

Community Perspectives on Underwater Munitions Response

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Over the past two decades, the U.S. government has been slowly developing the technology, policy, and legal framework for addressing unexploded ordnance and discarded military munitions on the millions of acres of former ranges and other properties where such weapons may be found. Less attention has been paid to the risks posed by chemical warfare materiel, conventional high explosives, and small caliber munitions dumped or fired into rivers, lakes, and the oceans and their estuaries.

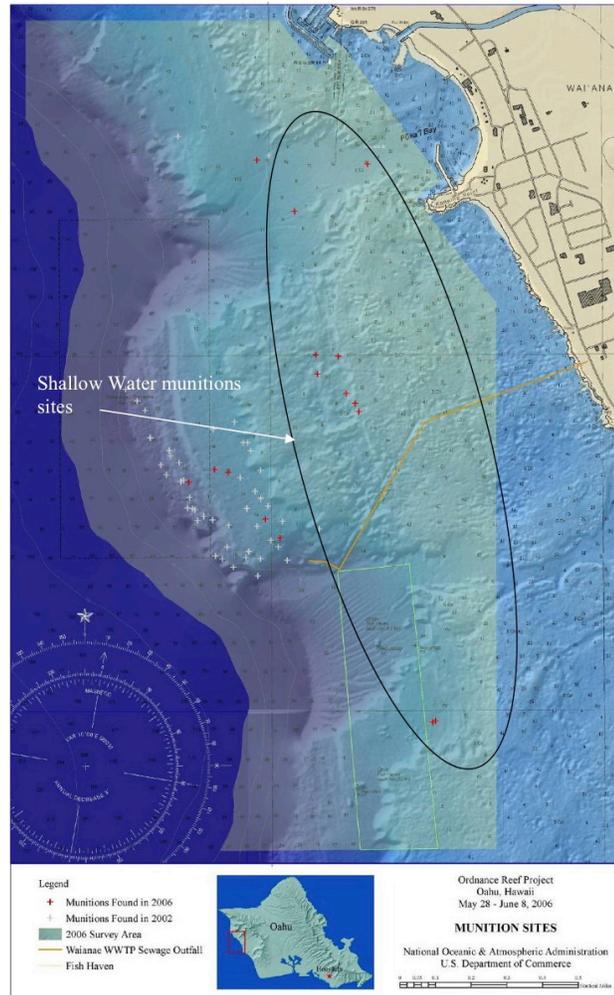
This is understandable. The presence of such munitions is not widely known. The risks seem more remote. It is usually difficult to find underwater munitions, let alone safely demilitarize and remediate them. Yet interest is growing. Congress enacted Section 314 of the Fiscal Year (FY) 2007 National Defense Authorization Act, which requires the Department of Defense to conduct a historical review of available records to determine the number, size, and probable locations of sites where the military disposed of munitions in U.S. coastal waters. In October 2007 private parties—including a number of U.S. based companies—convened the First International Conference of Chemical and Conventional Munitions Dumped at Sea, in Halifax, Nova Scotia.

In reviewing the universe of U.S. underwater munitions sites, I discovered enormous diversity in scale, the type of the munitions, and the nature of the waterways. However, in talking to a small number of people from a variety of sites, I found some common threads. Most important, the community members and officials I interviewed all shared a risk management perspective, where the need for cleanup is primarily determined by the potential for exposure. This contrasts with the resource restoration viewpoint, in which the purpose of cleanup is to restore resources such as groundwater to their original condition. I also found strong support for public education as a means of reducing risk.

Ordnance Reef, Hawai'i

The underwater ordnance site that has generated the greatest level of public interest is known as “Ordnance Reef,” just off the leeward (west) coast of O'ahu, near Wai'anae. About a mile long and half-mile wide, it lies in 10 to 70 meters of water. It consists of discarded military munitions such as naval gun ammunition, 105 mm and 155 mm artillery projectiles, mines, mortars, and small arms ammunition. In addition, nitrocellulose beads—known by locals as “Hawai'an jade”—wash ashore nearby. This site should not be confused with the chemical weapons dumping area deep offshore Pearl Harbor.

In March 2007, the National Oceanic and Atmospheric Administration (NOAA) completed a site study, and high-level Army officials have been meeting with members of the local community. Though NOAA and the Army have downplayed the risks from



the site, the community remains unconvinced. With the help of their Congressional delegation, they've persuaded the Army to conduct a \$3 million removal demonstration project as well as a \$1 million new study of "reef" health effects.

When the NOAA study came out, local fishermen criticized its methodology for measuring explosive compounds and heavy metals in fish tissue, so they welcome the new study. The community sought continuing input into the government's activities in the area, so they are appreciative of the attention now being paid to them by Army officials. Most important, at least for now they are pleased with the plan to remove ordnance at depths of 110 feet or less. This is the maximum diving depth for recreational divers, so the proposed removal would significantly reduce risk. Finally, the community supports the Army's "Recognize, Retreat, Report" (the new "Three R's") educational program.

