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STUDY PROJECT

CAN THE UNITED STATES ARMY ADJUST TO THE ENDANGERED SPECIES ACT OF 1973?

BY

Colonel Mark D. Ahner
United States Army

USAWC CLASS OF 1992

U.S. ARMY WAR COLLEGE, CARLISLE BARRACKS, PA 17013-5050

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release. Distribution unlimited.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) U.S. Army War College	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION Root Hall, Building 122 Carlisle, PA 17013 — 6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and ZIP Code)	7b. ADDRESS (City, State, and ZIP Code)
8a. NAME OF FUNDING/SPONSORING ORGANIZATION — 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State, and ZIP Code)	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. — PROJECT NO. — TASK NO. — WORK UNIT ACCESSION NO.

11. TITLE (Include Security Classification)
Can the United States Army Adjust to the Endangered Species Act of 1973?

12. PERSONAL AUTHOR(S)
Colonel Mark D. Ahner

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Study Project	FROM _____ TO _____	1992, April, 15	59

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	

19. ABSTRACT (Continue on reverse if necessary and identify by block number) A dramatic shift in the public's attitude towards environmental iss es has occurred in the past two decades. "Business as usual" now mandates that citizens, corporations, and governmental agencies must incorporate environmental compliance and protection into their respective ethics and conduct. The Endangered Species Act of 1973 (ESA) has significantly impacted the United States Army's ability to sustain its readiness posture by restricting its training activities. The findings, recommendations, and conclusions contained in this study project are supported by official documents and publications, oral interviews, and a survey. A review of the military's environmental responsibilities and current ESA issues on Army installations is evaluated in the context of balancing future training requirements with the protection of endangered species. Recommendations are made in anticipation of these future requirements and constraints imposed upon Army commanders by the ESA. The conclusions reflect a

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION	
☐ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS		
22a. NAME OF RESPONSIBLE INDIVIDUAL RALPH E. KAHLAN, COL, IN	22b. TELEPHONE (Include Area Code) (717) 245-3510	22c. OFFICE SYMBOL AWCAE

DD Form 1473, JUN 86 — Previous editions are obsolete. — SECURITY CLASSIFICATION OF THIS PAGE

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USAWC Military Studies Program Paper

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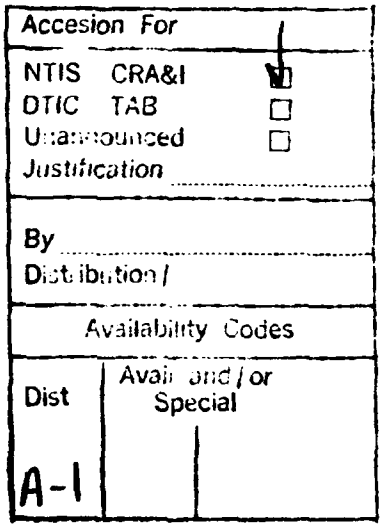
Can the United States Army Adjust to the Endangered Species Act of 1973?

An Individual Study Project

by

Colonel Mark D. Ahner
United States Army

Colonel Ralph E. Kahlan
Project Adviser



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U.S. Army War College
Carlisle Barracks, Pennsylvania 17013

Abstract

Author: Mark D. Ahner, COL, ARNG

Title: Can the United States Army Adjust to the Endangered Species Act of 1973?

Format: Individual Study Project

Date: 15 April 1992 Pages: 57 Classification: Unclassified

A dramatic shift in the public's attitude towards environmental issues has occurred in the past two decades. "Business as usual" now mandates that citizens, corporations, and governmental agencies must incorporate environmental compliance and protection into their respective ethics and conduct. The Endangered Species Act of 1973 (ESA) has significantly impacted the United States Army's ability to sustain its readiness posture by restricting its training activities. The findings, recommendations, and conclusions contained in this study project are supported by official documents and publications, oral interviews, and a survey. A review of the military's environmental responsibilities and current ESA issues on Army installations is evaluated in the context of balancing future training requirements with the protection of endangered species. Recommendations are made in anticipation of these future requirements and constraints imposed upon Army commanders by the ESA. The conclusions reflect a pessimistic yet realistic future for the Army in its attempt to reconcile its training and environmental responsibilities. A policy trace of the ESA and a survey of selected Army War College students is appended.

Introduction

Fort Bragg, home of the XVIII Airborne Corps and the 82nd Airborne Division, the leading edge of our contingency force and the key to the Department of Defense's (DoD, see Appendix A for full list of abbreviations/acronyms) strategy of CONUS-based force projection is now relegated to field training exercises no greater than dismounted platoon level activities; compliance with the Red-Cockaded Woodpecker (RCW), Picoides borealis, recovery plan precludes larger maneuvers.[1]

Criminal indictment of 3 DoD civilians at Fort Benning, Ga. on 28 January 1992 for violation of the Endangered Species Act (ESA) in conjunction with forest managements activities (destruction of RCW habitats) on the installation resulted in a prospective prison sentence of 36 years and fines up to $650,000 for one of the employees. [2]

A newly-constructed 24 million multi-purpose Range Complex (MPRC) at the Pohakuloa Training Area, Hawaii may never be used as a result of an environmental impact statement (EIS) induced by a public lawsuit. A soon-to-be-listed (Category 1) endangered plant species was discovered on the site, threatening any practical use of the range. [3]

Camp Gruber, Oklahoma, a National Guard installation that serves as a training center for the Army's Air Assault Course and a separate infantry brigade, must complete a biological survey as part of an environmental assessment to determine the extent of the American Burying Beetle, Nicrophorus americanus. During an informal consultation with the Fish and Wildlife Service (FWS), Guard officials identified a potential conflict with proposed military construction plans and protection of the beetle.[4]

Though vitally significant in themselves, these examples are not isolated, but

merely illustrative of a pervasive yet generally unacknowledged obstacle to the Army's primary mission—"training to fight, and if necessary fighting to win."

The political, social, economic, and natural environments within which DoD exists and functions are dynamic and the evolution of change is accelerating in an unprecedented manner. Similarly, the national security and military strategies, doctrine, equipment, and training requirements are in transition in this post-cold war era.

The United States Army, currently and in the foreseeable future, faces incredible changes, not the least of which is Secretary of Defense Cheney's directive that DoD be the federal leader in environmental compliance and protection. Notwithstanding the enormous costs and constraints associated with numerous U.S. environmental laws, the ESA is currently restricting the Army's training and readiness posture to a greater extent than other statutes. Its potential to further exacerbate training opportunities and inhibit the Army's ability to meet accepted standards of preparedness are enormous. The Department's ability to meet these challenges, for a number of reasons, is seriously constrained. Can we accomplish our military mission **and** comply with the ESA? A realistic, honest, and thoughtful examination of this issue is not only prudent, but critical in assessing the Army's role in the preservation of this nation's security and values.

Historical Perspective: The Military and an Environmental Ethic

Recent, profound, and genuine concerns about our global and national environment, both internal and external to military operations, have generated impressive debate, controversy, and information of truly historic proportions. However, even a cursory review of history illustrates that military activities have always been

intrinsically linked to man's natural resources, due to the destructive nature inherent to conflict. The Persian Gulf War vividly portrayed the desecration and frequently wanton destruction of the air, land, and water resources of that region's fragile ecosystem by the combatants.

Citizens have begun to question the ethical and practical implications of military exercises upon the natural environment, especially impacts to the flora and fauna by ground forces. Legal and ethical constraints upon military forces, particularly land forces, is not new or unique to the U.S. Army. An early admonition to military commanders is found in the Old Testament where we are commanded not to use fruit trees for military construction; only non-food producing trees are to be used.[5] Plato stated that Greeks "will not ravage the country or destroy the houses."[6] The first comprehensive guidelines to limit damage to the environment by military forces was presented by Hugo Grotius in *The Law of War and Peace*, published in 1625.[7] Prior to World War II, the German Army conducted large scale maneuver training in relatively small areas and protected their natural environment. They intentionally conducted maneuver on lands unsuited for agriculture and intensive forest management as well as scheduling their operations in the fall to limit crop damage and soil erosion. Agricultural tracts within training areas were used as obstacles to enhance realistic training and dictate innovative tactical maneuver schemes. This environmental heritage, as any U.S. Army commander who has trained in Europe can attest, is very much prevalent today, as extreme measures are taken to limit environmental damage within training areas.

In 1978 The Enmod Convention required its signatories to agree "not to engage in military or other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State party."[8] Protocol (I) of the Geneva Convention of 12 August 1949 (entered into force on 7 December 1978) specifically requires combatants to limit

environmental destruction. It states that:

> care should be taken in warfare to protect the natural environment against widespread, long-term, and severe damage. This protection includes a prohibition of the use of methods or means of warfare which are intended or may be expected to cause such damage to the natural environment and thereby to prejudice the health or survival of the population. Attacks against the natural environment by way of reprisals are prohibited.[9]

These arguments are primarily *utilitarian* and significant latitude is still available to military commanders; however convincing arguments are now being proffered that claim our environment deserves protection for its *inherent* worth. In contrast to utilitarian worth, that is, value related to *persons* affected by military decisions, the inherent argument implies that the environment is valuable in its *own right*, irrespective of its value or worth to human beings. Merrit Drucker, as a philosophy instructor at the United States Military Academy, makes a compelling case for the inherent value approach utilizing a logical extension of our protection of endangered species to support this proposition. Drucker says:

> Endangered species are generally considered to have great value. This value is not completely extrinsic. Think about our attempts to save the California condor, the American chestnut sea turtles, or the humpback whale. Why do we do this? It is certainly not a pure utilitarian argument that marshals thousands of people and millions of dollars to save a species that few have ever seen and that will have little or no input on the quality of their lives. We must want to save species for their inherent worth.[10]

Further he deduces that since endangered species have inherent worth, then all species are inherently valuable as is the environment that sustains them.

