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The Department of Defense and Its Precursors: History, Responsibilities, and Policies (1770s - Present)

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chapter 17

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The Department of Defense (DoD) is the nation's oldest agency, founded in 1789, and one of the world's largest single landholders, with approximately twenty-eight million acres under its control in the United States, its territories, and in thirty-eight countries. Over the course of nearly two and a half centuries, the DoD has enabled the United States to assert its influence and power on a global scale, with global consequences. Responsible for the military and defensive needs of the United States, the DoD has played a pivotal role in expanding and securing the nation's territorial claims and in spurring many of the technological developments, such as the harnessing of atomic energy, that have come to characterize modern society. Its policies and actions have resulted in tremendous social, political, and environmental change. Although many of these transformations occurred during wartime, the DoD and its precursors have had as much or more environmental impact in times of peace as in times of crisis. That history reveals a relationship with the natural world that is filled with paradox and ambiguity, a relationship that incorporates both environmental destruction and natural regeneration.

ORGANIZATION AND RESPONSIBILITIES

The Department of Defense's origins lie in the American War for Independence (1775–1783). The U.S. Army, U.S. Navy, and U.S. Marine Corps, all established in 1775, became the foundation for the Department of War, created in 1789. The Coast Guard joined the department in 1790. In 1798, the naval forces split from the Department of War to become the independent Department of the Navy. This organizational structure lasted until 1947, when the National Security Act placed all branches of the military, including the new Department of the Air Force, under a single Department of Defense. The DoD, headed by the newly created secretary of defense, oversaw the Departments of the Army (formerly the Department of War), Navy, and Air Force. Two years later, in 1949, Congress amended the National Security Act, further consolidating the power of the secretary of defense by eliminating the cabinet-level status of each of the branch departments. The National Security Act also created the Central Intelligence Agency (CIA), the Defense Intelligence Agency (the main military intelligence organization), and the National Security Council (NSC).

Despite these organizational and name changes, the DoD and its precursors had a consistent mission, to enforce the Constitution and protect the nation's physical territory. At times, this meant engaging in war against foreign troops; at others, it entailed fighting Americans. When not engaged in combat, the DoD continued to pursue its mission through the development of weapons and other technologies designed to enhance the nation's defense system. At all times, the DoD's mission required the requisition and utilization of vast amounts of resources, including land. For much of its history, the DoD actively participated in expanding the nation's territorial claims across the North American continent and, by the mid-twentieth century, into the Caribbean and the Pacific Ocean. After World War II (1939–1945), the DoD established military bases across the globe, ensuring an American military presence worldwide. It also ramped up its claims to land in highly secure reserves within the U.S. and its territories, where it could conduct a variety of defense-related research and weapons testing. The DoD, thus, has been party to or responsible for environmental change on a global scale.

The DoD's history as a facilitator of both territorial expansion and technological innovation and, ultimately, its role as a federal land manager, reflects broader developments in American environmental history. Many of the

environmental changes that can be linked to the DoD resulted from military action and from implementation of programs it considered to be in the national interest. Because such programs often operate under high levels of secrecy, the DoD has faced little oversight, especially with regard to environmental issues. However, changing notions about proper land use, the role of government in resource development and management, and the place of the United States in the larger geopolitical context have all resulted in greater scrutiny of DoD actions and policies. Indeed, negative environmental consequences were of little concern within the DoD until the late twentieth century, when the department adopted environmental regulations and policies, often in cooperation with other federal agencies, state and local governments, and international partners and in response to public demands for better environmental stewardship.

TERRITORIAL CONTROL

Throughout the nineteenth century, the Department of War played a crucial role in acquiring new territory for the nation and, in the later part of the twentieth century, as the Department of Defense, in reclaiming some of that land for its own purposes. In both cases, the environmental implications have been significant. In the former instance, the American military forces helped lay claim to new land for expanded white settlement, creating the means by which entire social and ecological systems were remade. While this process often had devastating results for indigenous plants and animals and for Native American communities, it benefited domesticated species such as cattle and wheat, resulting in greater access to nutrition for the nation's growing population. In the latter, the DoD created isolated research and training sites that have become some of the most polluted places on the globe. Ironically, some of these same areas have become wildlife refuges, protected against agricultural, industrial, and urban development. Therefore, in taking control over territory, the DoD has had both positive and negative effects on the nation's, and the world's, environment.

Nineteenth-Century Expansion and Ecological Change

Almost immediately upon the founding of the United States, resolving territorial issues became a top priority. Such concerns predated the American War for Independence, but with independence came unique challenges. The new government did not feel obligated by the Proclamation of 1763, brokered between the British government and various Native American tribes restricting white settlement to east of the Appalachian Mountains (even British enforcement of this agreement was difficult if not impossible, because white settlement had already begun in the region). Instead, within ten years of independence, the new U.S. government encouraged settlement as far west as the Mississippi River in an effort to secure the nation's western borders and alleviate its war debt, composed in part of back salaries due veterans of the Continental Army. One solution that promised to both reduce the debt to war veterans and expand American claims to the trans-Appalachian west was to offer land-for-service agreements, or bounties, to veterans (similar bounties were offered as enlistment incentives during the war as well). As growing numbers of settlers moved west to take advantage of these arrangements and other opportunities for cheap land, conflict with Native American tribes increased, prompting the intervention of the nation's fledgling armed forces and the creation of an extensive defensive fort system. The Department of War thus became a primary facilitator of westward expansion and white settlement through military action against and the forcible relocation of Native peoples.

In the decades between the War for Independence and the Civil War (1861–1865), soldiers and settlers were inextricably linked, as were issues of national security and territorial acquisition. Between 1783 and 1853 (date of the Gadsden Purchase, the last acquisition of contiguous territory), the United States more than tripled its territorial holdings. Much of this new acreage, such as the Louisiana Purchase (1803) and Oregon Territory (1846), came as a result of diplomatic negotiations with European nations who maintained territorial claims in North America but did not in any meaningful sense occupy the land. In contrast, the United States gained the Mexican Cession (1848) through war.