I anticipate that the Wai'anae community and Army will be discussing, for a long time, the levels of chemical and explosive risk associated with the site. The key point is that the community sees the cleanup requirement directly as a function of risk.

Lake Michigan's Illinois Shore

In January 2008, an activist attorney with the Blue Eco Legal Council took the FBI and Defense Department to court, demanding a halt to the discharge of lead bullets into Lake Michigan, at a North Chicago small arms firing range, and the cleanup of spent shells from the lake. Twenty-nine hundred acres of the lake serve as a buffer zone for the land-based range. From before World War I through World War II, the military operated the range.



A decade earlier, the same activist had called for the cleanup of anti-aircraft artillery and other explosive rounds in the lake adjacent to nearby Ft. Sheridan. A few years back he challenged the Coast Guard's plans to conduct live-fire training on the lake.

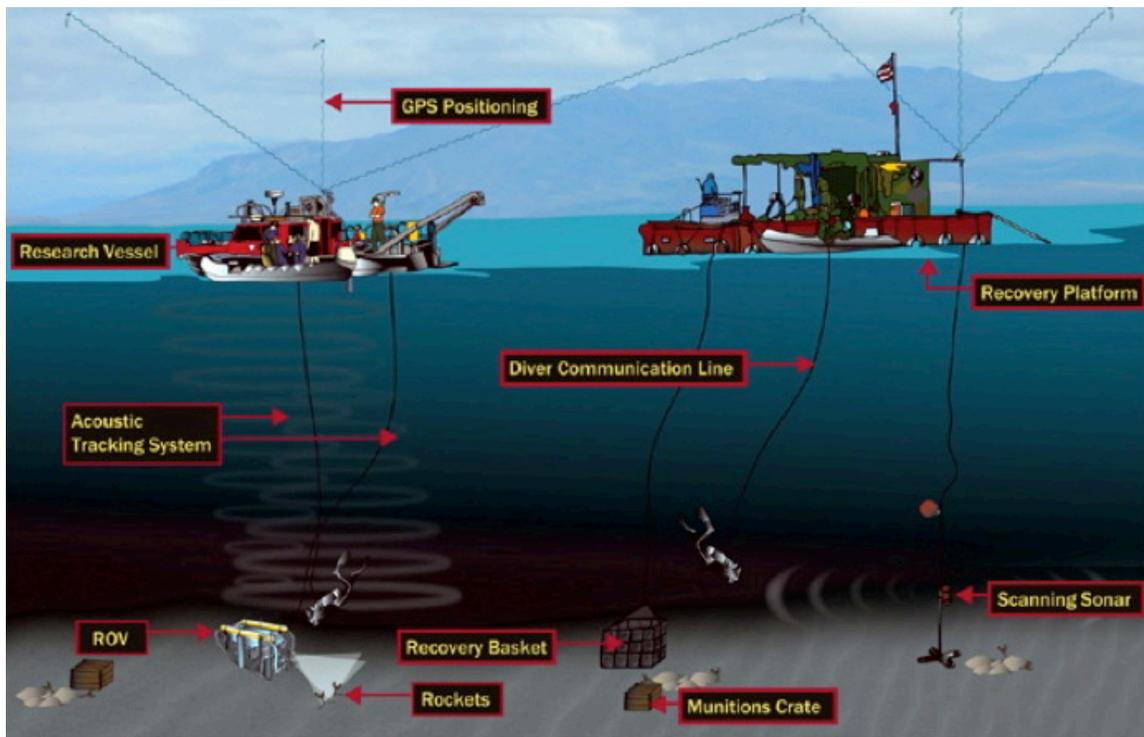
The attorney believes that the small arms shells in North Chicago, as well as the munitions from Ft. Sheridan, impact local drinking water supplies. The North Chicago municipal intake pipe is within the 2,900 acres of lake associated with the FBI range. Agencies tended to dismiss his concerns about Ft. Sheridan, but they have not answered his claims about the FBI range.

In addition to expressing concern about the impact of spent munitions on drinking water, the attorney has raised an important legal issue. Federal agencies treat the lake as if it is part of the range, but he asserts that under the Submerged Lands Act the lake is titled to its bordering states and governed by the public trust doctrine. Munitions that are fired into the lake, therefore, land *off range*. They are thus wastes under the Resource

Conservation and Recovery Act. I don't have the legal expertise to examine the full implications of this point, but it could have significant repercussions throughout the Great Lakes, in riverways, and in estuaries and coastal waters throughout the United States.

