

*Partnering in*  
**HAWAII**  
*benefits* **Birds &**  
**Military Training**

U. S. Navy photo by Journalist 2nd Class Timothy Walsh



*Rebounding Stilt Population  
Tells the Tale*





Two young stilts at the refuge.

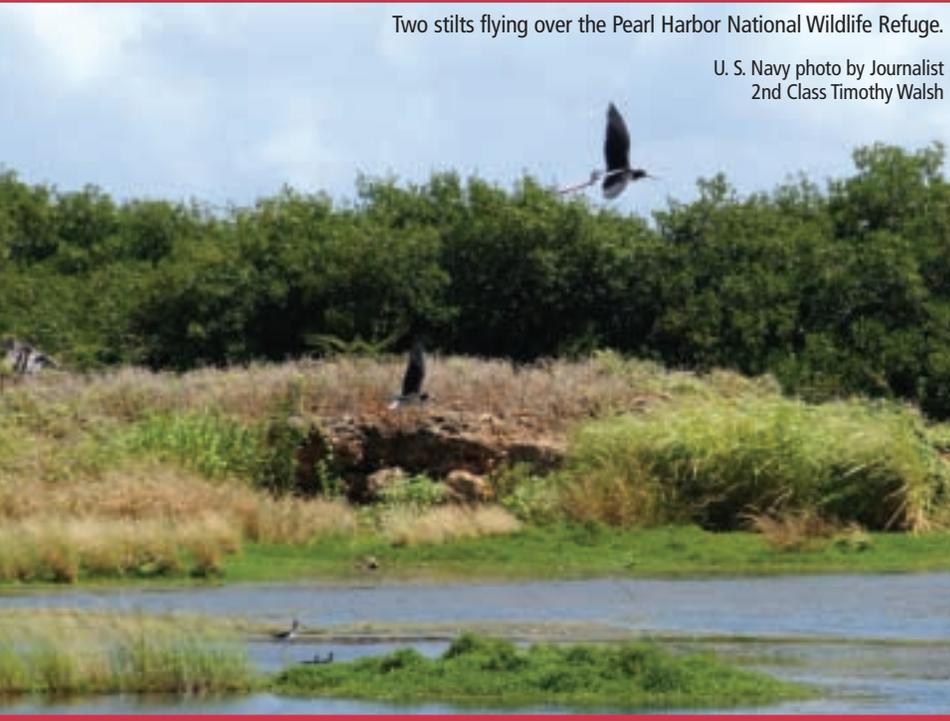
U. S. Navy photo by Journalist 2nd Class Timothy Walsh

## *Pearl Harbor National Wildlife Refuge*

Pearl Harbor is commonly known as a National Historic Landmark, site of the attack on the United States Pacific Fleet on Sunday morning, 7 December 1941. Others know Pearl Harbor as an active homeport for submarines and surface combatants, as well as a naval shipyard. Few know Pearl Harbor in its other capacity—that of a National Wildlife Refuge.

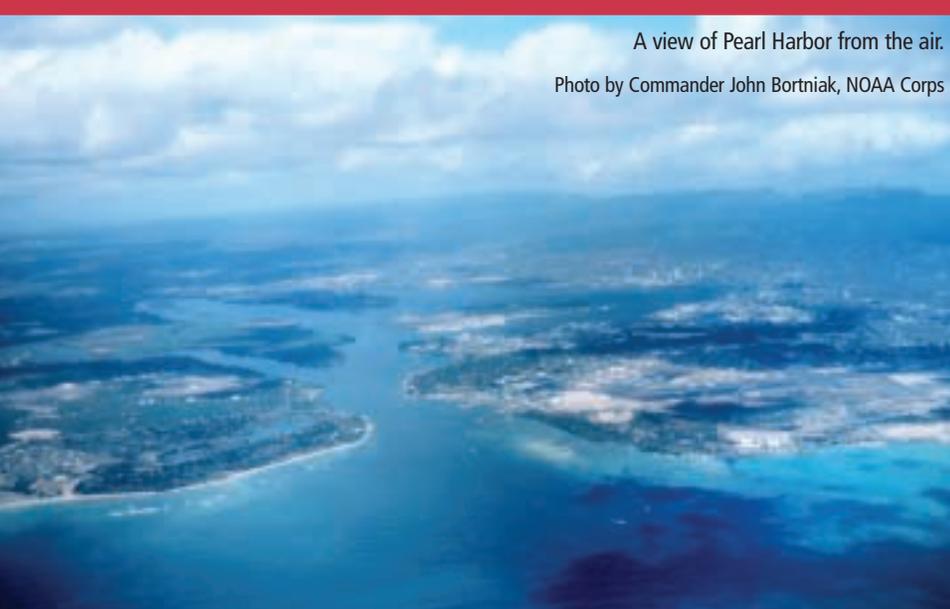
The Pearl Harbor National Wildlife Refuge was established in 1976. The U.S. Fish and Wildlife Service manages the refuge under a 1972 “Use Agreement” with the U.S. Navy. The refuge consists of two areas of Pearl Harbor constructed as manmade wetland habitats for Hawaii’s endangered native birds. The Hawaiian stilt is one of four state- and federally-listed endangered species now resident at the refuge. This refuge is possible through the collaborative efforts of the Navy, U.S. Fish and Wildlife Service, the Federal Aviation Administration, the State of Hawaii and numerous volunteers.