In the 1820s, the newly independent Mexican government implemented plans to increase settlement in its northern territories, including more liberal immigration policies for non-Mexicans. Disagreements between settlers, many of whom had migrated from the United States, and their descendants over increasingly restrictive taxation, labor, defense, and immigration policies led to armed rebellion in 1835 and the Texas declaration of independence from Mexico in 1836. The United States annexed Texas in 1845, accepting the erstwhile republic's definition of its southern boundary, which it claimed to be the Rio Grande. Mexico insisted the boundary lay farther north, at the Rio Nueces; this territorial dispute led directly to the Mexican, or Mexican-American, War (1846–1848). The 1848 Treaty of Guadalupe-Hidalgo, which ended the armed conflict, established the U.S.-Mexico border at the Rio Grande and provided for the Mexican Cession, transferring an additional 500,000 square miles to the United States—including the present-day states of California, Nevada, Utah, and Arizona, and parts of Wyoming, Colorado, New Mexico, and Texas—in exchange for $15 million.[1]

During this early period of territorial expansion, the Department of War had the responsibility of protecting the settlers, even when viewed as trespassing on the public domain, and for securing the nation's shifting and expanding borders. In this way, the military's presence enabled others to exact changes on the landscape. Many of these transformations occurred due to the institution of agriculture, the imposition of the township and range (grid) surveying system—which ignored natural topography in laying out town sites and property claims—and the introduction of large-scale resource extraction operations in places such as California, Nevada, Colorado, and Idaho.

After the Mexican War and the purchase of Alaska from Russia in 1867, American territorial expansion became less about acquiring territory than about asserting control over the land the nation already claimed. This was especially true during the so-called Indian Wars (c. 1868–1890) when the United States Army, under the aegis of the Department of War, expanded its efforts of forcibly relocating Native Americans onto reservations. These actions abrogated treaties many tribes had negotiated with the U.S. government regarding territorial claims and hunting rights and led to several major conflicts, such as the 1876 battle at Little Big Horn (Greasy Grass) in Montana and the 1877 Nez Perce War in Idaho and Oregon, and to massacres such as Sand Creek in Colorado (1864) and Wounded Knee in South Dakota (1890). By the end of the nineteenth century, most tribes had lost the majority of their traditional lands and were forced to remain on designated reservations.

Though much of the requisitioned land went into the public domain, the 1862 Homestead Act promoted white settlement across the region, with important ecological changes. Cattle replaced bison, prairies became wheat fields, mountains turned into gold mines, and forests became timberlands. Such changes brought both positive outcomes, such as greater access to food and increased national economic prosperity, and negative consequences, including biodiversity loss and increased erosion of topsoil and riverbeds. As part of the support network for white settlers, the U.S. Army and its parent organization, the Department of War, facilitated these large-scale changes to the nation's landscape.

The Army Corps of Engineers

The department's role in ecological transformations at this time was not completely ancillary or unintentional. In fact, through the work of the Army Corps of Engineers, commonly called the Corps, the Department of War contributed to considerable reorganization of the nation's waterways and transportation systems. In addition to designing and building fortifications, the Corps had responsibility for the improvement of coastal areas and rivers, building roads and canals, and exploring, surveying, and mapping the national territory.

According to an official Corps history, economic development and national security "required more reliable transportation arteries" than the nation had. Thus, the Corps' "greatest legacy" came from "its work on canals, rivers, and roads." Of particular importance were the nation's rivers, many of which had unpredictable water levels due to irregular cycles of flooding and drought and contained unseen hazards such as tree stumps and sandbars. Prior to the Civil War, the Corps successfully improved navigation on the Ohio and Mississippi Rivers, two of the most important waterways in the nation from the standpoint of commerce and transportation, by effectively removing dead trees and sandbars from their streams. Using new steam technologies, the Corps restructured the rivers to make them more useful to merchants and producers. After the Civil War, the Corps developed new tools to manage the rivers, including a "system of river regulation dams" on the Ohio to ensure predictable and safe passage for coal barges and a massive series of levees on the Mississippi for purposes of flood mitigation.[2]

Though arguably, and perhaps temporarily, beneficial from a commercial and infrastructural standpoint, these changes upset the ecological and hydrological systems of the rivers, with important environmental and even social repercussions that are of concern still today. For example, before the Corps' improvements, the Mississippi's periodic floods would spread rich, silt-laden deposits on the surrounding land, creating fertile soil for cultivation. The creation of the massive levee system impeded such deposition, making it increasingly necessary for area farmers to turn to chemical fertilizers to maintain agricultural productivity. In recent years, this has contributed to algal blooms in the Gulf of Mexico as the nitrogen- and phosphorous-rich fertilizers enter the river system, encouraging the growth of algae, which leads to lower oxygen levels in the water and, in turn, decreased fish and marine mammal populations, ultimately resulting in an ecological "Dead Zone."[3] Thus, by responding to popular demand in the nineteenth and early twentieth centuries to solve transportation and commercial challenges along the Mississippi, the Army Corps contributed to ecological degradation in the Gulf of Mexico, which has had continued environmental and economic implications for the region.

Twentieth-Century Technological Development and Military Installations

The end of the nineteenth century brought a new type of American expansion with the onset of the Spanish-American War (1898). In this conflict, the Department of the Navy and the Department of War contributed significantly to increasing America's geopolitical influence and its physical presence across the globe through the acquisition of territory for use by the armed forces. By the end of 1898, the

United States annexed Hawaii, the Philippines, Puerto Rico, and Guam as official territories. In 1900, the United States claimed the eastern islands of Samoa, in large part to serve as a coaling station for the Navy's fleet of steam ships. Many of these island claims literally fueled the growth of the U.S. Navy into one of the largest in the world and would serve as important ports during World War II. These distant territories were never intended to be settlement destinations like the American West but instead denoted a shift in the purpose and type of control over land cultivated by the Departments of War and of the Navy and, subsequently, the Department of Defense, over the next one hundred years.

