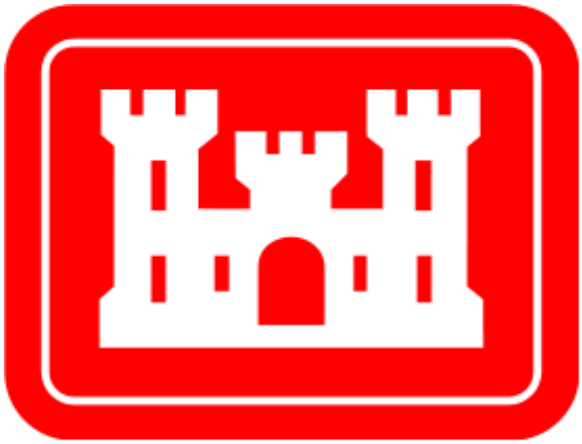
DRAFT
ENVIRONMENTAL ASSESSMENT

STREAM MODIFICATION AT THE SHOOTING RANGE DEER CREEK WILDLIFE AREA

MADISON TOWNSHIP

FAYETTE COUNTY, OHIO



January 2011

FINDING OF NO SIGNIFICANT IMPACT

Deer Creek Lake
Stream Modification at the Shooting Range

1. Members of my staff have conducted an environmental assessment, in the overall public interest, concerning the proposed modification to the stream within the Deer Creek Lake shooting range. The proposed action would relocate the stream to prevent lead shot from becoming illegal fill within the state waters. The newly formed channel would be of a natural channel design to provide an ecological lift to the waterway.

2. The possible consequences of the proposed action have been studied for environmental, cultural, and social well-being affects. The assessment produced the following pertinent conclusions:

    a. Environmental Considerations. The Huntington District has taken reasonable measures to assemble and present the known or foreseeable environmental impacts of the proposed action in the Environmental Assessment. The proposed action is not anticipated to create significant, negative environmental impacts on the natural and human communities. The proposed action will benefit the recreational purpose of Deer Creek Lake by allowing future use of the shooting range.

    b. Social Well-Being Considerations. No significant economic or social well-being impacts that are both adverse and/or unavoidable are foreseen as a result of the proposed action. The proposed action will not have any impacts on sites of significant archeological or historical importance.

    c. Coordination with Resource and Other Agencies. Pursuant to the Fish and Wildlife Coordination Act of 1958 as amended, coordination with the U.S. Fish and Wildlife Service has been conducted throughout the study. Also, in accordance with the Endangered Species Act of 1970 as amended, the proposed action should not impact listed species.

    d. Other Pertinent Compliance. The proposed action is in compliance with the National Historic Preservation Act (Section 10632 CFR 300), the Farmland Protection Policy Act, Executive Order 11988 (Floodplain Management), Executive Order 11990 (Protection of Wetlands), and Executive Order 13045 (Protection of Children from Environmental Health Risks and Safety Risks).

    e. Other Public Interest Considerations. There has been no opposition to the proposed action expressed by the state or local governments, or organized environmental groups, and there are no unresolved issues regarding the implementation of the project.

Section 401/404 Clean Water Act. The proposed alternative qualifies for Section 404 Clean Water Act Nationwide Permit #27 - "Aquatic Habitat Restoration, Establishment, and Enhancement Activities."

3. I find the proposed action has been planned in accordance with current authorization as described in the Environmental Assessment. The proposed action is consistent with National Policy, statutes, and administrative directives. This determination is based on thorough analysis and evaluation of the proposed action and the alternative course of action. In conclusion, I find the proposed modification to the stream within the Deer Creek Lake shooting range will have no adverse effect on the quality of the human and/or natural environment

_____ _____

Date

Robert D. Peterson
Colonel, Corps of Engineers
District Engineer

Environmental Assessment

Deer Creek Lake
Stream Modification at the Shooting Range

RESPONSIBLE AGENCY: U.S. Army Corps of Engineers, Huntington District, West Virginia

ABSTRACT: Ohio Department of Natural Resources, Division of Wildlife leases and operates a public shooting range that is part of the Deer Creek Wildlife Area in Fayette County near Mt. Sterling, Ohio. The shooting range is located east of, and near to, State Route 207 on the north side of Cook-Yankeetown Road. A stream running through the shotgun fallout area of the range has resulted in the Ohio Environmental Protection Agency citing the shooting range for being in violation of the Clean Water Act and Chapter 6111 of the Ohio Revised Code, and OAD 3745-1-04, including paragraph (D) of the rule, which provides: "All Ohio waters shall be free from substances entering the waters as a result of human activity in concentrations that are toxic or harmful to human, animal or aquatic life and/or are rapidly lethal in the mixing zone."

The proposed alternative for the project is to relocate the existing stream to an alignment outside of the shooting area protecting it from any additional illegal discharges. The new alignment would result in ecological uplift for the waterway through a natural stream channel design.

The proposed action is not anticipated to create significant, negative environmental impacts on the natural and human communities. The proposed action will benefit the recreational purpose of Deer Creek Lake by allowing future use of the shooting range.

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1. INTRODUCTION

1.1 PURPOSE AND NEED:

Based on Final Findings and Orders issued by the Ohio Environmental Protection Agency (EPA) regarding the Ohio Department of Natural Resources (ODNR), Deer Creek Shotgun Range, the Ohio Department of Natural Resources, Division of Wildlife (DOW) must submit a plan for preventing spent shot from falling into a tributary of Deer Creek near the Deer Creek Shotgun Range. The shooting range is located on federal lands as part of the United States Army Corps of Engineers' Deer Creek Lake project. Recreation is an authorized project purpose at Deer Creek Lake and the maintenance of the shooting range facility provides for that authorized purpose. The proposed alternative must be environmentally acceptable and should allow the continued use of the area for recreation.

1.2 BACKGROUND:

ODNR DOW leases federal lands to operate a public shooting range that is part of the Deer Creek Wildlife Area in Fayette County near Mt. Sterling, Ohio. The shooting range is located east of, and near to, State Route 207 on the north side of Cook-Yankeetown Road. The range is divided into two sections, a shotgun, low-velocity shell range and a rifle/pistol, high-velocity shell range. The shotgun range faces north and guns are discharged in that direction with spent pellets falling to earth in a large fan-shaped area similar in shape to a baseball field with the shooting area at home plate. The rifle/pistol range is east of the shotgun range and also faces north. This range is separated by earthen embankments into three separate sub-ranges of 100 yards, 50 yards, and 25 feet in length. Targets are placed in front of 10- to 15-foot high embankments that form the north end of the range. The target end of each sub-range is further protected by umbrella-like structures called "Eyebrows," which catch fragments and ricochets. An unnamed tributary to Deer Creek ("the tributary") flows east into Deer Creek. Deer Creek runs roughly parallel to the rifle/pistol range, about 70 yards to the east. This tributary is small and intermittent, completely lacking flow during dry periods. The tributary was bordered on both sides by roughly 30-foot strips of trees, brush and vegetative ground cover. The trees and brush along the tributary were removed in early spring 2009. The stream channel appears to have been channelized and shows signs of instability with steeply cut, exposed banks. Behind the tributary is an agricultural field which is managed for wildlife by ODNR. The field is planted in rotation with corn, soybean, and timothy grass and is disked every sixth year.

The tributary lies to the north of the shotgun range and runs behind the embankments of the rifle/pistol range at the target end. The tributary bisects the fan-shaped shotgun range about 350 feet north of the shooting stations. The majority of spent pellets fired from shotguns fall onto land on the near and far sides of the tributary but some pellets also fall into the tributary.

On or about March 6, 2006, a resident living near the range sent to Ohio EPA a verified complaint regarding the shooting range. The resident alleged that lead shot from the shotgun range and lead fragments from the pistol/rifle range fall into and contaminate the tributary. The

complaint further alleged that waterfowl, which use the area especially during high water periods in spring and winter when waterfowl are migrating through, dabble in the floodplain of the stream and may consume lead shot. In addition, the concerned resident claimed that his family and other citizens who recreate near the shooting range are at risk of lead contamination. The complainant further alleged that the DOW is in violation of the Clean Water Act and Chapter 6111 of the Ohio Revised Code, and OAD 3745-1-04, including paragraph (D) of the rule, which provides: "All Ohio waters shall be free from substances entering the waters as a result of human activity in concentrations that are toxic or harmful to human, animal or aquatic life and/or are rapidly lethal in the mixing zone."

The lead shotgun pellets, discharged from the guns and into the tributary are "other wastes" as defined in ORC 6111.01(D). The tributary is a "water of the state" as defined in ORC 6111.01(H). Placement of this waste into waters of the state constitutes pollution, as defined in ORC 6111.01(A). Pursuant to ORC 6111.04(A), no person shall place or discharge, or cause to be placed or discharged, in any waters of the state any sewage, sludge, sludge material, industrial waste, or other wastes without a valid, unexpired permit.

2. ALTERNATIVES

2.1 ALTERNATIVES NOT CONSIDERED FOR DETAILED ANALYSIS:

Several alternatives were considered to address the purpose and need for the project. The following were considered but were dismissed because they would not meet the needs of the project.

2.1.1 OBTAIN VALID PERMIT: The DOW did not consider applying for a valid permit authorizing it to discharge or allow the discharge of the lead pellets into the tributary. This would cause continuation of "waste" being placed into the tributary and was therefore dismissed from consideration.

2.1.2 CULVERT EXISTING TRIBUTARY: This alternative proposes to place in a culvert that portion of the existing tributary that runs behind the shooting range and is likely to receive lead shot from the range. Although this would prevent additional lead shot from entering the tributary, this alternative would result in a total loss of stream habitat for the portion that would be placed in the culvert. In addition, the culvert would prevent that portion of the existing stream from developing and adjusting its meanders as the stream ages. Resultant changes to stream flows from this action would likely result in instability throughout the open tributary channel causing increased erosion and bank failure and adversely impacting the surface water in the area. Therefore, the DOW did not consider this alternative for detailed analysis because it would not be environmentally acceptable.

2.2 ALTERNATIVES CARRIED FORWARD FOR DETAILED ANALYSIS:

After eliminating alternatives not to be considered, two alternatives remain to be carried forward for detailed analysis. The two alternatives carried forward are the No Action Alternative and the Proposed Alternative of stream re-alignment.

Different stream alignments were considered for the new drainage way. Alignments were screened for ecological uplift provided, ease of construction, number of road crossings, minimization of ground disturbance, and impact to resources. No other alignment provided the level of benefits that would be reached by this alternative including maintenance of natural stream flow, construction of sound barrier berms, and habitat and wildlife enhancement. Therefore, the stream channel modification alternative (see Section 2.2.1 below), as the most ecologically and economically responsible, is the Proposed Alternative.

2.2.1 PROPOSED ALTERNATIVE: This alternative will be referred to as the Proposed Alternative from this point forward in this document. The existing stream is approximately 2,075 linear feet. This alternative proposes to relocate 1,600 linear feet of the existing tributary into a grassed waterway located south of the parking lot to run between the parking lot and Cook-Yankeetown Road. The tributary would be re-routed to run southeast from the culvert under State Route 207, parallel with Cook-Yankeetown Road to Deer Creek. This path would take the waterway in front of the range area and eliminate any potential for shot to land within its route. The newly formed waterway would be of a natural channel design, dug to an average depth of five feet, with an average base width of seven feet. The new waterway would be designed to have a frequently flooded area between 50 and 100 feet wide based on the general tenet that ten times the bankfull channel width is most desirable with five times the channel width acceptable. The new path would run under the access road that leads to the shotgun range and would require the installation of 60 feet of 48 inch culvert under that access road. The existing, or old, waterway which was previously cleared of vegetation and would be filled with soil obtained from the creation of the new waterway. Lead analysis would be completed for the existing tributary that is located within the shot fall zone and if needed, remediation would be done prior to filling the existing channel, grading as necessary to eliminate erosion and allow for surface runoff. All vegetation would remain to the east fall zone or the north and northeast of the other firearms range. The backfilled area would then be seeded with grasses to produce an adequate level of vegetation. Due to the presence of lead in the soil, no area within the shot fall zone other than the existing tributary area (where backfill will occur) will be disturbed.

The Proposed Alternative would require 1,340 linear feet of new channel development which is initially less than the existing stream length to be re-routed. However, with the use of the wide channel and natural channel design allowing the stream to freely meander, the channel is expected to create a sinuous flow length of 1,750 feet to 2,010 feet within 10 years or less. The existing stream appears to have been channelized and shows signs of erosion with steeply cut and exposed banks. Therefore the new channel would be expected to provide higher quality habitat over time.

The Ohio EPA Headwater Habitat Evaluation Index (HHEI) Form would be used to document the existing tributary and to assess the proposed stream channel. After construction, the DOW would monitor and adjust as necessary the pH level of the soil on the shot fall zone utilizing lime and/or phosphates to maintain a neutral pH level. A neutral pH is needed to ensure chemical encapsulation of the lead and to minimize its potential for migration into soil and groundwater. The DOW would maintain records of facility use numbers and use an average number of rounds fired and/or targets thrown to determine the amount of lead deposited on the range. The DOW would develop an Operations and Maintenance (O&M) Manual which follows the "Best Management Practices" (BMPs) for ranges and lead reclamation and recycling would be conducted as necessary.

2.2.2 NO ACTION: Under the No Action alternative, no alteration of the shooting range would occur. It is assumed that the range would be forced to close in order to comply with state regulations. Once the shooting range is closed, it would require cleanup in accordance with the Comprehensive Environmental Response, Compensation, and Liability (CERCLA) statute. As a CERCLA site, removal of contaminants and reclamation of the site would be required

3. AFFECTED ENVIRONMENT AND IMPACTS

3.1 LAND USE:

The site is a combination of mowed grasses, agriculture, and the tree lined tributary. The trees and shrubs were removed from the existing tributary prior to April 2009. Past site disturbance involved a maintained grass field and row crop agriculture along with the active shooting range with lead contamination issues in the tributary.

3.1.1 PROPOSED ALTERNATIVE: Little negative impact would occur to the land use of the project area. Per the Ohio EPA order, the area would be brought into compliance with the Clean Water Act and the area could see an improvement in the health of the local environment with the backfilling and grading of the existing tributary area and with the area of the old waterway, west of the shot fall zone, planted with trees and shrubs. During construction, the shooting range would be closed for recreational use.

3.1.2 NO ACTION ALTERNATIVE: Under the No Action Alternative, the range could be forced to close and remediation would be required. After remediation, the land would be available for wildlife management or other recreation purposes.

3.2 SURFACE WATER:

Other than the small tributary located north of the shooting range, there are no other streams or wetlands located on the project area. The OEPA detected no lead in water samples from this stream. A Headwater Habitat Evaluation Index (HHEI) assessment was completed on the stream. The stream scored 55 points out of a total of 100 available.

3.2.1 PROPOSED ALTERNATIVE: The newly formed waterway would be of a natural channel design that would utilize the self-formed stream approach and would provide ecological uplift to the stream. Erosion control measures would be implemented during construction to reduce erosion and all impacted areas would be revegetated to reduce sediments entering surface waters. The project would improve water quality because the newly created channel would not be in the shot fall zone. The proposed alternative qualifies for Section 404 Clean Water Act Nationwide Permit #27 - "Aquatic Habitat Restoration, Establishment, and Enhancement Activities."

3.2.2 NO ACTION ALTERNATIVE: Under the No Action Alternative, the range could be forced to close and remediation would be required. This would result in the cessation of illegal fill in the stream.

3.3 THREATENED AND ENDANGERED SPECIES:

The project is within the range of the Indiana bat (*Myotis sodalis*), a state and federally endangered species, the Eastern massasauga (*Sistrurus catenatus*), a state endangered and a federal candidate snake species, and the loggerhead shrike (*Lanius ludovicianus*), a state endangered bird. The Natural Heritage Database has a record near the project area for the river redhorse (*Moxostoma carinatum*), a state fish species of special concern. This record is from 1985.

3.3.1 PROPOSED ALTERNATIVE: Tree removal at the site was done prior to April 2009 and was limited to as few trees as necessary. No additional tree cutting is necessary and therefore, the project would not likely impact roosting habitat of the Indiana bat.

The project is within the range of the Eastern massasauga but there are no records to indicate the species has been found in or near the project area. There are no wetlands, a preferred habitat for the snake, on the project area and the area has been routinely disturbed by mowing and cropland. Therefore, the project would not likely impact the Eastern massasauga.

Significant grassland or prairie habitat is not present near the project area. Due to the lack of this habitat type in or near the project area, the project would not likely impact the loggerhead shrike.

The project would not likely impact the river redhorse because of actions that would be taken to reduce the amount of sediment entering surface waters in the area during construction

3.3.2 NO ACTION ALTERNATIVE: The potential closure and remediation of the range could result in more land being available for wildlife management. This could provide more long-term benefits to state and federally listed species. In the short-term, any construction associated with closure and cleanup would be similar to that of the Proposed Alternative. Therefore, the No Action Alternative would not result in any negative impacts to state and federally listed species.

3.4 CULTURAL RESOURCES:

A Preliminary Archeological Survey was prepared in June of 1983. The survey included test pits along the proposed stream relocation area. "Extremely light density lithic clusters" were found and the report indicated that "the potential is low for these sites being of National Register quality and that further work would not significantly add to the information already obtained." The report prepared in 1983 has been submitted to the State Historic Preservation Office requesting a letter to confirm these findings. A separate field study in which an additional test pit was excavated was completed on April 5th, 2010 to address deficiencies with the 1983 study. No cultural resources were found during this subsequent study.

3.4.1 PROPOSED ALTERNATIVE: Based on the results of the archeological surveys prepared in 1983 and 2010, the Proposed Alternative would not affect historic properties.

3.4.2 NO ACTION ALTERNATIVE: Based on the results of the archeological surveys prepared in 1983 and 2010, the No Action Alternative would not affect historic properties.

3.5 ENVIRONMENTAL JUSTICE:

The project purpose is to bring the shooting range at Deer Creek Wildlife Area into compliance with the Clean Water Act. Therefore, the project must occur at its current location.

3.5.1 PROPOSED ALTERNATIVE: Under this alternative there would be no disproportionate adverse impacts on minority or low-income populations. Implementation of the proposed alternative would benefit all populations within the area irrespective of race, color, national origin, or income.

3.5.2 NO ACTION ALTERNATIVE: Under the No Action Alternative, there would be no disproportionately high adverse impacts on minority or low-income populations.

3.6 NOISE:

3.6.1 PROPOSED ALTERNATIVE: Fill from excavation of the new waterway would be used to construct sound barrier berms. These berms would be located west of the shooting range and would be planted with trees and shrubs to reduce noise levels from the range.

During construction, daytime noise levels would increase temporarily in the area due to the heavy equipment. However, because the shooting range will be closed during this time, this minor noise will not be additive and will likely be less than normal for a shooting range.

3.6.2 NO ACTION ALTERNATIVE: Under the No Action Alternative, the range could be forced to close and remediation would be required. During cleanup of the range, daytime noise levels would increase temporarily in the area due to usage of cleanup equipment. The closure of

the range would result in the discontinuation of gunfire reports and an associated decrease in noise.

3.7 CUMULATIVE EFFECTS:

Cumulative effects are "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions" Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR Part 1508.7 Council on Environmental Quality [CEQ] Regulations).

The cumulative effects analysis qualitatively presented below is based on the potential effects of the proposed project when added to similar impacts from other projects in the region. An inherent part of the cumulative effects analysis is the uncertainty surrounding actions that have not yet been fully developed. The CEQ regulations provide for the inclusion of uncertainties in the analysis and states that "when an agency is evaluating reasonably foreseeable significant adverse effects on the human environment….and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking" (40 CFR 1502.22). The CEQ regulations do not state that the analysis cannot be performed if the information is lacking.

3.7.1 PROPOSED ALTERNATIVE: This project is located on the Deer Creek Wildlife Area and near the Deer Creek State Park. Past actions in the area have been to manage for fish, wildlife, and general recreational purposes. Any future impacts would be additional actions to manage the area for fish and wildlife and to provide recreational opportunities. In the scoping of resources, it was determined that there would not be any significant cumulative effects as a result of this action.

3.7.2 NO ACTION ALTERNATIVE: Under the No Action Alternative, the range could be forced to close and remediation would be required. In the scoping of resources, it was determined that there would not be any significant cumulative effects as a result of this action.

3.8 REGULATED HAZARDOUS CONTAMINANTS:

3.8.1 PROPOSED ALTERNATIVE:
Per the Order issued to ODNR from OEPA, an HTRW investigation was conducted by ODNR's contractor, Stone Environmental, to determine the horizontal and vertical limits of lead contamination in soils and sediments of the existing tributary. This effort was required to determine if contaminated soils must be removed, and to define the limits of backfill to accommodate the shooting range drainage improvements. ODNR developed plans to reroute the existing tributary that currently crosses the shotfall area and backfill with soil from the new waterway. The investigation area consisted of the existing tributary and 3 other zones, described as follows:

- Zones 1 and 2 – These are the areas where the new waterway would be constructed. The excavated backfill from these areas would be used as backfill for the existing tributary and creation of a sound barrier berm.

