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DEPARTMENT OF THE ARMY  
ST. LOUIS DISTRICT, CORPS OF ENGINEERS  
8945 LATTY AVENUE  
BERKELEY, MISSOURI 63134

June 17, 2011

REPLY TO  
ATTENTION OF:

Formerly Utilized Sites Remedial Action Program (FUSRAP)

Subject: Transmittal of the U.S. Army Corps of Engineers (USACE) Biological Assessment for the Proposed Remedial Action at the FUSRAP Areas of the Iowa Army Ammunition Plant (IAAAP), Middletown Iowa

Mr. Mike Coffey  
U. S. Fish and Wildlife Service  
1511 47<sup>th</sup> Avenue  
Moline, IL 61265

Dear Mr. Mike Coffey,

In accordance with Section 7 of the Endangered Species Act, the U.S. Army Corps of Engineers, St. Louis District is requesting an informal consultation regarding the proposed remedial actions at the IAAAP in Middletown, IA. The USACE has prepared and enclosed a site-specific Biological Assessment (BA) for the soil and structure remediation activities at the Firing Sites Area (FSA) and at two Line 1 buildings at the IAAAP. This assessment evaluates the possible impacts to the Indiana bat (*Myotis sodalis*), a federally listed endangered species, from remedial actions proposed for several FUSRAP areas at the IAAAP. The Indiana bat has been observed to forage on the property and may have maternal roosts in the riparian forests of the IAAAP. No critical habitat has been identified on the IAAAP property. The purpose of this letter is to seek concurrence from the U.S. Fish and Wildlife Service (USFWS) with our determination that the proposed action for remediation at the FUSRAP areas at the IAAAP is not likely to adversely affect the Indiana bat.

The USACE, St. Louis District has prepared a Feasibility Study (FS) and a Proposed Plan (PP) for remedial actions at the IAAAP in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) under its authority to implement the FUSRAP at the IAAAP. Remedial action is required based on the results of the Remedial Investigation and Baseline Risk Assessment conducted for the FUSRAP areas. Potential human health risks were determined for the site worker and site construction worker, assuming industrial land use, due to radiological exposures to depleted uranium (DU) in soil at the FSA and two radiologically contaminated structural components, located inside two Line 1 Buildings at the IAAAP. The results of the ecological risk evaluations indicate that constituents detected in soil at the FUSRAP areas do not pose a risk to the Indiana bat.

As described in the enclosed BA, DU is the only FUSRAP contaminant of concern identified at the FSA based on the potential for human health risks. Remedial action is proposed at four of the five FSA subareas; Firing Sites 1 and 2; Firing Sites 3, 4, and 5; the Firing Site 6 Area; and the Firing Site 12 Area. The two interior structural components at Line 1 that are

radiologically contaminated are a steel grate covering a floor sump at Building 1-11 and the air filters in an air-handling unit at Building 1-63-6.

The enclosed BA evaluates the potential impact to the Indiana bat from implementation of the preferred remedial alternative, which includes the excavation of DU-contaminated soil at the FSA, with physical treatment and off-site disposal (Alternative 4), or any other action-based alternative for DU-contaminated soil evaluated during the FUSRAP Feasibility Study (Alternatives 2 or 3). The BA determined that the absence of remedial action at the FSA would result in DU-contaminated soil to continue to be present in the environment, while short-term insignificant impacts would result from the remedial action. The potential impacts of remedial action will be negligible, offset by proper construction management techniques, or will be avoided or minimized through appropriate environmental coordination. The specific areas proposed for remediation will be delineated to minimize the total volume of soil requiring excavation, and the construction methods selected will minimize environmental impacts. As any adverse effects will be minimized, the long-term persistence of the Indiana bat within the action area will not be threatened. The USACE anticipates that the proposed action will not incidentally take any Indiana bats or destroy any summer roosts in use by the Indiana bat at the IAAAP. Thus, the proposed action for the FSA is also unlikely to appreciably reduce the likelihood of survival and recovery of the species throughout its range. The proposed remedial action associated with the DU-contaminated structures at the two Line 1 buildings (Alternative S3) would be conducted on the interior portions of the building and would not impact the Indiana bat. Therefore, the BA has concluded that the proposed remedial actions (or any other action-based alternatives presented in the PP) for the FUSRAP areas of the IAAAP are not likely to adversely affect the Indiana bat. A copy of the PP is enclosed for your reference.

If you have any questions in regards to the BA, please contact Mr. Ron Frerker at 314-260-3936 or by email at [Ron.Frerker@usace.army.mil](mailto:Ron.Frerker@usace.army.mil).

Sincerely,



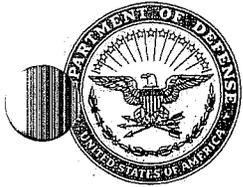
Sharon R. Cotner  
FUSRAP Program Manager

Enclosures:

*Biological Assessment for the Proposed Remedial Action at the FUSRAP Areas of the Iowa Army Ammunition Plant, Middletown, IA*

*FUSRAP Proposed Plan for the IAAAP; Final, April 22, 2011*

+ Prop Plan



DEPARTMENT OF THE ARMY  
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BERKELEY, MISSOURI 63134

June 17, 2011  
~~May 31, 2011~~

*HH*  
Hamm  
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*RT*  
Frerker  
EC-H

*MS*  
Bonstead  
OC

Mr. Mike Coffey  
U. S. Fish and Wildlife Service  
1511 47<sup>th</sup> Avenue  
Moline, IL 61265

*SC*  
Cotner  
PM-R

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As described in the enclosed BA, DU is the only FUSRAP contaminant of concern identified at the FSA based on the potential for human health risks. Remedial action is proposed at four of the five FSA subareas; Firing Sites 1 and 2; Firing Sites 3, 4, and 5; the Firing Site 6 Area; and the Firing Site 12 Area. The two interior structural components at Line 1 that are

radiologically contaminated are a steel grate covering a floor sump at Building 1-11 and the air filters in an air-handling unit at Building 1-63-6.