Throughout the twentieth century, but especially during and after World War II, the DoD began to claim land for its own use, creating a massive system of highly restricted bases in the United States—including, for example, turning the San Francisco Bay area into a citadel—and internationally, where it appropriated natural resources, especially timber and coal, to support its growing navy and where it developed and tested weapons and technologies that would change the world. From creating chemical and atomic weapons to researching methods for controlling weather and geological events, the War Department began in the twentieth century to look for ways to actively harness nature's power for military needs. Increasingly, this research took place on isolated military installations and reserves.

Global Holdings

As of 2010, the DoD controlled 4,249 sites nationally, with an additional 88 sites in U.S. territories and 662 sites located in other nations.[4] The DoD operates on more than twenty-eight million acres worldwide and owns nearly twenty million acres of that property, leasing the rest from host nations or other governmental agencies. In comparison, the National Park Service oversees 79,706,353 acres; the Forest Service manages 192,909,421 acres; the Bureau of Land Management maintains 247,859,076 acres; and the Fish and Wildlife Service is responsible for 300,197,306 acres.[5] Although the smallest landholder among these federal agencies, the DoD is the only one to control land internationally.

While the Department of War maintained military forts and other installations throughout the nineteenth century for the purposes of defense, beginning in the twentieth century, and especially during and after World War II, the DoD began acquiring land for purposes of creating and testing new military technologies. One of the most crucial of these technological developments was the harnessing of atomic energy. Although scientists had been exploring and making discoveries about the nature of the atom and applying their knowledge in such fields as medicine since at least the 1880s, it was not until 1942 that Enrico Fermi revealed its full potential when he performed the first controlled nuclear reaction. The timing of this discovery, in the midst of World War II, meant that nuclear power would first be used for war instead of peace. The U.S. Army would be intimately involved in discovering ways atomic science could be applied to its wartime strategy. To conduct research in a secure manner, the Department of War established one of its first secret installations in the northern mountains of New Mexico, near the small town of Los Alamos, where scientists led by Robert Oppenheimer developed the first nuclear bomb in 1945. Two additional highly restricted sites—near Richland, Washington, and Oak Ridge, Tennessee—housed the facilities that processed the uranium for these weapons.

The U.S. Army tested its new weapon on July 16, 1945, in the New Mexico desert, and then in August of that year dropped two nuclear bombs on the Japanese cities of Hiroshima and Nagasaki, killing an estimated 135,000 people from the immediate blasts and the longer-term health effects of radiation. The bombings "were tremendously and tragically destructive" for humans, but as historian William Tsutsui has shown, if "viewed from a less anthropocentric viewpoint," the environmental consequences "are far more ambiguous." Plants, insects, rats, and fish showed few immediate effects from the radiation and actually thrived in the depopulated cities.[6] Despite these initial environmental ambiguities, however, the dawn of the atomic age ushered in an intensive period of global military and technological competition that would have lasting environmental repercussions.

Calls for Remediation

The Cold War between the United States and the Soviet Union, and their respective allies, had global implications, including the death of millions of people in the period's several "hot wars," which elicited a wide variety of responses from myriad sectors of society. One of these centered on popular reactions to perceived and real governmental failures to protect citizens from all kinds of threats, not just military aggression. Broad changes to the world's ecological systems associated with the ideological, economic, and military conflict between the United States and the then-USSR in part inspired the development of the modern environmental movement, elements of which demanded access to clean, safe air and water and greater protection of natural areas. The Department of Defense was at the center of some of these calls for remediation. In response to public concerns over atmospheric pollution through nuclear testing and other types of contamination, the U.S. government developed a series of policies and laws governing DoD actions with regard to the environment.

Among these legislative developments is the Sikes Act, originally passed by Congress in 1960 and amended several times since. The Sikes Act governs natural resource conservation programs on DoD lands, with specific sections focused on military installations. The act requires interagency

TABLE 17.1 **Department of Defense Landholdings, 2010**

Location	Acres Owned	Total Acres*
Alabama	148,603	339,981
Alaska	1,686,371	1,825,527
Arizona	2,971,169	4,561,646
Arkansas	85,787	86,967
California	3,812,558	4,005,947
Colorado	449,964	477,702
Connecticut	1,608	1,803
Delaware	3,474	4,161
District of Columbia	1,508	1,569
Florida	641,526	686,033
Georgia	567,072	572,334
Hawaii	177,033	230,532
Idaho	4,178	16,495
Illinois	21,123	22,823
Indiana	112,397	115,601
Iowa	49,331	49,876
Kansas	163,011	183,738
Kentucky	163,726	163,816
Louisiana	127,934	235,363
Maine	23,141	23,417
Maryland	108,391	110,019
Massachusetts	26,896	46,151
Michigan	15,073	18,681
Minnesota	2,777	4,348
Mississippi	34,266	48,001
Missouri	68,445	81,126
Montana	8,338	61,453
Nebraska	11,265	21,764
Nevada	281,442	3,489,022
New Hampshire	3,131	3,183
New Jersey	71,071	71,690
New Mexico	3,395,090	3,508,909
New York	133,714	143,024
North Carolina	387,948	1,707,012
North Dakota	14,950	37,685
Ohio	29,143	34,990
Oklahoma	183,831	190,738
Oregon	77,153	131,393
Pennsylvania	43,502	45,209
Rhode Island	2,874	3,018
South Carolina	109,705	113,458
South Dakota	7,929	10,658
Tennessee	147,576	149,021
Texas	481,664	502,477
Utah	1,766,260	1,813,291
Vermont	11,936	12,202
Virginia	258,944	280,462
Washington	440,166	944,194
West Virginia	2,981	3,911
Wisconsin	67,540	147,666
Wyoming	16,025	32,006
U.S. Territories**	93,401	110,184
U.S. Total	**19,514,942**	**27,749,229**
International	244,949	623,525
Agency Total	**19,759,891**	**28,372,754**

SOURCE: Department of Defense, *Base Structure Report: Fiscal Year 2010 Baseline,* DOD-35 to DOD-95, http://www.acq.osd.mil/ie/download/bsr/bsr2010baseline.pdf.

