

Army Operational Noise Management Program Review

A Briefing Book
April 1999

Army Environmental Policy Institute/
U.S.A. Center for Health and Preventive Medicine



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Executive Summary:

" . . . where FORSCOM units train, we are experiencing an increase in noise issues with local civilian populations which impact on unit training programs " - Patricia P Hickerson, Major General, USA Deputy Chief of Staff for Personnel and Installation Management, memo from July 27, 1998.

Without question, noise is an unavoidable by-product of running a trained and ready army. However, there is also a growing recognition that noise has a significant impact on our installations and the communities surrounding them. This recognition is embodied in the FORSCOM DCSPIM quote cited above. While we cannot alter the physical properties of noise, we can influence it and manage it through our planning and operations efforts.

Since 1993¹, Army Environmental Policy Institute (AEPI) studies have documented the potential threat that noise poses to readiness training. The purpose of this paper is to examine previous related studies and trend analyses, existing perceptions on the issue, noise claims data, case study analyses, and legislative trends. As a result of this study, the following findings are noted:

Findings:

1. Most installation training and environmental staff think noise is a problem and expect it to get worse over the next five to ten years.

• 43 percent of installations surveyed reported noise problems that required either rescheduling or moving training ranges to resolve.

2. The Army is responsible (by federal statute) for guarding against the effects of military noise on TES (threatened and endangered species) but little scientific data exists in this area.

• There are known TES existing on 105 installations, limiting access to training lands.

3. More bills with more co-sponsors concerning noise issues are being proposed in Congress.

• More than 200 lawmakers co-sponsored more than 40 noise-related bills in the 104th Congress, eclipsing all other environmental issues in this session.

4. Political intervention, complaints, and damage claims will increase as installations become less remote.

• Many of our most active installations are experiencing regional rates of growth at five to ten times the national average.

5. The acquisition community ignores environmental noise throughout life cycle planning, design, and fielding.

•Adequate noise data has never been characterized for weapon systems e g MLRS, 120 mm mortar, AT-4, OH-58D, etc

6 Partnering and communication-based programs such as regionally focused JLUS (Joint Land Use Study) are a proven means to decreasing noise problems at installations

•Fort Bragg's JLUS process enabled the community to make rational decisions on land use planning, and provided a justification for acquiring new land

•Based on these findings, we make the following recommendations:

1. ACTION: Emphasize to the Army leadership that operational noise management is a training and readiness issue that threatens installation mission capability.

2 ACTION: Develop an operational noise program investment strategy and implementation plan, determining proponency, funding strategies, and prioritization, etc.

3 ACTION. Reinstate noise R & D technology development, build science partnerships with other services to enhance those technologies (e g prediction, measurement, simulation), and establish a representative user group to establish R & D needs and priorities

4 ACTION Train noise team personnel at all levels, on a "as needed basis", leveraging resources by partnering with other services to keep expenses down and maximize efficiency

5. ACTION: Conduct periodic IPRs to review lessons learned to maintain program focus and inform senior decision makers.

6 ACTION Develop a noise R & D program for investigation of key TES (threatened and endangered species), building partnerships with other services and the Departments of the Interior and Agriculture.

7. ACTION Assess pending noise legislation, determine the potential effects on the Army, and engaging legislative staff early in the law making process

8 ACTION Emphasize the integral nature of operational noise management to protect installation capability to maintain unit readiness

9 ACTION Align ENMP to a JLUS approach toward actively achieving regional compatible land use while leveraging limited resources and expertise

10 ACTION. Develop procedures with PMs/PEOs to acquire operational noise data prior to fielding of weapons systems.

1 In 1993 the Assistant Secretary of the Army for Installations Logistics and Environment (ASA (IL&E)) tasked the Army Environmental Policy Institute (AEPI) to examine future field training and environmental laws and regulations and identify potential critical impacts on field training which result from changing environmental requirements and changes in warfighting doctrine. This task resulted in the initiation of the Land for Combat Training (LFCT) study that consisted of a review of trends in training, environmental science, law and public policy

Introduction

With the perceived end of the Cold War, the public is less tolerant of military noise

- ⇒ If noise comes from/near an installation, it's the Army's noise**
- ⇒ The public expects the Army to manage its noise**
- ⇒ As a result, the public expects military noise in general to be reduced**

Introduction:

Because we live in an era of constantly increasing environmental controls that limit the use of natural and cultural resources for training, the DASA asked AEPI to examine policy options to ensure that the Army has access to adequate training land and airspace for the future. That study revealed that noise is a significant factor in training a ready Army.

The origins of an Army Environmental Management Program can be traced to a Policy Memo, entitled Installation Compatible Use Zone (ICUZ) Program, initiated in 1982 by the ASA(IL), Mr. Joel Bonner. It was subsequently included in 1983 by the ARSTAF in AR 200-1, Environmental Protection and Enhancement.

Although the EPA Noise Abatement and Control Office was eliminated during the early 1980s, the Army leadership saw the value in a policy program to proactively manage noise with adjacent local communities. Its goal was to reach a consensus leading to an MOA upon which land use decisions can be based, to educate the public, and to reduce complaints. In turn, the Army's ability to train as we fight would be protected.

The public often can't discriminate between "artillery fire" [Army] and "aerial bombing an impact range" [Air Force, Navy or Marine Corps]. As a result, complaints are then often directed to the landholding resident [Army].

Complaints continue to increase at many installations. Frequently heard comments from the public include

- "Since there is no longer any threat why do you need to shoot as much?"
- "Why can't you move all this noise out west somewhere?"

Introduction

- **Prior Studies Identified Noise as:**

- ⇒ “Potential threat to readiness” (Rzeszotarski, 1992; Conrad, 1995)

- ⇒ “Second most significant environmental constraint to training mission” (Rzeszotarski, 1994)

- ⇒ “Most pervasive problem with aircraft operations” (Conrad, 1995)

- ⇒ “Biggest problem for live firing exercises” (Conrad, 1995)

Introduction:

Over time, AEPI environmental trends studies continue to track noise concerns of affected publics and agencies. As civilian urban development continues to surround Army installations, noise is likely to become a more intractable problem. Being engaged in the region's land use planning processes prior to noise conflicts places the Army in a better position to avoid or reduce future noise incompatibility.

By keeping abreast of legislative developments, the Army postures itself to better anticipate pending law and implementation of regulations. This response can often mitigate the overall impact noise has on the Army mission.

Introduction

- **AEPI “Environmental Trends” continue to track noise concerns over time, places consistently in top quartile ranking**
- **Legislative monitoring**
 - ⇒ Noise concerns
 - ⇒ Technology implications

Introduction:

Over time, AEPI environmental trends studies continue to track noise concerns of affected publics and agencies. As civilian urban development continues to surround Army installations, noise is likely to become a more intractable problem. Being engaged in the region's land use planning processes prior to noise conflicts places the Army in a better position to avoid or reduce future noise incompatibility.

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Finding #1

- **Installation personnel believe:**
 - ⇒ Noise problems expected to worsen due to growing urbanization around installations.