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Sincerely,

Sharon R. Cotner  
FUSRAP Program Manager

Enclosures:

*Biological Assessment for the Proposed Remedial Action at the FUSRAP Areas of the Iowa Army Ammunition Plant, Middletown, IA*

*FUSRAP Proposed Plan for the IAAAP; Final, April 22, 2011*

# BIOLOGICAL ASSESSMENT FOR THE PROPOSED REMEDIAL ACTION AT THE FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM AREAS OF THE IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA

**INTRODUCTION:** This Biological Assessment (BA) was prepared to identify potential effects of the proposed remedial action and alternatives at the Formerly Utilized Sites Remedial Action Program (FUSRAP) areas of the Iowa Army Ammunition Plant (IAAAP) on federally threatened and endangered species that are protected by the Endangered Species Act (ESA). This BA is being submitted to the U.S. Fish and Wildlife Service (USFWS) for processing in accordance with the procedures of the ESA. Under Section 7 of the ESA, federal agencies must coordinate with USFWS when any action the agency carries out, funds, or authorizes may affect a listed endangered or threatened species or may adversely modify or degrade designated critical habitat. Where necessary, a federal agency would develop measures to minimize those impacts if a proposed action could affect threatened or endangered species or their habitat. This BA addresses actual or potential impacts of the remedial action in the FUSRAP areas of the IAAAP on the federally endangered Indiana bat (*Myotis sodalis*).



Indiana bat *Myotis sodalis*

**PROJECT LOCATION:** The IAAAP is an active, government-owned, contractor-operated facility that occupies approximately 19,000 acres in Des Moines County near Burlington, Iowa (Figure 1). Since 1941, the IAAAP has produced projectiles, mortar rounds, warheads, demolition charges, and other munitions components as part of its load, assemble, and pack operations. From 1947 to 1975, portions of the IAAAP facility were under the control of the Atomic Energy Commission (AEC) for nuclear weapons and additional weapon-assembly operations (non-nuclear components). FUSRAP was initiated to identify and remediate, or otherwise control, sites where residual radioactivity remains from activities conducted while under contract to AEC and to comply with the requirements under the Comprehensive Environmental Response, Compensation, and Liability Act. The specific areas of the IAAAP that are designated as FUSRAP areas are those areas previously used by AEC (Figure 1).

**PROJECT DESCRIPTION:** The U.S. Army Corps of Engineers (USACE), St. Louis District prepared a Feasibility Study (FS) (USACE 2011a) to identify and evaluate remedial alternatives for the FUSRAP areas at the IAAAP. Prior to preparation of the FS, potential ecological risks to the Indiana bat that could result from exposures to contaminated FUSRAP area soil, and potential human health risks that could result from exposures to radiological and chemical contaminants of concern (COCs) in FUSRAP area soil, sediments, and structures were characterized in the *Iowa Army Ammunition Plant FUSRAP Remedial Investigation Report for Firing Sites Area, Yards C, E, F, G, and L, Warehouse 3-01 and Area West of Line 5B* (USACE 2008) and in a Supplemental Investigation Report (Appendix A) of the FS (USACE 2011a). Human health dose and/or risks exceeding target criteria were determined for the site worker and site construction worker, assuming industrial land use, due to exposures from contaminated soil at the Firing Sites Area (FSA) of the IAAAP and two structural components located within two buildings at Line 1 (Figure 1). The radiological and chemical COCs for human health were identified as depleted uranium (DU); 2,4,6-trinitrotoluene (TNT); cyclotrimethylene trinitramine (RDX); and chromium. Evaluations of potential ecological risks for the Indiana bat were focused on the assumption that the bat ingests insects over a lifetime that are impacted by contaminated soil at the FSA and other FUSRAP areas. Ecological risks associated with exposures to Line 1 structures were not evaluated because the conceptual site model indicated this to

be an incomplete pathway. The results of the ecological risk evaluations indicate that constituents detected in soil at the FSA or any other FUSRAP area do not pose any risks to the Indiana bat.