- Zone 3 – This area is where the sound barrier berm will be constructed.

3.8.1.1 Sampling and Analytical Results of Zones 1, 2 and 3

Soil sampling was conducted in Zones 1 and 2 (new waterway channel) to determine if the soil was suitable for use as backfill in the existing tributary and for construction of the sound barrier berm. Samples from Zones 1 and 2 were analyzed for volatile organic compounds, semi-volatile organic compounds, metals, pesticides, and polychlorinated biphenyl analysis. Zone 3 samples were analyzed for lead to ensure this area was not part of the shot fall area prior to placement of clean soil during construction of the sound barrier berm. None of the contaminants exceeded the EPA action levels, except for arsenic in both zones. The action level for arsenic is listed to be 0.39 mg/kg. However, based on both this investigation and other local contaminant studies (see appendix H), the arsenic concentrations found in Zones 1 and 2 are naturally occurring and no cleanup/removal of the soil is needed. Also, it was determined that this soil is appropriate for use as backfill in the existing tributary and for construction of the sound barrier berm.

3.8.1.2 Sampling and Analytical Results of Existing Tributary

Soil and sediment sampling was conducted along the centerline and banks as well as from a cross-section approximately 25-feet north and south of the centerline of the tributary. Each sample was analyzed for Total Lead and Toxicity Characteristic Leaching Procedure (TCLP) Lead to determine 1) if lead was present which would require excavation prior to backfill efforts and 2) if hazardous levels of lead existed that would require treatment prior to disposal. The results were compared to the USEPA Risk Based Concentrations (for safety and health purposes) as well as CERCLA Hazardous levels for lead (for disposal purposes). Three samples exceeded the Total Lead Action Level of 400 mg/kg and one sample exceeded the TCLP Lead Action Level of 5 mg/L.

3.8.1.3 Conclusions

Conclusions from the investigation are as follows:

- Soil to be excavated from Zones 1 and 2 did not have exceedances of regional screening level residential soil action levels for any constituents except arsenic. Background arsenic range in this area of Ohio are 0-33 parts per million (ppm). Considering the background levels of arsenic found in this area of Ohio, the levels found in Zones 1 and 2 are not of concern.

- Soil fill area identified as Zone 3 did not have exceedances of regional screening level soil action levels for lead or volatile organic compounds.

- All samples collected and analyzed were field screened for lead shot prior to submittal to the laboratory (to simulate the screening that would be required during excavation, if necessary). There was no visible lead shot observed in the soils collected within the

existing tributary or along its banks. Screening for lead shot, prior to potential backfill efforts, therefore, is not required.

- Elevated concentrations of total lead referenced to published background levels appear to be confined to the top 6-inches of soil in the shotfall area.

- Isolated cases of total lead concentrations exceeding Regional Screening Level Master Table, Residential Soil Action Levels from US EPA (400 mg/kg) exist within the 50' investigation area on the site (25' on each side of the stream centerline). Several locations had lead concentrations that exceed the 400 mg/kg action level. Proposed backfill placement has been reduced to within 10' on each side along the centerline of the channel to eliminate any need for excavation in the impacted areas. Impacted areas outside of the immediate tributary channel will be addressed when the site is to be closed permanently.

- One sample collected from the top 6 inch interval of soil exceeded the TCLP concentration of 5 mg/l. However, this was not within the proposed 20' backfill limit (10' each side of the centerline of the channel). All other TCLP samples analyzed had lead results that were less than 5 mg/l.

- Per the OEPA order, no lead was detected in water sampled from the impacted stream.

3.8.1.4 Recommendations

ODNR's completion of the OEPA order requirements would allow the shooting range to continue operation into the future. Should the shooting range be permanently closed at a future date, a full-blown detailed assessment and remediation would be conducted. However, per the order and findings of this investigation, backfilling efforts for the existing tributary should not exceed 10-feet north and south of the centerline of the channel. Fill in this area should range from 6-inches to less than two feet in depth and should be sloped so that surface drainage from the immediate area flows to the east. ODNR should stake the limits of fill prior to construction. Backfill would only occur within the staked limits and soil outside the limits would not be disturbed. The proposed fill area does not appear to be impacted by shotfall and therefore, fill material can be placed in this area.

3.8.2 NO ACTION ALTERNATIVE: Under the No Action Alternative, shot would continue to fall into the existing tributary. This could result in the closure of the range and remediation would be required.

3.9 AIR QUALITY:

3.9.1 PROPOSED ALTERNATIVE: The use of construction equipment for the Proposed Alternative would not exceed *de minimus* levels of a criteria pollutant or its precursors and is exempted by 40 CFR Part 93.153.

3.9.2 NO ACTION ALTERNATIVE: The use of construction equipment for the No Action Alternative would not exceed *de minimus* levels of a criteria pollutant or its precursors and is exempted by 40 CFR Part 93.153.

3.10 PRIME FARMLAND:

3.10.1 PROPOSED ALTERNATIVE: The Proposed Alternative would not impact prime or unique farmland. Although the project is surrounded by potential prime farmland, the project site does not rate high enough on the Farmland Conversion Impact Rating form (AD-1006, Appendix C) to warrant additional consideration for protection under the Farmland Protection Policy Act. Quality soils, both the A and B horizon, should be stockpiled during construction for use as cover soil on the newly constructed features.

3.10.2 NO ACTION ALTERNATIVE: Under the No Action Alternative, the range could be forced to close and remediation would be required. Cleanup of the range would not impact Prime Farmland.

3.11 RECREATION:

3.11.1 PROPOSED ALTERNATIVE: The range would be closed temporarily during the construction period of the project causing minor impacts to recreation. Construction on the Proposed Alternative would likely last approximately two months. However, the Proposed Alternative would allow the shooting range to remain open after complying with ORC 6111.04(A).

3.11.2 NO ACTION ALTERNATIVE: Under the No Action Alternative, potential loss of recreational resources would result if the shooting range is forced to close because of violations to ORC 6111.04(A).

3.12 SUMMARY OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVES:

Resource Impacted	PROPOSED ALT.	NO ACTION ALT.
Land Use	+	None
Surface Water	+	+
Threatened and Endangered Species	None	None
Cultural Resources	None	None
Environmental Justice	None	None
Noise	+	+
Cumulative Impacts	None	None
Regulated Hazardous Contaminants	+	+
Air Quality	None	None
Prime Farmland	-	None
Recreation	None	-

"+" denotes that positive impacts would result from this alternative
"-" denotes that negative impacts would result or continue from this alternative
"None" denotes that no impacts would occur as a result of this alternative

4. CONCLUSIONS

The Proposed Alternative would allow the continued use of this site as a shooting range while providing ecological uplift to the impacted stream. The No Action Alternative could result in closure of the range and the initiation of CERCLA cleanup. This would be considered a loss of recreation, an authorized project purpose. Impacts from implementation of the Proposed Alternative are expected to be minor. Further, the Proposed Alternative would allow for compliance with ORC 6111.04(A) while protecting recreation, an authorized purpose of the project.

5. LIST OF PREPARERS

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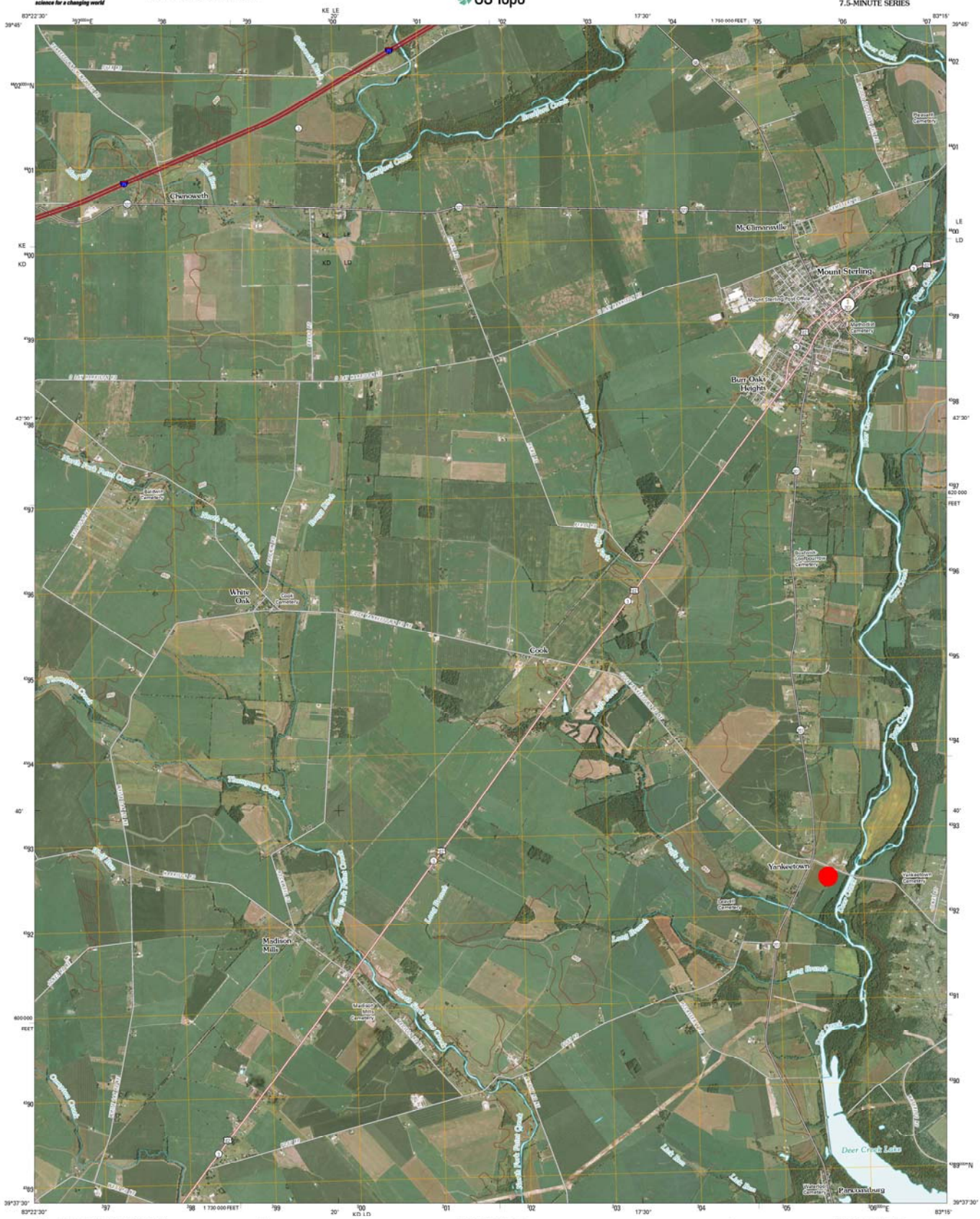
6. AGENCY COORDINATION

To complete this EA, consultation occurred with The Ohio Department of Natural Resources, Division of Natural Areas and Preserves, the U. S. Army Corps of Engineers, the Ohio Environmental Protection Agency, the State Historic Preservation Office, and the U.S. Fish and Wildlife Service.

Appendix A

Maps of the Project Area


U.S. DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY
The National Map
US Topo
MOUNT STERLING QUADRANGLE
OHIO
7.5-MINUTE SERIES
Chenoweth
McClamansville
Mount Sterling
Burr Oaks Heights
White Oak
Cook
Yankeetown
Midlothian Mills
Pancoastburg
Deer Creek Lake
Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid: Universal Transverse Mercator, Zone 17S
10 000-foot ticks: Ohio Coordinate System of 1983
(south zone)
Imagery NAIP, August 2004
Roads ©2006-2010 Tele Atlas
Names GNIS, 2008
Hydrography National Hydrography Dataset, 2004
Contours National Elevation Dataset, 2004
UTM GRID AND 2010 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET
SCALE 1:24 000
CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
This map was produced to conform with version 0.5.10 of the
draft USGS Standards for 7.5-Minute Quadrangle Maps.
A metadata file associated with this product is draft version 0.5.11
OHIO
QUADRANGLE LOCATION
Walnut Run
Big Plain
Harrisburg
Midway
Mount Sterling
Five Points
Washington Court House
New Holland
Clarksburg
ADJOINING 7.5' QUADRANGLES
ROAD CLASSIFICATION
Interstate Route
US Route
State Route
Ramp
Local Road
4WD
MOUNT STERLING, OH
2010

Close-up of Mount Sterling, OH topographical map showing the general area of the project.

Appendix B

Aerial View With the Proposed Alternative Plan

NORTH

STATE ROUTE 207

SHOTFALL ZONE

THE CONTRACTOR SHALL LIMIT ALL ACTIVITY WITHIN THE SHOTFALL ZONE AS SHOWN BELOW (20' CENTERED ALONG THE STREAM CENTERLINE).

20'

≈470 TONS ODOT TYPE "B"

≈205 TONS ODOT TYPE "B"

≈405 TONS ODOT TYPE "B"

GRASS

EXISTING ASPHALT PARKING LOT

EXISTING GRAVEL PARKING

GRAVEL DRIVE

BM # 1

WOOD BACKSTOP

TOWNSHIP PARK ROAD

APPROXIMATE LOCATION OF APRIL 2010 ARCHEOLOGICAL SURVEY

LEGEND

EXISITING MINOR CONTOURS	----ELEV----
EXISITING MAJOR CONTOURS	----ELEV----
PROPOSED MINOR CONTOURS	ELEV
PROPOSED MAJOR CONTOURS	ELEV
CONSTRUCTION LIMITS	
BENCHMARK	

ENGINEERING
Ohio Department of Natural Resources

DEER CREEK WILDLIFE AREA SHOOTING RANGE IMPROVEMENTS
FAYETTE COUNTY

DESIGNED BY:	JRP/JCR
DRAWN BY:	JRP
CHECKED BY:	JERRY C. REED, P.E.
APPROVED BY:	JERRY C. REED, P.E.

JOB NUMBER:	DNR-080083
SCALE:	1" = 75' (22"X34")
DATE:	DECEMBER 26, 2008
REVISED:	

SITE PLAN WITH AERIAL

1/1

Appendix C

Fayette County Soil Map and Farmland Impact Rating Form

Soil Map—Fayette County, Ohio
(Deer Creek Lake Shooting Range)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:4,270 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 17N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Fayette County, Ohio
Survey Area Data: Version 9, Jan 27, 2010

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Fayette County, Ohio (OH047)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
Bs	Brookston silty clay loam	0.3	0.4%
FnB	Fox silt loam, 2 to 6 percent slopes	5.5	7.5%
FnB2	Fox silt loam, 2 to 6 percent slopes, moderately eroded	0.4	0.6%
FnC2	Fox silt loam, 6 to 12 percent slopes, moderately eroded	4.2	5.7%
FoC3	Fox and Casco soils, 6 to 12 percent slopes, severely eroded	3.3	4.5%
MmC3	Miamian clay loam, 6 to 12 percent slopes, severely eroded	2.0	2.7%
Rs	Ross silt loam	15.4	21.1%
W	Water	4.0	5.5%
WsA	Wea silt loam, 0 to 2 percent slopes	2.0	2.8%
Wu	Westland silty clay loam	31.1	42.6%
Wv	Westland silty clay loam, overwash	4.9	6.7%
Totals for Area of Interest		**73.1**	**100.0%**

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 4/2/10
Name Of Project Deer Cr. Lake Shooting Range Stream Relocation	Federal Agency Involved US Army Corps of Engineers
Proposed Land Use Stream Relocation	County And State Fayette, Ohio
PART II *(To be completed by NRCS)*	Date Request Received By NRCS

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply – do not complete additional parts of this form).*	Yes ☑	No ☐	Acres Irrigated	Average Farm Size
Major Crop(s) Corn / Soybeans	Farmable Land In Govt. Jurisdiction Acres: 221,000 % 86		Amount Of Farmland As Defined in FPPA Acres: 216,000 % 98	
Name Of Land Evaluation System Used Ag Bulletin 685	Name Of Local Site Assessment System		Date Land Evaluation Returned By NRCS 4-6-10	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	3.0			
B. Total Acres To Be Converted Indirectly	0.0			
C. Total Acres In Site	3.0	0.0	0.0	0.0
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	2.9			
B. Total Acres Statewide And Local Important Farmland	0			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	.0013			
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	40 %			
PART V *(To be completed by NRCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*	0 88	0	0	0

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use		15			
2. Perimeter In Nonurban Use		10			
3. Percent Of Site Being Farmed		0			
4. Protection Provided By State And Local Government		0			
5. Distance From Urban Builtup Area		15			
6. Distance To Urban Support Services		10			
7. Size Of Present Farm Unit Compared To Average		10			
8. Creation Of Nonfarmable Farmland		0			
9. Availability Of Farm Support Services		5			
10. On-Farm Investments		5			
11. Effects Of Conversion On Farm Support Services		0			
12. Compatibility With Existing Agricultural Use		0			
TOTAL SITE ASSESSMENT POINTS	160	0 70	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	0 88	0	0	0
Total Site Assessment *(From Part VI above or a local site assessment)*	160	0 70	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	0 158	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☐ No ☐

Reason For Selection:

(See Instructions on reverse side)

Form AD-1006 (10-83)

This form was electronically produced by National Production Services Staff

Appendix D

Archaeology Report

PRELIMINARY ARCHAEOLOGICAL SURVEY FOR THE PROPOSED DEER CREEK SHOOTING RANGE IN THE DEER CREEK WILDLIFE AREA, FAYETTE COUNTY, OHIO

By
Elsie A. Immel

Submitted by
Shaune M. Skinner
Ohio Historical Society, Inc.
Columbus, Ohio

Submitted to
Ohio Department of Natural Resources
Division of Wildlife
Columbus, Ohio

June, 1983

ABSTRACT

In June of 1983, the Department of Contract Archaeology, Ohio Historical Society, conducted a preliminary archaeological survey for the proposed Deer Creek shooting range project in the Deer Creek Wildlife area, Fayette County, Ohio. Surface survey within the project tract identified two small, diffuse clusters of nondiagnostic lithic material, designated as 33 FE 90 and 33 FE 91. Supplemental subsurface testing within these sites failed to locate either significant amounts of material or evidence of in situ cultural deposits. On this basis, it is felt the potential is low for these sites being of National Register quality and that further work would not significantly add to the information already obtained.

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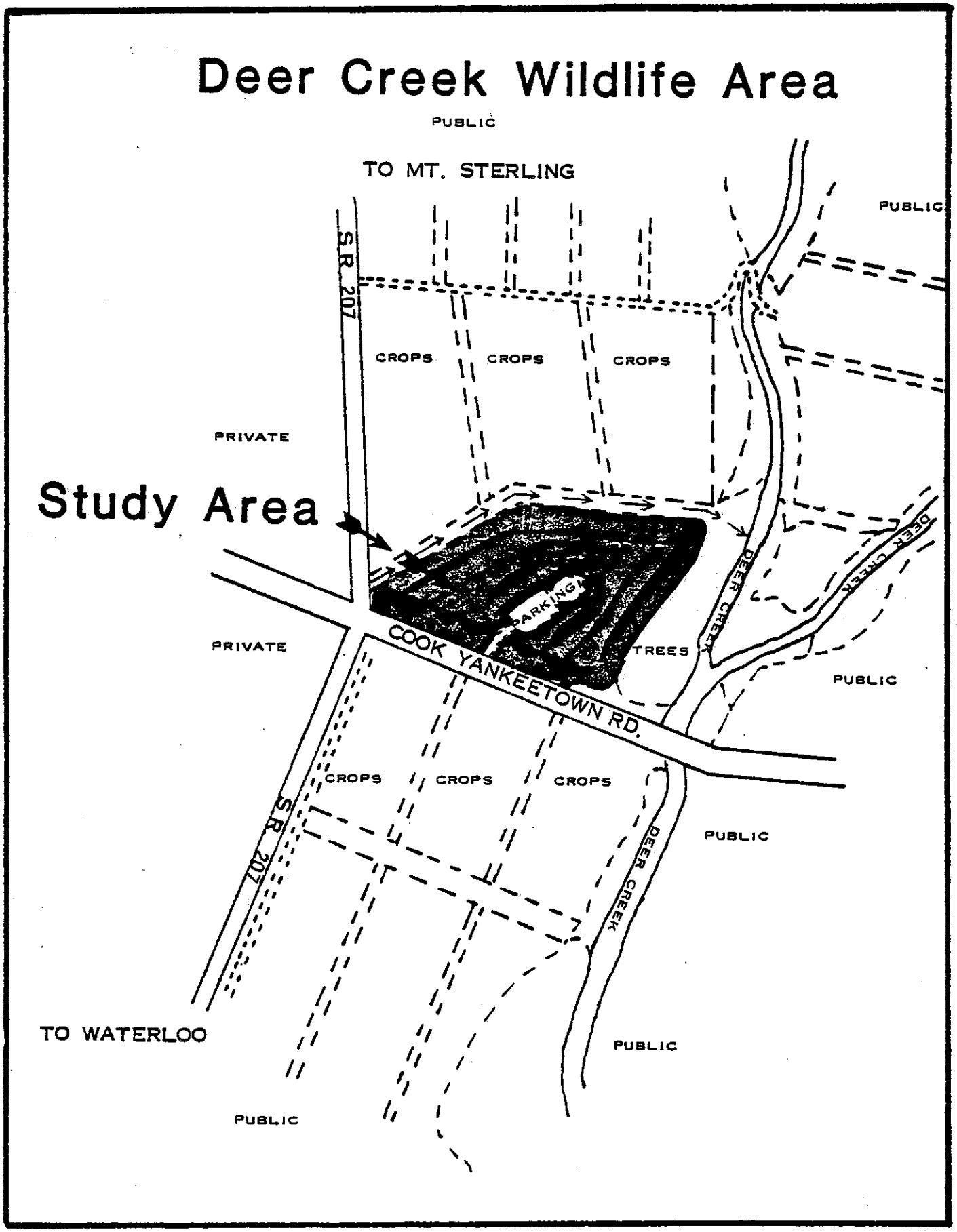
INTRODUCTION

In June of 1983, the Department of Contract Archaeology, Ohio Historical Society, was contracted by the Ohio Department of Natural Resources (O.D.N.R.) to conduct a preliminary archaeologcal survey for the proposed public shooting range project located in the Deer Creek Wildlife area at Deer Creek State Park, Fayette County, Ohio (Map 1). The proposed project involves the construction of a 50 foot/50 yard/100 yard combination range and associated parking facility. The parking lot has already been constructed (Map 2). The entire project area, indicated as the Study Area in mapping provided by O.D.N.R. (Appendix B), encompasses an 18 acre tract located northeast of the intersection of State Route 207 and Cooks-Yankeetown Road and immediately west of Deer Creek (Map 2). An intermittent drainage forms the northern boundary of the tract. As indicated on the project mapping provided by O.D.N.R., the actual site of construction will encompass the northeastern section of the study area (see Map 9). The remainder of the tract was subjected to survey so that, as necessary, borrow materials could be removed.