* Total acres includes leased lands

** Includes American Samoa, Guam, Johnston Atoll, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wake Islands

cooperation, with which the DoD conforms by promoting "effectual planning, development, maintenance, and coordination of wildlife, fish, and game conservation and rehabilitation in military reservations."[7] However, the DoD maintains that its lands must serve its mission before all other considerations: "The principal purpose of DoD lands, waters, airspace, and coastal resources is to support mission-related activities. All DoD natural resources conservation program activities shall work to guarantee DoD continued access to its land, air, and water resources for realistic military training and testing and to sustain the long-term ecological integrity of the resource base and the ecosystem services it provides."

Thus, the DoD primarily manages its lands and resources "to facilitate testing and training, mission readiness,

ENVIRONMENTAL DEBATES

Atomic Tests in the 1950s

Between 1951 and 1958, the U.S. Atomic Energy Commission, in partnership with the Department of Defense, conducted 119 nuclear tests at the Nevada Test Site, of which 97 were conducted above ground. In addition, between 1946 and 1962, the United States detonated 106 nuclear devices in the South Pacific, including 67 at the Bikini and Enewetak (Eniwetok) Atolls in the Marshall Islands. The atmospheric and underwater detonation of nuclear devices produces radioactive fallout, releasing radionuclides that contaminate soil and water and that can have carcinogenic effects. Significant controversy surrounded the tests, largely due to their environmental and health implications.

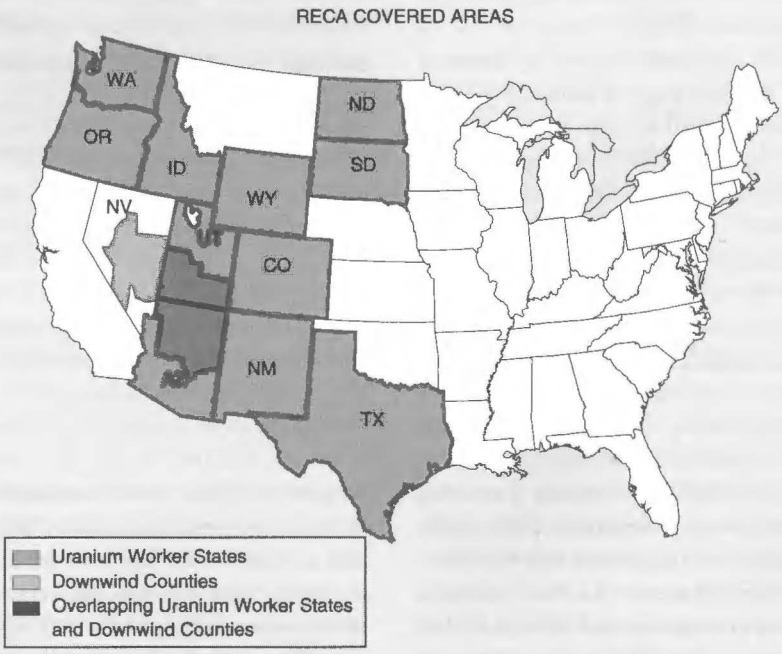
A pivotal moment in the opposition to nuclear testing came in 1954 when the United States conducted its Castle Bravo test in the Marshall Islands, detonating the first hydrogen (or thermonuclear) bomb. Due to miscalculations of the bomb's size and to failures in predicting weather and wind conditions, Bravo's fallout plume drifted over nearby inhabited islands and hundreds of miles out to sea, where it contaminated the Japanese fishing vessel *Lucky Dragon*. The incident created a diplomatic crisis between the United States and Japan and fueled international opposition to atmospheric testing. Soon after, President Dwight D. Eisenhower (1953–1961) began negotiations with the Soviet Union to limit atmospheric testing. Mistrust and disagreements over the parameters of the limitations stalled talks until 1963. In June of that year, President John F. Kennedy (1961–1963) stated, "I now declare that the United States does not propose to conduct nuclear tests in the atmosphere so long as other states do not do so. We will not be the first to resume. Such a declaration is no substitute for a formal binding treaty, but I hope it will help us achieve one. Nor would such a treaty be a substitute for disarmament, but I hope it will help us achieve it."

Two months later, the Soviet Union, the United Kingdom, and the United States signed the Limited Test Ban Treaty, banning tests in the atmosphere, under water, and in space, taking the first step toward addressing the problem of radioactive fallout.

It was, however, too late for many who lived in range of the test sites. Residents of Nevada, Utah, Arizona, and of several of the Marshall Islands experienced increased rates of cancer and other diseases associated with exposure to radioactive materials, but it was not until the 1980s that the United States government accepted liability for damages associated with its testing program. In 1983, the United States and the Republic of the Marshall Islands negotiated an agreement in which the United States agreed to compensate Marshall Islanders for personal injury and property damages caused by the nuclear testing program. Section 177(a) of the agreement states, "The Government of the United States accepts the responsibility for compensation owing to citizens of the Marshall Islands, or the Federated States of Micronesia (or Palau) for loss or damage to property and person of the citizens of the Marshall Islands, or the Federated States of Micronesia, resulting from the nuclear testing program which the Government of the United States conducted in the Northern Marshall Islands between June 30, 1946, and August 18, 1958."

In 1990, President George H.W. Bush (1989–1993) signed the Radiation Exposure Compensation Act into law, providing the legal means by which "Downwinders," those who were exposed to fallout from the Nevada tests (see Figure 17.1), could bring claims against the government for their losses.