The Navy and community volunteers have contributed time, equipment and enthusiasm to constructing and maintaining the wetland habitat. To gain useful training, Navy SeaBees construction battalion unit brought in heavy equipment and removed unwanted vegetation, created a drainage system and pond, and built potential nesting sites for the mud-loving stilts. Navy cleanup days, spent clearing the refuge of non-native plants, are often planned for Saturday mornings and can turn into popular family or single sailor events organized by the Refuge Manager and the Navy Public Affairs Office with the active support of the neighboring Leeward Community College’s environmental program. At past events, volunteers enjoyed getting wet, muddy and tired as they removed exotic vegetation, cleared outlet ditches of invasive bushes, repaired fences and planted native species.



Two stilts flying over the Pearl Harbor National Wildlife Refuge.

U. S. Navy photo by Journalist  
2nd Class Timothy Walsh



A view of Pearl Harbor from the air.

Photo by Commander John Bortniak, NOAA Corps

Sierra Club service project volunteers pull mangrove keiki along another part of Mokapu shoreline where contractors had removed established mangrove the previous year. The taller trees growing up in the background are more benign milo (*Thespesia populnea*) “reclaiming” the area. (Milo in Hawaii is thought to be either indigenous or introduced by early Hawaiians settlers. Its wood, fiber, shade, and shoreline protection capabilities are highly valued.)

Photo by Diane Drigot



Marines and local high school students pull young mangrove weeds (mangrove 'keiki') together at Nu'upia Ponds.

Photo by Diane Drigot

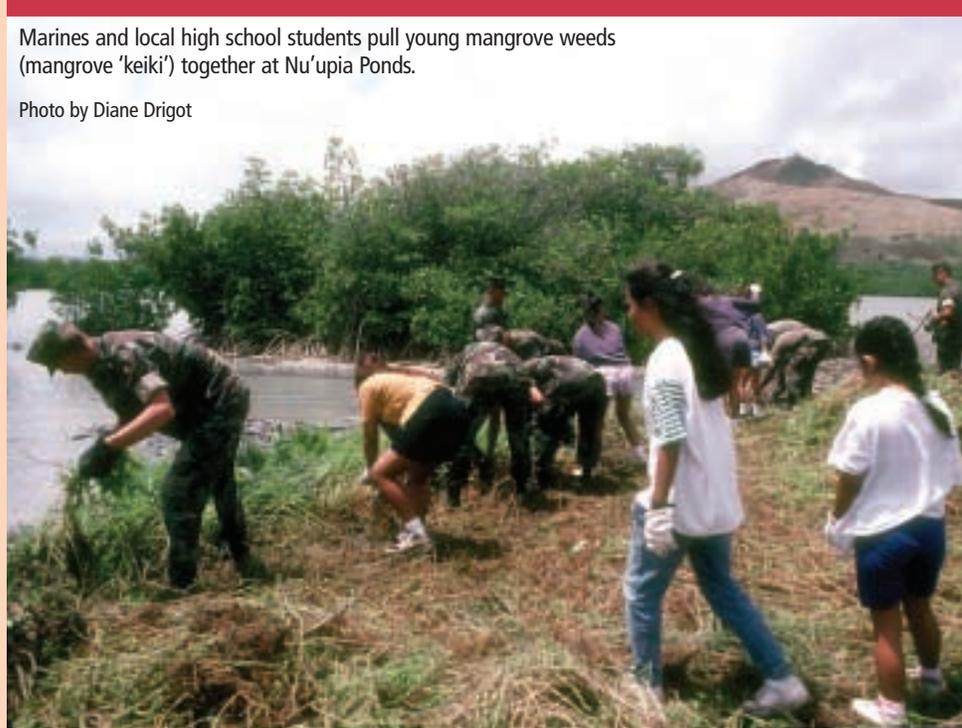
Hawaiian stilts nest, raise their chicks and feed at the Pearl Harbor refuge. The increase in nesting exceeds management expectations. Mike Silbernagle, biologist with the U.S. Fish and Wildlife Service, reports that during the 2003 stilt breeding season between 70–85 chicks were fledged at Pearl Harbor, a more than three-fold increase over the 2002 season.