The purpose of these investigations was to determine whether archaeological resources exist within the study area and based upon data gathered, to state whether any identified cultural resources are eligible for inclusion in the National Register of Historic Places or to recommend procedures for making such a determination. In order to accomplish this, a research strategy involving both literature search and field reconnaissance was employed.

Fieldwork was conducted on June 15 and 16 by Elsie A. Immel, field archaeologist, and Tod Benedict, field technician. Others who have contributed to the completion of this project include Donald R. Bier, Jr., principal investigator; Michael J. Dwyer, O.D.N.R. Hunting Safety Coordinator; and Laurel Shannon, typist. All notes, photographs, and artifacts related to this project are housed at the Department of Contract Archaeology, Ohio Historical Society, Columbus, Ohio.

Map 1: Map of Ohio showing general project location



Map 2: Map provided by O.D.N.R. showing location of study area

ENVIRONMENTAL SETTING*

Physiography

The project area is situated in the till plain section of the central lowlands physiographic province (Map 3) [Braun 1950:305-306]. This section is characterized by a small surface relief resulting from past glacial events (Fenneman 1938:455). The bedrock of the project area consists of dolomites of the Niagara group from the Silurian period. Niagara rocks outcrop in a wide area of southwestern and central northwestern Ohio (Stout et al. 1943:17).

The principal drainage of the project area is Deer Creek, a major tributary of the Scioto River drainage system (Map 4). Flowing southward, it borders the project area on the east. Overall, this stream drains an area of 408 square miles, primarily in Madison and Pickaway Counties. The basin is long and narrow, with no major tributaries (O.D.N.R. 1963:17). It joins the Scioto River just south of the Pickaway-Ross County line. An intermittent drainage borders the project in the north, flowing eastward to intersect Deer Creek.

Glacial Geology

The topographic features of the Fayette County area are a result of Pleistocene glaciation, the main effects of which were the alteration of drainage systems and deposition of glacial drifts. During the pre-glacial Teays stage, the Teays River, the primary drainage of the Teays system, flowed northwest through Madison Township, in close proximity to the project area (Stout et al. 1943:52).

With the advance of the Kansan ice sheet, the headwaters of the Teays River became blocked (Stout et al. 1943:24-25). Flood waters were forced to seek new routes initiating the Deep Stage drainage systems. In the Fayette County area, a small tributary of the Newark River passed southward through the Fayette and Ross Counties area (Stout et al. 1943:83-84). Together with its tributaries, the Newark River formed part of the basin that now is occupied by the Scioto River (Stout et al. 1943:83-84).

The next glacial advancement, the Illinois, covered the south central Ohio region, eradicating the Deep Stage streams and depositing large amounts of drift, which served to level the area (Stout et al. 1943:86). The last glacial advance, the Wisconsin, pushed out in lobes along main axes of flow (Map 5). The Scioto lobe entirely covered the Fayette-Pickaway County area and reached as far south as Chillicothe (Stout et al. 1943:31). The Scioto River formed below the terminal moraine and gradually extended northward as the glacier slowly retreated. Also formed during this time was Deer Creek (Stout et al. 1943:97).

---

*This section is adapted from Frye and Immel 1980.

The Wisconsin glacier was also responsible for additional deposition of drift, mainly till of a dense clay-like nature and in some cases, creation of kames, eskers, and moraines (Stout et al. 1943:36-37). The region around the project area is characterized as undulating till plain (Stauffer et al. 1911:269: Map) or ground moraine with alluvium and outwash occurring along Deer Creek (Goldthwait et al. 1961). The Bloomingburg Moraine is located just south and west of the project area, passing through Marion and Pain Townships (Goldthwait et al. 1961).

Soils*

The soils comprising the Deer Creek project area are of the Fox-Westland-Genesee Soil association. Fox soils are well-drained, light colored soils formed in silty material overlying calcareous sand and gravel. These soils are found on nearly level to steep areas. By contrast, Westland soils are dark, poorly drained soils formed in silty material overlying calcareous sand and gravel and occurring in nearly level to depressed situations. Genesee soils are confined primarily to level first bottoms of stream valleys. They are light colored, deep, well-drained soils overlying stream alluvium.

(*All information is from Smith 1962.)

Climate*

The climate in the area generally has a wide seasonal temperature range and a moderate amount of precipitation. The prevailing wind direction is from the southwest except during February (west), April (northwest), and September (south). The average temperature in December, January, and February is less than 35 degrees F. During cold spells, temperatures fall below 0 degrees F. Over 75% of the average annual snowfall (19.9 inches) occurs during this period. Flooding is most likely to occur from January to April. July is the warmest month with temperatures averaging around 75 degrees F and highs reaching above 90 degrees F. The average annual temperature is about 51 degrees F.

May is the wettest month with an average of 4.98 inches of precipitation. November is the driest month, receiving about 1.56 inches of precipitation annually. The average yearly precipitation is 33.8 inches.

This area has a long growing season. The average date of the last killing frost in spring is April 21 and the first in autumn is October 7.

(*All information is from Alexander 1924.)

Flora

The project area lies in the Northern Temperate Deciduous Forest biome. The flora is part of the Beech-Maple Forest region, which occupies much of the Till Plains of Ohio and

Indiana (Braun 1950:305). The dominant trees of this region include American beech (Fagus grandifolia), sugar maple (Acer saccharum), red maple (A. rubrum), tulip tree (Liriodendron tulipifera), white basswood (Tilia heterophylla), chestnut (Castanea dentata), silverbell (Halesia sp.), black cherry (Prunus serotina), white oak (Quercus alba), and northern red oak (Q. rubra) [Shelford 1963:30]. Understory trees include American hornbeam (Carpinus caroliniana), hophornbeam (Astrya virginiana), sassafras (Sassafras albidum), eastern redbud (Cercis canadensis), dogwood (Cornus florida), and striped maple (Acer pennsylvanicum) [Shelford 1963:21-23]. Shrubs which are important in this biome are pawpaw (Asimina triloba), spicebush (Lindera benzoin), arrow wood (Vibirnum acerifolium), huckleberry (Gaylussacia sp.), blueberry (Vaccinium sp.), witch hazel (Hamamelis virginiana), and Virginia creeper (Parthenocissus sp.) [Shelford 1963:23].

In a biome, there are local environments which permit variations in the plant community. Within the west central Ohio area, mixed oak forests, interspersed with prairie grasslands, predominated (Gordon 1966). Early land surveys of this region documented the occurrence of numerous oak-hickory types including white oak, black oak, red oak, scarlet oak, shagbark hickory, pignut hickory, and bitternut hickory (Gordon 1966). In the prairies of southern Madison and northern Fayette Counties, groves with burr oak and post oak were common (Gordon 1969:40). Some of the shrubs and herbaceous plants, which would have been present in this flora community, include wild yam, alum root, wood strawberry, heath aster, Virginia grape fern, may apple, woodland sunflower, shining bedstraw, and wood sorrel (Gordon 1969).

Fauna

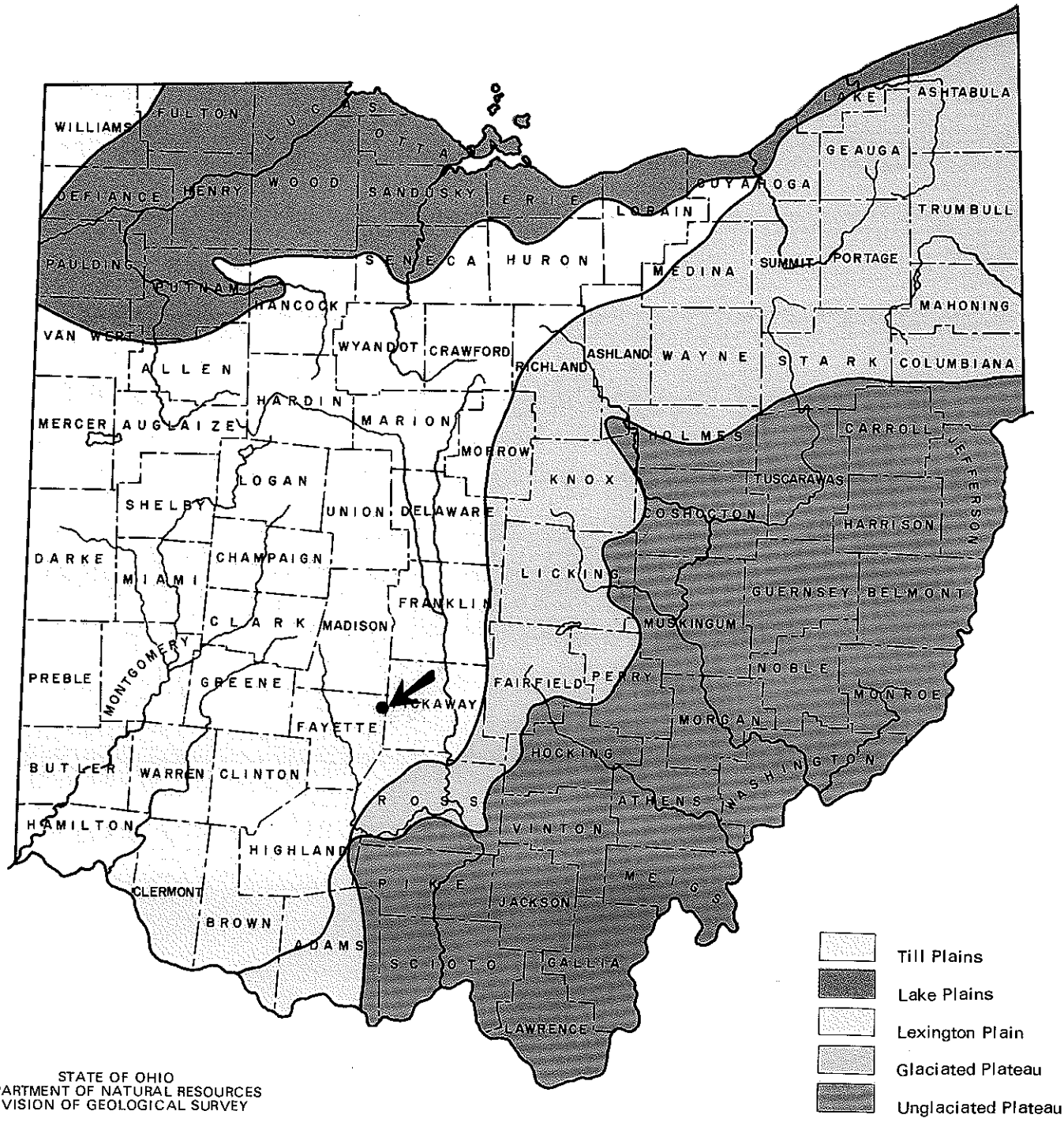
This region supports a wide variety of animals. Mammals, which might have been important to prehistoric inhabitants of the area, include white-tailed deer (Odocoileus virginianus), gray wolf (Canis lupus), mountain lion (Felis concolor), black bear (Euarctos americanus), bobcat (Lynx rufus), gray fox (Urocyon cinereo argenteus), elk (Cervus canadensis), squirrel (various species), rabbit (Sylvilagus floridanus), and opossum (Didelphis marsupialis) [Shelford 1963:27-29; Hall and Kelson 1959).

Game birds available for human exploitation would include the turkey (Meleagris gallopavo), ruffed grouse (Bonasa umbellus), and the prairie chicken, as well as ducks and other fowl (Cope 1872:25-26) [Gross 1932:262]. Waterfowl observed at the O'Shaughnessey Reservoir include 20 species of ducks and two species of geese and swan (United States Environmental Protection Agency [U.S.E.P.A.] 1976:C-15).

Early accounts of the Deer Creek vicinity also site the ocurrence of "buffaloes", pigeons, panther, wild hog, rattlesnakes, spotted snakes, and copperheads (Allen 1914:101-102).

Aquatic life, such as fish and mussels, are important resources. Over 50 species of fish have been recorded in the Olentangy River. These fish include various species of carp, bass, redhorse, bull head, minnows, shad, shiners, and darters (U.S.E.P.A. 1976:C-49, C-18). Mussels are also found in streams and rivers. In a study conducted by the Ohio State University Museum of Zoology, it was found that there are approximately 20 species of naiads in the Olentangy River (U.S.E.P.A. 1976:C-59 to C-69).

Turtles are another food source. Six species of turtles are present in Franklin County. These include snapping turtle (Chelydra s. serpentina), painted turtle (Chrysemys picta marginata), box turtle (Terrapene c. carolina), musk turtle (Sternotherus odoratus), spiny softshell turtle (Amyda s. spenifera), and map turtle (Graptemys geographica) [U.S.E.P.A. 1976:C-6].



STATE OF OHIO
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL SURVEY

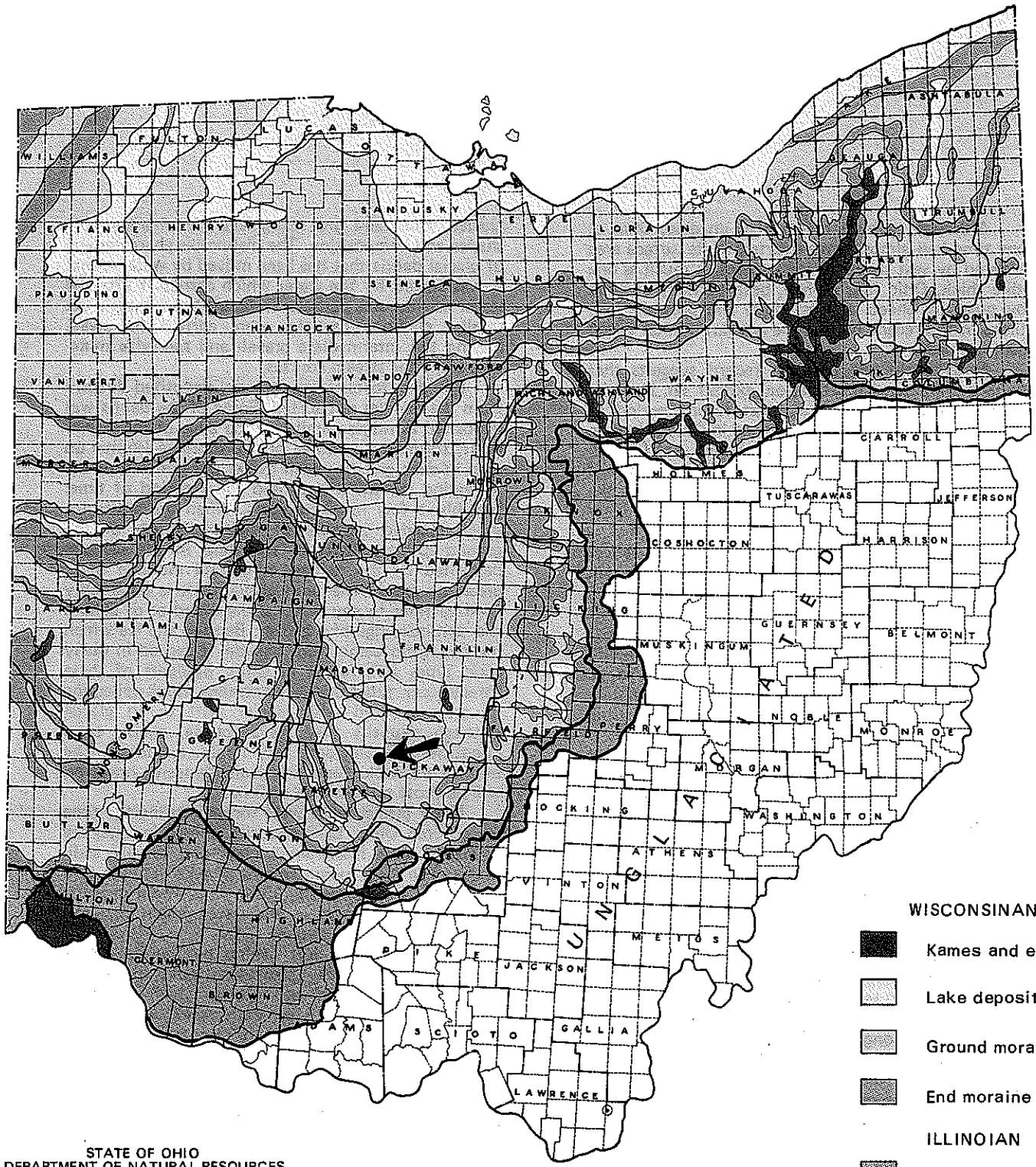
Scale in Miles
0 20 40 60

Map 3: **PHYSIOGRAPHIC SECTIONS OF OHIO**
(arrow denotes approximate location of project area)

Total copies printed: 10,000
Unit cost: $.0365
Publication date: 8/82
(Excludes paper costs)

STATE OF OHIO
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL SURVEY

Map 4: **PRINCIPAL STREAMS AND THEIR DRAINAGE AREAS**
(arrow denotes approximate location of project area)



STATE OF OHIO
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL SURVEY

ADAPTED FROM GLACIAL MAP OF OHIO, U.S. GEOL. SURVEY MISC. GEOL. INV. MAP I-316

Map 5: **GLACIAL DEPOSITS OF OHIO**
(arrow denotes approximate location of project area)

CULTURAL SETTING

Palaeoindian

It is estimated that the occupation of the Ohio area would have been possible approximately 11,000 to 11,500 years B.P., with the glacial front in Ontario during the Greatlakean maximum and retreat (Seeman and Prufer 1982:155-156). By this time, the climate was warmer and drier. This change in climate induced an increase in pine, oak, and herbaceous vegetation in the locally dominant spruce forest. The unglaciated areas of Ohio were covered by deciduous forests (Seeman and Prufer 1982:156). The Palaeoindians, the first known prehistoric population to occupy the Ohio area, were highly mobile, small band hunters moving on a seasonal basis in order to more fully exploit the available natural resources (Dragoo 1976:9). Although probably in pursuit of large herd animals, the Palaeoindians were opportunists, willing to utilize a broad spectrum of animal resources.

Archaic

By approximately 9,000 B.C., warmer and gradually drier conditions encouraged an increase of deciduous forest elements. The deciduous forest type was dominant by 5,000 B.C. (Cleland 1966:20-23). Cyclical plants developed, and smaller animals filled the opening ecological niches. Archaic inhabitants existed in this developing system, and their subsistence and settlement patterns reflected the changing environmental conditions.

During the Early Archaic period, 9,000 to 6,000 B.C., the increasing deciduous forests produced a more favorable habitat for game species, particularly the white-tailed deer (Cleland 1966). During this period, small mobile groups gradually became more geographically restricted as seasonally-oriented hunting and gathering activities were focused on smaller, well-exploited territories (Chapman 1975:6; Potter 1968:17). Although deer hunting was the major subsistence activity, a narrow spectrum of nutritious plant foods were also utilized (Chapman 1975:232-233; Cleland 1966:92-93).