Similarly, LTC Kent Butts, a Strategic Analyst at the U.S. Army War College, states:

> Environmental protection and compliance with environmental laws are now a fact of America's political culture.[11]

Few military leaders can argue against the merits of environmental protection and compliance that the public, through their elected representatives, has mandated. Yet, progressively restrictive environmental regulations are definitely impacting the Army and neither reluctance to adjust nor mere tolerance of environmental laws will suffice. A review and insightful reflection upon attitudes, laws, and our involvement with protection of plant and animal species is of special interest due to its complexity, potential for enormous resource expenditures, and profound implications on the Army's ability to maintain and sustain a force trained to fight and prepared to win in the event of conflict.

World–wide estimates of the number of existing plant and animal species vary anywhere from 5 million to 100 million and only a fraction (1.7 million) have been identified.[12] The rate at which they are becoming extinct is therefore also quite subjective with as many as 150 species being lost daily or a quarter of the total projected to be extinct within the next 50 years. Historically, mass extinctions due to cataclysmic natural events were not uncommon, but today population demands, poverty, waste, and pollution are the primary agents of destruction in the global perspective. Testimony before congressional committees in the early 1970's presented evidence that habitat destruction and hunting were the primary reasons for the demise of species in this country.[13] Previous legislation (Endangered Species Preservation Act of 1966 and the Endangered Species Conservation Act of 1969) proved inadequate and each year a species was disappearing. Deficiencies in previous legislation were corrected with the passage of the Endangered Species Act of 1973 which was signed into public law (PL 93-205) by President Richard M. Nixon on 28 December 1973. Little fanfare or attention was devoted to the signing as Nixon

was immersed in the Watergate scandal at the time. This legislation was considered the vanguard of enlightened environmental responsibility among the numerous environmental statutes enacted in the mid-1970's. The near unanimity expressed by Congress and the Nixon administration attests to its overwhelming support by the American public, but the intent of Congress in 1973 was challenged by the federal government in 1978. In the infamous "snail darter" case, a small fish on the endangered list, was found in the Little Tennessee River and its habitat and consequently its existence was jeopardized by the Tennessee Valley Authority's (TVA) planned $100 million dam. The U.S. Supreme Court decided in favor of the fish, regardless of the cost, and the dam construction was terminated.[14] The ESA had passed its first challenge and even subsequent amendments in 1978 and 1982 designed to provide some flexibility into the original law have not significantly diminished its impact.

Military institutions failed to recognize the ESA, assuming that national security interests or the federal sovereignty doctrine would somehow exempt them from its strict provisions. LTG Hatch, Commander of the U.S. Army Corps of Engineers, in a speech at the Defense Natural Resources Leadership Conference in August of 1991, conceded what most military commanders recognize, but were unwilling to admit until recently. He stated:

> As recently as two decades ago, natural resources had little relevance to the training mission. In fact, natural resource considerations were largely related to doctrinal requirements, such as the need for training in forests, grasslands, mountains, and valleys. And training constraints were characterized in physical terms of trafficability and mobility. At that time, terms such as wetlands, endangered species, biodiversity, excessive soil erosion, stream sedimentation, and mitigation of impacts were largely unheard of. Essentially, all training lands that *could* be used, *would* be used, if needed.[15]

Unfortunately, many, if not the majority of Army leaders, including some within the Corps of Engineers, still ignore, or at least refuse to acknowledge the serious nature of the ESA. This ambivalent attitude is supported by survey results conducted in the fall of 1991 of a select, but representative sample of U.S. Army War College students. Although 78% of the respondents believe that environmental issues are very to extremely important (56% even considered environmental neglect as a threat to national security), of twelve domestic issues, they ranked the environment as sixth in importance. However, 87% think that the Army is reactive rather than proactive in its approach to environmental issues. Equally disturbing was a finding that 74% of the surveyed officers had little knowledge or were completely ignorant of environmental laws and Army regulations that deal specifically with environmental protection and compliance provisions on military installations; a sample specifically chosen to reflect those "officers most likely to know and support those DoD initiatives."[16]

On the other hand, recent events do suggest that the Army's environmental ethic, as well as practices, are transitioning from an adversarial role to one of resigned acceptance. Precipitated by strict enforcement of environmental statues by aggressive state and federal agencies or lawsuits initiated by citizen's organizations, the Army has been forced, in several instances, to make a concerted effort to improve its image related to environmental protection and compliance. At any rate, pronouncements by Secretary of Defense Cheney, the Secretary of the Army, and the Army's Chief of Staff, exemplify this commitment to all environmental laws, including the ESA. In a July 1990 memo, General Sullivan endorsed Cheney's environmental policy by directing:

> that work and actions must be environmentally sustainable, meeting current needs, without compromising the integrity of the environment for future generations.[17]

Related to the ESA, an Army Endangered Species Task Force met at Fort Belvoir on 6-7 February 1992 to address the following *problem*:

> How will the Army be able to effectively train and operate to required levels of readiness, while fulfilling ESA compliance and environmental stewardship responsibilities?

Further, the Task Force's *mission* was stated as follows:

> To develop an action plan and overall Army strategy that insures sustaining required readiness while achieving the Army's vision for environmental leadership. The Task Force will focus on endangered species; solutions will provide a model for other areas of environmental stewardship.[18]

Can the Army adjust to the ESA? Are existing and potential conflicts reconcilable? Will General Sullivan's environmental vision be translated throughout the Army into concrete, measurable, and defensible actions without a subsequent degradation of the Army's readiness posture? The problem, succinctly stated by the Endangered Species Task Force, is difficult. What are the prospects?

The Dilemma

Few people took notice of the passage of the ESA in 1973 and the Army, preoccupied with the post-Vietnam War reductions and an endemic demoralization of its character, was even less attuned to the Act's actual and potential implications. The Fish and Wildlife Service (FWS) of the Department of the Interior as the federal government's lead agency in ESA issues was understandably slow in promulgating its rules for listing species and implementing individual recovery plans for each listed plant or animal. Inadequate funding, staffing, and scientific data precluded active enforcement of the statute. Until 1978 when the Supreme Court, in its strict interpretation of the ESA in the Tennessee Valley Authority versus Hill Case (snail

darter), little controversy or attention was focused on the FWS and other federal agencies.[19] The court's decision catapulted the ESA into intense public scrutiny and acted as a catalyst to environmental organizations. Many citizens and groups perceived the decision as an avenue to promote their respective anti-development, preservationist philosophies and agendas. Coupled with the National Environmental Policy Act (NEPA), the ESA proved to be a formidable instrument in achieving either laudable (depending on one's perspective), or "hidden" agendas for environmentally-minded citizens.

ESA Provisions

To appreciate the magnitude of the Act's provisions it is essential to delineate certain key requirements contained in the legislation:

• Expansion of the definition of an "endangered species" as one "which is in danger of extinction throughout all or a significant portion of its range," and a "threatened species" as one "which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."

• Directed the appropriate secretary to draw up lists of endangered or threatened species.

• Directed the secretary to cooperate "to the maximum extent practicable" with the states in carrying out provisions of the law, and authorized him to enter into wildlife management agreements with the states and to provide financial assistance to a state maintaining an "adequate and active" conservation and management program for endangered or threatened species.

• Prohibited the "taking" of such species within the United States, on its territorial waters or upon the high seas.

• Directed "all agencies, departments, and other instrumentalities of the federal government to cooperate in the implementation of the goals of the Act. Each agency shall, inter alia, take steps to insure that actions authorized, funded, or carried out by it do not jeopardize the continued existence of any such species or result in the destruction of its habitat."[20]

Subsequent amendments provided for the listing of plant species and substantial civil and criminal penalties for violation of the Act's provisions or failure to comply with the appropriate regulations. Both the civil and criminal penalty provisions of the ESA apply to "any person," defined as "any officer, employee, agent, department, or instrumentality of the federal government." For a knowing violation of the prohibited acts, the Secretary is authorized to assess a civil penalty of up to $25,000 per violation; criminal penalties can result in a fine up to $50,000 and imprisonment for up to one year for each violation.[21]

The ESA, explicitly protects endangered or threatened species, but also implicitly demands maintenance of biodiversity—the variety of living organisms and the environments they live in; without exception for rare and exotic species, but by extension all natural resources within the ecosystem that support their existence.

The following representative examples serve to illustrate the current atmosphere and difficult circumstances engendered by the ESA.

Pohakuloa Training Area, Hawaii

In accordance with NEPA procedures, the Army issued a Finding of No Significant Impact (FONSI) in 1986 upon completion of its Environmental Assessment (EA) for the construction of a $24 million Multi-Purpose Range Complex (MPRC) at the Pohakuloa Training Area. As the project neared completion in 1990, a lawsuit was filed to halt construction because an Environmental Impact Statement (EIS) had not been completed and the plaintiff thought significant impacts had been done to the

environment. Initially the District Court ruled against the plaintiff and construction continued, but the case was appealed to the 9th Circuit Court. Taking the advice of Justice Department lawyers, the Department of the Army decided to settle out of court. The settlement called for: 1) the plaintiff to drop the appeal and allow construction to be completed on schedule and 2) DA was to prepare an EIS for the operation of the MPRC. A subsequent botanical survey for the EIS discovered a soon-to-be-listed endangered plant species, Tetramolopium arenarium, and 10 other "candidate" species within the MPRC boundary.[22]

Will the MPRC ever be usable? Could these problems have been avoided? These are difficult questions with no discernible answers yet, but there are several lessons to be learned from this experience.