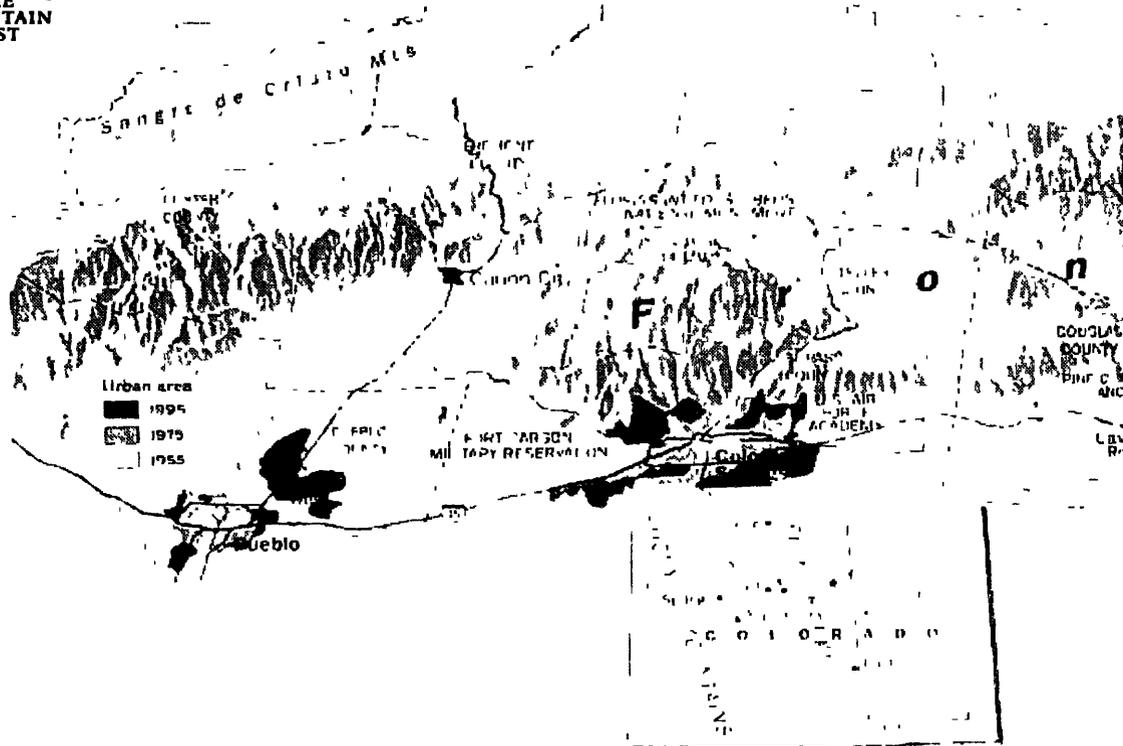


Under the 1996 AEPI survey, phone interviews were conducted with TRADOC and FORSCOM installation level personnel, both environmental and trainers, to determine their perceptions of noise concerns. Installations personnel believe the problems will continue to worsen, given increasing urbanization pressures.

However, these installation personnel recognize, in the future (5 to 10 years out) the need and benefits of open communication and engagement with the regional communities. Counterintuitively, installations have been reluctant to share noise studies/noise contours with the public.



Urban Development Surrounding Fort Carson



Example: Fort Carson had a \$3.2 million lawsuit filed against them by a developer. The suit contends that Fort Carson's noise has taken away the developer's right to use the land as intended. The fact is that we have decreased operations over the last few years.

Finding #1

Weapons expected are noisier, e.g.

⇒from 105mm to 120mm main tank gun

⇒from 107mm to 120mm mortar

⇒MICLIC

⇒MLRS



As the world threat changes the Army's requirements for more lethal weapons systems also changes. These often lead to more powerful weapons systems that produce more noise. Examples of these changes are the 120 mm tank gun and 120 mm mortar; both these systems are louder than the weapons they replaced.

Finding #1

Public noise concerns have caused installations to:

- ⇒relocate training on the base
- ⇒dislocate (move training off-base or to other bases)
- ⇒restrict aircraft operation
- ⇒limit firing frequency or size of
- ⇒limit time or day of training
- ⇒close ranges

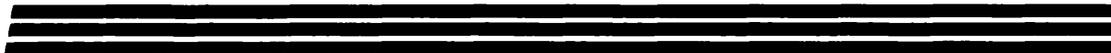
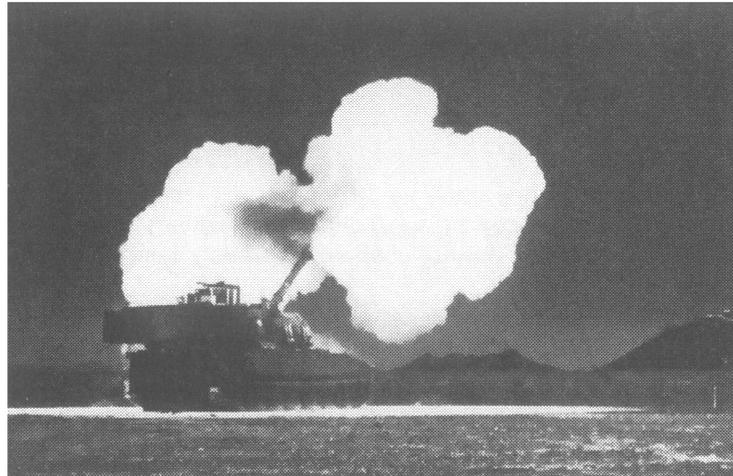
The survey indicates that these operational adjustments are made by installation operators and trainers. This is counter to the original policy intent of the ICUZ program where all affected parties were to employ a common approach and strive to achieve compatible land use

Many installations have limited training hours and have restrictions on late evening and weekends

This is an issue for testing, training, and maintaining the combat arms at our AMC, FORSCOM, NGB, TRADOC, and USAR installations

Examples: Fort Riley, Fort Carson, Fort Lewis, Camp Grayling, Camp Edwards, Aberdeen Proving Ground, Scholfield Barracks, Devens AFRTA, Fort Benning, Camp Navajo, Camp Ripley, Camp Bullis, Ft Richardson, Ft Sill, Ft Bragg, Ft Campbell, Camp Butner, Ft Rucker, Ft Knox, Yakima FC, Milan AAP, McAlister AAP, Longhorn AAP, Ft Belvoir and Ft Drum

- **Noise caused more frequent operational adjustments than any other “environmental” factor**



Installations believe that noise has caused more operational adjustments to training and testing than any other environmental factor. These adjustments include actions such as closing firing points, restricting hours of operations (aircraft flights and weapons firing) and moving operations. They expect noise will essentially increase in the next ten years.

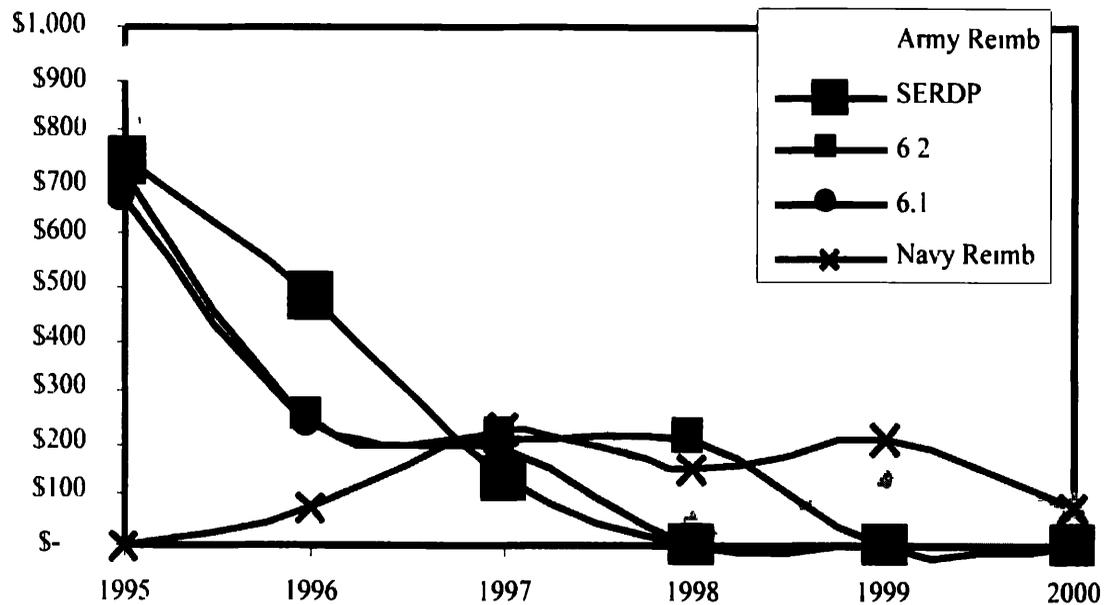
Finding #1

- **Extent of operational changes due to noise complaints is not well known at MACOM and HQDA** (until 24 July 98 Memo MG Miller. HQ-FORSCOM, DCSPIM to MG Whaley, HQDA, ACSIM)
 - ⇒ Noise not currently a NOV
 - ⇒ But NOVs don't close/restrict installations
 - Closed firing pts./ranges @ Sill, Lewis, Bragg, Camp Butner

Although the Environmental Program Requirements (EPR) guidance for the Noise Control Act provides for a “high priority” project (Class 1), the definition for “Class 1” states “projects and activities needed at facilities that are currently out of compliance with deadlines or conditions established by **legally-mandated** requirements ”

Since noise projects are not out of compliance with a legally-mandated requirement, installations treat all noise projects as “Class 3,” unless the noise is tied to NEPA mitigation. Without a “Class 1” status, noise projects do not receive any priority for funding and lack visibility at the MACOM and HQDA. To overcome this problem, installation commanders either divert funds from the command-operating budget or do not address noise issues. The ultimate result of this process is a poor Environmental Noise Management Program (ENMP) and the loss of installation mission capability.