The Middle Archaic period, 6,000 to 3,000 B.C., was characterized by the continued improvement in climate which resulted in a greater variety of available resources. The Middle Archaic economy became more diffuse as a wider selection of plant foods were exploited, but the major emphasis was still on deer (Cleland 1966:92-93). It appears that semi-permanent habitations had become common by this period (Clarke and DeWert 1977:10).

In the Late Archaic period, 3,000 to 900 B.C., the expansion of deciduous forests reached its northernmost limit (by approximately 2,000 B.C.), and the climate was warmer than present-day (Cleland 1966:33). Coinciding with an increase of territorial permanence was the appearance of regional adaptations such as Glacial Kame, Red Ochre, and the Old Copper culture

(Cleland 1966:93). Ceremonialism increased in importance, as evidenced by more elaborate, formalized burial practices and the presence of exotic grave materials obtained from the emerging trade networks (Chapman and Otto 1976:20).

By the close of the Late Archaic period, a wide variety of plant and animal foods were being utilized. Plant foods identified at the Salts Cave site in Kentucky, for example, included acorn, hazel and hickory nut, wild grape, blueberry, strawberry, and varieties of wild seeds (Yarnell 1974:14; Dye 1977:72). Small game was probably procured throughout the year, and white-tailed deer seems to have been the most frequently utilized large mammal (Dye 1977:70,73).

The first evidence of cultigens is associated with the Late Archaic period. At the previously mentioned Salts Cave site, chenopodium, sunflower, and gourd seeds have been recovered and date to approximately 1,500 B.C. (Yarnell 1974:120). Cultigens occurred as early as 2,300 B.P. in Missouri and Kentucky (Chomko and Crawford 1978:405).

Early Woodland

The Early Woodland period lasted from approximately 900 to 100 B.C.. This period represents a cultural expansion of the Late Archaic period and was characterized by a greater tendency toward territorial permanence and increasing elaboration of ceremonial exchange and mortuary rituals (Brose et al. 1978:67). In central Ohio, the local Early Woodland expression was the Adena culture, noted for the manufacture of pottery and the use of conical burial mounds for interment (Chapman and Otto 1976:21). The Adena culture exhibited many similarities to the Late Archaic period. For example, ritualized status rank burials and the building of burial mounds probably originated in Late Archaic ceremonial complexes (Brose et al. 1978:66-67).

Although semi-sedentary, like their Late Archaic predecessors, the Adena inhabitants of Ohio were more territorially restrictive. This is indicated by the occurrence of semi-permanent village sites and the manufacture of Fayette thick (both plain and cordmarked), Adena plain, and Montgomery incised ceramics (Chapman and Otto 1976:21). Curcurbita (squash and/or pumpkin), sunflower, and gourd were cultivated, but only as supplements to the hunting, gathering and fishing economy (Potter 1970:6; Brose et al. 1978:67).

The Adena sphere of influence was not limited to the Ohio area. It was a far-reaching phenomenon which encompassed the area around Ohio and also extended eastward through New England and the mid-Atlantic states and northward through New York and the upper Great Lakes (Fitting and Brose 1972:32; Thomas 1970:57; Kellar and Swartz 1970:123).

Middle Woodland

The predominant Middle Woodland manifestation in Ohio was the Hopewell culture, which lasted from 100 B.C. to A.D. 500. This culture was characterized by elaborate geometric earthworks, enclosures, and mounds which were often associated with multiple burials and a diverse assemblage of exotic ceremonial artifacts (Brose et al. 1978:68). Ceremonially, Hopewell appears to represent a continuation of the Adena culture, albeit on a more expanded and spectacular scale (Dragoo 1963:13; Otto 1979). Hopewellian trade networks were extensive, and the raw materials for ceremonial objects were acquired from various regions of North America. Copper and silver were procured from the upper Great Lakes area; quartz crystals and mica were acquired from the lower Allegheny region; obsidian and grizzly bear teeth came to Ohio from the west; while shark and alligator teeth, marine shell, and pearls were transported from the Gulf Coast (Prufer 1964:75).

Most of the information to date on the Hopewell culture has been obtained through mound exploration. Relatively little is known of settlement and subsistence patterns, because so few habitation sites have been located and excavated. Using information from non-mound excavations (e.g. Prufer 1964; Lee and Vickery 1972), Ford (1979) has suggested a basic hunting and gathering economy with limited horticulture. Nuts appear to have been important, as was deer. Corn seems to have been utilized but was not a dietary staple. Such a subsistence base suggests the use of the entire available environment: river valleys, terraces, and uplands.

During the Middle Woodland period, the large Hopewell "culture centers" were located in the central Ohio Valley and the Scioto River Valley of southern Ohio (Mayers-Oakes 1955:15).

Late Woodland

From approximately 100 B.C. to A.D. 500, the Scioto Hopewell experienced a cultural apex (Shane 1970:144). A decline took place in the sixth century A.D., the exact cause of which is not known. One theory suggests that climatic fluctuation inhibited agricultural pursuits and resulted in the decline (Baerreis et al. 1976:39, 50). Another theory stresses the breakdown of territories and intragroup contacts due to the concentration on a single subsistence activity, a focal agricultural economy (Cleland 1966:94-95). By A.D. 500, a shift had occurred from the Hopewell riverine occupations to those of the Late Woodland groups who utilized a variety of environmental settings. The Late Woodland population inhabited rockshelters in the Allegheny Plateau, flood plains along the Ohio River, and the flat, open terrains associated with the glaciated areas (Clarke and Cramer 1978:17). Subsistence activities appear to have included hunting, fishing, and gathering with some limited horticultural activities.

The Late Woodland period has been poorly defined for most of Ohio. To date, much of the definition for central and southern Ohio has been based on ceramic assemblages (Murphy 1975:232). The central Ohio region is represented by the Cole series, a grit tempered, cordmarked ware from the Cole site in Delaware County (Murphy 1975:232-234). The Peters series, primarily cordmarked and flint/chert tempered, and the Chesser series, which is cordmarked and limestone tempered, characterize southern Ohio (Prufer and McKenzie 1966:241; Prufer 1975:12).

Fort Ancient

Between A.D. 960 and 1,000, the Fort Ancient culture emerged from the Late Woodland culture in southern Ohio. The appearance of Fort Ancient was stimulated by increased reliance on maize agriculture, increased sedentism, and an influx of southern Mississippian influences (Essenpreis 1978:152; Brose et al. 1978:324). Ceramic attributes were probably the earliest Mississippian influences to enter the Ohio Valley (Brose et al. 1978:364). New architectural styles, beans, and Mississippian ceremonialism were introduced after this time (Brose et al. 1978:71).

The Fort Ancient subsistence economy was centered around a strong maize agricltural base with some growing of beans and squash. Hunting and gathering supplemented the economy (Essenpreis 1978:155-156). Settlements were occupied year-round and were conentrated along the major rivers. They were typically large, stable villages, often organized around a central plaza. Houses were round, oval, or rectangular (Essenpreis 1978:156; Brose et al. 1978:365). In some cases, a circular palisade was associated with the village (Brose et al. 1978:365)

Historic

Before the latter part of the seventeenth century, two tribes of Indians reportedly lived in the Ohio territory, these being the Mosopelea of southwestern Ohio and the Oniassenthe of southeastern Ohio (Wheeler-Voegelin 1974:198, 202-203). The extent of occupation in the central Ohio region is unknown due to the lack of early inland explorations. Around the 1650s, the Iroquois began raiding activities and by the 1680s, had dispersed tribes as far west as the Illinois area (Wheeler-Voegelin 1974:199-203; Hunter 1978:590). After this time, no tribes were reported to have inhabited the Ohio territory until the early 1700s, when various groups of Indians began to move into the Ohio area (Moorehead 1900:4). By the late 1730s, two Indian vilages had been established along the Ohio River. One of these towns, which was occupied by the Delawares, was situated across the river from present-day Meigs County. The other village, Lower Shawnee Town, was located at the confluence of the Scioto and Ohio Rivers (Wheeler-Voegelin 1974:1172). During this time, the Ohio region was utilized for winter hunting by the more northern

tribes (such as the Iroquois and Wyandot) but probably remained largely unsettled (Wheeler-Voegelin 1974:246).

It is not until 1765 that any established towns were noted in the central Ohio area. Salt Lick Town, a Mingo village near the juncture of the Scioto and Olentangy Rivers, existed until 1774 when it was destroyed by a detachment of Lord Dunsmore's army (Wheeler-Voegelin 1974:370, 528). After this time, there are no references to any settlements in the vicinity until 1789 when the Wyandots used the area for small seasonal camps. By the 1790s, the Wyandots had established a small town at present-day Columbus. In 1795, most of the Indian territory in Ohio was ceded to the United States through the Treaty of Greenville. With the exception of the northwest quarter of the state, which was established as Indian lands, Ohio became open to American settlement (Wheeler-Voegelin 1974:351-352; Thrower 1966:18-19).

LITERATURE REVIEW

A Phase I literature review was conducted for the proposed Deer Creek Rifle Range project area in order to locate any cultural resources which may be affected by the proposed project and to identify any previous archaeological investigations that have been conducted in the study area. This literature search included a review of the National Register of Historic Places, the Ohio Archaeological Inventory, the Fayette and Pickaway County files at the Ohio Historical Society, the Ohio Archaeological Council files, the Mount Sterling (7.5' and 15') and Five Points (7.5') quadrangle maps, and county and local archaeological reports and histories.

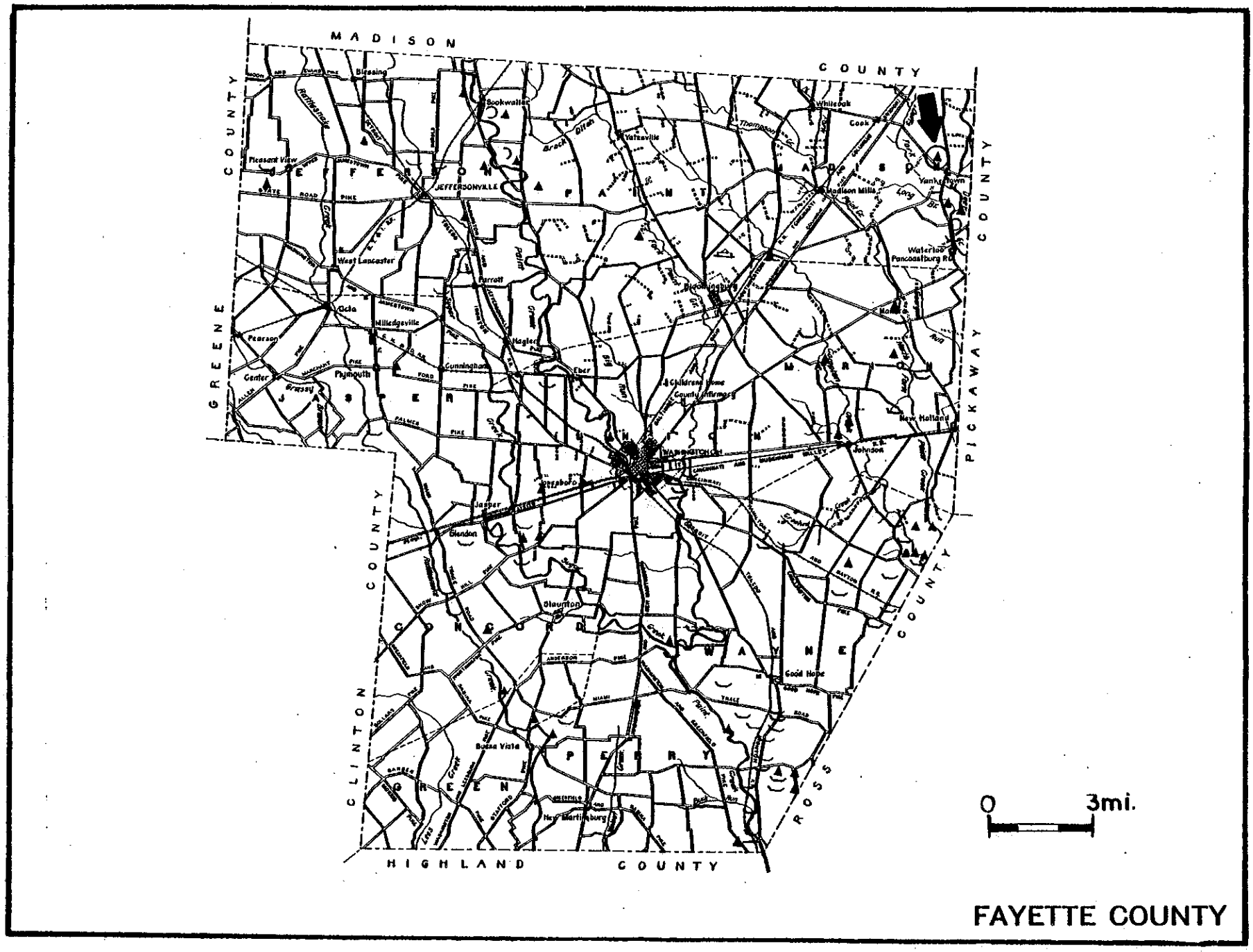
Within the Deer Creek project area, no detailed archaeological survey is known to have been undertaken. No cultural resources have been previously documented for the survey tract. However, in the vicinity of the project area, a few surveys have been conducted, and several sites have been documented, indicating an archaeological potential for the region.

Within a 2 km radius of the project area, four archaeological sites have been documented. The closest of the four is the Jackson Mound, 33 FE 2, located approximately 225 m northwest of the project area. This feature was first noted by Mills in 1914 (Map 6) and was documented in 1963 during the archaeological survey for the proposed Deer Creek Reservoir area (Baby and Potter 1963). In 1975, this mound was listed in the National Register of Historic Places. Although no excavations have been conducted on the mound, it is believed to be affiliated with the Adena period (National Register of Historic Places Inventory Nomination form, 10/21/75). In addition to this feature, two other mounds and two earthworks were noted by Mills (1914) to the south of the project area along Deer Creek (Map 6). However, the existence of these sites has not been confirmed (Baby and Potter 1963).

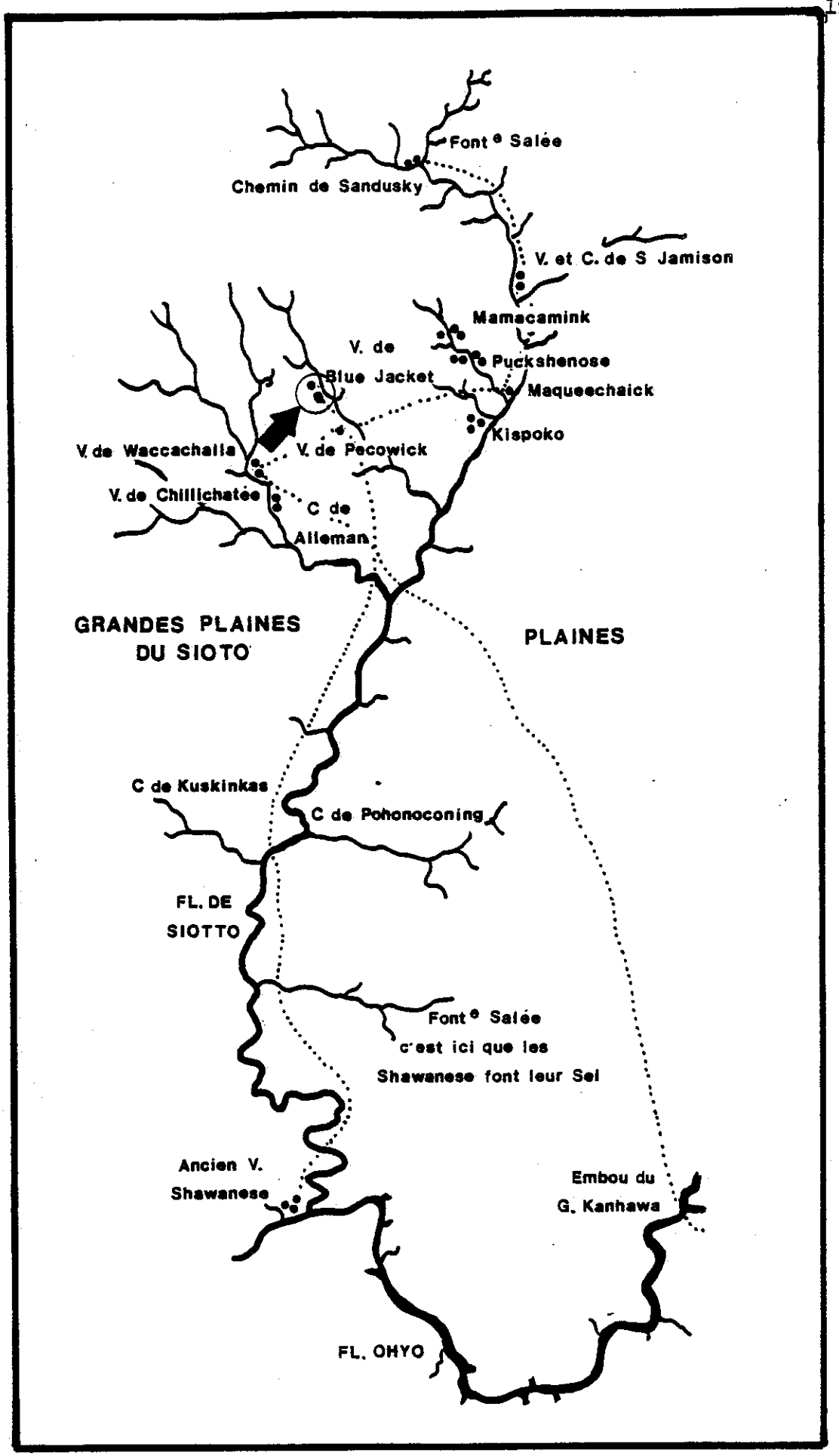
The remaining three sites within the 2 km radius were identified during an archaeological survey for the construction of the golf course at Deer Creek State Park (Tituskin 1979). This survey addressed a 215 acre tract south of Cooks-Yankeetown Road and just east of Deer Creek, approximately 1 km southeast of the current project area. Two of the sites, 33 FE 65 and 33 FE 66, were represented by moderate density lithic scatters associated with the Archaic-Early Woodland period. The third site, 33 PI 54, situated about 800 m east of 33 FE 65 and 66, contained a historic component which dated to the 1820-1840 period.

In addition to the four documented sites, literary information places the location of a historic Indian village, "Blue Jacket's town", in close proximity to the project area. Both Crevocoeur's map (Map 7) and Lewis and Dawley's map (Map 8)

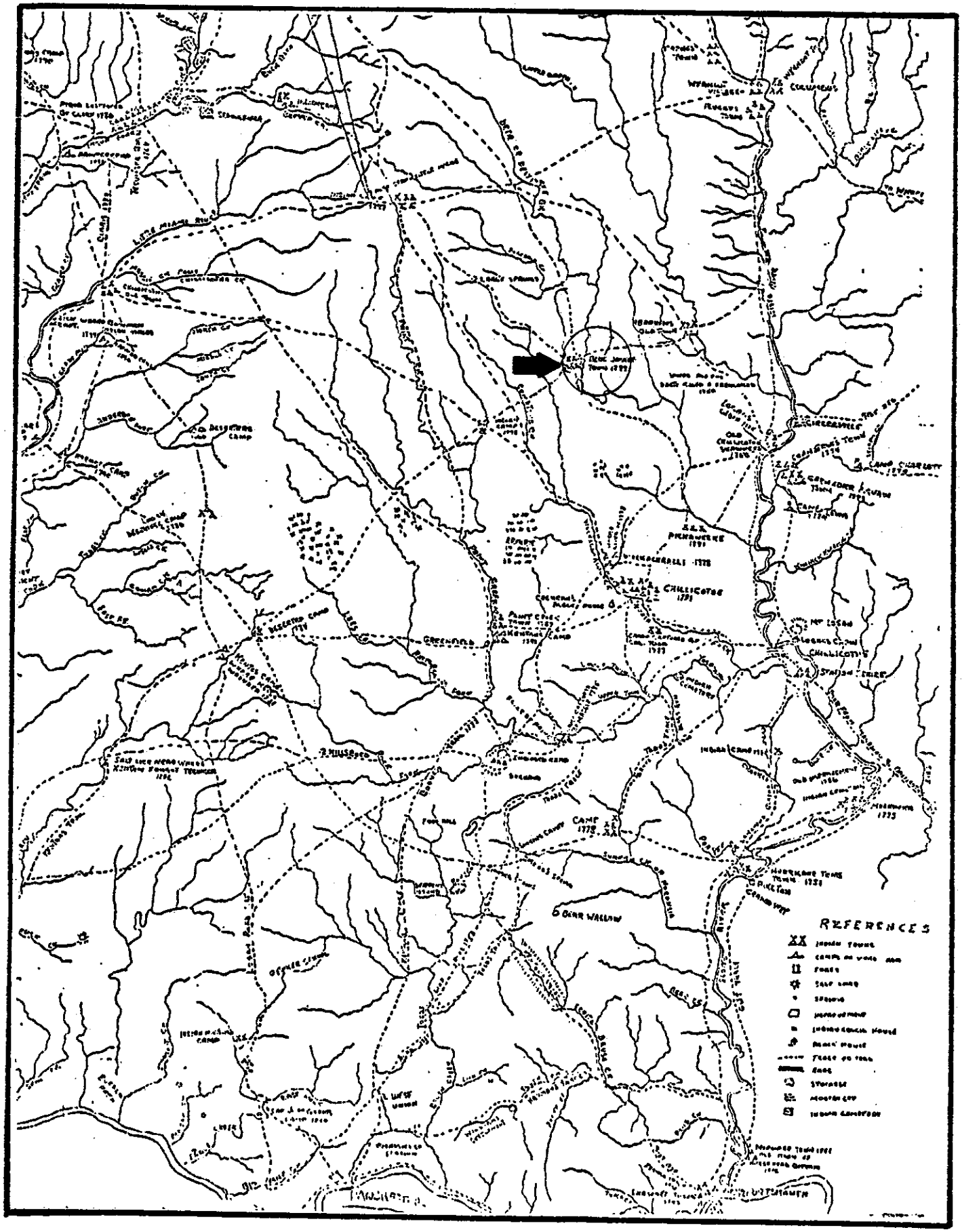
appear to place the location of this site near the juncture of Duffs Forks and Deer Creek, just south of present-day Cooks-Yankeetown Road. In 1773, David Jones, a missionary, visited this village which he described as being small, containing 12 log houses, and situated east of Deer Creek and north of a "large plain" (Wheeler-Voegelin 1974:361).