FIGURE 17.1 **States Covered by the Radiation Exposure Compensation Act**



SOURCE: U.S. Department of Justice, "Radiation Exposure Composition Act," http://www.justice.gov/civil/common/reca.html.

and range sustainability in a long-term, comprehensive, coordinated, and cost-effective manner." Specifically, the Sikes Act requires the DoD to "demonstrate stewardship of natural resources in its trust by protecting and enhancing those resources for mission support, biodiversity conservation, and maintenance of ecosystem services," to "manage DoD lands, waters, airspace, and coastal resources or natural resources for multiple uses when appropriate, including sustainable yield of all renewable resources, scientific research, education, and recreation," and to "follow an ecosystem-based management approach to natural resources-related practices and decisions, using scientifically sound conservation procedures, techniques, and data."[8] Nevertheless, the DoD's mission continues to trump other uses of the land, resulting in numerous instances of pollution, contamination, and resource degradation.

In some instances, this contamination did not take place on DoD lands. Throughout the twentieth century, the DoD engaged in a wide variety of technological developments in conjunction with corporations, independent researchers, and other federal agencies. These projects ranged from chemical weapons development and nuclear testing to attempts at weather control and massive chemical defoliation.[9] Some of this research occurred on DoD sites, but much of it took place at universities, private industrial areas, or installations under the jurisdiction of agencies such as the Atomic Energy Commission and, after 1977, the Department of Energy. Therefore, although some of the environmental effects of defense-related projects, such as uranium enrichment, are more directly the responsibility of those other entities, the DoD played a part in them as well.

The DoD's international presence has generated broad environmental and political implications with which the department has had to contend. In particular, American overseas military installations and the extensive pollution associated with them have at times impaired diplomatic relations between the United States and the host countries and have often resulted in problems for local populations. In 1996, the DoD issued Instruction 4715.5 regarding its duties and responsibilities with regard to environmental contamination on overseas bases. The directive prohibits dumping of toxic wastes and other polluting activities, but provides for exemptions and states that the DoD will not be responsible for past instances of contamination.[10] Similar problems plague military bases in the United States and its territories as well. One example is the naval proving grounds on Vieques Island, seven miles southeast of Puerto Rico. Beginning in the 1940s, the U.S. Navy used the island as an ordnance testing and training ground. Although the U.S. Navy ended its operations there in 2001, it left behind numerous areas that, according to the Environmental Protection Agency (EPA), "may be contaminated by solid and/or hazardous waste resulting from decades of military activity including training exercises, equipment maintenance, supply storage and waste disposal."[11] In an ironic twist, the Vieques proving grounds has since become a nationally protected wildlife refuge under the guardianship of the U.S. Fish and Wildlife Service.

Just as with its nineteenth-century actions, the DoD's activities in the twentieth century present an ambiguous environmental legacy. The DoD is directly responsible for increased radiation levels in space, in the atmosphere, and in the earth's soil and water. Its weapons-testing programs have littered numerous areas around the world with toxic materials and, in some places, dangerous unexploded ordnance. The DoD also participated in the massive use of chemicals, not only during wartime, against people, plants, and insects, but it also contributed to their use in domestic and agricultural settings through facilitating the chemicals' technological transfer from weapons of war into household pesticides, activities aptly described by Edmund Russell in his 2001 book *War and Nature*.[12] However, through their acquisition and control over millions of acres of land, the DoD has also been responsible for protecting those sites from other forms of development, inadvertently setting aside habitat for native and, in some cases endangered, species, thus creating a diverse range of wildlife refuges that, although ecologically important, have been hotly debated in terms of how they will be managed and used, and by whom.

CONSEQUENCES OF CONFLICT

If the Department of Defense has had measurable environmental impact in preparing for war, it has also played a significant role in ecological change by fighting it. By its very nature, war is destructive. Military forces, regardless of time or place, require resources to conduct their strategic and operational goals. They also engage in violent confrontations that affect not just human bodies but also the physical landscapes in which battles occur. Thus, both mobilizing for war and fighting it can have significant environmental effects. As the organization in charge of the U.S. Armed Forces, the DoD thus holds responsibility for important war-related environmental changes at home and abroad. Acknowledging this does not imply that the DoD destroyed ecosystems and landscapes with malicious intent; rather, it simply recognizes that planning for and engaging in military combat results in environmental consequences. Two prominent examples of the DoD's wartime environmental impact are Vietnam and the first Gulf War. These late twentieth-century wars illustrate especially well the connections among military decisions, ecological change, and environmental politics.

U.S. Involvement in Vietnam (1965–1975)

The Vietnam War was not the first military conflict in which American forces used chemical weapons, but it was the first where they used them extensively as a means of combating

environmental threats instead of human ones. Although during World War II the U.S. Armed Forces used (and continue to use) DDT and other insecticides prophylactically to kill lice and other disease-carrying insects, it was not until the conflict in Vietnam that the DoD deployed defoliants such as Agent Orange on a large scale as part of its arsenal and overall operational planning. The defoliation strategy, code named Operation Ranch Hand (1961–1971), attempted to destroy vegetative cover, thus denying protection to enemy combatants. Defoliation's military efficacy has yet to be determined, but the environmental consequences remain visible on the Vietnamese landscape. These environmental effects are widely debated inside and outside of government, and discussions about them continue to influence DoD policy on the development and use of chemicals in war.