The focus of this FUSRAP response is limited to the removal of source materials containing DU (USACE 2011a). DU is present on the FSA and will be included in the USACE response under FUSRAP in accordance with the December 2006 Dispute Resolution Agreement executed by the Department of the Army and the USEPA Regional Administrator for Region 7 (U.S. Army 2006). That agreement reflects the application of the Military Munitions Rule [(MMR) See 40 CFR 266.200 et. seq.] to the determination of the scope of FUSRAP authority on the Firing Sites. That is, there is no requirement to respond to explosive constituents and metals contamination on an operational range associated with the range operations. However, because the DU that is present in the FSA is a product of historic AEC operations at this site which are no longer conducted, and DU is not currently used at the FSA on the IAAAP, it may be included in the USACE response in a manner that is consistent with USACE FUSRAP authority. As part of the 2006 Dispute Resolution Agreement, the U.S. Army and USEPA's approach to handling the FSA was outlined. The settlement agreement stated:

*"FUSRAP will primarily be addressing the presence of depleted uranium (DU) at the Firing Site resulting from past testing operations conducted by the Atomic Energy Commission. The Firing Site is an operational testing range currently being used by the Army to test military munitions. DU rounds are no longer tested at the Firing Site by the Army. Any additional response actions at the Firing Site beyond those which will be addressed by FUSRAP will be addressed when the range ceases to be operational unless releases from the Firing Site require an immediate response to protect human health or the environment. If such a condition is determined to exist, response actions will be implemented consistent with provisions of the FFA."*

Furthermore, conducting response actions to fully address chemical contamination at an operational range (e.g., the FSA) (where re-contamination is anticipated) is inconsistent with the need of the United States to maintain its military capabilities through training and testing until the site has been put to a new use that is incompatible with range activities.

The soils in the FSA may contain materials that if excavated as part of a remedial action may require handling as a hazardous waste pursuant to the MMR and therefore will be handled as hazardous substances. Any reference to handling/disposal of chemical, metal or explosive contamination in the FSA should be understood as part of this authorized activity. Thus, it is noted that the authorized remediation of DU may result in remediation of other materials. The incidental benefits of an authorized activity are necessarily within this authorization.

**SPECIES/CRITICAL HABITAT CONSIDERED:** According to USFWS listing (USFWS 2011), the only federally listed species that is known to occur in habitat found at the IAAAP is the endangered Indiana bat (*Myotis sodalis*). The Indiana bat is a medium-size bat with a total length of 3 to 4 inches (in) and a wingspan of 9.5 to 10.5 in. It is a temperate, insectivorous, migratory bat that hibernates in caves and mines during the winter and colonizes in forested areas during the summer. The species was originally listed as being in danger of extinction under the Endangered Species Preservation Act of 1966 (32 *Federal Register* 4001, March 11, 1967) and is currently listed as endangered under the ESA of 1973, as amended.



U.S. Range of Indiana bat  
(Bat Conservation International, 2009)

The Indiana bat occurs throughout much of the eastern United States (Gardner and Cook 2002), having been documented in 27 states (Harvey 2002). Critical habitat for the Indiana bat was designated on September 24, 1976, and consisted of 11 caves and 2 mines in 6 states (41 *Federal Register* 41914, September 24, 1976). There are no known caves or other hibernacula used by Indiana bats in or near the FSA, and no critical habitat for the species has been designated on the IAAAP. The potential impacts to this species would be limited to summer maternal colonies.

During the winter, Indiana bats are restricted to suitable underground hibernacula, of which, the vast majority of these sites are caves located in karst areas of the east-central United States or in other cave-like locations, including abandoned mines. Naturalists believe that most of the Indiana bats from Iowa hibernate in Missouri caves (USAEC 2007). They hibernate from October to April depending on climatic conditions and depart the hibernation site for summer maternity roosts around mid-May. Most females from the major hibernacula in Indiana, Kentucky, and Missouri migrate north for the summer (USFWS 2007). Some males may spend the summer in the vicinity of the hibernaculum or migrate varying distances throughout the summer range of the species (Bowles 1981; Gardner et al. 1991a; Gardner et al. 1991b). During the summer months, female Indiana bats exhibit strong site fidelity to summer roosting and foraging areas while male Indiana bats do not. Although Indiana bats are faithful to their home area, exact roosting sites change frequently due to the natural decay of tree roosts (Kurta 2002).

During the summer, Indiana bats roost in trees in riparian, bottomland, and upland forests. Females become pregnant soon after emergence from the hibernaculum and form small maternity colonies under exfoliating bark of dead or dying trees. The Indiana bat will use various tree species for roosting; although, many trees do not have the proper characteristics for roost sites until they are dead or dying. The exfoliating bark allows the bat to roost between the bark and bole of the tree. However, some tree species, such as shagbark hickory and white oak, are used while they are still living because of their characteristic exfoliating bark. Most roost trees are ephemeral and may be habitable for only 2 to 8 years (depending on the species and condition of the roost tree) under natural conditions. Gardner et al. (1991a) evaluated 39 roost trees and found that 31 percent (%) were no longer suitable during the following summer and 33% of those remaining were unavailable by the second summer. Cavities and crevices in trees also may be used for roosting.

Male bats disperse throughout the range of the species and roost individually or in small groups. In contrast, reproductive females form larger groups, referred to as maternity colonies. A variety of suitable roosts are needed within a colony's traditional summer range for the colony to continue to exist. Indiana bat maternity sites generally consist of one or more primary maternity roost trees, which are used repeatedly by large numbers of bats, and varying numbers of alternate roosts, which may be used less frequently and by smaller numbers of bats. Bats move among roosts within a season and when a particular roost becomes unavailable from one year to the next. In addition to having exfoliating bark, roost trees must be of sufficient diameter. Trees in excess of 40 centimeters (cm) diameter at breast height (dbh) are considered optimal for maternity colony roost sites, but trees in excess of 22 cm dbh appear to provide suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as 8 cm dbh.

Bats forage between dusk and dawn and feed exclusively on flying insects, primarily moths, beetles, and aquatic insects (Humphrey et al. 1977). Indiana bats will forage over a variety of habitat types but prefer to forage in and around the tree canopy of both upland and bottomland forest or along the riparian corridors of small streams.