Noise R & D Funding (K)



Army Noise R&D direct funding is programmed to decline to zero by FY99. The Military Noise Management capability package at CERL (the only blast and helicopter noise R&D capability in existence in the U.S.) has been terminated. These events mean the loss of a capability that provides noise prediction and mitigation science R&D support to the Army Environmental Noise Management Program. They are the result of a lack of validated high priority User Requirements. The existing Compliance Pillar User Requirements were formulated primarily by DPW concerns.

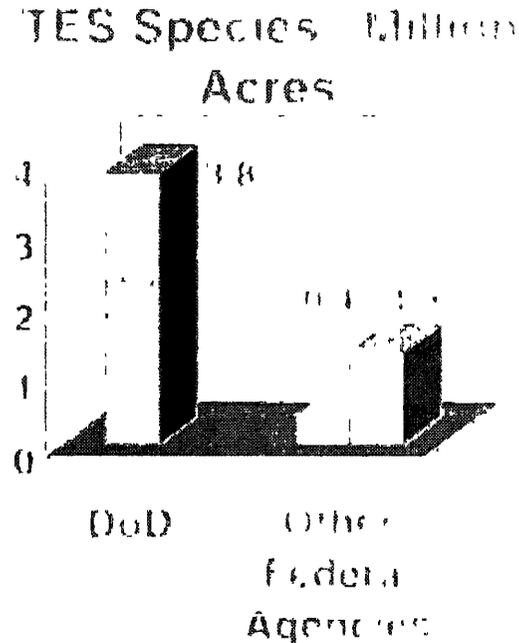
Without strong user requirements and proponentcy, noise R&D cannot compete for funds from sources such as the Corps of Engineers direct program or SERDP.

The reimbursable funding shown on the graph is focused on development of user tools, based on the results of several years of research. This activity is worthwhile and timely, and is the planned culmination of R&D efforts. It is not likely, however, that reimbursable funding sources will support true research and development. Thus future improvement in military noise management capability will not be forthcoming.

Finding #2:

Threatened and Endangered Species (TES): The Problem

- **Endangered Species Act (ESA)**
 - requires federal agencies to preserve and enhance TES on their lands
- **USFWS, the ESA regulator, is required to ensure TES preservation**
- **Lack of noise impact data leads to conservative decisions**
 - Training has been stopped
 - Land use restrictions



The Endangered Species Act (ESA) requires all federal agencies to carry out programs for conservation of threatened and endangered species (TES). Agencies must ensure that their actions do not jeopardize the continued existence of listed species or adversely modify critical habitat. The ESA requires agencies to conduct biological assessments to evaluate the impacts of their activities on listed species.

This assessment serves as the basis to include noise for consultation with the U.S. Fish and Wildlife Service (F&WS), which issues a biological opinion in addition to species management recommendations. In the absence of definitive information on noise impacts, the F&WS has made conservative management recommendations. Since the Army has more TES species per million acres than any other federal agency, activities (including military training such as weapons firing and aircraft operations) are often curtailed because of potential impacts.

Finding #2: TES Management

TES limits access to lands:

- Known species on 105 installations
- USF&WS proposed additional 35 species
- Limited knowledge of noise impacts on TES
- DoD has highest per acre number of species

Benefits of noise impact information:

- Improved access to training land (Ft. Bragg 60%)
- Credibility of management decisions
- Mission compatible TES management
- Reduction in lost training time
- Reduction of management dollars

Golden-cheeked Warbler



As stated in the 1993 AEPI survey installation identified, TES is the most significant environmental issue constraining combat training readiness. The next most significant constraint was environmental noise. These two issues go hand in hand and often noise is a key issue in evaluating impact on TES. Without sufficient information to assess the impact of our noise on TES, training is often constrained. Today there are known species on 105 Army installation and the F&WS is proposing the listing of an addition 35 species on Army installations.

The benefits of sufficient data on the impact of noise on TES include improved access to training land, better management decisions, and cost savings.

- In Southern California, the USFWS Office has proposed a threshold for noise impacts on endangered passerines [perching songbird] of 60 dBA. This has the potential to impact **all aircraft operations** at the NTC, if applied to species there.
- The proposed threshold would be applied to species in and around NAS Miramar. In addition if adopted by other F&WS offices, this could impact any installation with endangered birds, helicopter and fixed-wing aircraft training. A typical over flight of a AH-64 or UH-60 at 500 feet AGL would be 83.4 dBA and 82.5 dBA, respectively.

Finding #2:

Noise-Impacted Threatened and Endangered Species (TES)

Desert Bighorn Sheep - JTX
Roving Sands

Red-cockaded Woodpecker -
Southeast

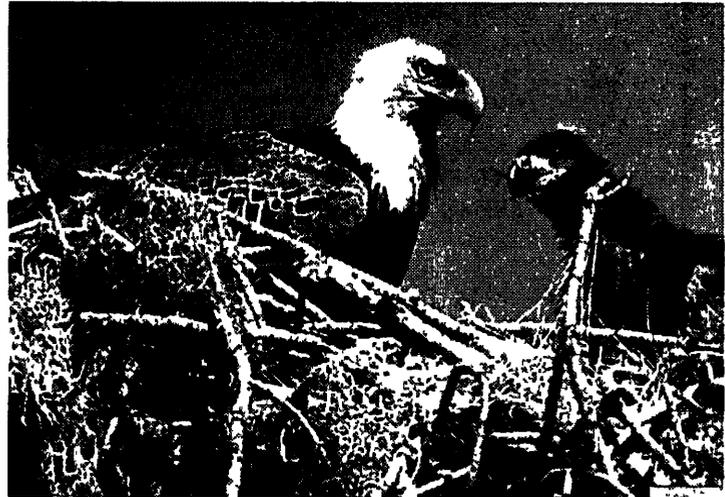
Bald Eagle - APG

Desert Tortoise - NTC

Golden-cheeked Warbler - Camp
Bullis

Black-capped Vireo - Fort Hood

Kirkland Warbler - Camp Grayling



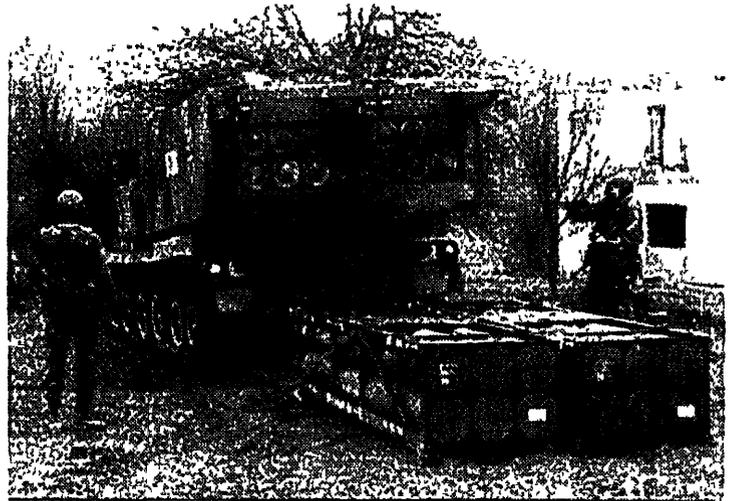
All of these species have impacted the Army's mission, be it through RDT&E or training. Noise impact data and coordination with the U.S. Fish and Wildlife Service on the desert bighorn sheep, bald eagle, and Kirkland warbler have reduced restrictions. Noise has been an issue for the following TES:

- The desert bighorn sheep impacted JTX Roving Sands by restricting aircraft operations in a portion of the White Sands Missile Range.
- The Red Cockaded woodpecker is found on virtually every installation in the southeast and impacts all types of training.
- The bald eagle restricted the use of some range areas during the breeding season at Aberdeen Proving Ground.
- The desert tortoise impacts training at NTC.
- The golden-cheeked warbler and black-capped vireo restrict the use of training areas on Fort Hood and Camp Bullis.
- The use of the primary tank range was restricted during the Kirkland warbler breeding at Camp Grayling.