Map 6: Sites located by Mills (1914) in Jackson County, Ohio (arrow denotes location of Jackson Mound, 33 FE 2)



Map 7: Crevocoeur's 1787 sketch of villages along the Scioto River and tributaries (Thwaites 1908) [arrow denotes location of Blue Jacket's Village]



Map 8: Map of the Indian towns, villages, camps, and trails in the Virginia Military District and southwestern Ohio (Evans 1903) [arrow denotes location of Blue Jacket's Village]

SURVEY METHODS AND PROCEDURES

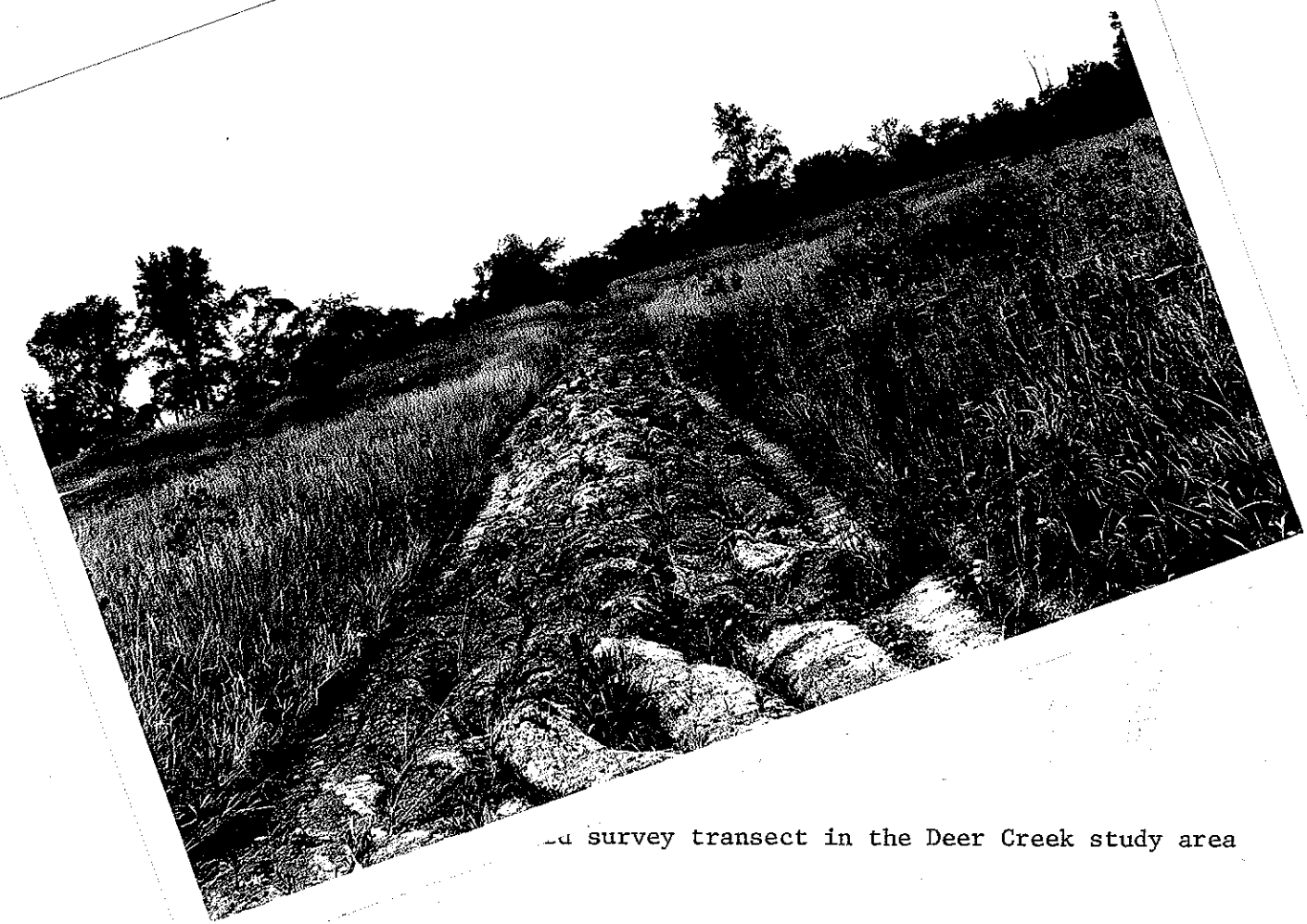
As indicated in the Scope of Service, survey methods would consist primarily of surface survey, supplemented by subsurface soil coring and test pit excavation (Appendix B). Prior to initiation of reconnaissance, a series of 2-3 m wide strips were plowed through the project area (Plate 1). The parallel transects were spaced approximately 15 m apart and were oriented on north/south axes, perpendicular to Cooks-Yankeetown Road. In the field, each of these transects were collected separately. Any artifacts encountered within a transect were flagged, then collected and provenienced according to their relative location within the transect (i.e. north 2/4, south 1/4, etc.). after collection was completed, any apparent artifact clusters were defined and their exact locations and perimeter definitions obtained from the survey flags.

Based on the distribution of lithic material within the cluster site perimeters, test pits were excavated within the area(s) of greatest lithic density. A 20 m interval was maintained between test pit transects and a 15 m interval employed between the test pits. Each unit was 50 cm squared in size and was excavated to varying depths below the base of the topsoil, then inspected for cultural deposits (Plate 2). Stratigraphy, test pit location, and cultural content were recorded. The fill of each unit was examined during both excavation and backfilling.

In addition to test pit excavation, limited auger testing was conducted along the terrace margin overlooking Deer Creek in order to determine if extensive alluvial deposits were present which would increase the potential for buried cultural strata. A single line of tests were excavated parallel to the creek, on a north/south axis. A 15 m interval was employed between tests. Using a small soil corer, each test was excavated to the underlying clay levels. Stratigraphy and test location were recorded. Limited soil coring was also conducted in the southeastern portion of the study area in an area of suspected disturbance.

In the laboratory, material recovered during field reconnaissance was cleaned, sorted, and examined, after which apparent non-artifactual items were discarded. Each artifct was then catalogued into the system currently employed by the Collections Department of the Ohio Historical Society.

Artifact analysis consisted of sorting the material into general classes, such as flake or fragment, based on visual inspection. It should be noted that the term "fragment" denotes an irregularly shaped lithic item which may be the result of human activity.



..d survey transect in the Deer Creek study area

area

RESULTS OF RECONNAISSANCE

Two days were spent conducting the field reconnaissance for the proposed Deer Creek Shooting Range project. At the time of reconnaissance, the extant ground cover in the majority of the project area consisted of tall weeds, grass, and brambles (Plate 3).

Through the project tract, a series of 2-3 m wide strips had been plowed, then allowed to weather, permitting adequate visibility for a surface survey. A total of 20 transects were collected within the study area. A very small amount of lithic material was recovered. The majority of material was derived from two spatially distinct, light density clusters. Several isolated artifacts were encountered outside of the cluster areas (Table 1). Both of these clusters were designated as archaeological sites, these being 33 FE 90 and 33 FE 91 (Appendix A).

In order to acquire additional information to evaluate site significance, a series of 50 cm squared test pits were excavated within each cluster. In addition, two arbitrarily placed test pits were excavated in the lower terrace locale adjacent to an area which produced two lithic items. Soil coring was also conducted in this terrace area. In all, 20 test pits and 22 soil core tests were excavated within the study area.

The results of testing for each site and the terrace area are presented below.

33 FE 90 (Cluster #1)

This site is situated along a slight rise in the northeastern portion of the study area (Map 9). This locale will be directly affected by the proposed construction of the shooting range. Surface lithic density was very light, with a total of nine lithic items being recovered, including a non-diagnostic biface/point tip (Table 1). The rise area measured approximately 75 m east/west by 45 m north/south.

Fourteen test pits were excavated across the rise. One biface fragment was recovered from the backdirt of a test pit. No in situ cultural deposits were encountered.

33 FE 91 (Cluster #2)

This site is situated in the southwest corner of the study area approximately 120 m south of 33 FE 90 (Map 9). A total of five lithic items were collected from an area measuring approximately 20 m east/west by 20 m north/south (Table 1). The majority of material was recovered from Transect 1.

Four test pits were excavated within the site area (Map 9). No cultural material or evidence of in situ features were encountered during subsurface testing.

Plate 3: View of Deer Creek study area (looking northeast)

Table 1: Table of material recovered during reconnaissance in the Deer Creek study area

Area, Site, and/or Provenience	LITHIC			HISTORIC		TOTAL
	Biface	Flake	Fragment	Ceramic	Glass	
33 FE 90	2	7	1			10
33 FE 91		3	2	1		6
Transect 3-N1/4			1			1
TR 5-S1/2			1			1
TR 6-S1/2				1		1
TR 14-S1/2				2	2	4
TR 15-S1/2		1				1
TR 20-N1/2		1	1			2
TOTAL	2	12	6	4	2	26

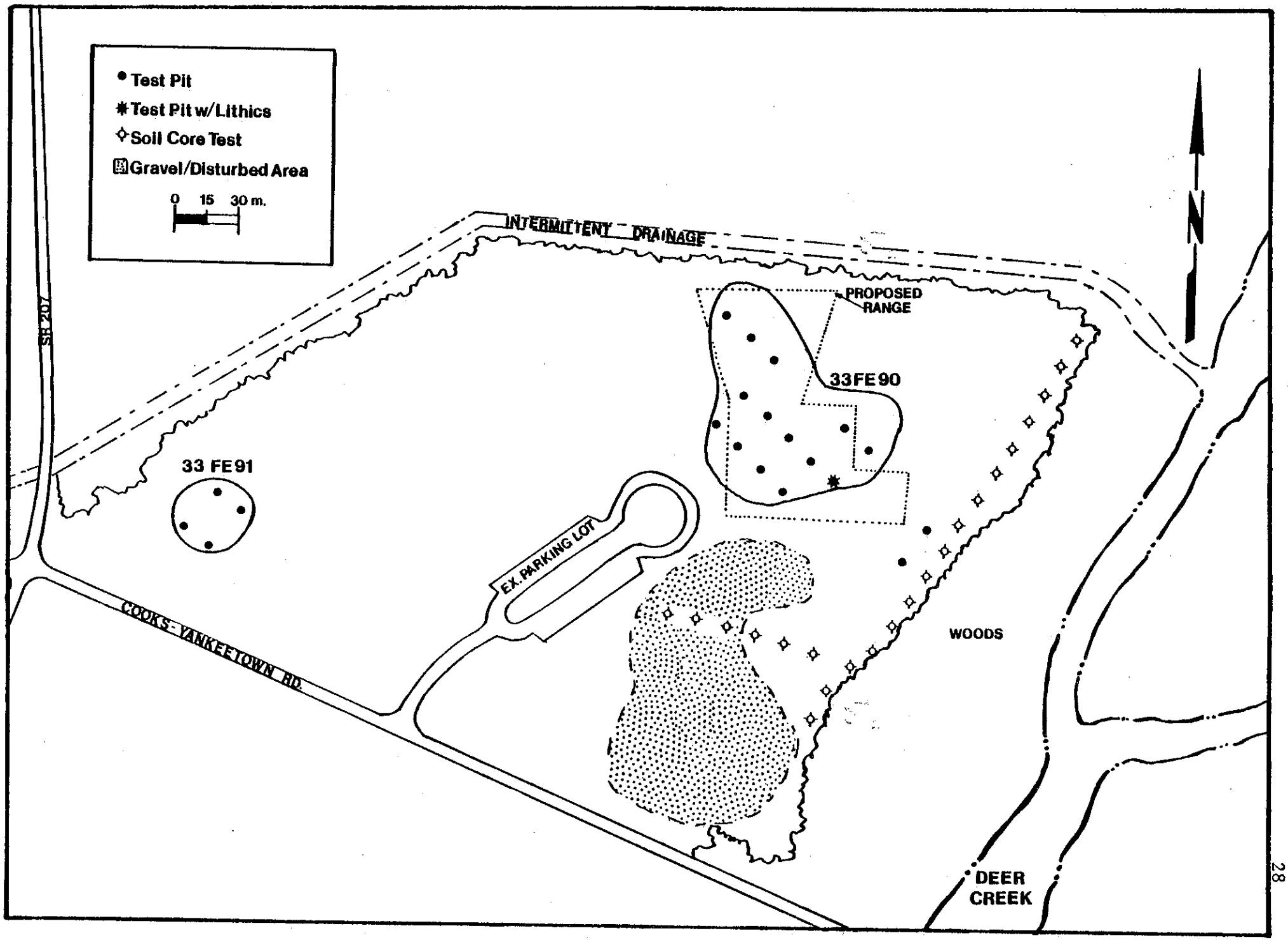
Terrace Area

The terrace area encompasses the extreme eastern margin of the study area paralleling the tree line along Deer Creek and approximating an elevation of 820 feet AMSL. The topography in the southern portion of this area is irregular, with small rises and depressions randomly occurring throughout. Surface reconnaissance in this locale encountered large gravel and rock deposits. An interview with Mike Dwyer indicated that this area may have been subjected to borrowing activities associated with construction of Cooks-Yankeetown Road.

In order to determine the extent of possible disturbance, as well as the nature of soil deposition in the terrace zone, subsurface soil coring was conducted. A transect of tests was excavated adjacent to the eastern tree line, paralleling Deer Creek (Map 9). A total of 16 tests, spaced at 15 m intervals, were excavated. Stratigraphy among the tests varied greatly. Tests in the extreme northern and southern portions of the transect were shallow, with an average depth of 30 cm below ground surface (b.g.s.) to the clay subsoil. In the central portion of the transect, depth to subsoil approximated 70 cm b.g.s., with some degree of alluvial material being present. The last test in the southern portion of the transect could not be excavated due to extensive surface gravel. The shallowness of the southern tests might be attributable to topsoil removal.

A second transect of tests, perpendicular to the first, was excavated in the southern portion of the terrace area (Map 9). This transect bisected the suspected area of disturbance. Tests became progressively more difficult to excavate, with gravel and rock concentrations encountered just below the surface. In all, six tests were excavated in this transect, four of which could not be completed due to the gravel. The results of these tests would definitely indicate that topsoil removal, probably associated with borrowing, had occurred.

In addition to the soil core tests, two test pits were excavated adjacent to an area which produced lithic material (Map 9). The southernmost unit could not be completed due to an increasing density of gravel and rocks. The other unit, located 15 m north of the first, was excavated to a depth of 62 cm below ground surface. No cultural materials or evidence of in situ cultural deposits was encountered.



Map 9: Map of Deer Creek study area showing locations of sites, test pits, and soil core tests

SUMMARY

Under contract with the Ohio Department of Natural Resources, the Department of Contract Archaeology, Ohio Historical Society, conducted a preliminary archaeological survey for the proposed Deer Creek Shooting Range in the Deer Creek Wildlife area, Fayette County, Ohio. The project area encompasses an 18 acre fallow field located northeast of the intersection of State Route 207 and Cooks-Yankeetown Road and immediately west of Deer Creek. An existing parking lot is located in the south central portion of the project area. The proposed construction will directly affect the northeastern section of the study area.

The survey strategy, outlined in the Scope of Service, involved a three stage testing scheme: 1) locational surface survey to identify any archaeological remains that may be present within plow zone soils, 2) subsurface testing to assess site(s) preservation and content, and 3) soil coring of the terrace area to evaluate the potential for buried cultural strata.

A total of 20 2-3 meter wide, parallel transects, spaced at 15 m intervals, were plowed through the project area. Surface collection of these transects encountered two spatially distinct, diffuse clusters of lithic artifacts. The first cluster, designated as 33 FE 90, approximated a slight glacial rise in the northeastern portion of the study area. A total of nine, non-diagnostic, lithic items were collected from an area measuring approximately 90 x 45 m. Of the 14 test pits excavated within the unplowed portions of the site area, only one yielded lithic material, this being a biface fragment from the backdirt. No evidence of sub-plow zone cultural features was encountered.

The other cluster, designated as 33 FE 91, was located in the southwestern corner of the study area. In all, five non-diagnostic lithic items were collected from an area measuring approximately 20 m x 20 m. Subsurface testing failed to locate either additional cultural materials or evidence of in situ cultural deposits.

Soil coring was conducted in the eastern portion of the survey tract along the lower terrace area paralleling Deer Creek. The results of these tests indicated that although some alluvial material was present, the southern half of the terrace area may have been disturbed. Based on information provided by Mike Dwyer of O.D.N.R., this may have been the area from which borrow materials were obtained for the construction of Cooks-Yankeetown road.

During surface collection in the central portion of the terrace area, two lithic items were collected. Limited test pit excavation in this locale failed to produce either additional materials or evidence of in situ cultural features.

RECOMMENDATIONS

In June of 1983, a preliminary archaeological survey was completed by the Department of Contract Archaeology for the proposed Deer Creek Rifle Range. The recommendations presented below are based on the results of testing and the area's cultural resource potential.

The preliminary literature search indicated that prehistoric cultural activity had been documented within the vicinity of the project area. In addition, literary information places the location of "Blue Jacket's" town, an historic Indian village dated to 1787, in the immediate vicinity. On this basis, the potential was considered to be high that field survey would encounter cultural manifestations.

Within the study area, two small prehistoric sites of unknown cultural affiliation were identified and recorded, these being 33 FE 90 and 33 FE 91. Both of these loci, identified during surface reconnaissance, appeared as extremely light density lithic clusters. Test pits excavated in the unplowed sections of the loci areas failed to locate either significant amounts of material or evidence of sub-plow zone features. Soil core testing in the southeastern portion of the study area indicated that a significant portion of this section had been disturbed, probably as the result of borrowing activities associated with the construction of Cooks-Yankeetown Road.

Because of these factors, it is felt the potential is low for these sites being of National Register quality and that further work would not significantly add to the information already obtained. Therefore, no further testing is recommended.

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APPENDIX A

OHIO ARCHAEOLOGICAL INVENTORY FORMS

Ohio Archaeological Council
Ohio Historic Preservation Office
Ohio Historical Center
Columbus, Ohio 43211

OHIO ARCHAEOLOGICAL INVENTORY

Site Number: 33 FE 90
County: Fayette
3. Township: Madison
4. Site Name: Dwyer Site
5. Other Names For Site: Cluster #1

City or Town: Mount Sterling Vicinity of: ☐
Map Reference: J.S.G.S. Topographic Map, Mount Sterling Quad, 7.5' Series
9. Township & Range Number: Virginia Military District
Section Number:
10. Latitude: ° ' "
11. Longitude: ° ' "
12. U.T.M. Reference: Zone 17 | Easting 305765 | Northing 4392520
13. Verbal Site Location: From intersection of Cooks-Yankeetown Rd., approx. 250 m east on Cooks-Yankeetown Rd. then 225 m north to glacial rise (immediately north of an existing parking lot).