Camp Shelby, Mississippi

Camp Shelby is the largest Army National Guard training site, encompassing 134,000 surface acres, the majority owned by the United States Forest Service (USFS) which has permitted Army training through Special Use Permits since World War II. In the mid-1980's the Mississippi National Guard recognized the need and potential to expand its facilities and maneuver training areas to meet emerging training requirements. AirLand Battle doctrine and the need to achieve higher levels of mobilization readiness necessitated effective combined arms training at brigade, battalion, and company levels. However, heavier, faster, and more maneuverable equipment, i.e. M1 tank, and Bradley Fighting Vehicles, longer combat engagement distances, increases in mechanization, and combined arms exercises had effectively reduced the amount of land available to satisfy training requirements.[23] Concurrently, the USFS and the general public expressed concern over the lack of control of maneuver training activities and alleged excessive environmental damage. To further compound the situation, the Red-Cockaded Woodpecker, an endangered species,

had been found within the installation's boundaries and in 1987 the Gopher Tortoise, Gopherus polyphemus, another inhabitant of the area was listed as a threatened species by the FWS.[24]

To accommodate Army training needs and protect the natural environment, a joint decision between the ARNG and the USFS was made to do an EIS. An innovative, comprehensive, and scientific method developed by the Construction Engineering Research Laboratory (CERL) of the Army Corps of Engineers was utilized to meet the challenge. This system, Integrated Training Area Management (ITAM), is actually a program consisting of six initiatives that can be used together or in part to address all facets of land management. The initiatives are: 1) Land Condition-Trend Analysis (LCTA), a program for cataloging and monitoring natural resources; 2) balancing training requirements with effective land management; 3) environment awareness i.e. soldier education; 4) structural rehabilitation and runoff control technologies; 5) rehabilitation and maintenance i. e. revegetation; and 6) computerized decision-support systems i.e. Graphic Information Systems, commonly known as GIS.[25]

Training at Camp Shelby had been relegated to platoon and company level, yet a Land Use Requirements Study (LURS) identified a shortfall of 49,000 acres of tracked vehicle maneuver area to achieve brigade level training standards. Additionally, to maintain mobilization and readiness standards, the LURS identified several other needs. Installation of a MPRC, Tactical Aviation Areas, an Automated Tank Wash Facility, a new Explosive Ordnance Disposal Facility, a Combined Arms Live-Fire Exercise (CALFAX) range and expansion of training areas for engineer battalions were also necessary.

A draft EIS was completed in November of 1991, and the preferred alternative would allow the 3 armored brigades to train to standard at battalion level. Brigade level maneuver training was not deemed feasible, but acceptance by the USFS of the preferred alternative, would elevate the site from platoon/company level to battalion

level. Significantly, this alternative would also allow the inclusion of the additional facilities to further enhance small arms, artillery, armor, and engineering training activities.

The partnership exhibited among the USFS, ARNG, and the FWS culminated in a plan that not only protects the Gopher Tortoise, but has the distinct probability of enhancing its habitat and furthering its recovery at Camp Shelby. For unknown reasons, the RCW population has diminished to the point that no observed sightings were confirmed in an extensive ground and aerial survey conducted in 1990 and 1991.[26]

Will Camp Shelby be able to achieve markedly enhanced maneuver and gunnery training and also ensure environmental compliance and protection of its natural resources? The jury is still out, but the prognosis is good, and it is apparent that a proactive, state-of-the-art, integrated systems approach conducted in a cooperative and coordinated interagency manner accomplished most of the Army's objectives.

Camp Gruber, Oklahoma

The training installation at Camp Gruber is one of several sites where the Army conducts its Air Assault Course. Early this year, construction plans for military facilities were modified due to the discovery of the endangered American Burying Beetle, Nicrophorus americanus, an insect listed by the FWS in July 1989.[27]

According to Colonel James Peck, Oklahoma's State Safety Officer, an updated environmental assessment including a biological survey for the endangered beetle had not been completed (an unseasonably cold October prevented a scheduled survey).[28] A proposed MOUT (Military Operations in Urban Terrain) site scheduled for ground breaking this spring had to be changed as it was considered suitable habitat for the beetle. A joint field inspection with the FWS officials resulted in an agreeable compromise for an alternative site. Will Camp Gruber be limited in its future

construction program or will the beetle's existence be jeopardized and result in further military construction limitations? With prudent planning and protective measures (elimination of pesticide use) in place, National Guard authorities believe they will not be seriously impacted by this species. Even though the current conflict was favorably resolved, the magnitude of the ESA as it progressively expands its list of endangered insects from the current nineteen species[29] to potentially hundreds of species, portends serious and irreversible consequences for Army training areas.

Camp Roberts, California

In 1967, under provisions of the Endangered Species Preservation Act of 1966, the San Joaquin Kit Fox, Vulpes macrotis mutica, was listed as an endangered species. California, the historic home of this animal, had been subjected to unprecedented urbanization, agricultural development, and extensive population growth; all to the detriment of the fox. But Camp Roberts, a relatively secure, undisturbed enclave of biodiversity, featured habitat conducive to the fox.

Early in the 1960's it was acknowledged that the Kit Fox inhabited Camp Roberts, but it wasn't until nearly two decades after its listing that FWS and ARNG personnel implemented comprehensive measures to protect it. Since then over $2 million has been spent on a long-term project to protect and enhance the fox's population.[30] Compliance with Section 7 of the ESA prompted National Guard officials to initiate policies for education of personnel using the installation, reducing speed limits, and limiting off-road vehicle use to training required activities. An intensive biological survey to identify and protect fox dens for all projects involving ground-disturbing activities was also undertaken. The California ARNG also established a 30-year research project to assess the effects of installation operations on Kit Foxes and develop means of reducing those effects.[31] The project has been recognized as a "model" for similar efforts elsewhere. The FWS, in issuing its Biological Opinion, now

states that activities at Camp Roberts do not threaten the species and allows the "incidental taking" of three foxes by military activities before further consultation with FWS authorities is required. In other words, the FWS is confident that current efforts at Camp Roberts are adequate and will lead to a stable if not an increased population of the species.

The dollar costs have been high, but compared to annual expenditures of $1.5 million to save the California Condor, Gymnogyps californianus,[32] they seem prudent. The costs must be balanced against the potential loss of a valuable training site with a subsequent degradation of military preparedness. Currently, the advantages outweigh the disadvantages especially when the landowner and manger (CA ARNG) would not be relieved of its responsibilities under the ESA, even if it ceased all operations at Camp Roberts. The prospects for meeting training standards and protecting the Kit Fox are apparently achievable.

Fort Bragg, North Carolina

No where is the dilemma confronting the Army more focused, of immediate concern, and of the magnitude, as exemplified at this training area. Solutions to satisfy the ESA's requirements, and assure a trained and ready force, are incredibly elusive; the Red-Cockaded Woodpecker, a species whose existence weighs in the balance, is the primary actor in this real-life confrontational scenario.

In 1970 when the RCW was listed as an endangered species, it received little or no attention from Army commanders. However, in the past decade not only has Ft. Bragg taken a keen interest in this bird, but it's widespread recognition has overshadowed training programs at Camp LeJeune, Ft. Benning, Ft. Polk, Camp Shelby, and other military installations within the historical range of the species, the southeastern and southcentral regions of the country.

Training standards at brigade, battalion, and company levels are not being met.

Even platoon level exercises must be dismounted and night training has been constrained in order to protect RCW colonies. The 82nd Airborne Division, the Army's vanguard unit of its contingency corps (XVIII Airborne Corps), can not meet Army readiness standards by training at Ft. Bragg. For a Corps that requires readiness for combat in 18 hours, in any part of the world, the implications are profound and very disturbing. A total of 44 FORSCOM battalions are assigned to Ft. Bragg and represent the full spectrum of combat and combat support forces. Although referred to as light forces, there are 550 tracked vehicles in Corps units. Additional tracked maneuver, artillery, and gunnery areas are required for National Guard, Army Reserve, and Marine Corps forces that utilize the installation.

According to Dr. Evelyn Johnson, a wildlife biologist, Ft. Bragg supports the largest concentration of RCW's of DoD lands, averaging one colony per square kilometer of forested maneuverable training area.[33] During the past five years, the installation has averaged 1.75 million person-days per year in the maneuverable training areas. Further, a recent GAO report found that "Ft. Bragg is the most heavily utilized training area per acre within the Army and needs almost double its present land base to meet the training requirements."[34]

Training that damages mature standing trees, (depending upon the species of pine, anywhere from 80-200 years of age)[35] that are or may provide cavity nesting sites, or that interferes with nesting birds is not compatible with the FWS recovery plan requirements. Translated, that means that forest management activities are severely curtailed, vehicle use within 200 feet of any active or inactive cavity trees is prohibited, parachute retrieval is limited to trees less than 6 inches in diameter, and earth-disturbing activities (including tank ditches, TOC sites and demo shots) are prohibited in colony areas and within 100 feet of natural waterways (22 watersheds). Bivouac sites and night training operations are also prohibited near colony sites during the April–June breeding season (which coincides with the heaviest use of Ft. Bragg's training areas).

Protective measures for the RCW are but one source of frustration for Ft. Bragg trainers. Two endangered plants, Michaux's Sumac, Rhus michauxii, and Rough-leaved Loosestrife, Lysimachia asperulaefolea, also inhabit the training area and must be protected from vehicular and concentrated foot traffic. Earth-disturbing activities are precluded within 100 feet of any streams or natural waterways. Erosional areas that are undergoing rehabilitation and some culturally sensitive sites are also "off limits" to any activities. When a composite overlay of all protected acreage is prepared, few realistic schemes are available to accommodate unit training requirements.

In the spring of 1990 a criminal investigation of an alleged violation of the ESA was conducted by the FWS and the Staff Judge Advocate. An incident resulting in the failure of a nesting pair of RCW near the Smith Lake Recreation Area was found to be caused by the removal of protective tape near an active nesting tree. Insufficient evidence was produced to conclude that a criminal violation had occurred,[36] but the FWS was probably skeptical of Ft. Bragg's commitment to the protection of endangered species with this latest incident. Only three months prior to the removal of the protective tape, the FWS had issued a "jeopardy opinion" (2 February 1990) to Ft. Bragg. A jeopardy opinion is issued after a biological assessment concludes protective measures are inadequate and the species (RCW in this case) existence is being jeopardized by the agency's activities. Statements made by the installation's wildlife biologists indicate that military officers are less than enthusiastic about compliance with the ESA, a not uncommon statement.[37]

Unfortunately, the habitat necessary to sustain the RCW is characterized by a mature, open, fire-maintained ecosystem, especially those dominated by loblolly and long leaf pine types; an ecosystem that requires a 100-200 year cycle. Federal lands, particularly USFS and DoD-managed tracts are the primary reserves of these ecosystems and a disproportionate population of RCW's are concentrated within their boundaries.