Each female gives birth to a single young in late June or early July, and the young become volant (i.e., are able to fly) in approximately 1 month. By late August, the maternity colonies begin to disperse and the bats migrate back to traditional winter hibernacula. Some male bats may begin to arrive at hibernacula as early as July. Females typically arrive later and, by September, the number of males and females are almost equal.

A number of factors have been identified that have likely contributed to the decline of the Indiana bat throughout its range, the most significant of which are human disturbance of hibernating bats and vandalism. Other causes of decline of Indiana bat populations include natural disasters, alteration of habitat, and pesticide poisoning (USFWS 2007).

According to the 2003 Indiana Bat Investigation Report (Chenger 2003) conducted for the U.S. Army, the Indiana bat was known to roost during the summer months at the IAAAP and to forage in the vicinity of several creeks on the property, including Long Creek and Skunk River tributaries located west and south of the FSA (Figure 3). During the 2003 bat surveys conducted on-site, six Indiana bats were captured, including two adult males and four adult females. Four individual day roosts were found in trees located along creek drainages at the IAAAP (Figure 3). The foraging route used by two of the bats was tracked to a large barn located on private property west of the IAAAP (Figure 3). Forty female Indiana bats and 28 male Indiana bats were captured during the trapping conducted at the barn, which is being used as a summer roosting area for the Indiana bat (Chenger 2003).

**DESCRIPTION OF ACTION AREA:** The proposed action by USACE will be conducted at the FSA and at two buildings at Line 1 of the IAAAP. The FSA is a fenced military use area located in the western portion of the IAAAP that encompasses 450 acres [1,821,085 square meters (m<sup>2</sup>)] and is approximately 1 mile from the nearest IAAAP boundary (Figure 1). Remedial actions are proposed at four of the five FSA subareas identified as Firing Sites 1 and 2; Firing Sites 3, 4, and 5; the Firing Site 6 Area; and the Firing Site 12 Area (Figure 2). Most of the firing sites contain buildings used for offices or storage, while the Firing Site 6 Area and Firing Site 12 Area are cleared areas used for munitions testing. The Firing Site 6 Area is currently active and used for munition testing as part of the operations of the IAAAP. The Firing Site 12 Area is currently dormant because of the presence of DU fragments. Two interior structures at two buildings at Line 1 are radiologically contaminated and will be decontaminated using high pressure water or removed and replaced (Alternative S3). The specific structures are a steel grate covering a floor sump at Building 1-11 and the air filters in an air-handling unit at Building 1-63-6.

The land area at each firing site is either routinely maintained grassy areas, old field habitats with herbaceous plants such as grasses and wildflowers, or woody shrubs that are periodically cleared for use. A larger portion of the FSA is primarily upland forest or riparian habitats that could potentially be used by the Indiana bat for foraging during the summer months (Figure 2). Sloped areas and storm-water drainage ditches at the FSA convey storm-water runoff that eventually discharges into Long Creek, flowing into Mathes Lake, and exiting the site along the southern boundary where it discharges into Skunk River (Figure 1), which is a major tributary to the Mississippi River. Sediments sampled within drainages to Long Creek from the FSA during the Remedial Investigation did not show concentrations above RI screening level criteria for DU, metals, or explosives.

**PROPOSED REMEDIAL ACTION:** The FSA is proposed for remedial action as a result of human health risks associated with potential exposures to depleted uranium (DU) in surface and subsurface soil along with two interior structures located within two existing buildings at Line 1. The activities associated with the remediation of the interior structures would be conducted wholly within the

interiors of the building and therefore, this BA focuses on the potential impacts to the Indiana bat from soil remediation activities.

A detailed analysis of remedial alternatives was conducted in the FS, which has provided the basis for identifying a preferred remedial alternative. The preferred alternative (proposed action) for surface and subsurface soil is Alternative 4 which includes the excavation of DU-contaminated soil to an approximate depth of 2 feet (ft) to meet the DU remediation goal (RG), treatment to reduce the volume of contaminated soil, and disposal of soil above RGs in a properly permitted off-site disposal facility. The estimated volume of soil requiring remediation at the FSA is approximately 16,941 cubic yards (USACE 2011b). Alternative 4 would achieve both long-term effectiveness and permanence associated with radiological risks at the entire FSA because the removal of DU-contaminated soil would result in a permanent reduction in site risks for human health.

Small isolated areas of DU-contaminated soil are proposed for remediation at Firing Sites 1, 2, and 5 and the Firing Site 6 Area. The majority of soil (approximately 99%) requiring remediation is located at the Firing Site 12 Area (Figure 3). Soil would be excavated using conventional earth-moving equipment or hand-tools as appropriate. This alternative also includes a post-excavation treatment of DU-contaminated soil to reduce soil volume by radiologically scanning and separating soil based on DU concentrations. Soil meeting RGs would be used for backfill at the IAAAP while contaminated soil would be packaged for disposal at an off-site facility. A soil staging and treatment area located within the FSA will be used for storing excavated contaminated soil prior to transport to an off-site disposal facility. This staging area will be approximately 40,000 ft<sup>2</sup> in size, will be lined with 60-mil plastic, and will be equipped with a storm-water sump. Storm water from the sump will be filtered and sampled for contaminant parameters prior to release to the nearest storm water drainage. Each excavation site will also be restored to original topography. This will involve the backfilling of each excavation with soil obtained from a borrow location, placing and compacting that soil, and re-establishing vegetation (assume native grass).