The United States had a long history of military involvement in Vietnam, beginning in the 1950s when American aid and advisers supported France in its bid to retain colonial power there. The French left Vietnam in 1954 following their military defeat at Dien Bien Phu. The Geneva Accords, developed to facilitate the end of French colonial rule, divided Vietnam at the 17th parallel into northern and southern administrative areas and provided for elections in 1956 to decide the nation's political future. The United States opposed the elections, fearing that the Vietnamese Communist Party led by Ho Chi Minh would gain the most support. President Dwight D. Eisenhower (1953–1961) sent military advisers in support of South Vietnam's president, Ngo Dinh Diem (1955–1963). Under John F. Kennedy's administration (1961–1963), American aid increased to include greater numbers of military personnel and resources, including the use of defoliants in counterinsurgency efforts. American involvement in Vietnam peaked during Lyndon B. Johnson's presidency (1963–1969), as did the use of herbicides and then began a slow decline under President Richard M. Nixon (1969–1974). Although Congress voted to end official American military support in 1973, limited numbers of American personnel remained in Saigon until 1975, when they were evacuated following the fall of that city.

Although conventional weapons certainly exacted a toll on the Vietnamese environment, the most widely debated weapon used during the war was the array of chemical defoliants developed by the United States. In his book *The Invention of Ecocide* (2011), historian David Zierler examined the history of defoliants from their origins as agricultural tools through their transformation into weapons of war. Zierler noted that during the Vietnam War, "The U.S. military combined 2,4-D and 2,4,5-T, named the 50:50 mixture Agent Orange, and defoliated approximately 5 million acres of forests in an attempt to expose communist guerrilla fighters loyal to the National Liberation Front (NLF, or Viet Cong) of South Vietnam. Known as Operation Ranch Hand, from 1961 to 1971 the herbicidal warfare program targeted not specific weeds but entire ecosystems. In Vietnam the forest was the weed."[13] Crops, too, became targets of the campaign, as did mangroves and rivers.

Early in Operation Ranch Hand's implementation, scientists began to question and criticize the defoliation policy. Some of these scientists feared a too-close connection between science and war, while others more specifically decried the ecological ramifications of defoliation. Beginning in 1969, several groups conducted scientific studies in Vietnam, despite the continued military hostilities. These studies found several striking results of Operation Ranch Hand: It destroyed from one-fifth to one-half of the mangrove forests in South Vietnam; it killed approximately one-half of the hardwood trees north of Saigon, leaving the area open to invasive bamboo; and it contributed significantly to "nutrient dumping," a phenomenon in which soils become saturated with decomposing matter, and therefore lose the ability to absorb nutrients from falling leaves, impeding re-foliation and making regeneration of the forest ecosystem difficult.[14] The studies supported the position of the scientists who opposed continued use of chemical defoliants. According to Zierler, they "framed the issue as one of unmitigated human and natural devastation, and in so doing upstaged the rhetoric of utilitarian tactical expedience advanced by the defenders of Operation Ranch Hand."[15] Armed with scientific data and political passion, the scientists involved in these studies effectively helped end the Vietnam War, demonstrating "how a group of nongovernmental actors were able to advance a vision of international security based on interdependence and environmental threats common to all people."[16] In 1975, they successfully encouraged the U.S. Senate to sign and ratify the Geneva Protocol, first proposed by the United States in 1925, banning the use of chemical and biological weapons.

The long-term effects of Operation Ranch Hand, both in terms of human health and environmental consequences, are not yet fully understood and are hotly debated. However, increasing medical evidence points to correlations between exposure to dioxin and increased rates of birth defects, not only among residents of the areas where Agent Orange was used, but also among U.S. and United Nations veterans involved in the operation.[17]

Operations Desert Shield and Desert Storm (1991)

The devastation caused by Cold War-era competition and military combat was a powerful incentive for citizens, politicians, and organizations to become involved in the demand for more environmental oversight for the armed forces and the DoD. Likewise, growing environmental awareness and the rise of the science of ecology, which demonstrated the interconnectedness of all living things, pointed to similar issues on the international level. In some