Further, a recent lawsuit initiated by an environmental organization against the USFS in Texas resulted in the agency being found guilty of violating Sections 7 and 9 of the ESA and put the national forest under a court-ordered plan.[38] Subsequent research validated the court's decision and the USFS has substantially modified its timber cutting practices throughout the southeast. The USFS, a recognized leader in natural resource management, now confesses that they had contributed to the RCW decline on lands adjacent to or in close proximity to Army military reservations; thereby indirectly putting additional stress on those lands as preserves for the small bird.

Adverse consequences are not limited to human actions. Hurricane Hugo had a devastating impact upon the resident RCW population in the Francis Marion National Forest.[39] Natural disasters such as fires, windstorms, and disease afflict wildlife habitat and individuals which, in turn, places greater demands upon remaining lands inhabited by endangered species.

Can Ft. Bragg comply with the ESA and train its soldiers and units to standard? Today, the answer is "no". Can innovative well planned and scheduled field training *significantly* mitigate detrimental impacts to Army activities? At this installation, the answer in "no". In the near term (10-20 years), will Ft. Bragg conceivably be able to train to standard at battalion and brigade levels? All available research (compiled since 1970) on the RCW coupled with current declining population trends indicate no realistic expectation for recovery of the species or relief from the FWS-mandated actions in the near or even long term future. Likewise, the projected acreage requirements to maneuver ground forces over terrain will increase. Even though technological video simulations (i.e. Simnet, etc.) and other substitutes will obviously diminish individual unit gunnery and maneuver requirements, base closures, AirLand Operations doctrine, joint exercise requirements, and improved weapon systems capabilities will preempt gains derived from other measures. Ft. Bragg has lost its ability to "train to standard" and it won 't recover this capability in the foreseeable future.

The Outlook

An insightful, futuristic analysis is always somewhat subjective and not without its pitfalls, nevertheless it's imperative that the attempt be made. Pessimists and optimists on this issue abound, but reasonable, unbiased judgment based upon relevant situations, scientific fact, and irrefutable trends leads to a dismal conclusion.

A summary of the primary factors influencing future opportunities to achieve adequate training standards and simultaneously comply with the ESA is a prerequisite to drawing an informed decision. The following factors are categorized either advantageous or disadvantageous as they affect the Army's ability to meet this dual challenge.

Disadvantages:

• Past and continuing population growth, urbanization, land conversion (i.e. wetlands to agricultural production), conversion of old growth forests to 40-100 rotation cycles, and pollution will reduce the amount of habitat available to support endangered species. Army installations are "islands of biodiversity" in an ever-expanding sea of sterile landscapes inimical to the recovery or sustainment of unique plant and animal species.

• Base closures will concentrate training activities into remaining areas, resulting in higher personnel and equipment densities with concurrent if not proportionate, increases in environmentally destructive operations.

• A CONUS-based Army rather than a forward-deployed force will exacerbate already constrained training areas. Required readiness levels for the rapid force projection strategy (Contingency Corps) dictate intensive and extensive training routines for affected units.

• Evolving AirLand Operations doctrine envisions a deep (up to 400 km), nonlinear battlefield where joint operations dominate. Emphasis on joint exercises over greater

land distances are essential ingredients to acquire the skills inherent to future conflicts.

• Listing of endangered plant and animal species will immeasurably exceed those species delisted (recovered). Of the more than 520 native plant and animal species listed,[40] the FWS has reversed the decline of only a handful of those protected by the Act. Conservative estimates expect an additional 50 species per year to be listed by the FWS;[41] to date 15 have been delisted and of those only a few were recovered, the remainder declared extinct or removed due to error of the original data.[42]

To appreciate the scope and trend of this process an examination of the class 1 and 2 candidate species (those species anticipated to be listed) reveals that in California alone the present list of 25 or so endangered plants will escalate to 604. Invertebrate animal species (insects, spiders, snails, etc.) can be expected to follow a similar pattern throughout the U.S. Currently over 375 of the 520 listed species are found on Army lands ,[43] 65 of them on 13 installations.

• Habitat requirements for listed species are frequently difficult to manage because of the inability to accelerate changes in the natural environment as illustrated by the mature (100-200 year) pine forests conducive to the RCW. Military commanders at Ft. Hood, Texas have found themselves in the unenviable position of trying to manage two endangered bird species which have mutually exclusive habitat requirements. The Black-capped Vireo, Vireo atricapillus, benefits from military-related fires that favor successional habitat used by this bird. The Golden-checked Warbler unfortunately prefers mature woodland habitat that is adversely affected by these fires.[44] Species with competing habitat requirements prevent a single-species approach that will become more conspicuous as the list expands and research data accumulates.

• Trainers are frequently frustrated because they have limited management control over leased lands utilized for other purposes. Millions of acres of military reservations are leased from the USFS and the Bureau of Land Management (BLM), agencies with a charter to provide multiple-use management. In some cases, uses such as grazing

allotments for domestic livestock, recreational pursuits, and timber harvesting have been identified as agents detrimental to endangered species, but political and economic considerations tend to favor their continuance over military pursuits.

• Financial constraints faced by the Army and other federal agencies will limit progress towards species recovery; it's a costly enterprise. Over $1 billion has been spent during the past decade to save the Pacific Salmon, yet its numbers have dwindled from about 16 million in 1940 to a few hundred thousand.[45]

• Public scrutiny, the proliferation of aggressive, well-funded environmental groups, and the propensity to sue federal agencies to achieve their goals has shown no indication of subsiding. To the contrary, the Army can anticipate more critical public involvement as the NEPA and ESA gain prominence in future decades.

• Legal and legislative relief from the ESA are doubtful. Congress has been reluctant to weaken the "flagship" of environmental laws. However the ESA must be renewed by September of 1992 and the Spotted Owl controversy in the Pacific Northwest has ignited a firestorm of protest by its opponents. Loggers claim recovery of the owl will mean a loss of 28,000 to 40,000 jobs in the wood products industry in the three affected states.[46] The Administration is more than sympathetic to these arguments as Secretary of Interior, Manuel Lujan has been campaigning to amend the Act to take into account the economic ramifications of saving endangered species. Although the ESA was amended in 1978 to provide for "exemptions" to it for national security reasons deemed necessary by the President, no exemptions have been granted. One of the first requests for an exemption involved the snail darter. The Endangered Species Committee, a body empowered to review and authorize federal actions to proceed, based upon very specific criteria, disapproved TVA's exemption request. The snail darter won out against a $100 million dam; Congress later granted its own exemption. Nevertheless the snail darter episode is an indicator of the remoteness of gaining an exemption.

• Requests for range and impact area enlargements as well as maneuver training area expansions will not recede with the reduction of Army force structure. Heavier, faster, and more maneuverable vehicles combined with longer-range weapons require greater distances, extended range fans, and more training area. At a time when society is closing in on our installations, and stewardship expectations are increasing from both the public and the leadership within the Army, acquisition efforts will face stiff opposition.

Advantages:

• Command emphasis within the Army will eventually manifest itself and exert a positive influence on its environmental ethic and performance. As Secretary Cheney stated:

> Defense and the environment is not an either/or proposition. To choose between them is impossible in this real world of serious defense threats and genuine environmental concerns.[47]

Both the Secretary of the Army and General Sullivan have lent their support to this issue and as legal developments and Congressional concerns mount, military commanders will be forced to change their attitude and actions. The Legacy Resource Management Program, one of several Congressional management directives in the Defense Appropriations Act of 1991, definitively charged DoD with developing a comprehensive program to enhance the management of natural and cultural resources.

• The Army, especially through its Construction Engineering Research Laboratory (CERL) in Illinois, has spearheaded efforts supporting the Legacy Program and the widespread implementation of the Integrated Training Area Management (ITAM) system. The FWS, the USFS and other natural resource agencies recognize the ITAM system as an excellent state-of-the-art method of managing training activities in harmony with the natural environment.

• In a recently published paper, CERL established criteria for siting Army maneuver installations based upon natural resource considerations and land values.[48] This proactive analytical approach to decisions related to future training acreage acquisition is only one of many examples of the Army's progress and demonstrated commitment to the environment.

• Dramatic improvements in cooperation, coordination, and communication between the Army, other federal agencies, state authorities, and public interest groups have been effected through "partnership" programs. Informal consultations with FWS biologists and enforcement officers are increasing and notices of violations have decreased substantially. A conducive, respectful atmosphere has replaced adversarial confrontations in most locations that characterized early Army-FWS interaction.

• Soldier education and installation adherence to protective stipulations has contributed to recovery efforts of several species and has demonstratively enhanced opportunities to resume training activities previously prohibited.

• Funding and staffing, although still inadequate, has increased in the past several years. At the National Guard Bureau the Environmental Resources Management Office staffing will have gone from 4 positions in 1988 to 23 by 1993; funding for environmental matters has gone from $8 million in 1988 to $55 million (includes Superfund dollars) in 1992.[49] DA funds expended specifically for the conservation and management of threatened and endangered species for fiscal year 1990 was $8 million for the Corps of Engineers and $5 million for the Army.[50]

• Innovative computer-assisted exercises are replicating and frequently improving battalion to corps level command and staff training. Reforger 1992 is a prime

example of the new training approach. Colonel Childress, Chief of Public Affairs, Europe has written:

> Fewer soldiers (82% less than 1988) and pieces of equipment, no tanks, and a greater reliance on computer simulation have lessened maneuver damage to the host nation countryside, protected the environment, and cut the costs of the exercise by about 50%.[51]

• Training simulation devices for infantry, armor, and aviation weapon systems are reducing range and ammunition requests. The extent and realism of simulation substitutes for range firing and ground maneuver exercises has not peaked by any means and these technological enhancements provide the best chance for the Army to meet its training and environmental responsibilities.

• Another not-so-distant scientific revolution may be biogenetic engineering; the creation, modification, or reproduction of plant and animal species through genetic mapping and replication. Within a decade it may be entirely feasible to analyze a particular ecosystem, genetically map every species that contributes to or is dependent upon that system, and artificially replace or reproduce endangered species through genetic engineering.