In addition to Alternative 4, the described remedial actions associated with the other action-based alternatives (Alternatives 2 and 3) are also evaluated here for potential impacts to the Indiana bat if public or regulatory preference for any of these alternatives is determined. Alternative 2 includes the implementation of long-term institutional and land-use controls along with monitoring to prevent exposures to contaminated soil. Alternative 3 is similar to Alternative 4 as it includes the excavation of soil to meet radiological RGs with disposal of soil in a properly permitted off-site disposal facility but Alternative 3 does not include post-excavation treatment of soil. A soil staging area as described in Alternative 4 would also be utilized for Alternative 3.

**ANALYSIS AND DETERMINATION OF EFFECTS:** The absence of the proposed remedial action for DU-contaminated soil would not be significant for the Indiana bat although contaminated media would continue to be present and pose a human health risk while short-term insignificant impacts may result from the remedial action.

The proposed action, Alternative 4, as well as Alternatives 2 and 3, do not require removal of any upland or riparian forest habitat that may contain suitable roosting or foraging habitat that may be used by the Indiana bat. The majority of the FSA that is proposed for soil excavation is currently, or was previously, used for the IAAAP operations, is primarily herbaceous or cleared areas, and is devoid of any large trees. Soil excavations will be completed using traditional small- to medium-size construction equipment and will be primarily limited to the existing footprint of the cleared military use areas. Prior to excavation at the Firing Site 12 Area, an estimated area of 9,662 m<sup>2</sup> (2.39 acres) will

require clearing, but no grubbing is necessary. Soil in some upland forested areas immediately surrounding the cleared area at the Firing Site 12 Area may be remediated at isolated locations where DU fragments may be located, but remediation activities are not expected to extend into any riparian habitat. These excavations are expected to be minor and would be completed using small equipment such as a backhoe or shovel, and no trees will be removed. Temporary soil staging or treatment areas and temporary roads would also be developed, but these areas will also be located within the footprint of the existing cleared areas. Under Alternative 2, modifications to the FSA area would likely include installation of fencing within existing cleared areas to prohibit human entry without authorization.

There is a slight chance that remedial actions could temporarily disturb any Indiana bats inhabiting areas surrounding the proposed excavation areas during the summer months. Temporary disturbance would be noise from equipment used to excavate or treat soil and/or equipment used to construct temporary roads. Air quality could be affected by the release of particulates during soil excavation or soil treatment. During these activities, dust suppression measures will be used to mitigate fugitive dust emissions. Although measures for noise and dust suppression will be taken to minimize the impacts of the remediation, Indiana bats are known to switch roosts often throughout the summer maternity season (every 2 to 3 days), traveling up to 5.2 kilometers between successive roosts (Kurta 2002; Bat Conservation International, Inc. 2009). All colonies use multiple trees during a season and at any one time (Kurta 2002). If a bat would be disturbed during the summer months it would be able to move to another tree. The availability of suitable habitat within the entire FSA and at the IAAAP would also enhance the potential for any displaced bats to relocate to a new roost if remediation activities would disturb individuals of the population.

Erosion and runoff from remediation activities could increase the amount of sedimentation to drainage ways and creeks draining the FSA and could potentially impact the production of insects associated with aquatic habitats, which make up a portion of the prey base for the Indiana bats. The areas proposed for remediation will be delineated to minimize the total volume of soil requiring excavation, and erosion control measures will be used to minimize environmental impacts. Additionally, although the implementation of remedial action will create temporary non-point source surface-water discharges, all of these impacts will be managed in compliance with the substantive requirements of applicable laws and regulations. Overall, the total area proposed for remediation at the FSA is insignificant (<2%) as compared to the total 450 acres of the FSA and, along with appropriate monitoring and management practices in place during remediation, the potential impacts would be negligible.

**POTENTIAL CUMULATIVE IMPACTS:** Cumulative effects include any effects of future federal, state, local, or private actions that can reasonably occur within the proposed action area. Because the IAAAP is a government-owned property, during and after completion of the remedial action at the FUSRAP areas, the areas will continue to be under the jurisdiction of the Department of Defense (U.S. Army). All future actions authorized, funded, or carried out on those lands will be carried out by, or will require the approval of, the Department of Defense (Army) and will require compliance with Section 7 of the ESA. Therefore, cumulative effects, as defined by the ESA, will not occur.

The proposed action or alternatives are not anticipated to impact large portions of Indiana bat habitat or individually or cumulatively have an adverse impact on their population. The forested areas surrounding the firing sites are a small portion of the total possible roosting areas within the FSA and within the IAAAP. As any adverse effects will be minimized, the long-term persistence of the Indiana bat within the action area will not be threatened. The USACE anticipates that the proposed action will not incidentally take any Indiana bats nor destroy any summer roosts or habitats used by the Indiana

bat at the IAAAP. Thus, the proposed action is also unlikely to appreciably reduce the likelihood of survival and recovery of the species throughout its range.

**CONCLUSION AND DETERMINATION OF EFFECTS:** After reviewing the current federal status of the Indiana bat as an endangered species, the existing environmental conditions of the area proposed for remedial action, the benefits of the proposed remedial action for human health, and the potential short-term and cumulative effects; the USACE believes that the proposed action (Alternative 4 as well as the proposed Alternative S3 for structures) or any of the potential alternative remedial actions (Alternatives 2 and 3, or S2 for structures) are not likely to adversely affect the Indiana bat.