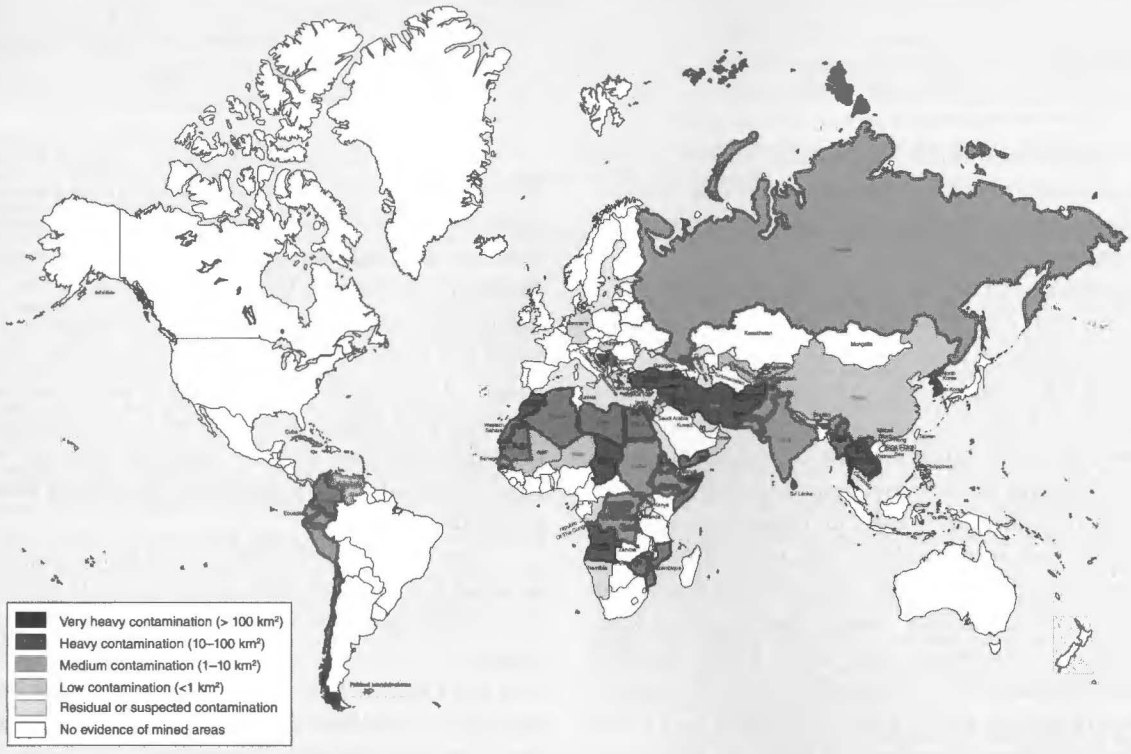
GLOBAL CONNECTIONS

Landmine Cleanup in Southeast Asia

Landmines have been used since at least the nineteenth century, but since World War II their use in civil wars and international conflicts has increased exponentially. Landmines consist of any weight-triggered explosive device planted in or on the ground intended to disable a target through blast force or fragment impact. They are easy and cheap to manufacture and use, do not require maintenance or monitoring once set, and remain live until detonated by pressure or deactivated by trained personnel. Once planted, landmines are notoriously difficult to locate and remove, creating lasting political, humanitarian, and environmental challenges.

Southeast Asia is one of the most land-mined regions of the world. Throughout the Vietnam War, and during the intraregional conflicts that continued into the 1990s in Cambodia, Laos, and Vietnam, combatants on all sides used landmines with lasting effects. For example, in December 2012, forty years after the United States evacuated Saigon (now Ho Chi Minh City), Vietnam reported that landmines and other explosive remnants of war continued to contaminate one-fifth of its territory; that same year, Cambodia noted that a 1,046 kilometer stretch of its border with Thailand has as many as 2,400 mines per linear kilometer, one of the densest rates of contamination in the world. Because of these high concentrations of landmines, Southeast Asia has become a primary focus of remediation and removal efforts. In 2011, Cambodia received the second-largest amount of international assistance after Afghanistan, including funds for mine clearance, victim assistance, and risk education.

FIGURE 17.2 **Mine Contamination as of October 2012**



SOURCE: Landmine Cluster Munition Monitor, http://www.the-monitor.org/lm/2012/maps/map_resources/2012_Monitor_Mine_Contamination_full.jpg.
Argentina and the United Kingdom have both declared that they affected by virtue of their claim of sovereighty over the fairland Islands/Marvinas.
NOTE: Other areas are indicated by italics.

Although intended as a weapon of war, landmines have had significant impacts on civilians. According to the United States Campaign to Ban Landmines (USCBL),

> Landmines are indiscriminate weapons that maim or kill civilians every year. There are between seventy and eighty million landmines in the ground in one-third of the world's nations. The presence of landmines threatens people's lives, and also prevents much-needed economic growth and development. . . . Long after wars are over, landmines make land unusable for farming, schools or living, preventing people from rebuilding lives torn apart by conflict. Because they lurk undetectably in the ground, population movement is restricted, land cannot be cultivated, roads and bridges cannot be rebuilt and refugees cannot return to their homes.

(Continued)

(Continued)

The USCBL joined other nongovernmental organizations and nation-states in Oslo, Norway, to draft the 1997 Mine Ban Treaty. The treaty aims to end the use, stockpiling, transfer, and production of landmines and to ensure destruction of existing mines. In September 1997, 122 nations signed the treaty, which entered into force in December of that year. As of February 2013, 161 states were treaty signatories, one had yet to ratify it, and thirty-five had not yet signed, including the United States.

The United States has not acceded to the treaty, despite being in basic compliance of it, because of the on-going conflict in Korea, where U.S. military personnel continue to serve. In September 1997, President William J. Clinton (1993–2001) stated:

> As commander in chief, I will not send our soldiers to defend the freedom of our people and the freedom of others without doing everything we can to make them as secure as possible. For that reason, the United States insisted that two provisions be included in the treaty negotiated at Oslo. First, we needed an adequate transition period to phase out the anti-personnel mines we now use to protect our troops, giving us time to devise alternative technologies. Second, we needed to preserve the anti-tank mines we rely upon to slow down an enemy's armor defensive in a battle situation. . . . Take the Korean Peninsula. There, our 37,000 troops and their South Korean allies face an army of 1 million North Koreans only 27 miles away from Seoul, Korea. . . . Our anti-personnel mines there are a key part of our defense line in Korea. They are deployed along a DMZ [demilitarized zone] where there are no villages and no civilians.

The United States has signed other landmine agreements, including the Amended Mines Protocol to the Convention on Conventional Weapons, and has participated in cleanup efforts around the world. In 2011, the United States contributed more than $131 million to thirty-seven countries, including at least $5 million each to Cambodia and Lao Peoples Democratic Republic and nearly $3.5 million to Vietnam.

SOURCES: The Monitor: http://www.the-monitor.org/index.php/cp/display/region_profiles, see profiles for "Vietnam" and "Cambodia." United States Coalition to Ban Landmines: http://www.uscbl.org/landmines/, see "Landmine Facts." William Jefferson Clinton, "U.S. Leads in Land Mine Removals as Others Talk," http://www.defense.gov/speeches/speech.aspx?speechid=785.

cases, the process resulted in cooperation; in others, such as in the debates over the first American war in Iraq, the acrimonious tenor resurfaced in the public critique of the American "war for oil."