Recommendations

These recommendations are not inclusive and future funding constraints will inhibit attainment of many objectives; however immediate proactive measures can and must be taken to limit further training degradation and population declines of threatened and endangered species. The Army must heed Secretary Cheney's admonition that:

> The real choice is whether we are going to build a new environmental ethic into the daily business of defense—make good environmental actions a part of our working concerns, from planning to acquisitions, to management.[52]

Specifically, it would be of mutual benefit to the U.S. Army, and the endangered species that it is entrusted to protect, to proceed with the following measures:

• Restructure the Army's environmental organization to facilitate a dedicated, single-focused, integrated approach to insure compliance and implementation of the Army's environmental program. The current structure is fragmented without distinct lines of communication, command, and control from HQDA to installation/unit level.

• Command emphasis and infusion of an environmental ethic into all facets of Army planning, acquisition, and management must be institutionalized. Installation and unit commanders must be held accountable for environmental protection, compliance, and adherence to the ESA and applicable Army regulations.

• Aggressively communicate the Army's commitment to environmental research, system designs, and program implementation, internally and externally.

• Establish effective working relationships through partnering initiatives with the general public, environmental organizations, the FWS, and appropriate state and federal agencies.

• Congress must be appraised of the costs associated with required staffing and funding to execute environmental programs. Positions, both military and civilian, must be focused where they can be best utilized to insure on-the-ground benefits accrue at those installations determined to be most essential and most likely to succeed in achieving training objectives.

• Education and training of Army legal staffs, and installation and unit commanders on key provisions of the National Environmental Policy Act, the Endangered Species Act (ESA), AR 200-2, and AR 420-74; emphasis should be placed on efforts to prevent violations of these laws/regulations.

• Training schedules and plans should be implemented at such times and in such a manner to maximize protection of species and provide realistic tactical exercises.

• Proactive efforts to enhance critical habitat through informal consultations with the FWS, and adjacent landowners, i.e. land exchanges, special reserves, and land acquisitions/leases to create "buffer zones" for species protection.

• Translocate individual animals from essential training sites to "safe" areas if feasible.

• Implement ITAM throughout the Army as rapidly as funding permits.

• Acquire new training areas utilizing CERL's site selection criteria as the primary basis for decisions.

• Irreconcilable conflicts between ESA compliance and military preparedness that jeopardize national security interests, i.e. inability of Contingency Corps to achieve and sustain training standards, must receive immediate attention. In extreme situations, the Secretary of Defense, through the President, should request "exemptions" from the ESA for military training activities.

• DoD officials need to present documented evidence of its preliminary findings by DA's current Inspector General's systemic review of the U.S. Army's Environmental Program[53] to the appropriate Congressional subcommittees. Hearings are to be conducted this session of Congress on the renewal of the ESA.

• Through consultations with the FWS, DA environmental specialists should aggressively pursue captive breeding, population relocation, and experimental research in biogenetic engineering programs to alleviate pressures on military installations.

• Financial incentives to encourage endangered species' habitat preservation on private lands to promote expansion of endangered species' populations beyond the currently restricted federal lands should be advocated. Organizations, such as the Nature Conservancy, should be consulted for opportunities to acquire conservation easements on suitable private lands adjacent to military reservations for population stability.

Conclusions

Current legal requirements, constrained resources, and biological realities are, almost without exception, diametrically opposed to existing and future training requirements for the Army. Compliance with the Endangered Species Act though is practical, ethically appropriate, and sustainable on many training areas. Proactive, innovative, and insightful military leaders can achieve prescribed training standards and comply with the ESA within many ecosystems. The Army leadership must not, however, fail to recognize that several existing and numerous future **irreconcilable conflicts do and will unequivocally preclude attainment of military training standards.** Irrefutable trends militate for a "sense of urgency;" ambivalence and dilatory posturing will serve only to delay the inevitable consequences.

Ultimately, the will of the American people, expressed through the Congress and the President will decide the proper balance to be struck between our natural heritage embodied in the ESA and national security needs provided by its armed forces.

Appendix A

List of Abbreviations/Acronyms

ARNG	Army National Guard
BLM	Bureau of Land Management
CALFAX	Combined Arms Live-Fire Exercise
CERL	Construction Engineering Research Laboratory
DA	Department of the Army
DoD	Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act of 1973
FWS	Fish and Wildlife Service
GAO	General Accounting Office
HQDA	Headquarters, Department of the Army
ITAM	Integrated Training Area Management
LCTA	Land Condition Trend Analysis
LURS	Land Use Requirements Study
MOUT	Military Operations in Urban Terrain
MPRC	Multi-Purpose Range Complex
NEPA	National Environmental Policy Act
RCW	Red-Cockaded Woodpecker
TVA	Tennessee Valley Authority
USFS	United States Forest Service

Appendix B

A Policy Trace:

Endangered Species Act of 1973

Prior to the passage of this historic legislation, the American people, through their elected representatives, had led the rest of the world in efforts to protect rare animals. In 1966 and again in 1969 Congress had passed and the President had signed into law protective statutes specifically aimed at preserving endangered species. The Endangered Species Preservation Act of 1966 (PL 89-669) and the Endangered Species Conservation Act of 1969 (PL 91-135) recognized that our society's true quality of life is diminished with the extinction of any native species of fish and wildlife. These acts as well as others related to environmental concerns were a reflection of an environmental awakening and an expression of a new maturity of American public life. However, the practical application of these laws as administered by the United States Department of Interior failed to satisfy the "spirit" of the original legislation. One species was disappearing annually, primarily caused by hunting and the destruction of natural habitat. In 1972 and again in 1973, President Richard M. Nixon publicly urged Congress to pass legislation that would provide remedies to earlier shortcomings identified by the Interior Department.

Whether the President's environmental messages were an accurate reflection of his sensitivity to a tarnished American heritage that had wantonly exploited its natural resources or merely an astute political maneuver is irrelevant. Within forty days, Congress picked up the baton, scheduled hearings, and passed an unprecedented piece of legislation by the end of its 93rd session. In the end, the President signed into law a bill that was more comprehensive and gave the Federal Government more authority than he had envisioned. Ironically, less than five years later the Supreme

Court listened as the government argued against the act's provisions in the case brought by a coalition of environmental groups against the Tennessee Valley Authority.

Part. I—Congressional Action

Several bills, nearly identical in language, were introduced in the House of Representatives and the Senate in the spring of 1972; however, it was H.R. 37 and S 1983 that ultimately received the most attention. The final public law was PL 93-205 and was defined in the statutes as 87 Stat. 884 with a United States code number of 16 USC Sec. 1531-1544.

The bill (H.R. 37) was drafted by the Interior Department and introduced in the House of Representatives by Representative John D. Dingell, Michigan on January 3, 1973. Senator William B. Spong Jr., Virginia introduced S 1983 on June 12, 1973, which was similar to the House bill. Although the Interior Department was the principal architect of the original bills, it had solicited comments from other executive agencies, national environmental organizations, and state governments during the drafting process.

The sponsors of the respective bills enunciated the criticality of preserving America's natural heritage and the essence of acting promptly to prevent current abuses that affected unique and rare animal species were the main attributes of the draft legislation.

Key provisions of the bills included:

— Expansion of the definition of an "endangered species" as one "which is in danger of extinction throughout all or a significant portion of its range," and a "threatened species" as one "which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."

— Define "secretary" as either the Secretary of Interior or the Secretary of Commerce, depending on program responsibilities.

— Direct the appropriate secretary to draw up lists of endangered or threatened species.

— Authorize the appropriate secretary to acquire "by purchase, donation, or otherwise" lands and waters for the purpose of "conserving, protecting, restoring, or propagating any endangered or threatened species." The secretary would be authorized to use funds available under the Land and Water Conservation Fund Act.

— Direct the secretary to cooperate "to the maximum extent practicable" with the states in carrying out provisions of the law, and authorize him to enter into wildlife management agreements with the states and to provide financial assistance to a state maintaining an "adequate and active" conservation and management program for endangered or threatened species.

— Prohibit the following:

1. The Import or export of endangered species.

2. The taking of such species within the United States, on its territorial waters or upon the high seas.

3. The possession, sale, transportation or receipt of species taken in violation of the act.

4. The delivery, sale, receipt or transportation in interstate or foreign commerce of such species or products manufactured from them.

5. Trading in or possession of specimens of fish, wildlife, or plants contrary to the Convention on International Trade in Endangered Species of Wild Fauna and Flora signed on March 3, 1973.

— Exempt certain Alaskan natives from provisions of the act in specific situations.

— Imposed a three-tiered civil penalty provision for violators with an upper limit of $10,000 for violations.

In the House, the committee on Merchant Marine and Fisheries had jurisdiction and its Subcommittee on Fisheries and Wildlife Conservation and the Environment conducted the hearings. Chaired by Dingell, the subcommittee scheduled hearings In the Longworth office Building In Washington D.C. on March 20-21, 1972, April 10-11, 1972, and March 15, 26, 27, 1973.

In the Senate, the Committee on Commerce presided over the hearings. Its

Subcommittee on the Environment conducted hearings on August 4, 10, 1972 and June 18, 1973 In the new Senate Office Building in Washington, D.C.

Overwhelming support for the bills was expressed in testimony by executive agencies, environmental groups, state wildlife organizations, and many members of Congress. The Departments of Commerce, Interior, State, Agriculture, and Treasury were unanimous in their forceful and articulate endorsement of the legislation. Likewise major environmental organizations testified In favor of the bills' intent and objectives, but generally expressed their concerns about key provisions being too weak and not as comprehensive as they thought necessary. They also expressed reservations about state jurisdictional responsibilities vs. federal authority. Several groups were vehemently opposed to the Department of Commerce being Involved with the implementation of the law based on its historical predilection towards commercial interests. The National Parks and Conservation Association representing 50,000 members, the Fund for Animals, the Sierra Club with 140,000 members, the Friends of the Earth espousing a membership in excess of 26,000 and the Defenders of Wildlife with 38,000 members were the primary proponents for very strong federal legislation. On the other hand, the National Wildlife Federation with 3,000,000 members argued for state authority over resident fish and wildlife species. It was joined by the International Association of Game, Fish, and Conservation Commissioners who pressed for state jurisdiction and more federal financial assistance to the states for program implementation. Congressmen supported the bills but differed In their approaches to state vs. federal responsibilities.