Finding #3:

Training and Testing Capability

- **Noise is not a legally-mandated compliance requirement**
- **There are no national noise limit laws or regulations**
- **Noise impacts training capability and military readiness**



The Noise Control Act of 1972 (Public Law 92-574 1972) states " that it is the policy of the United States to promote an environment for all Americans free from noise that jeopardizes their health or welfare" and that Federal agencies "(1) having jurisdiction over any property or facility, or (2) engaged in any activity resulting, or which may result, in the emission of noise, shall comply with Federal, State, interstate and local requirements " [Section 4(b)]

In Section 6 of the Act, the Administrator of the EPA is directed to establish noise emission standards for products and to prescribe regulations for such products However, in Section 3, Congress excluded any military weapons or equipment that are designed for combat use from the definition of product

The Office of The Judge Advocate General (U.S. Army 1989) states "... we think the correct Army policy with respect to the Noise Control Act is that all Army activities should endeavor to comply with all Federal, State and local requirements respecting the control of noise as stated in Section 4(b) of the Act, unless to do so would conflict with the Army's mission The obligation to comply with State and local noise laws arises out of the Army's policy of cooperation on environmental matters generally " and Executive Order 12088

As emphasized earlier the lack of "legally-mandated" requirements hampers the installation's capability to adequately address noise issues and develop a proactive program Yet, they are generally expected to cooperate and comply with all state and local requirements

Reference. U S. Army, 1989, Office of the Judge Advocate General, Applicability of State and Local Noise Regulations to Army Activities

Finding #3

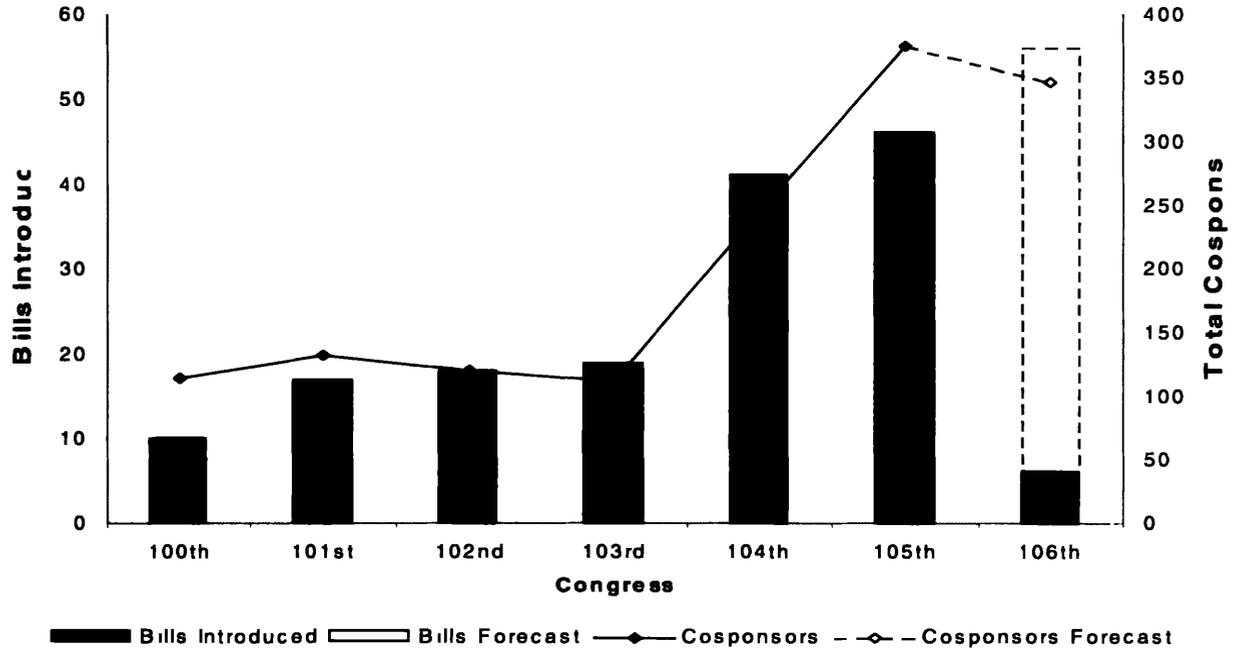
- **The amount of federal legislation calling for control, mitigation, and prevention of noise is increasing**
 - ⇒ Legislative pace exceeds other environmental issues
 - ⇒ Aviation noise; urban area and uninhabited area noise
 - ⇒ Re-establishment of EPA-ONAC
- **Local ordinances, not state law, may pose the greatest future challenge to Army**

The 1990s have seen a shift from the "study and recommend" legislation of the 1980s to "allow/disallow noise generating activities based upon compatibility" legislation. Specifically, the last two Congresses have shown a sharp rise in the number of both bills and cosponsors for bills mandating the regulation of airspace over uninhabited spaces (from no bills in the 102nd Congress to 10 bills and 46 cosponsors in the 104th)

(Jeanne Mejeur, Program Principal for noise issues at the National Conference of State Legislatures) "the majority of state legislative efforts have focused and continue to focus on control and mitigation of airport and transportation noise. The larger legislative/regulatory effort is currently at the local (ordinance) level." This concentration of legislative activity at the federal and local levels has an even greater impact on the Army when one considers the cross-impact of the public involvement trend at the local level with the trend towards increased federal enforcement of noise statutes.

If EPA-ONAC is re-established, an Army installation may face a situation in which it has to comply with potentially restrictive federal provisions at the same time that it is trying to respond to increasing local demands for public involvement in solving noise problems.