This thriving wetland also provides educational opportunities. Each year the Hawaii Nature Center's third grade Wetlands Education Program arranges visits to this site for many of O'ahu's children to learn the value of wetlands to Hawaii's environment.

The U.S. Fish and Wildlife Service's Haleiwa Office manages access to the refuge. Visits to the area are by special permit and are prohibited during the February to July nesting season.

### *Nu'upia Ponds Wildlife Management Area at Marine Corps Base Hawaii*

On the opposite and windward side of O'ahu is Mokapu Peninsula, where a primary component of MCBH, known as MCBH Kaneohe Bay, is located. MCBH's 482-acre Nu'upia Ponds Wildlife Management Area is an inter-connected complex of eight shallow ponds and vegetated mudflats that links Mokapu Peninsula to the rest of O'ahu. With Hawaii's total Hawaiian stilt population estimated to be 1,600 birds, these ponds support nearly 10 percent of the population. This is an increase from the roughly 60 birds found here twenty years ago.



Kaneohe Bay.

Photo by Commander Grady Tuell, NOAA Corps





A nesting stilt is evidence of the successful efforts to re-establish its habitat on O'ahu.

Photo by Rob Shallenberger, U.S. Fish and Wildlife Service

An active wildlife management program involving base staff, state and federal agency partners and community volunteers has supported this stilt population increase. Partners include Hawaii Department of Land and Natural Resource, U.S. Fish and Wildlife Service, the Navy's Pacific Division, Naval Facilities Engineering Command and the National Marine Fisheries Service.

Deliberate removal and control of invasive plant species, particularly pickleweed (*Batis maritima*) and mangrove (*Rhizophora mangle*) is a critical component of the efforts. By the early 1970s, invasive pickleweed mats had engulfed much of the pond's open mudflats valued by foraging shorebirds. No stilt had been seen in the area since the early 1960s. Marine amphibious assault vehicles (AAV) were regularly using pond perimeter mudflats in their daily drive to the sea for maritime maneuvers. In 1971, partner agency biologists noted the presence of the first Hawaiian stilt nests in the area since the early 1960s. Stilts were attracted to the muddy, moist areas disturbed by the massive track marks left by these 26-ton vehicles. The tracks would stir up juicy morsels to eat (insects, worms, larvae, small fish) and created a "moat and island" pattern in the watery terrain that discouraged predators and encouraged nesting. Stilts use a simple scrape on a mud mound for a nest.

When active stilt nests were noted along the "muddy highway" traveled

by the AAVs, what could have been a mission "show-stopper" turned into an opportunity for all. Agency biologists obtained permits to remove eggs from threatened nests and transferred them to the Honolulu Zoo for captive rearing. Stages of the hatchlings' growth were studied—yielding valuable, previously unknown information about the stilt's biology. A way was found to resolve an apparent conflict of missions—a new daily access pathway to the sea was constructed for the AAVs north of the pond in the drier brush. AAV access into the ponds was allowed, on a seasonal basis, just before the beginning of stilt nesting season to control pickleweed and enhance habitat. These annual "mud ops" maneuvers have been happening for more than twenty years to the benefit of both stilt habitat and military training.