At the Committee level, in both the House and Senate, the vote for passage was unanimous for H.R. 37 and S 1983, respectively.

On the House floor on September 18, 1973, insignificant debate and no substantive changes were made; the vote was 390 for and 12 against. On July 24, 1973, the Senate voted on S 1983 after some discussion and adopting eight relatively

minor amendments; the vote was 92 for and 0 against. The key managers for the House were Leonor K. Sullivan, John D. Dingell, and George A. Goodling. For the Senate, Philip Hart, John V. Tunney, Ted Stevens, Frank E. Moss, and Marlow W. Cook engineered the legislation through that session of Congress. The respective floor managers had little trouble with their bills and with one exception amendments were passed by voice vote. The exception, an amendment proposed by Senator Stevens of Alaska to strengthen state jurisdiction, was adopted by a roll-call vote of 60-33.

It is quite obvious that both bills received tremendous bipartisan support and the few dissenting votes in the House were probably due to the perception that federal preemption of what had historically been state jurisdiction over wildlife management was not prudent.

Between the House and Senate, differences between the two bills had to be reconciled in a conference committee. The previously named House and Senate members who managed the respective bills were selected to be on the conference committee. Their thorough knowledge of the proposed legislation and testimony that had been heard by the committees they represented made them logical choices for this committee. Conference Report 93740 indicates that a compromise resulted on all issues that separated the two bodies initially. Jurisdictional responsibilities, penalty amounts, and strong language related to federal actions to prevent the destruction or modification of critical habitat were adopted. The conference report on S 1983 (in lieu of H.R. 37) was approved, again overwhelmingly, by the Senate on December 19, 1973 and the House on the following day.

With the passage of this act, the Endangered Species Act of 1969 was repealed and several federal statutes were amended to conform with the Act.

Part II—Administration Action

The White House was instrumental in initiating this historic legislation. President Richard M. Nixon on February 8, 1972 and again on February 15, 1973 urged Congress to pass his proposed legislation related to endangered species. As a forum, he utilized the rather formal "Presidential Message to Congress" as the catalyst for this initiative.

The Department of Interior drafted the legislation, secured other executive agencies' concurrence, and convincingly argued for its passage through all the congressional deliberations.

President Nixon signed S 1983 into law on December 28, 1973 and issued a public statement from his residence in San Clemente, California. His statement was brief, but echoed his earlier pronouncements on the issue as providing the Federal Government the authority to protect threatened wildlife. He noted the values associated with America's natural heritage and congratulated Congress on its efforts.

It is not surprising that the President did not go to any great lengths to promote or publicly exhibit his signing of the bill; he was immersed in the Watergate controversy.

The President had requested in the draft legislation that the Department of Commerce and Interior would jointly administer the law in accordance with Reorganization Plan No. 4 of 1970. Among other things. the plan delineated specific responsibilities to both these agencies related to fisheries and wildlife and he wanted the administration of the Endangered Species Act to be consistent with this alignment. Congress, although hesitant, abdicated to his desires and both departments shared the administrative responsibility, with Interior playing the major role.

Since 1973 there has been an extensive number of regulations that have been promulgated to implement the statute. Currently the Code of Federal Regulations lists these under Title 50 (Fish and Wildlife), Part 17-17.108. With the increasing number of species that are being listed coupled with major amendments enacted In 1978 and

1982, the volume of regulations has also increased proportionately. A brief examination of the more than sixty pages of regulations generally supports the contention that they have had the effect desired by Congress. However, the jurisdictional disputes between the states and the federal agencies is a continuous problem, one that Congress thought it had adequately addressed.

Part III—Judicial Action

Legally, the Endangered Species Act of 1973 did not generate much attention for the first few years following its inception. But by 1978, three major court cases had been heard; all of them dealt with Section 7 of the law and resulted in enormous potential and actual impacts on federal activities. The constitutionality of the statute has not been challenged thus far, but recent decisions by the Secretary of the Interior may prompt a suit by western states.

Judicial action rendered in the Supreme Court decision of June 15, 1978 in the infamous "snail darter" case apparently enlarged the scope of the statute. This is concluded by reviewing the testimony related to amendments adopted in 1978, subsequent to the court's decision, that inserted more flexibility into the law. The amendments provided a mechanism whereby federal agencies could be exempted from the act's mandate that they not jeopardize endangered species or their habitat; a procedure not available in the original act.

The Tennessee Valley Authority v. Hiram G. Hill, Jr., et al. case was argued before the Supreme Court on April 18, 1978. Environmental groups brought action under the Endangered Species Act of 1973 to prevent TVA from completing the construction of the Tellico Dam. Upon passage of the Act, a small fish known as the snail darter was listed by the Secretary of Interior as an endangered species and its habitat in the Little Tennessee River was designated as critical. At the District Court level the complaint

was dismissed, but the Court of Appeals reversed the decision and directed the District Court to enjoin the TVA from completing the dam.

The arguments by TVA at the Supreme Court level centered on the "intent of Congress" since it had continually appropriated funds for the dam (in excess of $100 million by 1977), knowing full well that the snail darter's existence would be jeopardized. Also it felt that since the dam project was started prior to the discovery of the fish, it was exempt from the act. The Supreme Court upheld the Court of Appeals decision and in the opinion delivered by chief Justice Burger, it stated that the language in the statute as well as the intent of Congress was clear and that no exceptions, regardless of the cost, would be granted to federal agencies whose actions would jeopardize a "listed" species or its critical habitat.

Appendix C

MEMORANDUM FOR: Selected students in the USAWC class of 1992

SUBJECT: Pretest survey of "Awareness and Knowledge of Environmental Management" as a national and military issue.

PURPOSE: To gather information from a selected sample of military and civilian personnel on their recognition and understanding of laws, regulations, and responsibilities related to this country's national and military environmental strategy.

The information that is obtained and analyzed will be used to further refine the scope of research being conducted in conjunction with the Shippensburg University graduate program on this national issue. Your frank, insightful, and complete responses are appreciated in assisting me in this research. The results of this "non attribution" survey will be used solely for this project and to insure anonymity, names are not desired.

The survey utilizes both closed and open-ended questions to provide you an opportunity to expand upon questions or make recommendations for improvement of the survey itself.

Completion and return of the survey NLT COB 10 Dec. 1991 to BOX 40 or directly to me will be appreciated.

Mark D. Ahner
Box 40

Attachment — survey form

Environmental Issues Survey

I. Demographic Data:

1. Education: (check highest level attained)
   - High school graduate _____
   - College credits w/o degree _____
   - College graduate _____
   - Advanced degree _____

2. Age: (give current age) _____

3. Service/Agency Affiliation:
   Army_____ Navy_____ Marine Corps_____ Air Force_____
   Civilian (specify agency)_____

4. Component: (military personnel only)
   Active_____ National Guard_____ USAR_____ Other (specify)_____

5. Branch: (Army personnel)
   Cmbt Arms_____ Cmbt support_____ Cmbt service support_____

6. Grade: (give current grade of GS rating if civilian) _____

7. Sex:
   Male_____ Female_____

8. Years of Service: (government or military) _____

9. Gross Annual Salary: (in thousands)
   15-25_____ 25-40_____ 40-60_____ 60-80_____ >80_____

II. Significance of Environmental Issues

1. How important to you as an individual is it that environmental issues be aggressively addressed by all levels of government?
   - Extremely important _____
   - Very important _____
   - Important _____
   - Not very important _____

2. Do you perceive environmental neglect as a threat to this nation's security?
   Yes_____ No_____ Unsure_____

3. In your judgment, does the U.S. have a strategic vision and complementary program to protect our environment?

Yes_____ No_____ Unsure_____

4. In your opinion, does the military have an effective environmental strategy?

Yes_____ No_____ Unsure_____

5. Do you think the current military environmental stance is proactive or reactive?

Proactive_____ Reactive_____ Unsure_____

6. Would you be in favor of the creation of a federal cabinet-level Department of the Environment?

Yes_____ No_____ Unsure_____

7. Of the following environmental concerns, prioritize 1 to 5 (1 need the most attention, 5 the least) those that you believe should receive substantial financial allocations to mitigate/eliminate.

_____ Air pollution
_____ Nuclear waste disposal
_____ Noise abatement
_____ Asbestos removal
_____ Deforestation
_____ Water pollution
_____ Solid waste disposal
_____ Wetlands conversion
_____ Protection of endangered wildlife species
_____ Elimination of ozone-depleting substances
_____ Pesticide regulation
_____ Hazardous materials and waste disposal
_____ Other (specify)_____

8. Of the domestic issues below, list, *in priority*, the 5 most important to you that require immediate attention by our government?

_____ Drugs
_____ Crime
_____ Education
_____ Health care costs
_____ Environment
_____ Poverty
_____ Immigration
_____ Unemployment
_____ Tax burden
_____ Population growth
_____ National debt
_____ Racism
_____ Other (specify)_____

9. Would you be in favor of a federal tax increase to alleviate environmental hazards deemed critical to the nation's health?

Yes_____ No_____ Other (explain)_____
_____
_____

10. Would you support an increase in your property tax to alleviate a local (county) environmental hazard?

Yes_____ No_____ Other (explain)_____

_____

_____

11. On an annual basis how much of your disposable income (after taxes) would you be willing to contribute to environmental hazard reduction?