14. Land Form: Upland rise
15. Elevation: 830' AMSL
16. Soil Type: Fox-Westland-Genesee
17. Floral Cover: Grass and weeds
18. Condition of Site: Plow disturbed
19. Present Use: Wildlife area
20. Type of Site: Unknown
21. Drainage System: Deer Creek
22. Dimensions of Site: Approx. 90 m E/W x 45 m N/S

23. Ownership: Public ☒ Private ☐
O.D.N.R.
Div. of Wildlife
24. Form Prepared by: E. Immel
25. Organization: Ohio Historical Society
26. Location of Negatives: O.H.S. Survey Files
27. Date of Survey: June, 1983
28. Survey Conditions: Fair-Good
29. Cultural Classification or Time Period: Unknown

1. Site No. 33 FE 90
2. County Fayette
4. Site Name Dwyer Site
5. Other Names for Site Cluster #1

Artifacts Collected
A4097/8-12, 17-19, 22: 1 biface/point tip, 1 biface fragment, 7 flakes, 1 fragment

31. References

Immel, Elsie
1983 Preliminary Archaeological Survey for the Proposed Deer Creek Shooting Range in the Deer Creek Wildlife Area, Fayette County, Ohio.

Remarks
This site approximated a slight rise situated in the northeastern portion of the field. Surface collection of plowed transect strips encountered a highly diffuse cluster of lithic material. Fourteen test pits, each 50 cm squared in size, were excavated in the unplowed sections across the rise. One additional lithic item was recovered from a backdirt context. No evidence of in situ cultural deposits was encountered.

Use opposite side to copy portion of topographic map with site located, attachment of contact print, sketch of site plan, or continuation of items 1-32.

Ohio Archaeological Council
Ohio Historic Preservation Office
Ohio Historical Center
Columbus, Ohio 43211

OHIO ARCHAEOLOGICAL INVENTORY

Site Number: 33 FE 91
County: Fayette
3. Township: Madison
4. Site Name: Yankeetown Site
5. Other Names For Site: Cluster #2

City or Town: Mount Sterling Vicinity of ☒
Map Reference: U.S.G.S. Topographic Map, Mount Sterling Quad, 7.5' Series
Township & Range Number: Virginia Military District
Section Number:
10. Latitude: ° ' "
11. Longitude: ° ' "
12. U.T.M. Reference: Zone 17 | Easting 305475 | Northing 4392430
13. Verbal Site Location: From intersection of S.R. 207 and Cooks-Yankeetown Rd., 60 m east on Cooks-Yankeetown Rd., then approx. 45 m north.

14. Land Form: Upland till plain
15. Elevation: 835' AMSL
16. Soil Type: Fox-Westland-Genesee
17. Floral Cover: Grass and weeds
18. Condition of Site: Plow disturbed
19. Present Use: Wildlife area
20. Type of Site: Unknown
21. Drainage System: Deer Creek
22. Dimensions of Site: Approx. 20 m N/S x 20 m E/W

23. Ownership: Public ☒ Private ☐
O.D.N.R.
Div. of Wildlife
24. Form Prepared by: E. Immel
25. Organization: Ohio Historical Society
26. Location of Negatives: O.H.S. Survey Files
27. Date of Survey: June, 1983
28. Survey Conditions: Fair-Good
29. Cultural Classification or Time Period: Unknown

30. Artifacts Collected
A4097/1-4: 3 flakes, 2 fragments, 1 historic ceramic sherd

31. References
Immel, Elsie A.
1983 Preliminary Archaeological Survey for the Proposed Deer Creek Shooting Range in the Deer Creek Wildlife Area, Fayette County, Ohio.

Remarks
Surface collection in plowed transect strips, 2-3 m wide, identified a small, diffuse scatter of lithic material in the southwestern corner of the field. Four test pits (50 cm squared in size) were excavated in unplowed portions of the scatter area. No additional cultural materials or evidence of in situ features was encountered.

Use opposite side to copy portion of topographic map with site located, attachment of contact print, sketch of site plan, or continuation of items 1-32.

1. Site No. 33 FE 91
2. County Fayette
4. Site Name Yankeetown Site
5. Other Names for Site Cluster #2

APPENDIX B

PROJECT DOCUMENTATION

ODNR

Ohio Department of Natural Resources

DIVISION OF WILDLIFE

April 4, 1983

Mr. Donald Bier, Jr.
Department of Contract Archaeology
Ohio Historical Society
I-17 & 17th Avenue
Columbus, Ohio 43202

Dear Mr. Bier:

The Division of Wildlife is planning to relocate and reconstruct the public shooting range at the Deer Creek Wildlife Area. A Level 3 Eligibility Assessment must be conducted on the affected tract prior to construction. As an archeologist certified by the Ohio Archeological Council at level 3 or 4, you are invited to submit a bid on this archeological survey.

The project tract is located along the North side of Cooks-Yankeetown Road between SR 207 and Deer Creek. Previous archeological work indicates one known site within ½ mile of the project tract (Jackson Mound). See the enclosed material for specific information concerning the location of the project tract.

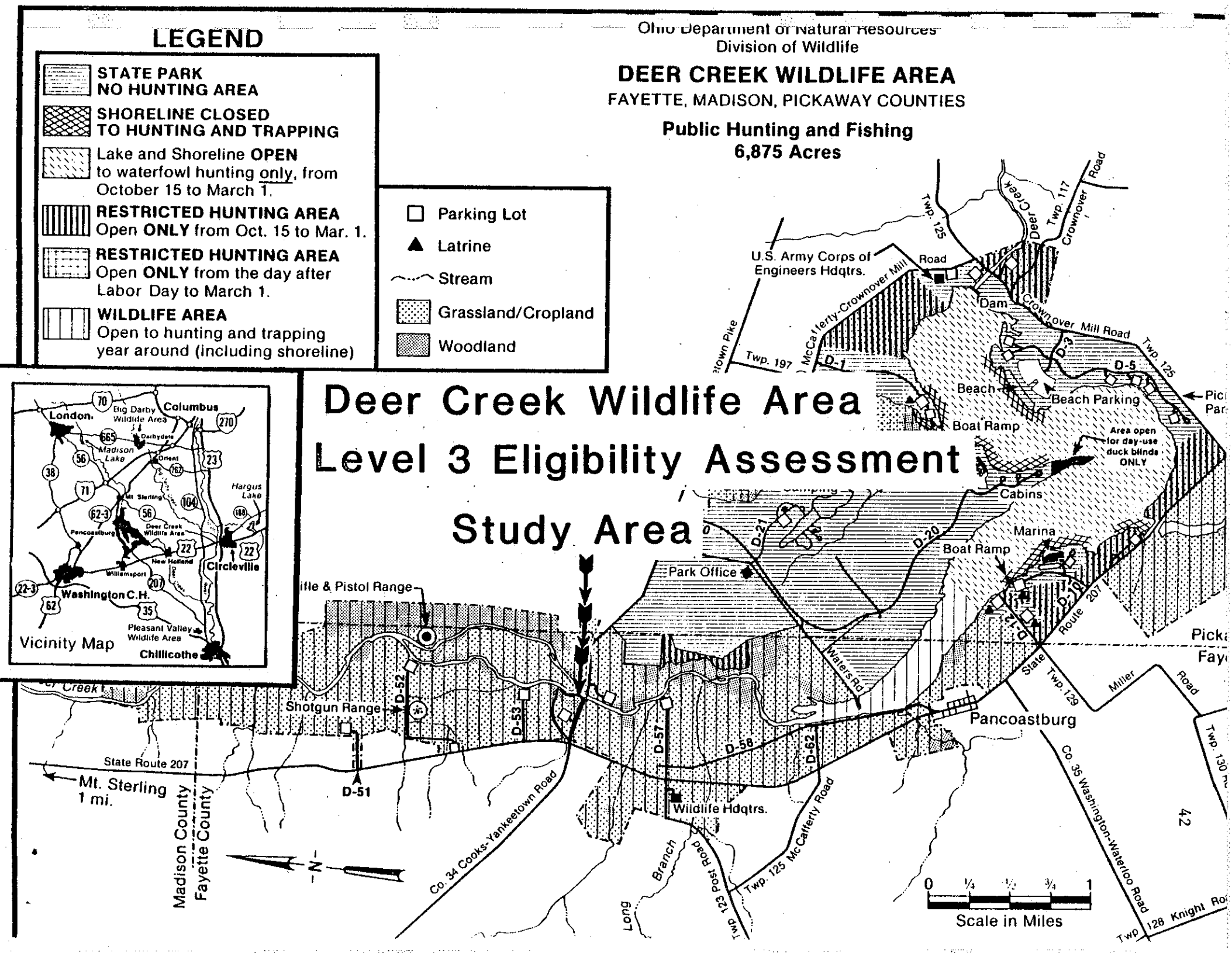
When formulating your bid, take into consideration that the Division of Wildlife is interested in an expedient resolution of the significance of this tract. Also consider that the Division of Wildlife is willing to provide field labor and equipment as needed including any preliminary plowing or discing that may be required.

The Eligibility Assessment final report will be subject to review and comment by the Ohio Historic Preservation Office. The final report will therefore need to be prepared according to the current specifications for reports of archeological services of the Ohio Archeological Council. Bids should be received at the Hunter Safety Unit, 1500 Dublin Road, Columbus, Ohio 43215 by 5:00 p.m. Thursday April 28, 1983. If additional information is required for the preparation of your bid, I can be reached during business hours at (614) 265-7034.

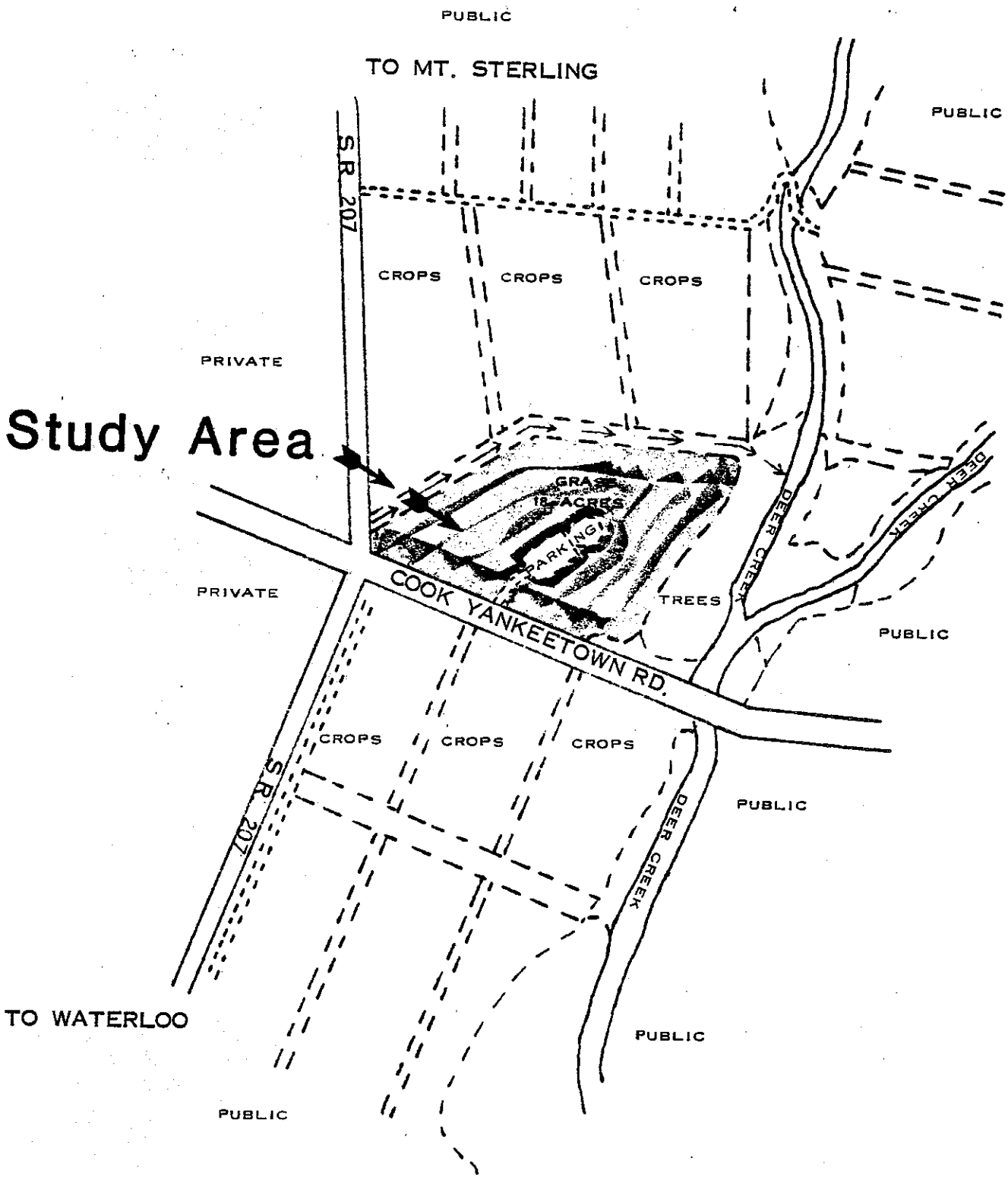
Sincerely,

Michael J. Dwyer, Assistant
Hunter Safety Coordinator

MJD:maf
Enclosure

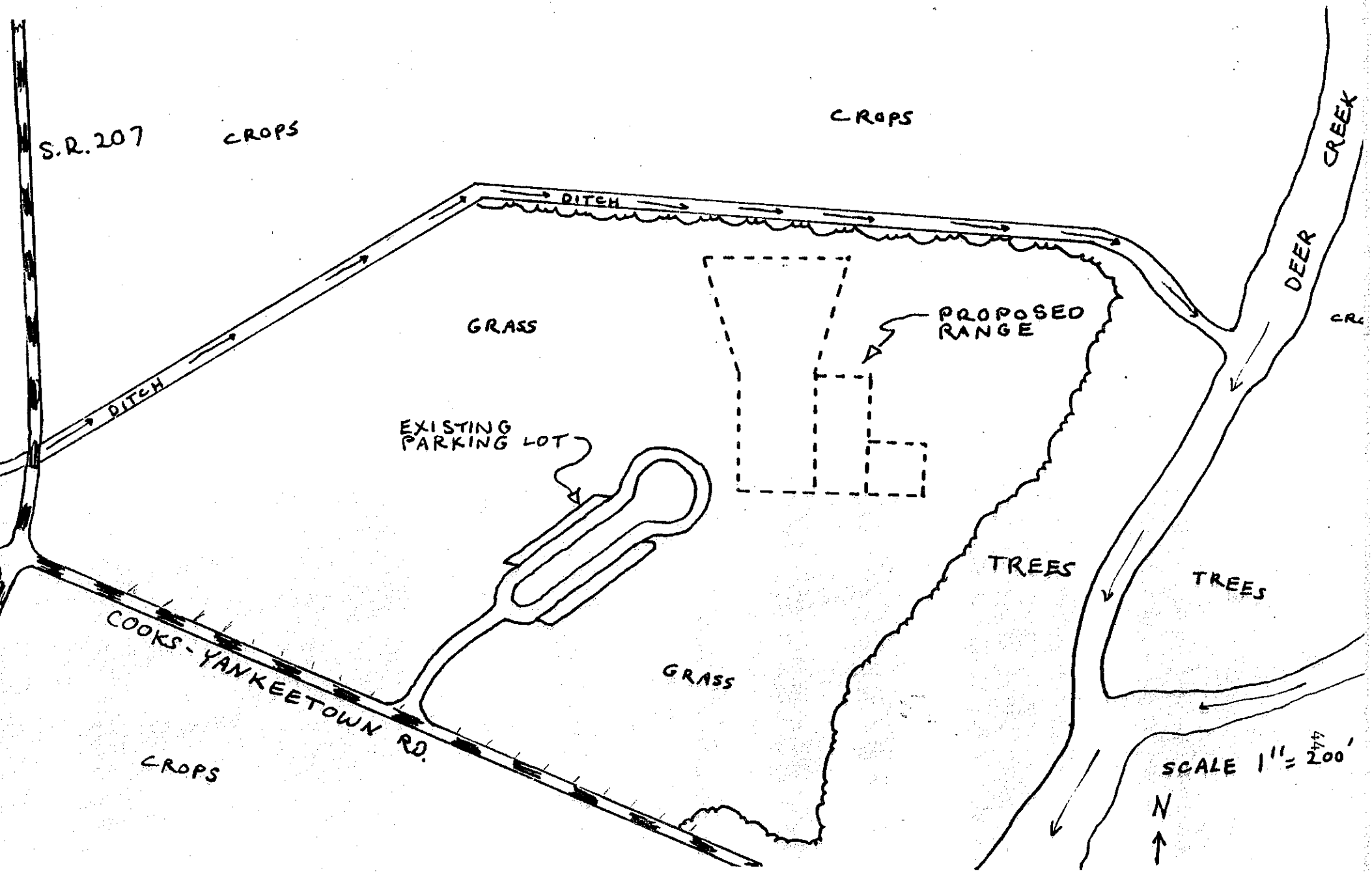

LEGEND
STATE PARK
NO HUNTING AREA
SHORELINE CLOSED
TO HUNTING AND TRAPPING
Lake and Shoreline OPEN
to waterfowl hunting only, from
October 15 to March 1.
RESTRICTED HUNTING AREA
Open ONLY from Oct. 15 to Mar. 1.
RESTRICTED HUNTING AREA
Open ONLY from the day after
Labor Day to March 1.
WILDLIFE AREA
Open to hunting and trapping
year around (including shoreline)
Parking Lot
Latrine
Stream
Grassland/Cropland
Woodland
Ohio Department of Natural Resources
Division of Wildlife
DEER CREEK WILDLIFE AREA
FAYETTE, MADISON, PICKAWAY COUNTIES
Public Hunting and Fishing
6,875 Acres
Deer Creek Wildlife Area
Level 3 Eligibility Assessment
Study Area
Vicinity Map
London
Columbus
Big Darby Wildlife Area
Madison Lake
Mt. Sterling
Orient
Hargus Lake
Pancoastburg
Deer Creek Wildlife Area
New Holland
Circleville
Williamsport
Washington C.H.
Pleasant Valley Wildlife Area
Chillicothe
U.S. Army Corps of Engineers Hdqtrs.
McCafferty-Crownover Mill Road
Twp. 125
Twp. 117
Deer Creek
Crownover Road
Dam
Crownover Mill Road
Twp. 197
D-1
D-3
D-5
Beach
Beach Parking
Boat Ramp
Area open for day-use duck blinds ONLY
Cabins
Marina
Boat Ramp
Park Office
D-27
D-20
D-21
D-22
Route 207
Rifle & Pistol Range
Shotgun Range
D-52
D-53
D-57
D-58
D-62
D-51
Waters Rd.
State Route 207
Mt. Sterling 1 mi.
Madison County
Fayette County
Co. 34 Cooks-Yankeetown Road
Wildlife Hdqtrs.
Long Branch
Twp. 123 Post Road
Twp. 125 McCafferty Road
Pancoastburg
State
Twp. 129
Miller
Road
Co. 35 Washington-Waterloo Road
42
Twp. 128 Knight Rd
Twp. 130
0
1/4
1/2
3/4
1
Scale in Miles
N

Deer Creek Wildlife Area



Level 3 Eligibility Assessment

Proposed Range
Deer Creek Wildlife Area



the
Ohio Historical
Society, Inc.

April 22, 1983

Michael J. Dwyer, Assistant
Hunter Safety Coordinator
Ohio Department of Natural Resources
Division of Wildlife
Fountain Square
Columbus, Ohio 43224

Re: Deer Creek Wildlife Area
Public Shooting Range
Phase I-III Archaeological Survey

Dear Mr. Dwyer:

This letter is to transmit our Scope of Service and Cost Estimate for the above referenced project. As you requested, the proposal is for survey of the full 18 acres. At present there are no known sites within the specified project area. Against the possibility that one or more sites will be located, the scope of work includes two work days per crew member for site testing. If no sites are located, this testing would not be performed.

Thank you for the opportunity to bid on this project. If you have any questions please contact me at your convenience at 466-1500, ext. 265.

Sincerely,

Donald R Bier, Jr.

Donald R. Bier, Jr., Head
Department of Contract Archaeology

Enclosure

FILE

SCOPE OF SERVICE
Deer Creek Wildlife Area
Public Shooting Range Survey

Project Title

Deer Creek Wildlife Area, Public Shooting Range

Project Area

The project area covers 18 acres (7.3 hectares) just west of Deer Creek. An intermittent drainage forms the northern boundary, S.R. 277 the west boundary, Cook Yankeetown Road the southern boundary, and the bluffs above the Deer Creek flood plain form the eastern boundary. Excepting a limited parking facility, the project area is a fallow agricultural field at an elevation of about 830-835 feet.

Level of Survey

Phase I Literature Research
Phase II Location Survey of project area

Previous Data

Although the project area has not been previously surveyed, available data indicates that it should be considered archaeologically sensitive. For example, literary information places the location of "Blue Jacket's" town, an historic Indian village dated to 1787, in this vicinity.

More extensive information is available with respect to prehistoric occupation in the immediate vicinity of the project area. Four prehistoric sites have been documented within a two kilometer radius of the proposed shooting range. The Jackson Mound (33FE2) is located about 225 meters northwest of the project area. This mound was listed in the National Register of Historic Places in 1975. At that time it was reported to be in excellent condition, standing 1.7 meters high and having a diameter of 22.9 meters. The mound is of Woodland period construction, perhaps related to the Adena culture (N.R.H.P. Inventory - Nomination Form, 10/21/75).