In the case of invasive mangrove, hand pulling and mechanical removal have been necessary. While mangrove is protected in its native habitat elsewhere, it is an invasive plant in Hawaii. Since its introduction in the early 1900s, mangrove have degraded wildlife habitat, water quality, flood retention, and recreational values of Hawaii's wetlands. At Nu'upia Ponds, mangrove became well-established by the mid-1970s. MCBH recently completed a 20-

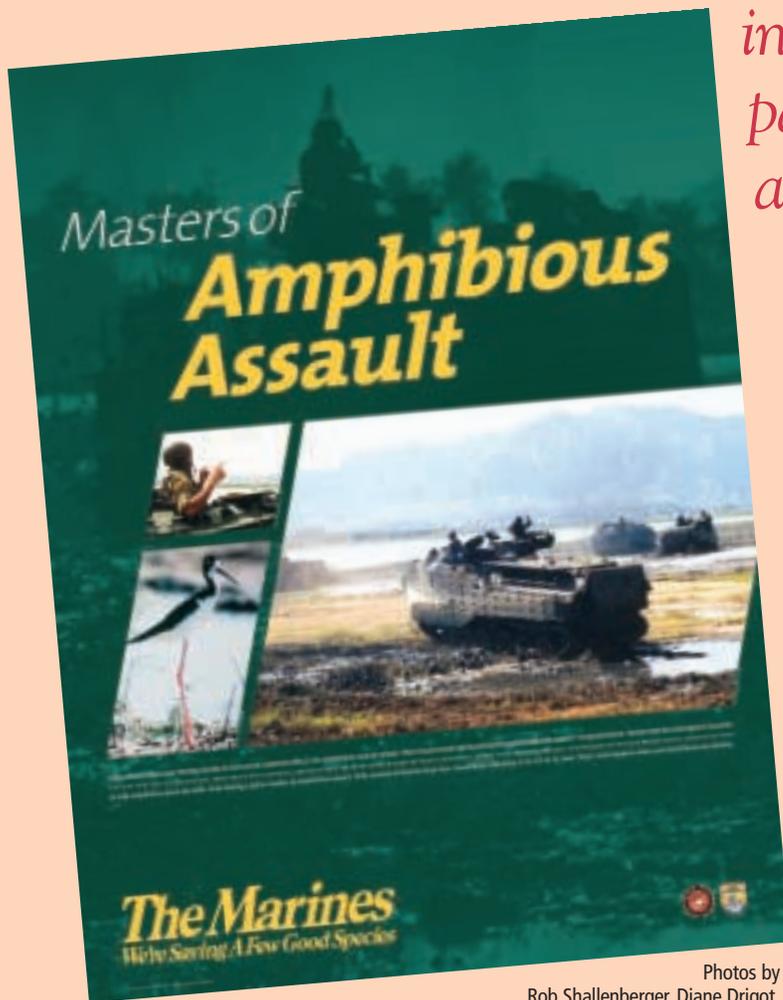


Another in the range of efforts required to get 25 acres of mangrove cleared off the peninsula—equipment used to remove large, established mangrove.

Photo by Mark Rauzon

*Stilts were attracted to the muddy, moist areas disturbed by the massive track marks left by the 26-ton AAVs.*

*Enhancement of both endangered species and the military mission can occur through collaborative involvement among agency partners, military trainers and an involved public.*



Photos by  
Rob Shallenberger, Diane Drigot,  
Dean Sensui (Honolulu Star-Bulletin—used with permission)

year phased effort to remove 25 acres of mangrove infestation from Nu'upia ponds and several smaller coastal wetlands on Mokapu Peninsula. Thousands of weed-pulling volunteers kept further mangrove advancement “at bay.” The mechanical and manual removal of mature mangrove stands as well as scientific documentation of improvements to native wildlife habitat, water flow and quality required \$2.5 million to accomplish.

Volunteer service projects and annual AAV “mud ops” maneuvers at the ponds will help prevent reinfestation by either plant species. The AAVs continue to keep pickleweed in check; the Marines enjoy a change from their training routine; and the stilts get improved habitat. The latest edition in a “Saving a Few Good Species” national poster series partnered by U.S. Marine Corps and U.S. Fish and Wildlife Service commemorates this

sustained, successful symbiosis between AAVs and the Hawaiian stilt.

These examples show that enhancement of both endangered species and the military mission can occur through collaborative involvement among agency partners, military trainers and an involved public—following a shared vision while respecting each agency’s specific priorities. 

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