$0_____ $0–100_____ $100–300_____ $300–500_____ >$500____

III. Environmental Awareness and Knowledge

1. How familiar are you with the following environmental laws and regulations? (Use the listed scale, 1-5)

1 - intimate knowledge of it
2 - familiar with its basic purpose *and* requirements
3 - aware of it and have vague concept of its purpose and requirements
4 - heard of it but have no real idea of its intent or requirements
5 - never heard of it

_____ National Environmental Policy Act
_____ Clean Air Act
_____ Federal Insecticide, Fungicide, and Rodenticide Act
_____ Safe Drinking Water Act
_____ Endangered Species Act
_____ National Historic Preservation Act
_____ Clean Water Act
_____ Resource Conservation and Recovery Act
_____ Toxic Substances Control Act
_____ Noise Control Act
_____ AR 200-1, Environmental Protection and Enhancement
_____ Comprehensive Environmental Response, Compensation and Liability Act
_____ Commander's Guide to Environmental Management

2. Do you think the military services have any significant environmental problems?

Yes_____ No_____ If yes, please specify_____

_____

_____

_____

3. In your current or past assignments as a manager, staff officer, or commander were you advised on your responsibilities as they related to environmental matters?

Yes_____ No_____ Not applicable_____

4. Were you advised on any environmental reporting or recording requirements associated with your particular position?
Yes_____ No_____ Not applicable_____

5. How would you describe the "emphasis" placed upon environmental management by your immediate supervisor or chain of command?
_____ Strong and dedicated
_____ Concerned
_____ Enough to get by
_____ Weak
_____ Nonexistent
_____ Other (explain)_____

6. Do you think increased command emphasis on environmental awareness/compliance is an effective tool to improve the military's environmental management strategy?
Yes_____ No_____ Unsure_____

7. In your judgment, does the military do an adequate job of environmental training for those responsible for enforcing its regulations?
Yes_____ No_____ Unsure_____

8. Do you think that our government (at any level) adequately funds environmental compliance?
Yes (all levels)_____ Yes (some levels)_____ No_____ Unsure_____

9. Do you think that your military service or governmental agency adequately funds its environmental programs?
Yes_____ No_____ Unsure_____

10. Can a military commander or governmental representative be held personally liable or violation of a federal environmental law? State or county law?
Federal law Yes_____ No_____ Unsure_____
State or local law Yes_____ No_____ Unsure_____

11. Should federal installations/training centers be subject to more restrictive state and local environmental laws or exempted?
Yes_____ No_____ Unsure_____

12. Do you think that military training centers/installations should be exempt from certain environmental laws/regulations if they significantly degrade military readiness?
Yes_____ No_____ Unsure_____

13. Does the current military organizational structure effectively prevent and resolve environmental issues?
Yes_____ No_____ Unsure_____

14. If you were in a position to implement any changes that you felt were necessary to improve your organization's (military or civilian) environmental management program (i.e. structure, funding, training, public relations, or management emphasis), what would you do?

Comment: _____

_____

_____

_____

15. Any recommendations, suggestions, or modifications to the content, wording, depth (or lack of) in this pretest survey?

Comment: _____

_____

_____

_____

Thank you very much for your time and thoughts!

Survey Analysis

The intent was to pretest a questionnaire to confirm or refute expected facts, attitudes, and knowledge related to environmental issues, particularly those related to military matters. Of equal importance, question structure, wording, respondent interpretations, and recommendations for improvement of the questionnaire design were solicited or analyzed during the tabulation process. An enclosed data summary is presented following the pretest survey.

Data relevance was confirmed as the survey provided information not found elsewhere. Respondent interest and willingness to provide requested information was high (23 of 25 surveys returned or 92%), indicating further research of the subject matter was validated. Most of the questions were very germane to the survey's purpose as each provided information useful to enhancing the questionnaire's resolution and design. The utility of the information can be of great value to military agencies responsible for specific command policies and environmental objectives, laws, and responsibilities that the Department of Defense (DoD) claimed to have disseminated and complied with from its upper organizational echelons to the lowest unit level. Contrary to this assertion, the survey revealed a general ignorance of these facts even though the sample was specifically chosen to reflect those individuals "most likely to know and support those DoD initiatives." Equally revealing, was the overwhelming respondent judgment that neither the nation nor the military has articulated an effective environmental strategy. Further, 87% think the military posture is reactive rather proactive, a disturbing and insightful finding that deserves the institution's immediate attention.

Questions testing attitudes reflected similar survey findings of the general public. Although 78% of the respondents believe that environmental issues are extremely or very important and more than 56% went as far as to consider environmental neglect as

a threat to the nation's security; as a domestic issue requiring immediate governmental attention, it only ranked 6th out of twelve choices offered. This finding substantiates the degree and number of chronic problems that confront our society that respondents recognize require major resources to solve.

Many of the responses served to reinforce basic attitudes, knowledge (or lack of), and degree of support for various environmental issues identified in the survey. For example, the #1 domestic issue for this sample was the national debt and even though respondents apparently supported federal and local tax increases (about 40%) to solve environmental problems, most of these qualified their support by commenting on the specific type of tax they would support (usually targeted to the polluter). This attitude was further amplified in that 35% of the sample would not be willing to contribute **any** additional personal money and 74% would contribute $100 or less. This is especially noteworthy since the sample represents the upper middle income class; 65% in the $40,000-60,000 and 30% in the $60,000-80,000 income bracket.

The pretest survey confirmed most expectations, provided a much clearer definition of environmental issues, and served as a useful instrument to further refine the questionnaire design. It also satisfied the purpose of eliciting recommendations to improve the military's approach and responsibilities for environmental compliance.

Summary Results
of
Environmental Issues Survey

I. Demographic Data:

1. Education: (check highest level attained)
   High school graduate __0__
   College credits w/o degree __0__
   College graduate __8__
   Advanced degree _15__

2. Age: (give current age) **ave.:__43__** **range: 36-47**

3. Service/Agency Affiliation:
   Army_19__ Navy__0__ Marine Corps__1__ Air Force__2__
   Civilian (specify agency)___1 - **Defense Mapping Agency**__

4. Component: (military personnel only)
   Active_19__ National Guard__3__ USAR__0__ Other (specify)__0__

5. Branch: (Army personnel)
   Cmbt Arms_13__ Cmbt support__3__ Cmbt service support__4__

6. Grade: (give current grade of GS rating if civilian)
   1 GS 15
   16 LTC
   6 COL

7. Sex:
   Male_22__ Female__1__

8. Years of Service: (government or military) **range: 13-28** **average: __21__**

9. Gross Annual Salary: (in thousands)
   15-25__1__ 25-40__0__ 40-60_15__ 60-80__7__ >80__0__

II. Significance of Environmental Issues

1. How important to you as an individual is it that environmental issues be aggressively addressed by all levels of government?
   Extremely important __7__
   Very important _11__
   Important __5__
   Not very important __0__

2. Do you perceive environmental neglect as a threat to this nation's security?
   Yes_13__ No__8__ Unsure__2__

3. In your judgment, does the U.S. have a strategic vision and complementary program to protect our environment?

Yes__0__ No_22__ Unsure__1__

4. In your opinion, does the military have an effective environmental strategy?

Yes__3__ No_11__ Unsure__9__

5. Do you think the current military environmental stance is proactive or reactive?

Proactive__1__ Reactive__20__ Unsure__2__

6. Would you be in favor of the creation of a federal cabinet-level Department of the Environment?

Yes__9__ No_12__ Unsure__1__

7. Of the following environmental concerns, prioritize 1 to 5 (1 need the most attention, 5 the least) those that you believe should receive substantial financial allocations to mitigate/eliminate.

_#1__ Air pollution
_#5__ Nuclear waste disposal
_____ Noise abatement
_____ Asbestos removal
_____ Deforestation
_#2__ Water pollution
_____ Solid waste disposal
_____ Wetlands conversion
_____ Protection of endangered wildlife species
_#4__ Elimination of ozone-depleting substances
_____ Pesticide regulation
_#3__ Hazardous materials and waste disposal
_____ Other (specify)_____

8. Of the domestic issues below, list, *in priority*, the 5 most important to you that require immediate attention by our government?

_#2__ Drugs
_#4__ Crime
_#3__ Education
_#5__ Health care costs
_____ Environment
_____ Poverty
_____ Immigration
_____ Unemployment
_____ Tax burden
_____ Population growth
_#1__ National debt
_____ Racism
_____ Other (specify)_____

9. Would you be in favor of a federal tax increase to alleviate environmental hazards deemed critical to the nation's health?

Yes_10__ No_13__ Other (explain)_____

___use a gas tax, tax incentives, entitlements, use available funds more wisely (several)_____

10. Would you support an increase in your property tax to alleviate a local (county) environmental hazard?

Yes__9__ No_13__ Other (explain)___**polluters should pay the costs, not a fair tax, advalorem tax would be better, redistribute revenues, reorder revenue expenditures**_____

11. On an annual basis how much of your disposable income (after taxes) would you be willing to contribute to environmental hazard reduction?

$0__8_ $0–100__9_ $100–300__5_ $300–500__0__ >$500__1_

III. Environmental Awareness and Knowledge

1. How familiar are you with the following environmental laws and regulations? (Use the listed scale, 1-5)

1 - intimate knowledge of it
2 - familiar with its basic purpose *and* requirements
3 - aware of it and have vague concept of its purpose and requirements
4 - heard of it but have no real idea of its intent or requirements
5 - never heard of it

Generally, extremely poor recognition by respondents to laws and regulations that govern military activities; 25% of the responses indicate that they had never heard of the law, 29% had heard of it, but had no idea of what was required of the law, and finally 83% of the replies indicate that these personnel had only a vague concept of the statute and its requirements or less. The least known of all was the Federal Insecticide, Fungicide, and Rodenticide Act, then the Comprehensive Environmental Response, Compensation and Liability Act, followed by the Resource Conservation and Recovery Act, the Toxic Substances Act, and the Noise Control Act. The Clean Air and Water Acts were the most familiar to the respondents, yet 74% of the responses still fell into the bottom 3 categories even for these well-known and historic acts.

2. Do you think the military services have any significant environmental problems?

Yes_18__ No__4__ If yes, please specify_____
___**nuclear weapons disposal, hazardous materials disposal (several), underground storage tanks, training area problems, turtle at NTC, rapidly changing state laws, asbestos removal, storage of chem. and nuke ammo, H_2O quality, maneuver damage at training sites**_____

3. In your current or past assignments as a manager, staff officer, or commander were you advised on your responsibilities as they related to environmental matters?