Pyramid Lake, Nevada

Pyramid Lake is a salt lake northeast of Reno, Nevada, located entirely within the Pyramid Lake Paiute Reservation. Fed by the Truckee River and Lake Tahoe, it covers 188 square miles at a surface elevation of nearly 3800 feet. In 1944-45, the U.S. Navy used the lake to practice dive-bombing and strafing. From 2002 to 2005, the tribe, the Army Corps' Sacramento District, and nearby Fallon Naval Air Station formed a partnership that quickly and cost-effectively removed rockets and crates of small arms from deep within the lake. Funded through the Defense Department's Native American Lands Environmental Mitigation Program, the project used Navy divers and innovative technological applications, including the Deepwater Ordnance Recover System and high-altitude diving tables. It won a Defense Department Environmental Award in Fiscal Year 2005.



A Paiute tribal official told me that the purpose of the cleanup was to make the lake safe for fishing and recreational use, the economic foundations of the tribal economy. There had been no casualties from the ordnance, but the uncertainty was a problem. He said that it was better to be safe than sorry. But the lake is also central to the tribe's identity. The Army Corps explained, "The lake and its wildlife are held in high regard culturally by the Paiute tribe because of their interweaving with the tribe's ancestry." The tribe and its partners consider the cleanup complete.

Mare Island Naval Shipyard, California

Mare Island is one of the oldest military installations on the West Coast. Located in Vallejo, California, at the north end of the San Francisco Bay, the shipyard was established in 1854 and its Naval Ammunition Depot was created soon after. The entire base was closed in 1996. The Navy has identified four offshore ordnance areas, all of which resulted from either deliberate or unauthorized dumping. Its 2000 Validation of Detection Systems report was one of the first serious evaluations of technologies for finding munitions located in shallow waterways.

According to a community member of the Mare Island Restoration Advisory Board, the community expects a full underwater munitions response, because the ordnance is accessible: “The Navy must continue down the path to aggressive removals to the extent technologically feasible, with a plan in place to even return as new technology becomes available.” She added, “There is a great deal that has already been done at Mare Island to dramatically reduce risk of exposure by the public. But, the work must be finished and long-term management strategy put in place.” She explained that the local ferry service generates wakes that continuously reshape the underwater landscape, and that treasure hunters would love to get their hands on some of the antique munitions lying in the inter-tidal waters and mudflats. Finally, she insisted, “As importantly, they must sufficiently fund an education and management endowment.” That is, the community’s goal is to prevent members of the public from encountering and handling ordnance.

Clamshell Shells, Delaware

One of the most unusual pathways for exposure to underwater ordnance is the commercial dredging of clamshell beds off the coast of New Jersey. Driveways and parking lots throughout Delaware, parts of Maryland, and southern New Jersey are paved with crushed clamshells recovered from the deep ocean more than fifty miles from the Atlantic Coast. Unfortunately, this is the same seabed into which the U.S. military dumped old, unserviceable munitions, including chemical weapons, decades ago.

So many of these munitions—grenades, artillery rounds, and mortars—have shown up in Delaware driveways that the Army Corps established a special program for conducting geophysical surveys to find those munitions and then destroy them. A handful of such munitions have turned out to be mustard agent rounds. Since 2005, when one of them injured three explosive ordnance disposal (EOD) experts who didn’t recognize its contents, the chemical munitions have been carefully handled and then destroyed in the Army’s Explosive Destruction System.

Surprisingly, there has been no wide public outcry. Residents seem satisfied with the government’s response. Dredging has not been outlawed. No one is demanding cleanup of the seabed.

The Army has issued a pamphlet to guide the operators of clamshelling and other boats, explaining the Three R's. It warns, "Never bring actual or suspect munitions into port," but there is no practical alternative. Scandinavian countries have programs for collecting recovered chemical munitions on shore, but American fishers and clamshellers risk penalties if they knowingly bring even conventional munitions to land. Thus, the handling of recovered munitions is not yet well managed. Delaware regulators are concerned that boat operators, with no clear program for disposition of recovered munitions, simply toss munitions overboard in shallow waters, spreading the risk.

Lessons

The communities and others potentially impacted by offshore munitions—whether dumped, fired, or launched—recognize that it is not always feasible to recover and treat such items. But often they believe that action is necessary because there is an explosive risk, a chronic toxic risk from conventional explosives or small arms, or an acute risk from chemical agent. Their calls for cleanup, therefore, are directly tied to the confirmation of a potential pathway, and that in turn depends upon depth, the nature of the munitions, and the potential for either natural or human-caused movement. And those conditions vary enormously from site to site. As I have written before, their willingness to accept assurances that risk levels are acceptable is a function of whether they trust the officials and experts who offer such assurances.

Furthermore, community members support public education designed to prevent encounters with munitions and exposures to munitions constituents or wastes. In fact, they seek assurances that it will continue as long as there are hazards.

In summary, the approach taken by concerned community members isn't that different than the perspective of those policy-makers and technical experts who take the risks of underwater munitions seriously. Where the military tries to work closely with communities, common solutions are possible.