Changing Levels of Noise Legislation



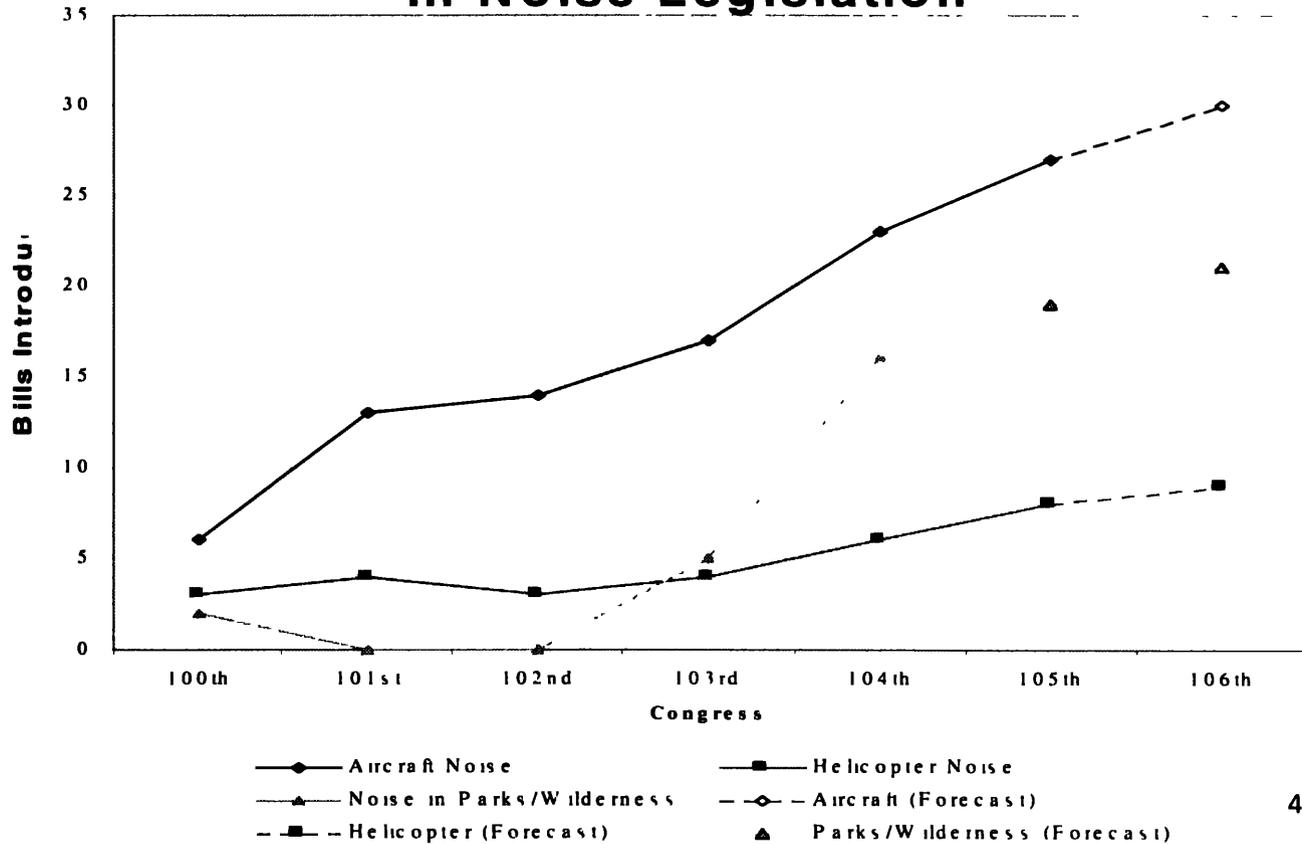
Legislative interest in noise issues can be tracked through two indicators the number of bills introduced which substantively address noise abatement, control, and/or prevention, and the number of members of Congress who support such legislation. Both of these indicators have risen since 1983

Another concern is Public Law 100-91 (U S. Congress 1987) this requires the U S Department of Agriculture Forest Service and the National Park Service to assess aircraft noise impacts on outdoor recreationists in National Parks and Forest Service wildernesses. This legislation was in response to the ongoing environmental deterioration in the nation's protected areas. The major noise concern was commercial helicopters, such as those in Hawaii's Volcano National Park and Arizona's Grand Canyon National Park

In fulfilling their mandate, the U S. Forest Service and National Park Service started fresh with no anchoring to the existing Federal guidelines on DNL. Instead, these agencies focused on audibility, noticeability, and detectability. Because these variables depend on background noise, the Forest Service funded contractors to develop models predicting the background noises of nature, such as rivers, wind in the trees and insect noise. Since some Army training takes place in or near areas controlled by these agencies of the Federal government, a policy based on the audibility of sound could have an effect on future training

Reference:U S Congress 1987 Public Law 100-91, National Park Overflight Act of 1987 Washington, DC. United States Congress.

Major Themes in Noise Legislation



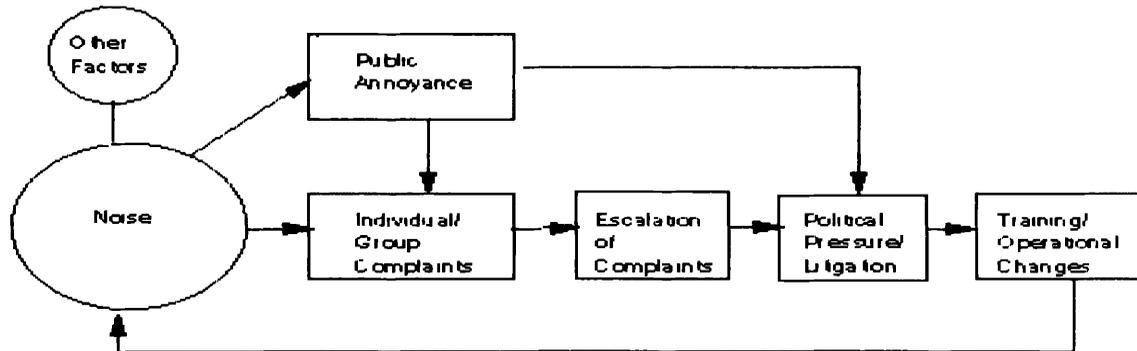
The most significant themes in noise legislation over the last 16 years have been clearly reflected in the subject content of that legislation. Aviation-related noise has by far dominated the legislative agenda, accounting for approximately two thirds of all noise legislation introduced.

Within this theme, noise caused by helicopters was mentioned in legislation intermittently during the 1980s, but steadily since 1993. Air route planning is another major aviation noise domain that has steadily increased in recent years. Since 1989, between one quarter to one half of the noise legislation introduced has contained provisions for rerouting air traffic to reduce the impact on populated areas.

Considering the sizable fleet of both fixed and rotary wing aircraft in the Army's inventory, as well as the number of aircraft from other services which train in Army airspace, this aviation noise theme has potentially restrictive implications for aviation training.

Finding #3

Noise and Its Threat to Mission



"The dynamics of how conflict about noise can impact mission capability is portrayed in the simple model shown here. Noise is sound that disturbs or that poses a threat to human well-being. When people are disturbed by noise they can manifest their displeasure by complaining to the installation or to political officials, or through civil litigation. In addition to direct manifestations of displeasure, there is a well documented relationship between noise levels and population annoyance, i.e. the likelihood that an increasing proportion of the population will report being annoyed as environmental noise levels increase."
(Schultz, 1978, Job, 1987, Schomer, 1985)

Source: Conflict Management Strategies for Reducing Threats to Readiness Posed by Annoyance and Complaints About Military-Generated Environmental Noise by C. Mark Dunning, Ph.D., Engineer Institute for Water Resources, Casey Building, Ft. Belvoir, Va.

High Population Growth Adjacent to Army

<u>Installation</u>	<u>Location</u>	<u>1980-96 Change</u>	
Stewart	Liberty County, GA	57.2 %	
Carson	El Paso Co.-Colorado Spgs. MSA, CO	50.5 %	
Gowen Field	Ada Co.-Boise MSA, ID	50.2 %	
Roberts	San Luis Obispo County, CA	47.6 %	
Lewis	Seattle-Tacoma-Bremerton MSA, WA	45.7 %	
Aberdeen PG	Hartford County, MD	43.3 %	
Bliss	El Paso, MSA, TX	41.3 %	
Hood	Killeen-Temple MSA, TX	35.1 %	
Eustis	Norfolk- VA Bch-Nwpt. News MSA, VA	32.8 %	
Drum	Jefferson County, NY	29.1 %	
Huachuca	Coshise County, AZ	28.8 %	
Campbell	Clarkesville-Hopkinsville (KY) MSA, TN	26.1 %	
<hr/>			
Jackson	Columbia MSA, SC	17.5 %	19.4%Above National Average
Shelby	Hattiesburg City, MS	16.8 %	
Bragg	Fayetteville MSA, NC	15.7 %	
	US Population Change 1990-1996 est	6.7 %	
	MSA Population Change 1980-1990 act	13.7%	

MSA = Metropolitan Statistical Area

The top installations experienced growth (above the national average of 6.7%) are listed here. There are several explanations for this growth: they include simulation of economic growth by the military installation, the need for land and the expansion of urban areas. The fact remains that our installations are under increasing pressure by civilian population growth and development. Other power support or power projection installations are included below:

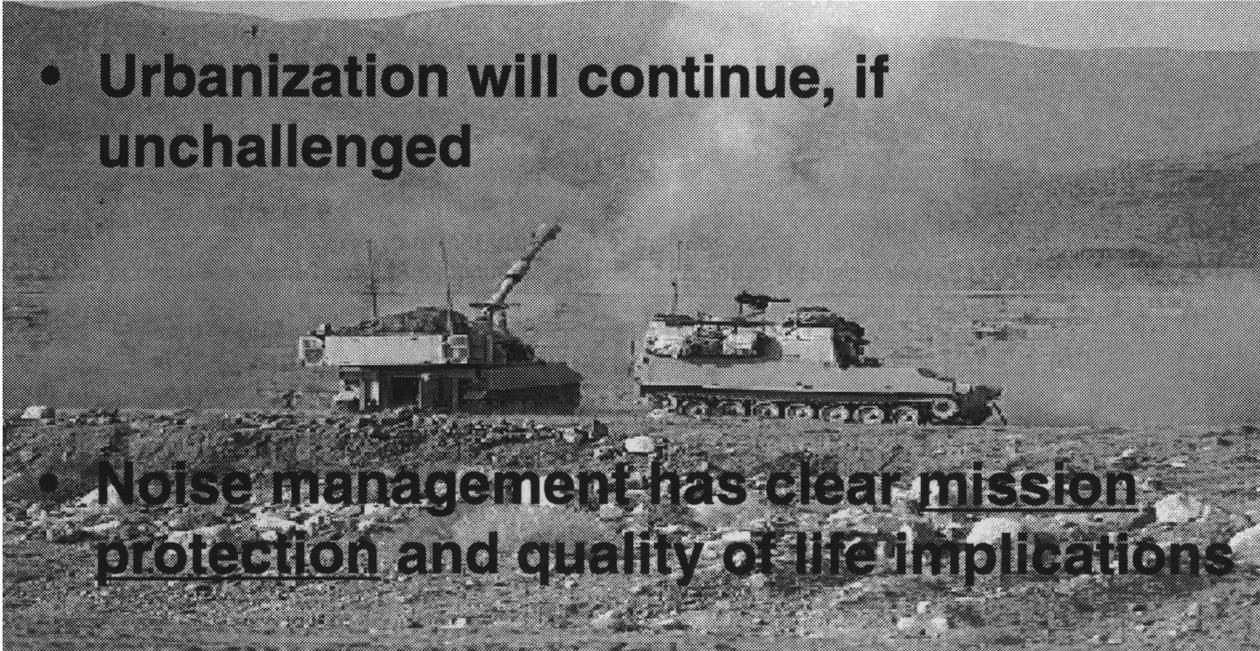
Benning	Columbus MSA	GA	13.9%
Dix	Burlington County	NJ	13.3%
Lee	Prince Georges	VA	10.4
McCoy	Monroe County	WI	11.3
Atterbury	Bartholomew County	IN	5.2
Sill	Comanche Co-Lawton	OK	2.9
Rucker	Dale County	AL	2.8
Polk	Vernon Parish	LA	2.0
Knox	Hardin County	KY	0.6

Also, some of our major Army power projection/power support platforms located adjacent to or near major air bases, e.g. Polk/England, Lewis/McCord, and Bragg/Pope, etc

Finding #4

- Urbanization will continue, if unchallenged

- Noise management has clear mission protection and quality of life implications



Because of community and political pressures, resulting from complaints, the installation makes concessions that impact training capabilities. These have included, closing firing points, closing ranges, closing drop zones, restricting the hours of training, moving training, limiting types of training, and limiting amount of explosives used. Individually these may not have a significant impact, but taken together they present a significant threat to an installation's mission.

These steady increases in the competition for available land suggests that the Army must actively protect the land and airspace it requires. Growing urbanization adjacent to installations will not likely abate, but its type and intensity can be guided through appropriate land use planning on a regional scale. Due to shrinking budgets we should focus our limited resources upon our essential power projection and power support platforms. 27 installations

Some examples where urbanization is impacting on installations by increasing complaints and land use conflicts include Aberdeen Proving Ground, Fort Benning, Fort Carson, Fort Campbell, Camp Grayling, and Fort Knox. They have/are all experiencing pressure from the expansion of surrounding communities residential development.

Finding #4

- **Damage claims (>\$25K) doubled over six years (admin. support cost not included)**
- **Complaints are an administrative burden that can lead to political constraints**
 - ⇒Fort Campbell complaints up 100% in 3 yrs.
 - ⇒Fort Benning complaints up, suit threatened
- **Reduction in complaints is not an indicator of noise program success**

Complaints, damage claims, litigation, and political intervention are the stages through which Army noise problems currently evolve

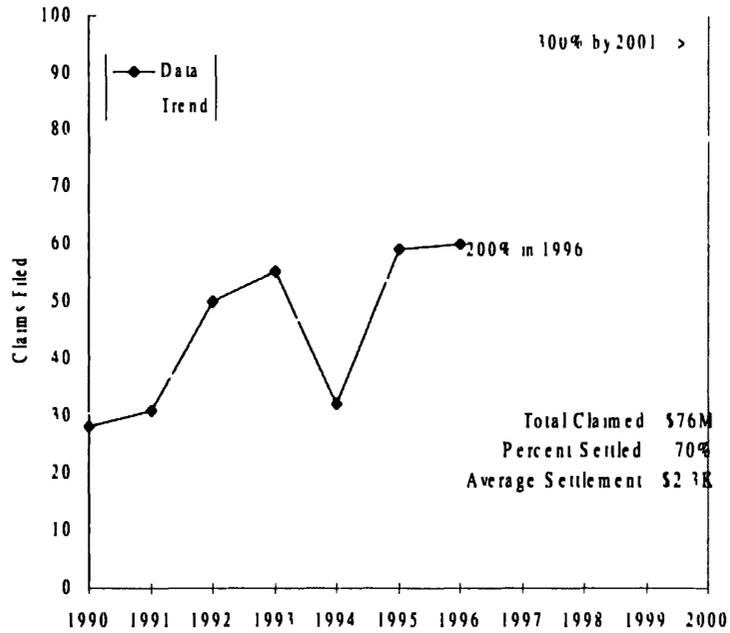
Complaints can go into lull periods (e.g. troops go to Bright Star or Reforger TXs) but increase upon troop return

From 1990 to 1996, the number of claims evaluated by USACS doubled. Each year from 1990 to 1996 with the exception of one year, the number of claims USACS contracted for evaluation increased. If this trend continues, the number of complaints will have tripled by 2001, and quadrupled by 2003. Approximately one third of the claims involved broken glass. Another third or more involved cracks in concrete, masonry, swimming pools, and foundations.

Other damages claimed included fallen brick-a-brack (10%) and collateral water damage (3%). Approximately one third of claims filed did not relate to a specific noise event. Many claimants cited a range of several days, while others asserted cumulative damages over multiple years.

The noise complaint trends and the growing organized opposition to noise is strong evidence that the threat to our installation training and soldier readiness will continue to grow. In today's computerized society the internet has organized citizen groups against noise pollution. By the use of web sites these organizations, such as the No Noise Clearinghouse, Anti-MilNoise Headquarters, Citizens Coalition Against Noise and others, are providing assistance and rallying opposition against all types of noise, especially military sources.

Historic and Predicted Noise Damage Claims 1990-2000



In a related investigation, we gathered information on damage claims (over \$25K threshold) made against the Army over noise. Claims could be thought of as “next steps” in the escalation of complaints.
Data Source: Army Claims Office, Ft Meade, MD

Note: The dip [1994] is accounted for by a change in the methodology of tracking noise claims

Finding #5

- **New equipment and tactics expand the noise “foot print”**
 - ⇒ Formerly, constrained (in live fire) to specific firing points
 - ⇒ Howitzers and self-propelled launchers now have capability to move rapidly/independently anywhere on (training) battlefield
 - ⇒ New weapons and tactics have expanded the battle space required for a mechanized battalion from a few thousand acres in World War II to 82,000 acres today.