Located about 1065 meters southeast of the project area are the Troxell I and Troxell II sites (33FE65-66). These sites were identified in 1978 by a location phase survey performed in advance of the golf course constructed at Deer Creek State Park. Artifacts from these sites indicate an Archaic period/Early Woodland period utilization (Tituskin 1979). Some 880 meters east of the Troxell sites is the Yankeetown Road Farmstead Site (33PI154). Although a small amount of prehistoric material was encountered at this site, the major component is historic, dating mainly to A.D. 1820-1840 (O.A.I. file). In addition to these recently documented sites, W.C. Mills (1914) located four aboriginal mounds about three kilometers south of the project area along Deer Creek. However, the existence of these mounds has not been confirmed (Baby and Potter 1963).

Other sources of data concerning the prehistoric inhabitants of this region include archaeological surveys for the Deer Creek State Park golf course (Clarke 1979), the proposed relocation of U.S. Route 35 through Greene, Fayette, and Ross counties (Baker and Genheimer 1976; Baker 1979; DeWert 1980), small scale surveys in New Holland, (White 1977) and Clarksburg (Immel and Kime 1980), and a survey within the lower Deer Creek valley in Ross County (Piotrowski n.d.).

Survey Methods

Although the proposed shooting range will affect only a limited portion of the project area, the entire 7.3 ha. will be surveyed so that, as necessary, borrow materials can be removed from undeveloped areas.

Two survey strategies will be employed. Primary reliance will be placed on surface survey. A series of 2-3m wide strips will be plowed through the project area. The parallel transects are to be spaced at about 15m (49.2 ft.) intervals, permitting a systematic inspection of the ground surface. In our opinion, this interval is sufficiently narrow to permit identification of such archaeological remains as may be present in plow zone soils.

Surface survey will be supplemented by subsurface soil coring and test pit excavation. Although buried cultural strata are not anticipated within this project area, a limited number of hand augered soil cores along the bluff margin will ensure that this is the case. In the event that an archaeological site or sites are encountered, a limited number of 50cm squared test pits will be excavated to derive additional site data (e.g. depth of plowing, quality of site preservation). Such information would be required to assess an archaeological site or sites for National

Register eligibility. No test pits will be excavated if surface collection and soil augering survey results are negative.

Plowed survey transects will be mapped by brunton compass and metric tape. The field map will be keyed to the intersection of S.R. 277 and Cook Yankeetown Road or the benchmark if it can be located. During surface survey, all potentially cultural materials will be collected unless they are of obviously recent origin (i.e. aluminum cans, plastics, etc.). During test pit excavation, soils will be shoveled to the plow zone/subsoil interface, the pit floor will examined for intact cultural remains, and excavated soils will be trowelled back into the test pit to determine if prehistoric or other cultural remains are present in the plow zone. Written notes and, as appropriate, photographs will be maintained for all excavations.

Analysis/Report Preparation

All materials recovered will be cleaned and cataloged at the Ohio Historical Center, Columbus, Ohio. Standardized analytical procedures will be utilized to evaluate cultural remains and the distribution and context of such remains. These procedures will comply with Ohio Archaeological Council "Specifications for Reports of Archaeological Services". All artifacts, notes, and photographs will be entered into the collections of the Ohio Historical Society, Inc., subject to the collections policy of the Society.

Ohio Department of Natural Resources Obligations

O.D.N.R. has indicated its willingness to have the project area plowed to facilitate surface survey procedures. We therefore request that strips be plowed through the project area, excepting the area developed for a parking facility. Plowed strips should be parallel to one another at intervals of approximately 50 feet and if at all possible, the total pattern should be perpendicular to Cook Yankeetown Road. The road would provide the best baseline for mapping purposes. The plow should be run over each strip at least two times to breakdown soils--thereby increasing the likelyhood that artifacts present will be exposed for collection.

Survey Schedule

The Department of Contract would begin this survey two weeks after the completion of plowing (additional time would be required if it fails to rain in the project area within the two weeks after plowing). The written report would be completed within fifteen (15) working days of the completion of field

survey. With the onset of our primary field season, we have added one week to the completion schedule of reports. A summary letter to be used for coordination purposes could be provided within ten (10) working days of the completion of field survey.

Report Distribution

1 Original	O.D.N.R.
2 Xeroxes	O.D.N.R.
1 Xerox	O.H.S. County File
3 Xeroxes	Ohio Archaeological Council

REFERENCES

Baby, Raymond S. and Martha A. Potter
1963 Archaeological survey of proposed reservoir areas in Ohio. Ms. prepared for the National Park Service; on file at the Department of Archaeology, The Ohio Historical Society, Columbus, Ohio.

Baker, Stanley W.
1979 Preliminary archaeological survey of the proposed U.S. Route 35 by-pass through Fayette and Ross counties, Ohio (FAY/ROSS-35-17.54/0.00). Ms. submitted to the Ohio Department of Transportation; on file at the Department of Archaeology, The Ohio Historical Society, Columbus, Ohio.

Baker, Stanley W. and Bob Genheimer
1976 Preliminary archaeological survey of the proposed U.S. 35 by-pass in Greene and Fayette counties, Ohio. Ms. submitted to the Ohio Department of Transportation; on file at the Department of Archaeology, The Ohio Historical Society, Columbus, Ohio.

Clarke, Wesley S.
1979 Testing and excavation on Tick Ridge including the Tick Ridge Site (33PI44), Deer Creek State Park, Pickaway County. Ms. submitted to the Ohio Department of Natural Resources; on file at the Department of Archaeology, The Ohio Historical Society, Columbus, Ohio.

DeWert, John
1980 Phase III investigation of archaeological sites to be affected by proposed Route 35 through Greene and Fayette counties, Ohio, GRE/FAY-35-14.89/00.00 (PF 398). Ms. submitted to the Ohio Department of Transportation; on file at the Department of Archaeology, The Ohio Historical Society, Columbus, Ohio.

Immel, Elsie A. and Julie Kime
1980 Preliminary archaeological survey for a flood diversion project near Clarksburg, Ross County, Ohio. Ms. submitted to Soil Conservation Service, Columbus, Ohio; on file at the Department of Archaeology, The Ohio Historical Society, Columbus, Ohio.

Ohio Archaeological Inventory
n.d. Housed at the Department of Archaeology, The Ohio Historical Society, Columbus, Ohio.

Piotrowski, Leonard R.
n.d. Deer Creek project (Ross County) final report. Ms. on file at the Department of Archaeology, The Ohio Historical Society, Columbus, Ohio.

National Register of Historic Places Inventory Nomination Form
1975 Fayette County, Mount Sterling vicinity, Jackson Mound.

Tituskin, Sue
1979 Preliminary archaeological survey of the Deer Creek State Park golf course area, Fayette and Pickaway counties, Ohio. Ms. submitted to the Ohio Department of Natural Resources; on file at the Department of Archaeology, The Ohio Historical Society, Columbus, Ohio.

White, Claude F.
1977 An archaeological impact assessment of the New Holland Sewer System (12-4-574). Ms. submitted to the Village of New Holland; on file at the Department of Archaeology, The Ohio Historical Society, Columbus, Ohio.

Appendix E

Supplemental Archaeology Report

MSchaney/5346

7 April 2010

Supplemental Archaeological Investigation at Deer Creek Shooting Range, Madison Township, Fayette County, Ohio

A supplemental archaeological investigation was conducted for the Shooting Range Drainage Modification project located at Deer Creek Wildlife Area in Fayette County, Ohio on April 5, 2010 by a USACE Archaeologist. A 15 ft trench was excavated approximately 3 ft wide and 3 ft deep, in the floodplain of Deer Creek and an unnamed secondary artificial drainage. Location was determined by the change in vegetation pattern / land use that has developed since the previous archaeological investigation conducted by Elsie A. Immel of the Department of Contract Archaeology, Ohio Historical Society in June 1983. During the 1983 investigation this portion of the project area was forested and subsequently not surveyed.

The trench revealed neither cultural artifacts, nor any soil horizons suitable for cultural integrity. Topsoil was a silty loam that ranged from black to very dark grayish brown in color. Subsoil was encountered at 25 inches below ground surface and consisted of a yellowish brown clay loam that graded into a gravelly sandy loam at the western end of the trench, nearer the stream. This soil profile was interpreted as alluvial deposition eroding from agricultural fields further upstream and being deposited at this location by flood waters being backed-up by the adjacent bridge over Deer Creek.

In accordance with 36CFR800.4(d)(1), it is the District's determination that ***no historic properties will be affected*** by the Project, as none are present. However, if unanticipated archeological deposits or human remains are discovered during construction, the District requires that all work near the location of the discovery must cease and the District Archeologist shall be contacted immediately. The Ohio State Police, the Fayette County Coroner, and OHPO must also be notified immediately if human remains are discovered.

Appendix F

Other Agency Communications

ATTACHMENT F
Request for comments to the U.S. Fish and Wildlife Service

Division of Wildlife
David M. Graham, Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

June 22, 2009

Dr. Mary Knapp
U.S. Fish and Wildlife Service
Ecological Services
4625 Morse Road
Suite 104
Columbus, OH 43230

RE: Shooting Range Drainage Modification
Deer Creek Wildlife Area
Madison Township
Fayette County, Ohio

Dear Dr. Knapp:

An intermittent tributary to Deer Creek runs north of the shooting range at the Ohio Department of Natural Resources, Division of Wildlife (DOW), Deer Creek Wildlife Area. Lead shot from the range falls into the intermittent tributary. The Ohio Environmental Protection Agency (EPA) did not detect lead in samples of the water from the tributary. However, based on orders issued by the EPA, the DOW must submit a plan for preventing spent shot from falling into the tributary near the Deer Creek Shooting Range. The DOW plans to bring the area into compliance by relocating the unnamed tributary in a manner such that the activities of the shooting range no longer cause lead pellets to be directed toward the stream.

Past site disturbance in the project area involved a maintained grass field and row crop agriculture along with the active shooting range with lead contamination issues in the tributary. The habitat of the area to be impacted consists of mowed, maintained lawn and the narrow riparian habitat at the current tributary location.

The DOW requests information you have regarding the occurrence or possible occurrence of Federally-listed threatened or endangered species within the vicinity of this project.

The DOW finds the project is within the range of the Indiana bat (*Myotis sodalis*), a state and federally endangered species, and the Eastern massasauga (*Sistrurus catenatus*), a state endangered and a federal candidate snake species.

The DOW finds that the following species of trees have relatively high value as potential Indiana bat roost trees: Shagbark hickory (*Carya ovata*), Shellbark hickory

(*Carya laciniosa*), Bitternut hickory (*Carya cordiformis),* Black ash (*Fraxinus nigra*), Green ash (*Fraxinus pennsylvanica*), White ash (*Fraxinus americana*), Shingle oak (*Quercus imbricaria*), Northern red oak (*Quercus rubra*), Slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*), Eastern cottonwood (Populus deltoides), Silver maple (*Acer saccharinum*), Sassafras (*Sassafras albidum*), Post oak (*Quercus stellata*), and White oak (*Quercus alba*). Indiana bat habitat consists of suitable trees that include dead and dying trees of the species listed above with exfoliating bark, crevices, or cavities in upland areas or riparian corridors and living trees of the species listed above with exfoliating bark, cavities, or hollow areas formed from broken branches or tops. If suitable trees occur within the project area, these trees will be conserved. If suitable habitat occurs on the project area and trees must be cut, cutting will occur between September 30 and April 1. Since this construction guidance will be followed, the DOW believes the project is not likely to impact this species.

Although the project is within the range of the Eastern massasauga, there are no records to indicate the species has been found in or near the project area. There are no wetlands on the project area and the area has been routinely disturbed by mowing, agriculture, and human activity. Therefore, the DOW believes the project is not likely to impact this species.

If you have any questions, contact me at (614) 265-6631 or becky.jenkins@dnr.state.oh.us. Thank you for your assistance.

Sincerely,

Becky Jenkins
Environmental Specialist

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / FAX (614) 416-8994

COPY FOR YOUR INFORMATION

September 1, 2009

Becky Jenkins
ODNR
Division of Wildlife
2045 Morse Road. Bldg G
Columbus, OH 43229

TAILS: 2009-TA-0798

Re: Deer Creek Shooting Range Drainage Modification, Fayette County, Ohio.

Dear Ms. Jenkins:

This letter is in response to your June 22, 2009 letter requesting information we may have regarding the occurrence or possible occurrence of federally listed threatened or endangered species within the vicinity of the proposed project located at the Deer Creek Wildlife Area shooting range in Madison Township, Fayette County, Ohio. According to your information, lead shot from the range falls into the intermittent tributary of Deer Creek and the Division of Wildlife (DOW) has been ordered by the OEPA to submit a plan for preventing spent shot from falling into the tributary near Deer Creek Shooting Range. We understand that the DOW plans to bring the area into compliance by relocating the unnamed tributary currently located north of the shooting range to the southern portion of the shooting range near Yankeetown Pike Road. We understand that ODNR is proposing to relocate approximately 1,800 lf of stream under a NWP 38 designed for the cleanup of hazardous and toxic waste. Additional information was received on the proposed project on August 12, 2009 from ODNR. We understand that an environmental assessment was requested by the USACE and that ODNR is in the process of finalizing the EA. We understand that tree clearing has recently occurred within the project area and that the riparian buffer to the unnamed tributary proposed to be relocated has been removed prior to receiving permits for the proposed project.

There are no Federal wildlife refuges, wilderness areas, or Critical Habitat within the vicinity of this site.

The Service recommends that impacts to streams and wetlands be avoided, and buffers surrounding these systems be preserved. Streams and wetlands provide valuable habitat for fish and wildlife resources, and the filtering capacity of wetlands helps to improve water quality. Naturally vegetated buffers surrounding these systems are also important in preserving their wildlife-habitat and water quality-enhancement properties. The proposed activities do not constitute a water-dependent activity, as described in the Section 404(b)(1) guidelines, 40 CFR 230.10. Therefore, practicable alternatives that do not impact the special aquatic site (i.e., wetlands, streams) are presumed to be available, unless clearly demonstrated otherwise. Therefore, before applying for a Section 404 permit, **the client should closely evaluate all project alternatives that do not involve stream relocation**, and if possible, select an alternative that avoids impacts to the aquatic resource.

We understand that unauthorized activities (tree/riparian buffer clearing) may have already had direct/indirect impacts to the on-site stream (tributary to Deer Creek), as well as possible impacts downstream to Deer Creek. Riparian zones provide a variety of extremely valuable functions including providing habitat, moderating water temperature, stabilizing banks, limiting erosion, improving water quality, and minimizing impacts of flood events. We recommend restoring the cleared area by replanting with native trees, shrubs and vegetation and enhancing the on-site riparian buffer to the unnamed tributary to Deer Creek. We strongly recommend that the riparian buffer be restored to 100 ft on both sides of the unnamed tributary to Deer Creek to protect water quality from lead contamination and support habitat for fish and wildlife. We recommend replanting with native vegetation, removal of invasive plant species, and preserving riparian corridors to the maximum extent possible. The attached document is a list of recommended native grass species and a list of native trees that may benefit the Indiana bat.

According to the OEPA's Findings and Orders, the majority of spent pellets fired from shotguns fall onto land on the near and far sides of the tributary and some fall into the tributary. However, we understand that no lead was detected by the OEPA in the samples of the water from the tributary. The OEPA orders state that ODNR must submit a plan for preventing spent shot from falling into the tributary and the plan may provide for relocation of the tributary, in accordance with the law. We understand that ODNR proposes to relocate the tributary to the southern end of the shooting range along Yankeetown Pike Road and SR 207 and install a box culvert under the existing driveway to the parking lot. According to ODNR, the proposed plan will facilitate a 50 foot overwide channel design to allow the stream to naturally seek its own alignment, floodplain, pools, riffles and bankfull section.

The Service is concerned that the proposed plan to relocate the stream between Yankeetown Road and the existing range while culverting it under the access road will shorten the overall length of the stream. In addition to this, the stream would be channelized next to the existing development, not allowing for enough area to support natural channel design or an adequate buffer to protect the stream. The Service recommends that mitigation for any unavoidable stream impacts occur at a minimum in kind replacement ratio of 1.5:1. Additional mitigation at a ratio of 1:1 should also occur and may include stream enhancement or preservation. If stream relocation is to count towards stream mitigation, the relocated stream channel must support natural channel habitat features including connectivity to vegetated flood plain, meanders, riffle/run/pool complexes, and natural substrate. The Service believes that ODNR should seek alternatives to relocating the stream and these alternatives should address the collection of lead shot. OEPA's orders state that the plan should provide for development of a program for collection of shot fall within the shotgun range. The Service has not seen evidence that the current plan will provide for the collection of lead shot. We understand that targets for the rifle range are placed on 10-15 foot high embankments that are further protected by umbrella-like structures that are designed to catch fragments and ricochets. The Service suggests that ODNR explore a plan that will provide a barrier to the stream that may include modification of the earth embankments to increase the height and width to prevent lead from reaching the stream.

If the proposed project is to be permitted through a NWP 38 the activity must contain, stabilize or remove hazardous or toxic waste materials. The proposed plan to relocate the existing stream on the shooting range and filling in the existing stream channel does not appear to meet the current qualifications of NWP 38, as this permit is intended for cleanup of hazardous and toxic waste and consists of the above mentioned activities. The Service feels that an individual permit may be more appropriate for this type of project where there the proposed impacts include approximately 1,800 lf of stream impacts.

ENDANGERED SPECIES COMMENTS: The proposed development lies within close proximity to the **Indiana bat** (*Myotis sodalis) a* federally endangered species, the **eastern massasauga** (*Sistrurus catenatus catenatus*), a Federal Candidate species, and the **bald eagle** (*Haliaeetus leucocephalus*) a species of concern, protected by the Bald and Golden Eagle Protection Act and Migratory Bird Protection

Act.

The proposed project lies within 1 mile of a positive recording of a male Indiana bat that was captured in 2008 within the Deer Creek Wildlife Area, directly south of the project area. According to the OEPA's Director's Final Findings and Orders, the tributary was bordered on both sides by an approximate 30 foot buffer of trees, shrubs and vegetation. You stated in the June 22, 2009 letter that if suitable habitat occurs on the project area and trees must be cut, cutting will occur between September 30 and April 1, to avoid adverse impacts to the Indiana bat. However, we understand that all trees along the stream were removed during the summer of 2009 without prior consultation with the Service. Aerial maps indicate that this riparian buffer was connected to a larger forested corridor that buffers Deer Creek to the east and it appears likely that this habitat is serving as roosting/foraging habitat for Indiana bats within the area.

The Service cannot assess the impacts to fish and wildlife resources that may have already occurred because we were not able to examine the onsite habitat prior to clearing and development. We assume that any suitable habitat for federally listed species that has already been impacted was of high quality, and that listed species may have been impacted by the action. Any mobile species that may have inhabited the site prior to disturbance would no longer be expected to inhabit the area and adverse impacts (such as decreased fitness or reduced reproductive capacity) resulting from habitat loss would likely have occurred. Any non-mobile species may have already been injured or killed by actions that have taken place. **We strongly recommend that future projects be coordinated with this office prior to clearing and ground disturbing activities commencing, and that substantial and additional mitigation for un-permitted stream, wetland, and associated high quality upland impacts occur immediately. As bats are known to occur within similar habitat and in very close proximity to the project area, it is possible that adverse affects and take may have already occurred from unauthorized activities.**

For all Federal actions, which are defined under the ESA as action(s) funded, authorized, or carried out by the Federal government, the action agency (the Federal agency funding, authorizing, or carrying out the action) must ensure that their action does not jeopardize the continued existence of a federally listed endangered or threatened species. Under section 7 consultation, the Service and the USACE must evaluate the direct and indirect effects of the action being proposed, including all interdependent and interrelated actions. Interdependent and interrelated actions, as defined in 50 CFR §402.02, are actions which have no independent utility apart from the proposed action and actions that are part of a larger action and depend on the larger action for their justification. Therefore, the proposed action in its entirety must be considered during the consultation process, not just those parts of the action that require authorization from a Federal agency. If operations begin prior to obtaining the necessary authorization, an applicant runs the risk of violating the ESA section 9 take provision and may preclude reasonable and prudent avoidance and minimization measures or alternatives developed during the section 7 consultation process. Furthermore, the Service cannot consult on activities that have already occurred and we must assume species have been impacted by those activities. Part of the Corps of Engineers 404 permitting process includes section 7 consultation and if the Service cannot concur due to after the fact activities, the 404 permit could be jeopardized.