## REFERENCES:

- Bat Conservation International, Inc. 2009. Species and Profiles, *Myotis sodalists*, accessed from Bat Conservation International website at <http://www.batcon.org>, July.
- Bowles, J.B. 1981. *Ecological Studies on the Indiana Bat in Iowa*, Central College, Pella, IA.
- Chenger, John 2003. *Iowa Army Ammunition Plant 2003 Indiana Bat Investigations*, Bat Conservation and Management, Inc., Carlisle, PA.
- Gardner, J.E., J.D. Garner, and J.E. Hofmann 1991a. *Summer Roosting Selection and Roosting Behavior of Myotis sodalis (Indiana Bat) in Illinois*, Final Report, Illinois National History Survey, Dept of Cons., Champaign.
- Gardner, J.E., J.D. Garner, and J.E. Hofmann 1991b. *Summary of Myotis sodalis Summer Habitat Studies in Illinois: with Recommendations for Impact Assessment*, Special Report, Illinois National History Survey, Dept. of Cons., Champaign.
- Gardner, J.E. and E.A. Cook 2002. *Seasonal and geographic distribution and quantification of potential summer habitat. The Indiana bat: biology and management of an endangered species* (A. Kurta and J. Kennedy, eds.), Pages 9-20, Bat Conservation International, Austin, TX.
- Harvey, M.J. 2002. *Status and ecology in the southern United States. The Indiana bat: biology and management of an endangered species* (A. Kurta and J. Kennedy, eds.), Pages 29-34, Bat Conservation International, Austin, TX.
- Humphrey, S.R., A.R. Richter, and J.B. Cope 1977. "Summer Habitat and Ecology of the Endangered Indiana Bat, *Myotis sodalis*." *J. of Mammalogy*, 58: 334-346.
- Kurta, Allen 2002. *Roosting Ecology and Behavior of Indiana Bats (Myotis sodalis) in Summer*, Proceedings of Indiana Bat and Coal Mining: A Technical Interactive Forum, November 16-18, 2004, Louisville, KY.
- USACE 2008. *Iowa Army Ammunition Plant FUSRAP Remedial Investigation Report for Firing Sites Area, Yards C, E, F, G, and L, Warehouse 3-01, and Area West of Line 5B*, U. S. Army Corps of Engineers, St. Louis District, St. Louis, MO, Draft Final, July 25.
- USACE 2011a. *FUSRAP Feasibility Study for the Iowa Army Ammunition Plant*, U. S. Army Corps of Engineers, St. Louis District, St. Louis, MO, Final, April 22.
- USACE 2011b. *FUSRAP Proposed Plan for the Iowa Army Ammunition Plant*, U. S. Army Corps of Engineers, St. Louis District, St. Louis, MO, Final, April 22.
- USAEC (U. S. Army Environmental Command) 2007. *Cooperation helps Endangered Bats Thrive in Iowa*, Environmental Update, Volume 19, Number 2, Spring 2007, Assessed from U.S. Army website at <http://aec.army.mil/usaec/newsroom/update/spr07/spr0708.html>.
- U.S. Army 2006. Letter from Addison D. Davis, Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health) to John B Askew, Regional Administrator, U.S. EPA Region VII, Regarding *Statement of Dispute Resolution between USEPA Region 7 and the U.S. Army for Operable Unit 4 (OU4) Work Plan for Supplemental Remedial Investigation*. December.



USFWS (U. S. Fish and Wildlife Service) 2007. *Indiana Bat (Myotis sodalis) Draft Recovery Plan*, Department of the Interior, U. S. Fish and Wildlife Service Region 3, Fort Snelling, MN, First Draft, April.

USFWS 2011. Iowa List of Federally Endangered, Threatened, Proposed, and Candidate Species - by County, accessed from [http://www.fws.gov/midwest/endangered/lists/iowa\\_cty.html](http://www.fws.gov/midwest/endangered/lists/iowa_cty.html) , Fish and Wildlife Service, Midwest Region, January.