Yes_20__ No__2__ Not applicable__1__

4. Were you advised on any environmental reporting or recording requirements associated with your particular position?

Yes_18__ No__3__ Not applicable__2__

5. How would you describe the "emphasis" placed upon environmental management by your immediate supervisor or chain of command?

__6__ Strong and dedicated
_10__ Concerned
__6__ Enough to get by
__0__ Weak
__1__ Nonexistent
_____ Other (explain)_____

6. Do you think increased command emphasis on environmental awareness/compliance is an effective tool to improve the military's environmental management strategy?

Yes_22__ No__0__ Unsure__1__

7. In your judgment, does the military do an adequate job of environmental training for those responsible for enforcing its regulations?

Yes__4__ No_12__ Unsure__6__

8. Do you think that our government (at any level) adequately funds environmental compliance

Yes (all levels)__1__ Yes (some levels)_10__ No_11__ Unsure__1_

9. Do you think that your military service or governmental agency adequately funds its environmental programs?

Yes__5__ No_10__ Unsure__8__

10. Can a military commander or governmental representative be held personally liable or violation of a federal environmental law? State or county law?

Federal law	Yes_17__ No__2__ Unsure__4__
State or local law	Yes_15__ No__0__ Unsure__8__

11. Should federal installations/training centers be subject to more restrictive state and local environmental laws or exempted?

Yes__4__ No_13__ Unsure__4__

12. Do you think that military training centers/installations should be exempt from certain environmental laws/regulations if they significantly degrade military readiness?

Yes_14__ No__6__ Unsure__3__

13. Does the current military organizational structure effectively prevent and resolve environmental issues?

Yes__6__ No_10__ Unsure__7__

14. If you were in a position to implement any changes that you felt were necessary to improve your organization's (military or civilian) environmental management program (i.e. structure, funding, training, public relations, or management emphasis), what would you do?

Comment: ___**more training (several), more education, command emphasis (few), better P.R., comply with directives and regulations, increase funding, execute required training on specific subjects and issues, awareness training, fine violators, must change thinking on environmental concerns, require TV to broadcast messages to kids, increase gas tax by .25 or .50/gal, create DA level directorate, write policy statement of roles and responsibilities, increase staffing, set the climate in the command, more emphasis, major prevention awareness is key, increase education, ODP/NCODP, brief soldiers on oil dumping, train on handling of hazardous wastes, pull environmental respon. away from DEH and create a new directorate for safety and environmental matters, management emphasis on environment, man units at full strength—labor then available to address unit environmental requirements**_____

15. Any recommendations, suggestions, or modifications to the content, wording, depth (or lack of) in this pretest survey?

Comment: ___**question 11—can't be answered yes or no; quest.12—answer depends on how one defines "significantly;" quest.7—only truly person responsible is CG; quest.11, Part III is worded strangely; quest.7&8, Part II wasn't sure if you wanted a number in every blank? (few)**_____

Thank you very much for your time and thoughts!

Notes

[1] Major General Sobke, remarks at Endangered Species Workshop, 6 February 1992, Fort Belvoir, Va.

[2] Chris Conrad, Colonel, Office of Deputy for Environmental Safety and Occupational Health, DA, interview by author, 6 February 1992, Washington D.C.

[3] Robert B. Shaw and Richard D. Laven, "NEPA Compliance and the Multi-Purpose Range Complex at the Pahakuloa Training Area, Hawaii," in *Proceedings of Department of Defense Natural Resources Leadership Conference,* U.S. Air Force Academy, Colorado Springs, Co., 12-16 August 1991, 77.

[4] James Peck, Colonel, State Safety Office, OK Army National Guard, interview by author, 13 February 1992.

[5] Deut. 20: 19-20.

[6] Plato, *Republic*, 471b.

[7] Hugo Grotius, *The Law of War and Peace*, trans. Francis W. Kelsey, Arthur E.R. Book et al., 751-56.

[8] Merrit P. Drucker, "The Military Commander's Responsibility for the Environment," Discussion paper, United States Military Academy, summer 1989.

[9] *Ibid.* , 145.

[10] *Ibid.* , 138.

[11] Kent Hughes Butts, Lieutenant Colonel, *Army Strategy for Environmental Success,* Strategic Studies Institute, United States Army War College, 1 April 1991, 1.

[12] Foreign Policy Association, "Planet Earth: dying species, dying habitats," *Great Decisions,* 1992 edition, 47.

[13] Appendix A, "A Policy Trace: Endangered Species Act of 1973."

[14] *Ibid.*

[15] Henry Hatch, Lieutenant General, Commander and Chief of Engineers, USA Corps of Engineers, "Supporting the Military Mission," in *Proceedings of DOD Natural Resources Leadership Conf.*, 12-16 August 1991, 26.

[16] Appendix B, "Survey of Awareness and Knowledge of Environmental Management."

[17] Henry Hatch, LTG, "Supporting the Military Mission," in *Proceedings of DOD Natural Resources Leadership Conf.*, 12-16 August 1991, 25.

[18] Donald R. Holzwarth, Colonel, Task Force Leader, "Agenda, RCW/ Endangered Species Workshop," 6-7 February 1992, Fort Belvoir, Va.

[19] App. A.

[20] *Ibid.*

[21] David Mercier, Major, USMC Special Counsel, Environmental Law, "Legal Considerations of the Endangered Species Act," in *Proceedings of the Red-Cockaded Woodpecker Management Workshop,* MCB Camp Lejeune, North Carolina, 3-5 April 1991, 20.

[22] Robert Shaw and Richard Laven, "NEPA Compliance and the MPRC, Hawaii," in *Proceedings of DOD Natural Resources Leadership Conf.,* 12-16 August 1991, 77.

[23] National Guard Bureau, *Draft EIS, Military Training Use of National Forest Lands, Camp Shelby, Mississippi,* Vol. I, November 1991, ES 2.

[24] U.S. Fish and Wildlife Service, *Endangered and Threatened Wildlife and Plants,* 50 CFR 17.11 and 17.12, 15 April 1990, 18.

[25] Bill Goran and Dana Finney, "GIS Critical to Army's Land Management Program," *GIS World,* Vol. 4, No. 9, December 1991, 49.

[26] NGB, *Draft EIS, Camp Shelby,* Vol. II, App. N.

[27] FWS, *Endangered Wildlife and Plants,* 15 April 1990, 24.

[28] James Peck, Colonel, OK ARNG, interview by author, 13 February.

[29] FWS, *Endangered Wildlife and Plants,* 15 April 1990, 24.

[30] Robert McGuire, Lieutenant Colonel, Chief, National Guard Bureau's Environmental Resources Management Office, interview by author, 5 February 1992, Washington D.C.

[31] William H. Berry and William Stanley, Camp Roberts, Ca., "Conservation of the Endangered San Joaquin Kit Fox at Camp Roberts Army National Training Site, California," in *Proceedings of DOD Natural Resources Leadership Conf.*, 12-16 August 1991, 79.

[32] Foreign Policy Association, "Planet Earth," *Great Decisions,* 1992 edition, 52.

[33] Evelyn Johnsonn Endangered Species Specialist, Fort Bragg, NC, "The Military Mission and RCW Management--How Do We Do Both?" in *Proceedings, RCW Workshop,* 3-5 April 1991, 89.

[34] *Ibid.*

[35] Joe Dabney, United States Forest Service, "Forestry and RCW's--Working Within the Guidelines and Long-Term Strategies," in *Proceedings, RCW Workshop*, 3-5 April 1991, 87.

[36] William C. Pendleton, Colonel, "Endangered Species Act (ESA) Incident at Smith Lake," *Report of Investigation, Staff Judge Advocate*, Headquarters, XVIII Airborne Corps, Fort Bragg, NC., 21 August 1990.

[37] *Ibid.*

[38] Joe Dabney, USFS, "Forestry and RCW's," in *Proceedings, RCW Workshop*, 3-5 April 1991, 81.

[39] *Ibid.*, 83.

[40] Foreign Policy Association, "Planet Earth," *Great Decisions*, 1992 edition, 54.

[41] Warren T. Olds, Assistant Regional Director, FWS, in interview by author at RCW/ Endangered Species Workshop, Fort Belvoir, Va., 6 February 1992.

[42] FWS, *Endangered Wildlife and Plants*, 15 April 1990, 36.

[43] Kim Mello, Wildlife Biologist, Fort McCoy, Wisconsin, "Recovering Endangered Species," in *Proceedings of DOD Natural Resources Leadership Conf.*, 12-16 August 1991, 76.

[44] Dave Tazik, Dennis Herbert, and John Cornelius, "Endangered Species Management at Fort Hood, Texas," in *Proceedings of DOD Natural Resources Leadership Conf.*, 12-16 August 1991, 78.

[45] Foreign Policy Association, "Planet Earth," *Great Decisions*, 1992 edition, 52.

[46] *Ibid.*, 54.

[47] Thomas Baca, Assistant Secretary of Defense (Environment), "DOD Endangered Species Policy," in *Proceedings, RCW Workshop*, 3-5 April 1991, 5.

[48] Victor E. Diersing and others, *Criteria For Siting An Army Maneuver Installation: Natural Resource Considerations For Optimum Use*, 1992.

[49] Robert McGuire, LTC, interview by author, 5 February 1992, Washington D.C.

[50] Thomas Baca, Asst. Sec. of Def., "DOD Endangered Species Policy," in *Proceedings, RCW Workshop*, 3-5 April 1991, 8-9.

[51] Phillip W. Childress, Colonel, "Reforger: Smaller but Smarter," *Armed Forces Journal*, February 1992, 12.

[52] Thomas Baca, Asst. Sec. of Def., "Future Directions," in *Proceedings of DOD Natural Resources Leadership Conf.*, 12-16 August 1991, 38.

[53] John Beasley, Lieutenant Colonel, Office of the Judge Advocate General, remarks (excepting presentation of findings to Congress) at RCW/ Endangered Species Workshop, Fort Belvoir, Va., 6 February 1992.

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