Changes in doctrine and capability have greatly expanded the use of our training areas. Since the Civil War, the area of influence/interest of a maneuver battalion has increased steadily. That trend continues unabated. The battlespace for a typical heavy task force has expanded due to improved mobility, communications, navigational aids, command and control, and armament. The area required to conduct a full-up, live simulation of a specific task, such as an attack, grows accordingly. As a unit occupies more terrain, the noise "footprint" expands.

Range and impact area requirements depend on the type weapon and mission of units assigned to or supported by the installation. Today's sophisticated weapons systems and the Army's training design to increase individual skills and unit tactical and technical proficiency have increased training/testing land requirements. As the Congressionally mandated base closures reduce land resources and relocate units the demand on land will increase.

Increasing public concern about the environment, including noise abatement and protection of endangered species, as has generated additional restrictions on training/testing land use.

TC 25-1 p 11 states "To train for combat on a modern battlefield, a battalion must move, shoot, and communicate over large distances. It must train to react quickly as the commander senses the enemy's intent. It must train to move rapidly so as to concentrate combat power at a decisive place. In other words it must train on large expanses of land."

Finding #5: New Weapons Systems

- **The acquisition community does not consider environmental noise**
- **Noise source data for new weapons systems is not available**

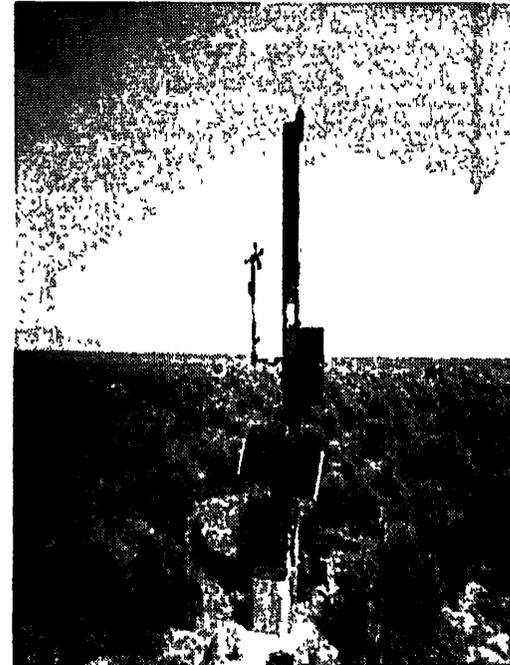


Efforts have been underway to develop a comprehensive approach to integrating environmental considerations into existing weapon system acquisition process. The study addressed policy and management issues and then transitioned into a method design. This provided PMs and weapon system design teams with life cycle environmental cost data needed to perform system-level tradeoffs and to optimize environmental design.

AR 200-1, Environmental Effects of Army Actions requires the evaluation of environmental impacts of materiel development, acquisition, and/or transition. In addition, AR 70-1 System Acquisition Policy and Procedures, and AR 70-10, Research, Development and Acquisition, Test and Evaluation both require the development of a life-cycle environmental document to assess the impact of new weapon systems. To adequately assess these impacts noise data must be acquired on that weapon. Currently, there is no mechanism within the Army acquisition system to provide the necessary noise data for assessing impacts.

Finding #5

- **R&D EQ Technology base is faltering**
 - ⇒ No program funding at CERL after FY 99
- **Acoustics technology gaps, e.g.,**
 - ⇒ Modeling terrain/weather effects,
 - ⇒ Maintain software on new operating systems
- **Lacking acoustic data for modeling**
 - ⇒ Large caliber weapons, small arms, improved munitions, rockets, and missiles



R&D provides information and technology that enables an effective Environmental Noise Management Program. Modern noise contour models are needed to assess noise exposure for purposes of defining compatible land use in the surrounding community.

Noise prediction capability is needed to plan training activity for minimum noise emission. Computerized noise management tools require maintenance and upgrades. Data are needed to develop noise contour models for new weapons and systems. Technology is required for mitigating noise effects, for example building techniques and source noise reduction technology. Research is needed to assess the impacts of noise on animals, particularly threatened and endangered species.

Finding #5



- **Weapons system technology gaps, e.g.,**
 - ⇒ **Modeling weapons noise from an aerial platform (AH-64, AC-130, A-10 & F-16)**
 - ⇒ **Modeling new or improved aircraft (RAH-66 Comanche), TH-67, and the advanced heavylift helicopter**

Current noise models are not capable in predicting impulsive noise from aerial platforms. This presents a significant gap in our ability to assess noise affects and in turn to produce truly representative noise contour maps.

In cooperation with NASA Langley Research Center, U.S. Air Force Research Laboratories, and the Navy a new helicopter noise prediction model is being developed. To support this improved and current prediction models, noise data on existing, new and improved helicopters are required.

Finding #6

- **“Communication” with the local communities believed to hold greatest promise to manage noise, e.g.,**
 - ⇒ Cooperative regional land use planning
 - ⇒ Disclosure of Army noise

Although respondents overwhelmingly believe that technological improvements will continue to enhance noise mitigation programs, the greatest potential noise mitigation solutions are those based on improved communication strategies with local stakeholders. There was a frustration expressed that the current policies and practices, as implemented, have little effect on noise problems at their installations.

Finding #6

- **Mitigation has been a one-way effort, borne by installations through operational changes & reparations**

Noise mitigation has been unilateral. If the program focused on managing noise with regional communities, as was envisioned by original policy program, there would be a greater potential win-win for all parties.

- Protection of the health and safety of residents near military installations from the impacts of military operations
- Preservation of long term compatibility between installations and the adjacent communities
- Greater emphasis on community comprehensive planning
- Integration of community(ies) comprehensive plans with the installation(s)

Finding #6

- **Partnering (via JLUS regional/multi-service approach) with local communities have achieved noise management success**
⇒e.g.,Bragg/Pope.
- **JLUS has been successful in providing financial (matching cost sharing grants) and technical incentives to help resolve noise management problems**
⇒Bragg/Pope; Campbell

Since 1985, OEA has responded to military department requests for joint land use study (JLUS) projects at bases. Twenty-one studies are complete for 24 bases (some involved 2-3 bases) and 4 are in progress. JLUS projects were initiated to help assure compatible land development around military bases, thus preventing, or spreading of urbanization (incompatible development) that would impair mission accomplishment.

The Air Force was first to use the program with successfully completed studies for Beale AFB, Castle AFB, Charleston AFB, Ellsworth AFB, Fairchild AFB, Hill AFB, Luke AFB, March AFB, Mather AFB, McChord AFB, McClellan AFB, Pope AFB, Robins AFB, Shaw AFB, Travis AFB, Westover AFB, and Williams AFB. Beginning in 1987/1988, the Army requested OEA to initiate projects at several locations: Camp Bullis, Ft. Bragg, Ft. Knox, and Ft. Lewis. They have completed JLUSs.

The Navy and Marine Corps also expressed interest, with projects completed at NAS Miramar and MCAS Cherry Point.

- Studies to date have cost \$1,718,482. The average grant is \$74,717 and average cost per base JLUS is \$63,647.

Finding #6

- **JLUS precondition: Installation command and community ownership is a prerequisite to noise management success**

⇒ Campbell building barracks in Zone II, near Zone III, adjacent community now cites this as rationale for their development into noise sensitive zones

⇒ Carson air to ground range and MPRC

There are occasions where the ENMP advances no further than the current lead office, most often the Environmental office. The JLUS program message implies, "if its important enough to receive program funding then its important enough to engage the **Garrison** Commander

- At Fort Campbell, KY the installation completed a very good JLUS, but the installation has constructed their own troop barracks within the noise Zone II, very near the Zone III. In discussions with neighboring community to prevent incompatible development near and in the Campbell AAF APZs and noise zones the community said "you did why can't we?" The proposed development would seriously impact CAAF and Sabre Army Heliport
- At Fort Carson 2 of the noisiest ranges, the air to ground range and MPRC, in the southern portion of the installation will be seriously impacted by the further expansion of West Pueblo. The area is now subdivided into 30,000 residential lots. If this area develops as expected range operations in this portion of Fort Carson may be seriously restricted

A JLUS is usually completed in a year, although the degree of coordination and complexity may dictate that a longer period of time is needed to achieve the necessary consensus and commitment to implementation. Through the JLUS process, communities voluntarily adopt land development controls to implement the plan and assure the overall goal of mutually beneficial coexistence is achieved.