**FIGURES**

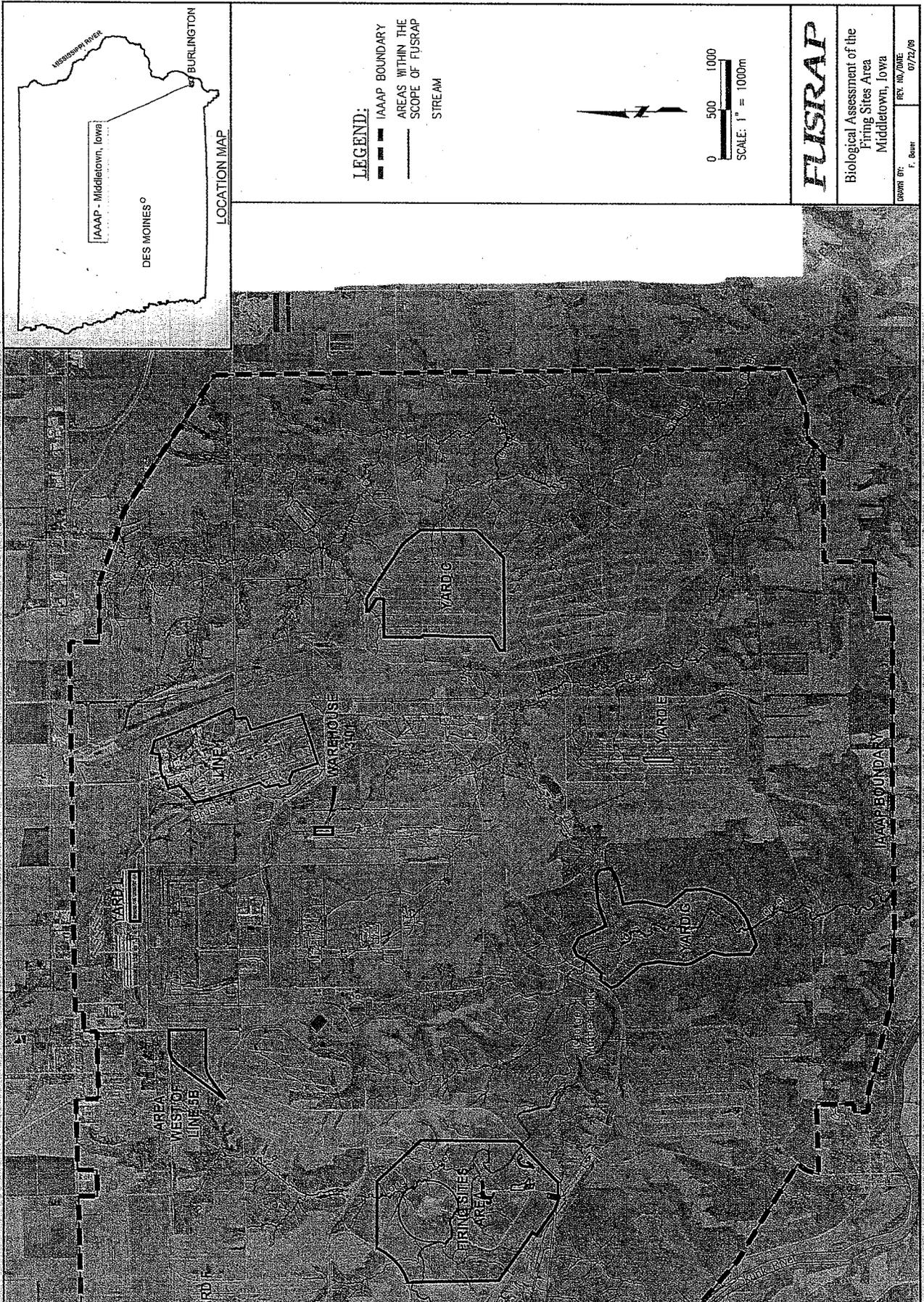


Figure 1. FUSRAP Areas at the IAAAP

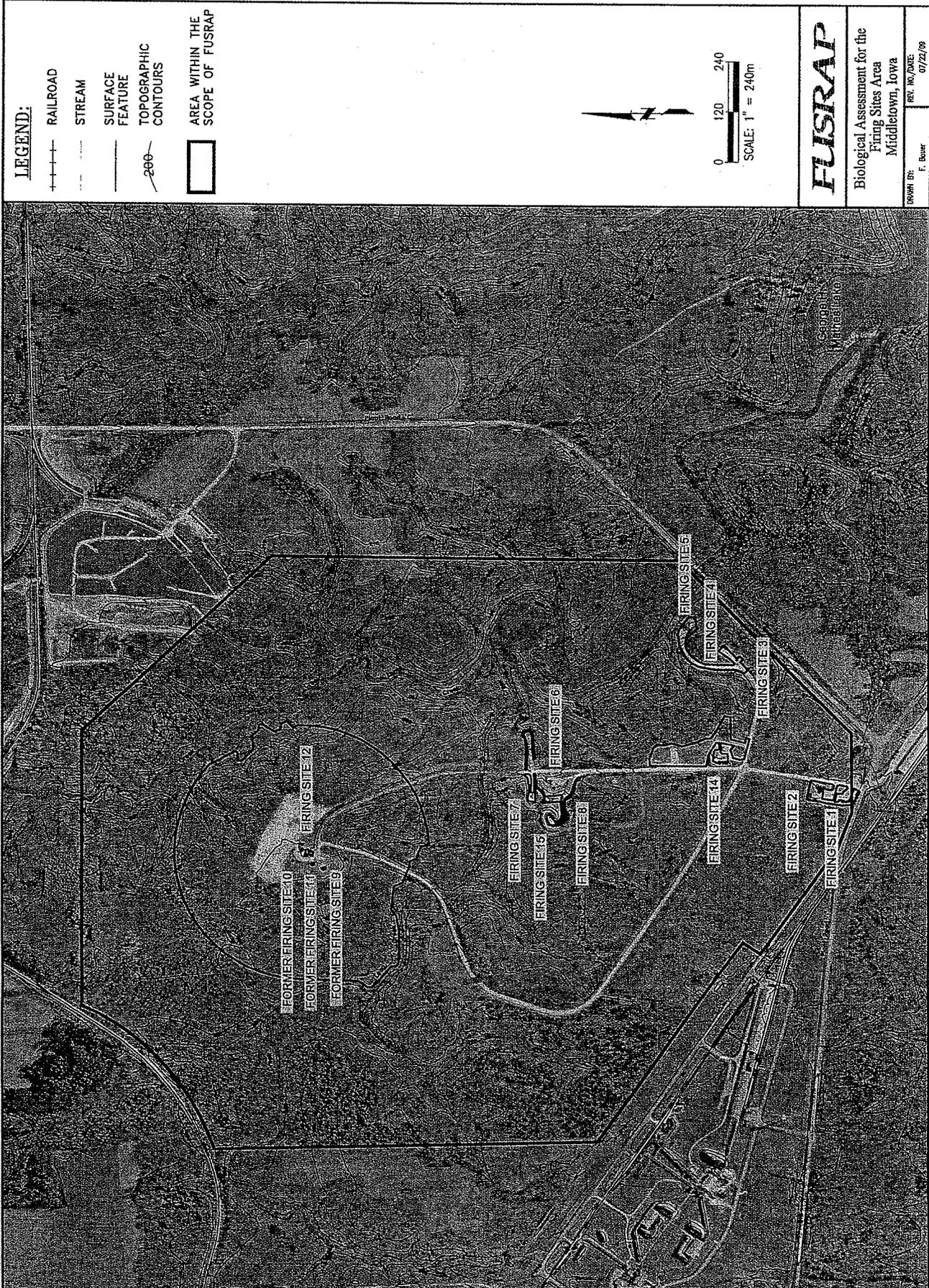