Environmental activists were at the forefront of that debate. In 1991, Carl Pope of the Sierra Club compared America's actions in Kuwait and Iraq to the Mongolian invasion of the region in 1258, a conquest based, according to Pope, on "a hunger for a single resource—grass." Pope explained, "Nomadic Mongol society depended exclusively on ever-expanding pastures to support its growing herds of horses. By the early part of the 13th century the Mongols had overrun their own grasslands and, rather than change a way and scale of life no longer supportable at home, they poured out of Central Asia." Nearly eight centuries later, Pope argued, "American and allied forces bombed Baghdad, then invaded and vanquished Iraq. The underlying cause of the war was an American hunger for a single resource—oil." Pope contended that American society was dependent on oil, just as the Mongols had been dependent on grass. By the late twentieth century, Pope noted, Americans had depleted their own oil reserves and waged war to access it elsewhere.[18] Pope was one among thousands who criticized President George H. W. Bush (1989–1993) for what they considered to be his resource-based politics and demanded that he stop paying "blood for oil." Pope's critique linked environmental concerns with antiwar sentiment and gained traction with many in America and around the world who opposed the war, especially once evidence of war-related environmental problems became clearly marked on the Iraqi landscape.

Both American and Iraqi military actions during the war resulted in visible pollution and physical destruction, prompting scientists to issue predictions of dire atmospheric, water, and land degradation. Susan L. Cutter, geographer and director of the Hazards Research Lab, wrote in 1991, "The immense environmental ramifications of Operations Desert Shield and Desert Storm are just now coming into view. The images of oil-soaked birds and the towering infernos of the Kuwaiti oil fields held the United States' attention for a brief time, but long after the hostilities cease and media reports diminish, the environmental degradation caused by the conflict remains."

Cutter predicted that the damage would take decades to repair and that immediate problems would give way to "longer-term ones with regional and possibly global repercussions." She also noted that neither the United States nor Iraq was a signatory on a number of treaties and declarations intended to limit the environmental consequences of war. "The environment has become one of the many casualties of war," she suggested. Indeed, the smoke from the oil well fires frequently obscured the sun in the region, causing some observers to speculate that a "petroleum winter" might set in, and the oil dumped into the Persian Gulf had tremendous effects on marine and bird life. Cutter indicated that Caspian terns, cormorants, and grebes suffered major losses, as did turtles, shrimp, and marine mammals. In addition, she noted that the mangrove regions and coral reefs underwent significant degradation as well.[19]

As other sources have argued, however, some of the region's ecosystems benefited from the war. A brief in *Environment* noted that the first Gulf War "temporarily

slowed desertification in Kuwait" and that plant and animal communities in the delicate desert environment enjoyed a brief recovery period because hunters and other desert users stayed away due to unexploded landmines and bombs. The report, initially published in *Bulletin of the Atomic Scientists,* indicated that Charles Pilcher, who had been studying the area's birds for seventeen years, found in 1993 a hundred-fold increase in the desert's bird life since before the war and a massive growth of natural vegetation that resembles, in Pilcher's words, "a U.S. prairie."[20] Life flourished in spite of, or perhaps because of, the war. In addition, the apocalyptic predictions of major downward temperature changes caused by increased smoke cover (the feared "petroleum winter") never materialized.

Despite the reassuring rebound of desert bird populations and the relief that the massive air pollution did not result in extended weather and climate changes, a significant and potentially deadly problem associated with the first Gulf War persists. The 1991 war was the first in which the Department of Defense employed depleted uranium (DU) shells and armor, and serious questions have arisen regarding its lasting health and environmental effects. Although countless studies have been and are being conducted into the relationship between DU and Gulf War Syndrome, fetal abnormalities, and cancer rates, its long-term environmental effects are less well known. The DoD maintains that the DU shells and armor contributed significantly to the success of Operation Desert Storm and to protecting American and allied troops, but it is as yet unclear at what ecological and human price.

A U.S. Navy carrier is escorted into port by two tugboats. To lessen its dependence on fossil fuels, the DoD is committed to developing strong green initiatives and implementing advanced alternative fuel technologies. The U.S. Navy has developed hybrid electric and bio-fuel ships and plans to create a "Green Strike Force" by purchasing drop-in bio-fuels to be used on jets and vessels. Drop-in bio-fuels are most often described as renewable fuels that can be blended with petroleum products, such as gasoline, and used in the current infrastructure of pumps, pipelines, and other existing equipment.

SOURCE: U.S. Navy photo by Chief Mass Communication Specialist John Lill/Released.

AN AMBIGUOUS LEGACY

The Department of Defense has been responsible for both the destruction and the protection of valuable ecosystems and has played a critical role in shaping the global environment. Although environmental considerations will always be secondary to its stated mission to "provide the military forces needed to deter war and to protect the security" of the United States, the DoD has begun to acknowledge that healthy ecosystems and safe environments contribute to that goal. The DoD is increasingly involved in sustainable and ecologically sound resource management on its bases and installations and has begun to integrate and implement environmental protection as part of its operational mandate. In 1962, the DoD established the annual Secretary of Defense Environmental Award, which "honors individuals, teams, and installations for their outstanding achievements and innovative environmental practices and partnerships that promote quality of life and increase efficiencies without compromising mission success." These awards recognize achievement in six major categories: sustainability, environmental quality, environmental excellence in weapon system acquisition, natural resources conservation, environmental restoration, and cultural resources management.[21] The award program represents an important development in the DoD's views of its responsibilities and reveals that it intends to improve its environmental record.

Because its mission is inherently connected to weapons development and military combat, however, the DoD will likely continue to operate in ways that compromise ecological integrity and environmental health. The DoD actively investigates ways to decrease its use of fossil fuels, thereby reducing its carbon footprint, but it will not adopt technologies that it perceives might impede its mission or endanger its personnel. It continues to manage highly restricted research and testing sites that are not subject to external environmental regulation. Thus, while the DoD has made significant improvements to its environmental scorecard, it is hampered in these efforts by the very nature of its mission, and it therefore will continue to have an ambiguous environmental legacy.

See also **Chapter 1: Agricultural Practices, Westward Expansion, and Land Use (First Arrivals through the 1870s); Chapter 4: Legacies of Indigenous Resistance to Colonial Expansion (1860s–Present); Chapter 8: Water and Waterways: Issues and Policies (1700s–Present); Chapter 18: The Department of Energy and Its Precursors: History, Responsibilities, and Policies (1942–Present).**

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