Experience from these studies show a high success rate.

Source: DOD-OEA

Finding #6

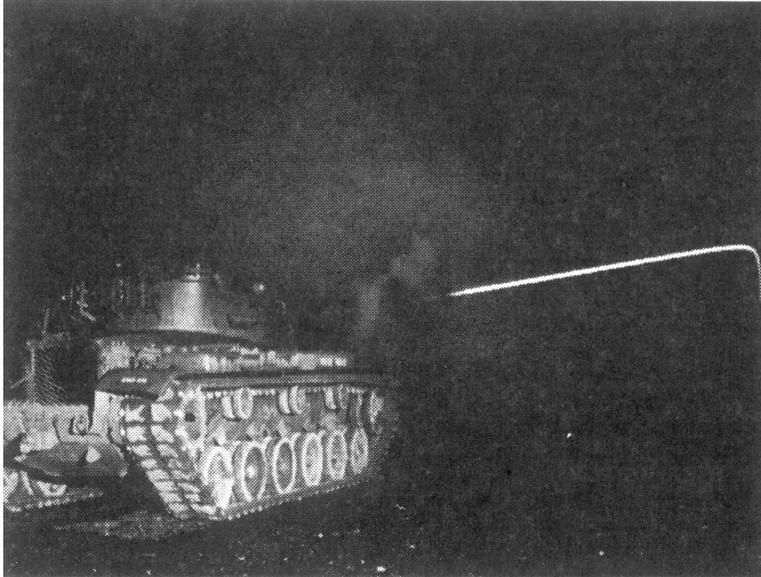
- **ECAS program measures ICUZ “compliance” as the completion of a report, but not reaching consensus with adjacent communities to manage noise**

Noise management goes well beyond the mere production of a paper study. The original ICUZ had called for reaching an MOU among the affected parties, with the intention to work toward guiding compatible land uses in high noise areas

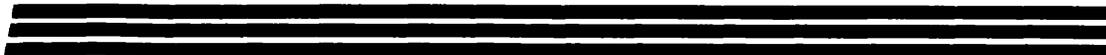
During the Environmental Compliance Assessment System (ECAS) process the criteria for identifying "Class 1" noise findings is the same as in the EPR. The installation noise programs are not **out of compliance with a legally-mandated requirement**. Thus, all findings are "Class 3," unless the noise is tied to NEPA mitigation. Without a "Class 1" status noise findings do not receive any priority for funding and lack visibility at the MACOM and HQDA.

To address this lack of funding the installation commanders either divert funds from the command operating budget or do not address noise issues. The ultimate result of this process is the loss of installation mission capability.

Finding #6



- **Noise management entails a multi-disciplinary approach:**
Ops, Env, SJA, PAO, & Master Planning



No one office or professional persons has all the skills necessary to manage noise. A team approach has been proven successful, but there are no guarantees for trouble free implementation. It is essential that the responsibility for the Environmental Noise Management Program (ENMP) be shared among the commander's staff. The following is provided as an example.

Installation Commander The Commander is ultimately responsible for the success of the installation noise abatement program, but requires the complete support of the installation staff to execute a successful program.

Directorate of Public Works (DPW) The DPW plays a great role in an installation noise abatement program. The DPW often supervises the Master Planning and Environmental Offices, evaluates management and implementation of the compatibility planning.

Environmental Quality Control Committee (EQCC): The committee can be responsible for the following seven functions:

Reviewing noise and vibration complaints

Coordinating with the public to educate them on noise, vibration, and how noise affects them

Assessing installation activities

Monitoring land development plans

Reviewing the siting of new on-post

Reporting findings and potential problems to the installation commander

The committee should include:

Installation Commander/Representative

Environmental Manager

Master Planner

Staff Judge Advocate

Public Affairs Officer

G3/Director of Plans and Operations (Range Control Officer and Airfield Operations Officer)

Preventive Medicine or Environmental Science Officer

Tenants with Noise Making Activities

Findings

1. Installation operators and environmental staff think noise is a problem and expect it to get worse over the next five to ten years.

- 43 percent of installations surveyed reported noise problems that required either rescheduling or moving training ranges to resolve.

2. The Army is responsible (by federal statute) for guarding against the effects of military noise on TES (threatened and endangered species) but little scientific data exists in this area.

- There are known TES on 105 installations, limiting access to training and testing lands.

3. More bills with more co-sponsors concerning noise issues are being proposed in congress.

- More than 200 lawmakers co-sponsored more than 40 noise-related bills in the 104th Congress, eclipsing all other environmental issues in this session.

Findings

4. Political intervention, complaints, and damage claims will increase as installations become less remote.

- Many of our most active installations are experiencing regional rates of growth at five to ten times the national average.

5. The acquisition community does not consider environmental noise throughout the life cycle planning, design, and fielding.

- Adequate noise data has never been characterized for weapons systems, e.g. MLRS, 120 mm mortar, AT-4, OH-58D, etc.

6. Partnering and communication-based programs such as regionally focused JLUS (Joint Land Use Study) are a proven means to decreasing noise problems at installations.

- Fort Bragg's JLUS process enabled the community to make rational decisions based on planning, and provided a justification for acquiring new land.

Recommendations

- **Emphasize to all levels of the Army leadership the integral nature of operational noise management as an issue that threatens training and readiness and installation mission capability.**
- **Establish and develop an operational noise program investment strategy and implementation plan, determining proponency, funding strategies and prioritization (e.g. EPR, ECAS).**
- **Reinstate noise R & D technology development, build partnerships with other services to enhance those technologies (e.g. prediction, measurement, simulation), and establish a representative user group to establish R & D needs and priorities.**
- **Train appropriate personnel at all levels, on an “as needed basis”, leveraging resources by partnering with other services to keep expenses down and maximize efficiency.**
- **Develop a noise R & D program for investigation of key TES (threatened and endangered species), building partnerships with other services and the Departments of the Interior and Agriculture.**

Recommendations

- **Conduct periodic IPRs to review lessons learned to maintain program focus and inform senior decision makers.**
- **Assess pending noise legislation, determine the potential effects on the Army, and engaging legislative staff early in the law making process.**
- **Emphasize the integral nature of operational noise management to protect installation capability to maintain unit readiness.**
- **Align ENMP to a JLUS approach toward actively achieving regional compatible land use while leveraging limited resources and expertise.**
- **Develop procedures with PMs/PEOs to acquire operational noise data prior to fielding of weapons systems.**

Acronyms

ENMP	Army's Environmental Noise Management Plan
AEPI	Army Environmental Policy Institute
AICUZ	Air Installation Compatible Use Zone
AR	Army Regulation
CERL	Construction Engineering Research Laboratories
CFR	Code of Federal Regulations
CHPPM	U S Army Center for Health Promotion and Preventive Medicine
DA	Department of the Army
dB	Decibels
DNL	Day-night average sound level
DOD	Department of Defense
ENMP	Army's Environmental Noise Management Plan
EPA	Environmental Protection Agency
HQDA	Headquarters, Department of the Army
ICUZ	Installation Compatible Use Zone
JLUS	Joint Land use Study
MACOM	Major Command
MLRS	Multiple Launch Rocket System
MICLIC	Mine Clearing Linear Charge
mm	Millimeter
NCA	Noise Control Act of 1972
NEPA	National Environmental Policy Act
OEA	Office of Economic Adjustment
PAO	Public Affairs Office
PL	Public Law
RCO	Range Control Officer
SJA	Staff Judge Advocate
U S C	United States Code