Figure 2. Firing Sites Area

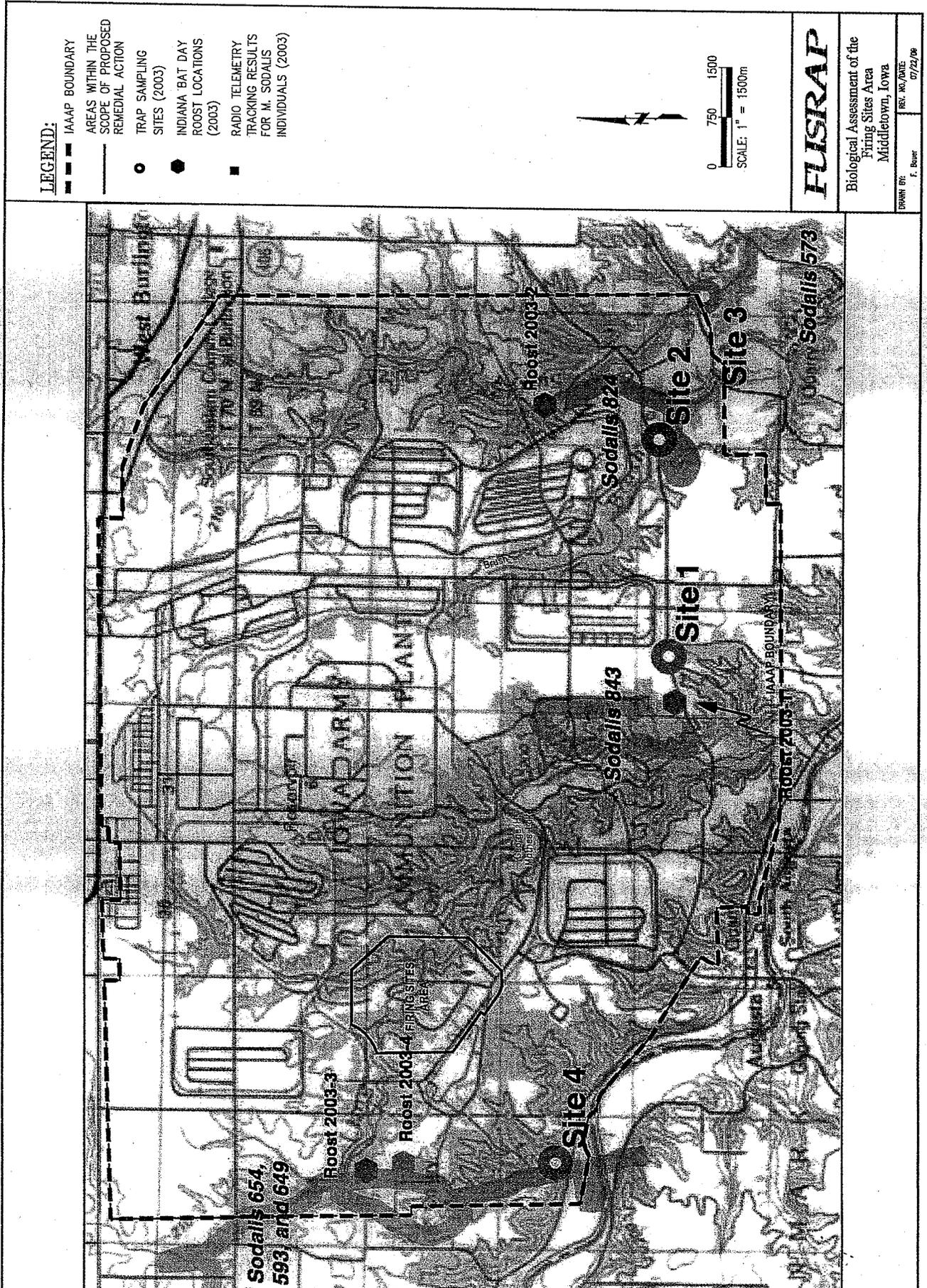


Figure 3. Results of the 2003 Indiana Bat Investigations at the IAAAP (Chenger, 2003)