Specifically, the Service is concerned with any forest clearing activities within suitable Indiana bat habitat, which may have been undertaken and/or completed prior to applying for a Federal permit. At the point when it is determined that any Federal permit is necessary, no irreversible or irretrievable commitment of resources (e.g., tree clearing) should occur until that permit has been obtained, and all necessary consultation between the Federal action agency, Service, and any other Federal agencies and/or their designees has been completed. In summary, we strongly recommend that, for all projects where forested habitat will be impacted, no work occur on-site until the Service has had the opportunity to review the proposed project in order to assist project proponents in complying with section 9 of the ESA.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973 (ESA), as amended, and are consistent with the intent of the National Environmental Policy Act of 1969 and the U.-S. Fish and Wildlife Service's Mitigation Policy. This letter provides technical assistance only and does not serve as a completed ESA section 7 consultation document.

We appreciate this opportunity to provide the above comments and your conscientious efforts to comply with Federal requirements. If you have questions, or if we may be of further assistance in this matter, please contact Melanie Cota at extension 15 in this office or by email at Melanie_Cota@fws.gov or visit our website at http://www.fws.gov/midwest/Ohio/.

Sincerely,

Mary Knapp

Mary Knapp, Ph.D.
Field Supervisor

cc: Ohio EPA, 401/Wetland Section, Attn: Randy Bournique, Columbus, OH
USACOE, Huntington District Planning Section, Attn: Andy Johnson
USACOE Huntington District North Regulatory Section, Attn: Jim Spence

Suggested Native Tree Species for Indiana Bat Habitat

^*Black Ash	*Fraxinus nigra*
+^*Green Ash	*Fraxinus pennsylvanica*
+White Ash	*Fraxinus americana*
^*River Birch	*Betula nigra*
+^Eastern Cottonwood	*Populus deltoids*
^American Elm	*Ulmus americana*
Slippery Elm	*Ulmus rubra*
^Bitternut Hickory	*Carya cordiformis*
^*Shagbark Hickory	*Carya ovata*
^Shellbark Hickory	*Carya laciniosa*
*Black Locust	*Robinia pseudoacacia*
^*Red Maple	*Acer rubrum*
^*Silver Maple	*Acer saccharinum*
*Sugar Maple	*Acer saccharum*
+*Black Oak	*Quercus velutina*
Post Oak	*Quercus stellata*
*Red Oak	*Quercus rubra*
^Shingle Oak	*Quercus imbricaria*
^*White Oak	*Quercus alba*
Sassafras	*Sassafras albidum*
^*Sycamore	*Plantanus occidentalis*
^Black Willow	*Salix nigra*

^ Indicates bottomland or mesic species; suitable for planting near rivers and streams

* Indicates tree species available from the Ohio Division of Forestry (2001)

+ Species most likely to survive on reclaimed mine land.

It is recommended that no more than 25% of the trees planted are one species. This will provide diversity necessary for wildlife habitat.

Ohio Field Office
U.S. Fish and Wildlife Service

Ohio Department of Natural Resources

TED STRICKLAND, GOVERNOR — SEAN D. LOGAN, DIRECTOR

Division of Natural Areas & Preserves
Steven D. Maurer, Chief
2045 Morse Road, F-1
Columbus, OH 43229-6693
Phone: (614) 265-6453 Fax: (614) 267-3096

May 20, 2008

Becky Jenkins
ODNR Division of Wildlife
2045 Morse Rd., G3
Columbus, OH 43229

Dear Ms. Jenkins:

After reviewing our Natural Heritage maps and files, I find the Division of Natural Areas and Preserves has records of rare or endangered species near the ODNR Division of Wildlife Deer Creek Shooting Range project #IOHXO1. The site is located 0.1 mi. NE. of the junction of St.Rt. 207 and Co.Rt. 34, Madison Twp., Fayette Co., Mount Sterling Quadrangle. *Moxostoma carinatum,* River Redhorse, has an Ohio Status of Special Concern and was last observed at this location on August 19, 1985. The map I have included with this letter displays the location of this record.

There are no existing or proposed state nature preserves at the project site. We are also unaware of any unique ecological sites, geologic features, breeding or non-breeding animal concentrations, state parks, scenic rivers, or state forests within the project area.

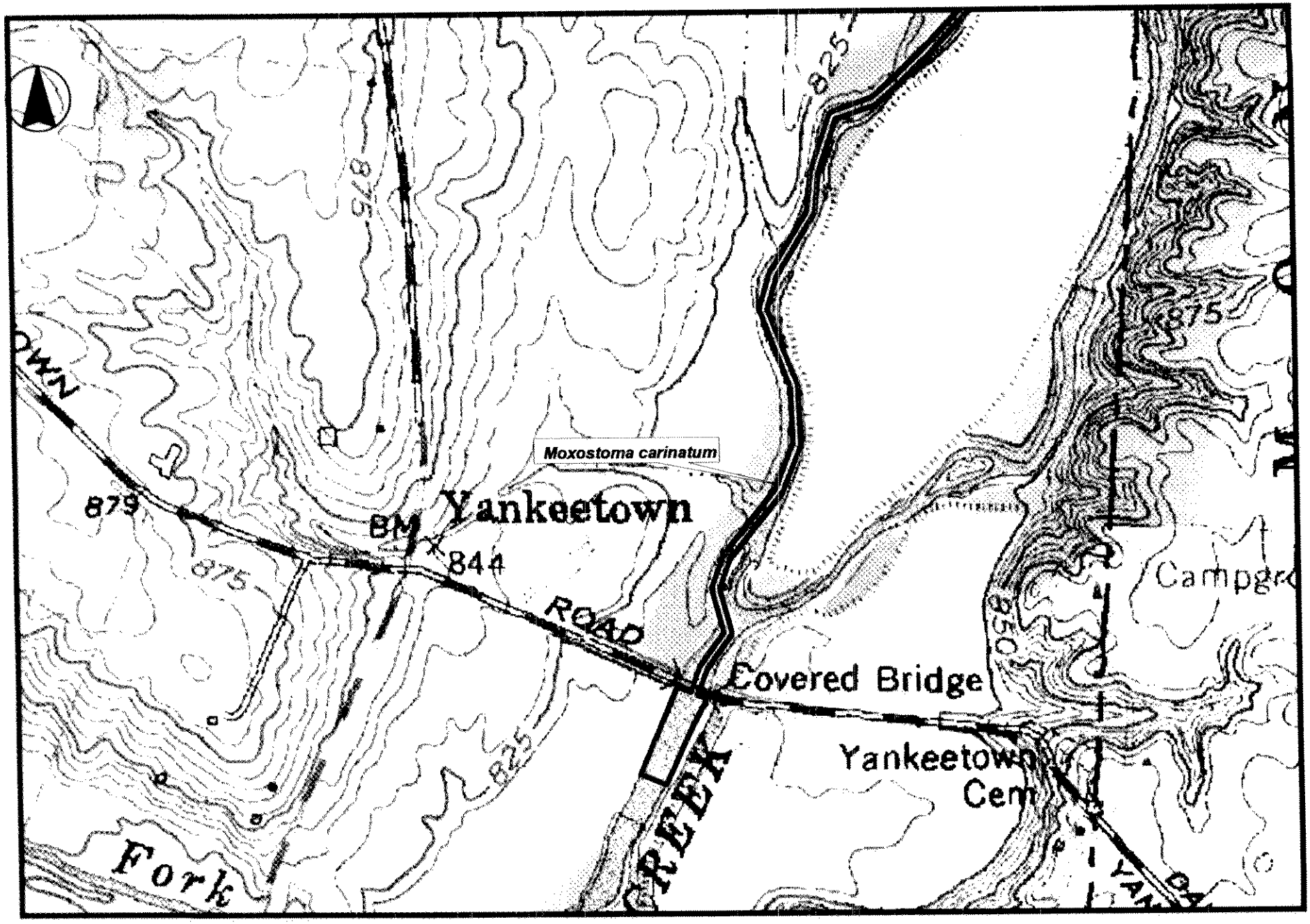
Our inventory program has not completely surveyed Ohio and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although we inventory all types of plant communities, we only maintain records on the highest quality areas.

Please contact me at (614) 265-6409 if I can be of further assistance.

Sincerely,

Butch Grieszmer, Data Specialist
Resource Services Group

Deer Creek Shooting Range #IOHXO1



Division of Wildlife
David M. Graham, Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

October 22, 2009

Julie Quinlan, Program Reviews Manager
Ohio Historic Preservation Office
567 East Hudson Street
Columbus, OH 43211-1030

RE: Deer Creek Shooting Range
Deer Creek Wildlife Area
Madison Township, Fayette County, Ohio

Dear Ms. Quinlan:

The Ohio Department of Natural Resources, Division of Wildlife (DOW) has constructed a shooting range on the Deer Creek Wildlife Area. The range has been in use for many years. In June, 1983, prior to beginning construction on the shooting range, a preliminary archaeological survey was done. Enclosed is the "Preliminary Archaeological Survey for the Proposed Deer Creek Shooting Range in the Deer Creek Wildlife Area, Fayette County, Ohio" prepared by Elsie A. Immel and dated June 1983. The conclusion of this survey was that "…the potential is low for these sites being of National Register quality and that further work would not significantly add to the information already obtained."

Due to an order by the Ohio EPA, the DOW must submit a plan for preventing spent shot from falling from the shotgun range into the tributary near the Deer Creek Shotgun Range. The tributary is an unnamed intermittent tributary to Deer Creek. The DOW proposes to comply with this order by relocating a portion of the tributary from behind the range to the front of the range. This action will require a permit from the U.S. Army Corps of Engineers.

The area of impacts is the same as the area covered in the enclosed survey findings. Since the survey was done, the shooting range was constructed and the area has been, and still is, used as a shooting range surrounded by mowed grasses with an agricultural field located behind the range. No buildings will be constructed or destroyed in association with this project. All required permits will be obtained prior to the start of work.

The DOW respectfully requests your review of the information provided and your determination whether historic properties will potentially be affected by this project and if further coordination with your office is required.

If you need additional information, contact me at (614) 265-6631 or at becky.jenkins@dnr.state.oh.us

Sincerely,

Becky Jenkins, Environmental Specialist

Enclosures

November 18, 2009

Becky Jenkins
Division of Wildlife
2045 Morse Road, Building G
Columbus, Ohio 43229-6693

Dear Ms. Jenkins:

Re: Deer Creek Shooting Range, Madison Township, Fayette County, Ohio

This is in response to your correspondence, received on October 23, 2009, regarding the relocation of an unnamed small stream at this address. My comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and the associated regulations at 36 CFR Part 800. Based on the information submitted, it is my opinion that the proposed undertaking will not affect properties listed in or eligible for listing in the National Register of Historic Places. No further coordination is required unless the project changes or archaeological remains are discovered during the course of the project. In such a situation, this office should be contacted as per 36 CFR 800.13.

If you have any questions, please contact me at (614) 298-2000, or by email at nyoung@ohiohistory.org.

Sincerely,

Nathan J. Young, Project Reviews Manager
Resource Protection and Review

1029017

OHIO HISTORICAL SOCIETY
Ohio Historic Preservation Office
1982 Velma Avenue, Columbus, Ohio 43211-2497 ph: 614.298.2000 fx: 614.298.2037
www.ohiohistory.org

Appendix G

Ohio Environmental Protection Agency Order

BEFORE THE
OHIO ENVIRONMENTAL PROTECTION AGENCY

In the Matter of:		
Ohio Department of Natural Resources	:	Director's Final Findings
2045 Morse Road	:	and Orders
Columbus, Ohio 43229	:	
	:	
Respondent.	:	

PREAMBLE

Respondent Ohio Department of Natural Resources ("Respondent") and the Director of the Ohio Environmental Protection Agency ("the Director") agree as follows:

I. JURISDICTION

These Final Findings and Orders ("Orders") are issued by the Director to Respondent pursuant to the authority vested in the Director under Ohio Revised Code ("ORC") ' ' 6111.03 and 3745.01.

II. PARTIES BOUND

These Orders shall apply to and be binding upon Respondent and its successors in interest liable under Ohio law.

III. DEFINITIONS

Unless otherwise stated, all terms used in these Orders shall have the same meaning as defined in ORC Chapter 6111. and the rules promulgated thereunder.

IV. FINDINGS

The Director makes the following findings:

1. Respondent owns and operates a public shooting range that is part of the Deer Creek Wildlife Area in Fayette County near Mt. Sterling, Ohio.

2. The shooting range is located east of, and near to, State Route 207 on the north side of Cook-Yankeetown Road. The range is divided into two sections, a shotgun (low-velocity shell) range and a rifle/pistol (high-velocity shell) range. The shotgun range faces north and guns are discharged in that direction, with spent pellets falling to earth in a large fan-shaped area similar in shape to a baseball field with the shooting area at home plate. The rifle/pistol range is east of the shotgun range and also faces north. This range is separated by earthen embankments into three separate sub-ranges of 100 yards, 50 yards and 25 feet in length. Targets are placed in front of 10- to 15-foot high embankments that form the north end of the range. The target end of each sub-range is further protected by umbrella-like structures called "Eyebrows," which catch fragments and ricochets.

3. An unnamed tributary to Deer Creek ("the tributary") flows east into Deer Creek. Deer Creek runs roughly parallel to the rifle/pistol range, about 70 yards to the east. This tributary is relatively small and may even be intermittent, completely lacking flow during dry periods. The tributary is bordered on both sides by roughly 30-foot strips of trees, brush and vegetative ground cover. The stream channel appeared to have been channelized and showed signs of erosion with steeply cut, exposed banks. This tributary is currently not designated with a particular aquatic use under Ohio rules. Behind the tributary is a fallow field, which is managed for wildlife by ODNR. The field is planted in rotation with corn, soybean and timothy grass and is disked every sixth year.

4. The tributary lies to the north of the shotgun range and runs behind the embankments of the rifle/pistol range, at the target end. The tributary bisects the fan-shaped shotgun range, about 350 feet north of the shooting stations. The majority of spent pellets fired from shotguns falls onto land on the near and far sides of the tributary, but some pellets also fall into the tributary.

5. On or about March 6, 2006, a resident living near the range, James Hoyle, sent to Ohio EPA a verified complaint regarding the shooting range. Mr. Hoyle alleged that lead shot from the shotgun range and lead fragments from the pistol/rifle range fall into and contaminate the tributary. He further alleges that

waterfowl use the area; especially during high water periods when waterfowl are migrating through in spring and winter, and that they dabble in the flood plain of the stream and may consume lead shot. In addition, he claims that his family and other citizens who recreate near the shooting range are at risk of lead contamination. He further alleged that Respondent is in violation of the Clean Water Act and Chapter 6111 of the Ohio Revised Code, and OAC ' 3745-1-04, including paragraph (D) of that rule, which provides: "All Ohio waters shall be free from substances entering the waters as a result of human activity in concentrations that are toxic or harmful to human, animal or aquatic life and/or are rapidly lethal in the mixing zone."

6. The spent lead shotgun pellets that are discharged from the guns and into the tributary are other wastes, as defined in ORC ' 6111.01(D). The tributary is a "water of the state" as defined in ORC ' 6111.01(H). Placement of this waste into waters of the state constitutes pollution, as defined in ORC ' 6111.01(A). The Ohio EPA did not detect lead in samples of the water from the tributary.

7. Pursuant to ORC ' 6111.04(A), no person shall place or discharge, or cause to be placed or discharged, in any waters of the state any sewage, sludge, sludge materials, industrial waste, or other wastes without a valid, unexpired permit.

8. Respondent has caused to be placed in to a water of the state, the tributary, other wastes, the spent pellets. Respondent does not hold a valid, unexpired permit authorizing it to discharge or allow the discharge of the lead pellets or other lead fragments and pellets into the tributary. Respondent is in violation of O.R.C. 6111.04(A).

9. Pursuant to ORC Section 6111.07(A), no person shall violate or fail to perform any duty imposed by ORC Sections 6111.01 to 6111.08 or violate any order, rule, or term or condition of a permit issued or adopted by the Director pursuant to those sections. Each day of violation is a separate offense.

10. The Director has given consideration to, and based his determination on, evidence relating to the technical feasibility and economic reasonableness of complying with these Orders and to evidence relating to conditions calculated to result from compliance with these Orders, and their relation to the benefits to the people of the state to be derived from such compliance in accomplishing the purposes of ORC Chapter 6111.

V. ORDERS

1. Within ninety (90) days after the effective date of these Orders, Respondent shall submit a plan for preventing spent shot from falling into the tributary. The plan may provide for relocation of the tributary, in accordance with law. The plan should provide for development of a program for collection of shot fall within the shotgun range. The plan shall also contain a schedule for implementation. In developing an implementation schedule, the schedule may account for time taken for review by the U.S. Army Corps of Engineers of any application submitted to the Corps and may account for time taken for review by the Director of any application submitted to the Director in accordance with section 401 of the Clean Water Act; provided that Respondent acts expeditiously to any requests by the Corps or the Director for information or revisions of the 404 or 401 applications or other approvals. As an example, the schedule may provide for submittal to the Corps of a 404 application within so many days of an earlier milestone, and then provide for the next milestone within so many days after the Corps approves a 404 application.

2. Prior to approval of the plan by Ohio EPA, and within thirty (30) days of receipt of any written comments from Ohio EPA regarding the plan required under Order No. 1 above, Respondent shall make any requested changes or modifications necessary to make the plan effective in preventing spent shot from falling into the tributary.

3. Within one hundred twenty (120) days after approval by the Director of Ohio EPA of the plan submitted by Respondent pursuant to Order No. 1 of these Findings and Orders, Respondent shall begin implementation of the plan.

4. Every one hundred twenty (120) days starting with approval by the Director of Ohio EPA of the plan submitted by Respondent pursuant to Order No. 1 of these Findings and Orders, Respondent shall submit written reports to Ohio EPA on the progress Respondent has made implementing the plan.

VI. TERMINATION

Respondent's obligations under these Orders shall terminate when Respondent certifies in writing and demonstrates to the satisfaction of Ohio EPA that Respondent has performed all obligations under these Orders and the Chief of Ohio EPA's Division of Surface Water acknowledges, in writing, the termination of these Orders. If Ohio

EPA does not agree that all obligations have been performed, then Ohio EPA will notify Respondent of the obligations that have not been performed, in which case Respondent shall have an opportunity to address any such deficiencies and seek termination as described above.

The certification shall contain the following attestation: certify that the information contained in or accompanying this certification is true, accurate and complete.

This certification shall be submitted by Respondent to Ohio EPA and shall be signed by a responsible official of Respondent. For purposes of these Orders, a responsible official is defined in OAC Rule 3745-33-03(E)(4) for a state agency.

VII. OTHER CLAIMS

Nothing in these Orders shall constitute or be construed as a release from any claim, cause of action or demand in law or equity against any person, firm, partnership or corporation, not a party to these Orders, for any liability arising from, or related to the violations alleged in these Orders.

VIII. OTHER APPLICABLE LAWS

All actions required to be taken pursuant to these Orders shall be undertaken in accordance with the requirements of all applicable local, state and federal laws and regulations. These Orders do not waive or compromise the applicability and enforcement of any other statutes or regulations applicable to Respondent.

IX. MODIFICATIONS

These Orders may be modified by agreement of the parties hereto. Modifications shall be in writing and shall be effective on the date entered in the journal of the Director.

X. NOTICE

All documents required to be submitted by Respondent pursuant to these Orders shall be addressed to:

Ohio Environmental Protection Agency
Central District Office
Division of Surface Water
Attn: DSW Enforcement Unit Supervisor
122 South Front St.
Columbus, Ohio 43215

or to such persons and addresses as may hereafter be otherwise specified in writing by Ohio EPA.

XI. RESERVATION OF RIGHTS

Ohio EPA and Respondent each reserve all rights, privileges and causes of action, except as specifically waived in Section XII. of these Orders.

XII. WAIVER

In order to resolve disputed claims, without admission of fact, violation or liability, Respondent consents to the issuance of these Orders and agrees to comply with these Orders. Compliance with these Orders shall be a full accord and satisfaction for Respondent's liability for the violations specifically cited herein.

Respondent hereby waives the right to appeal the issuance, terms and conditions, and service of these Orders, and Respondent hereby waives any and all rights Respondent may have to seek administrative or judicial review of these Orders either in law or equity.

Notwithstanding the preceding, the Ohio EPA and Respondent agree that if these Orders are appealed by any other party to the Environmental Review Appeals Commission, or any court, Respondent retains the right to intervene and participate in such appeal. In such an event, Respondent shall continue to comply with these Orders notwithstanding such appeal and intervention unless these Orders are stayed, vacated or modified.

XIII. EFFECTIVE DATE

The effective date of these Orders is the date these Orders are entered into the Ohio EPA Director's journal.

XIV. SIGNATORY AUTHORITY

Each undersigned representative of a party to these Orders certifies that he or she is fully authorized to enter into these Orders and to legally bind such party to these Orders.

IT IS SO ORDERED AND AGREED:

Ohio Environmental Protection Agency

Chris Korleski
Director

Date 1/14/08

IT IS SO AGREED:

Ohio Department of Natural Resources

Sean D. Logan
Director

Date 11/29/07