb levels in the fish and shellfish caught in Pearl Harbor with cautions about limiting consumption. (Campora 2011)

Pearl Harbor is on the EPA's National Priorities List (NPL). According to the EPA website, "NPL is the list of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants or contaminants through out the United States and it's territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation." Cleanup efforts at JNPHH are massive and ongoing. There 2011 INRMP Ten- Year Fiscal Plan has a 10 million dollar ten year spending plan for such things as mangrove control, predator control, and riparian restoration, surveys and environmental education expenses. This kind of spending will not be ending any time soon as there are so many endangered species on the base and water and it is anticipated the giant oil spill (refer to developing problems) will cost 10's of millions as well.

Military Activity:

Pearl Harbor Naval Complex provides logistical support for ship maintenance, berthing, supply, storage and repair. It can house the largest ships in the fleet and because it is the only maintenance facility in the Middle Pacific for submarines it hosts visiting submarines in large numbers. Hickam Air Force Base operates on this land as well and serves as a launch point for special air missions and operational missions in support of the Global War on Terrorism. It is often referred to as Joint Base Pearl Harbor- Hickam (JBPHH). There is naval and airforce housing; a hospital and the world's largest communications station the Naval Computer and Telecommunications Area Master Station Pacific is situated in the center of the island. PHNC began operation in 1901 and was merged with Hickam Field in 2005.

Natural Marine Environment:

Pearl Harbor can be divided into four lochs that provide an estuarine environment. South, Middle, South East and West. The lochs are bordered by marsh habitat and wetlands. Waiau, Waimal, Kaalauao Honouliuli, Aiea, Waikele, Waiawa, and Halawa are streams that drain into seven watersheds before pouring into the harbor. The harbor was named for the oysters that flourished and created pearls before the Navy built their complex.

Mitigation actions and developing problems:

Tens of millions of dollars are spent every decade to improve the massive environmental concerns at JBPHH. Endangered flora is being propagated and restored into the habitat,

educational material is being created, and predators of the endangered species are being controlled. The Red Hill jet fuel that was leaking was removed and the storage facilities retrofitted. Basically, because of the massiveness of the environmental contamination, the large numbers of endangered species and the crucial tactical importance of JBPHH there is massive funding and effort being put forward to comply with Federal Law on protecting and restoring the region.

In 2016 an instruction memo was released by the DoD- Department of the Navy at JBPHH instructing the seamen to be increasingly aware of the endangered species within Pearl Harbor's inner harbor and entrance channel as several endangered species were finding this habitat especially attractive. Sea turtles, monk seals, humpback whales and rays are mentioned and it is cautioned that Federal law protects endangered and threatened species from harassment, harm, pursuit, hunting, shooting, wounding, killing, trapping, capturing, collecting or attempting to engage. With regards to sonar they are instructed to power down the equipment if a marine mammal is sighted within 200-1000 yards. And there are instructions for reporting sightings. (Keeve 2016)

In 2015 awareness grew about the fact that there is bunker fuel that has been leaking from a tank farm since World War II. It is estimated that about 5 million gallons encompassing 20 acres lying 5-40 feet below ground under substantial power lines. The Navy, EPA and the State of Hawaii have been working on this problem since 1983. The Navy says it is stable, not moving toward the ocean and not in a water table that is currently being used. There are 700 documented areas of contamination on the base. (D'Angelo 2015)

Recommendations for future action:

JBPHH is in dire need of a PR upgrade. The public has no idea how much is being done and spent to improve the habitat and contain environmental issues. The Navy makes few public statements about the environmental situations affecting the marine habitat in Pearl Harbor and when it does they are negative. The environmentalists have a field day in the media, as they are the only ones speaking very much. When you read the internal communications it is obvious how much care is being taken but after speaking with people born on the island and people who visit O'ahu there is a real disdain for the military presence and a palpable hostility towards what is being perceived as harm to the beautiful, biodiverse island. For example in September 2015 when the Huffington Post reported on the oil plume, Tom Clements, a Navy spokesman commented that it is not a threat to drinking water and it is not moving. They quoted a Senator, and three environmentalists; one called it "the most egregious, the most harmful environmental issue there is." Even the Senator mentioned how this type of situation makes one not trust the government. (D'Angelo 2015) There is a wonderful quote by Admiral Gary Roughead- Chief of Naval operations in 2009 . "What happens in our environment and to our natural resources is a matter of national security. What happens in our environment cannot be dealt with at some later date; it must be addressed now, and we must keep it on our minds constantly," Navy spokesmen should be using this quote over and over as well as quoting some of the expenditures in the Ten-Year Fiscal Plan from the INRMP showing millions of dollars spent on environmental cleanup and habitat restoration at JBPHH. This quote should be repeated constantly to the media to help the public

understand that the U.S military mission is to protect the environment despite past military land use discretions. Something could have been mentioned about the laws firmly in place that help fund the kind of clean up that are ongoing at JBPHH. The Navy needs to form a better relationship with news outlets and with community outreach as volunteers could even be recruited to help with labor costs. The extensive restoration, habitat protection and careful monitoring and protecting of endangered and threatened species needs to be a daily source of public information within the community. The fact that DoD controlled land is three times more be a safe harbored endangered species than private land is a fact that is important for islanders to know.

The fish and shellfish contamination issue is not only terrible for community health who have a long history of fishing within the harbor but is also threatening to the endangered species that live within the harbor. The regular posting of pcb warnings is also a PR nightmare- regularly reminding the community about the past failures of the military presence on the island. This problem needs to receive immediate attention and because Hawaii is humid in general it may be a great environment to work with the white rot fungal species that are know to significantly reduce pcb contamination in soil.

“*P. ostreatus*, which resulted in PCB removals of 18.5, 41.3 and 50.5% from the bulk, top (surface) and rhizosphere, respectively, of dumpsite soils after 12 weeks of treatment. Numerous transformation products were detected (hydroxylated and methoxylated PCBs, chlorobenzoates and chlorobenzyl alcohols), which indicates that both fungi were able to oxidize and decompose the aromatic moiety of PCBs in the soils.” (Mater 2017)

Regular educational tours with school children, the indigenous community and tourists should be encouraged regularly on the restoration sites with expenditure education as well as slide shows showing before pictures and final restoration landscape tours.

Summary:

Joint Base Pearl Harbor-Hickam Base is situated on one of the most biodiverse regions of the world. The last century's environmental military failures are highlighted on this relatively small ecosystem. Massive contamination and high numbers of endangered flora and fauna make this a region that has its work cut out for the EPA, Military and State of Hawaii. The incredible improvements made by these agencies to this beloved island need to be highlighted to the community and more can be done to improve the food quality for the local people that rely on the harbor for their dietary needs as well as the endangered and threatened species who cannot afford any more pollutants in their diet.

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