

**Cover Sheet**

**Proposed agency actions:** Approval of the Surface Use Plan of Operations submitted by Carlton Oil Company for their existing lease on federal minerals at the Drake 4C well site.

**Type of statement:** Environmental Assessment

**Lead agency:** USDA – Forest Service

**Cooperating agencies:** USDI – Bureau of Land Management

**Deciding official:** Myra L. Williamson, Athens District Ranger

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**Abstract:** Carlton Oil Corporation is proposing to exercise their lease of federal minerals to develop the Drake 4C well in Benton Township, Monroe County. Carlton Oil has submitted an Application for Permit to Drill an oil/gas well to the United States Department of Interior – Bureau of Land Management (BLM). BLM has, in turn, forwarded Carlton Oil Corporation’s request for approval of the Surface Use Plan of Operations (SUPO) to the USDA – Forest Service. Less than one acre of federal land would be disturbed to construct 400 feet of additional access road and a 100’ by 200’ well pad.

A scoping letter was sent to interested members of the public in February, 2002, and a notice was published in the newspaper of record. Twenty-five scoping comments were received from the public. Issues raised resulted in an additional alternative being proposed which includes mitigations as proposed by Forest Service specialists. Alternative A is the No Action alternative. Alternative B is to approve the SUPO as submitted by the proponent. Alternative C would be to approve the SUPO subject to mitigations required by specialists upon evaluation of the impacts.

The Forest Service has chosen Alternative C as the preferred alternative, to approve Carlton’s SUPO subject to mitigations.

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## Drake 4C Federal Well Development Environmental Analysis

**Brief Summary** Carlton Oil Corporation's lease on reserved minerals converted to a federal lease in February 1996. The Drake #4 and Drake 4A wells were developed in 1984 during private ownership. The Drake #4B well was developed in October 2001. Carlton filed a Notice of Staking for the Drake #4C well on December 18, 2001. A field review of the site was held on January 30, 2002. An Application for Permit to Drill (APD) was presented to the Bureau of Land Management on February 5, 2002, upon which BLM asked the Wayne National Forest to approve the companion Surface Use Plan of Operation (SUPO) for the development of the Drake 4C well. This document analyzes the impacts of the SUPO.

### Chapter 1: Purpose and Need

**Purpose:** When Carlton Oil Corporation proposed to exercise their lease of federal minerals to develop a fourth oil/gas well on the Drake Lease in Benton Township, it triggered the Forest Service to analyze the potential impacts of the site development, as called for in the Record of Decision for Amendment 8 to the Wayne Forest Plan.

**Need:** There is a need to make federally owned energy minerals available for public use. This project proposes to extract oil and/or gas for the purpose of supplying our nation's energy needs.

### Decision to be Made

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The decision to be made is whether to approve the Surface Use Plan of Operation for development of the Drake 4C well, construction of approximately 400 feet of new access road, and placement of an additional tank at an existing tank battery as submitted in the Application for Permit to Drill and accompanying Surface Use Plan of Operations; to approve the above plan with mitigations for the environmental impacts; or to disapprove it for reasons stated (no action). Forest Service approval of the SUPO is required before BLM can approve the Application for Permit to Drill.

### Scope of Decision

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The scope of this decision is limited to approval of the SUPO for occupancy of the surface in federal ownership, as proposed or with mitigations. The decision to allow the drilling of the well is made by the Bureau of Land Management in a separate analysis.

### Cooperating Agency Role

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The Department of Interior – Bureau of Land Management has the major role in issuing and supervising operations on mineral licenses, permits and leases for federally-owned minerals per the Mineral Leasing Act for Acquired Lands (Act of August 7, 1947). The Forest Service cooperates with the Interior agency per Memorandum of Understanding, 1991, to ensure that management goals and objectives are achieved, that impacts upon surface resources are mitigated to the maximum degree possible, and that the land affected is rehabilitated.

The Forest Supervisor shall review for adequacy proposed operating plans received from the BLM. Such reviews should be made in close coordination with BLM responsible officers. Upon completion of a review, the Forest Supervisor shall advise the BLM responsible officer of the Forest Service decision, and of terms and conditions required for protection of surface resources, and for access, construction, or use and protection of existing roads.

## **Environmental Assessment Mandated in Forest Plan**

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A decision was made in 1992 to make federally owned minerals underlying the Wayne National Forest available for lease. The Environmental Impact Statement/Record of Decision was incorporated as Amendment #8 to the Land and Resource Management Plan (USFS 1992). In Record of Decision, the Forest Service committed to analyzing the environmental effects resulting from the proposed development of individual tracts. This proposal must be analyzed under the decision of 1992.

## **Compliance with Forest Plan Management Area Prescriptions and Standards and Guidelines**

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Forest Plan Designation of 2.1: Management Area 2.1 on the Marietta Unit is defined in the Wayne Forest Plan as a one-mile corridor along the Little Muskingum River. This same corridor is identified as Visual Quality Zone: Retention in the Wayne Forest Plan. Visual Quality Objective maps are in FS files; a copy has been placed in Project File 7-2. The well pad for Drake 4C falls within the one-mile corridor.

### **Purpose of Management Area 2.1**

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From the Wayne National Forest Plan, Page 4-63: this area will emphasize a vegetative condition along canoe-able and fishable streams that:

- Protects and enhances visual quality
- Protects high quality recreation opportunities.

Mineral exploration and extraction may occur in this area (USFS 1988, Page 4-63). Viewing scenery, hunting, trapping, fishing, canoeing, and hiking are key recreation activities. Portions of [this area] appear as an unbroken mixture of shade tolerant trees such as sugar maple, silver maple, beech, paw-paw, river birch, buckeye, sycamore, and box elder. The vegetation is characterized by a continuous tree canopy and a variety of tree sizes. The forest is accessible by canoe-able streams, hiking trails, and a low density of roads open to public travel. Utility corridors occur here only when it is not in the public interest to locate them elsewhere.

### **Forest Roads Analysis**

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A landscape or watershed level roads analysis has not been prepared for this particular area. However, the road construction and use is limited in extent. It would not result in changes in access, such as changes in current use, traffic patterns, or road standards. Measurable adverse effects on soil and water resources, ecological processes, or biological communities are not expected to occur. Oil well sites are regularly monitored for compliance with operating plans and effects on resources. The determination has been made that additional roads analysis is not warranted. This decision is in compliance with FSM 7712.13c.

### **Compliance with other laws and regulations**

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On August 6, 1992, the Forest Supervisor of the Wayne-Hoosier National Forest signed a Record of Decision (ROD) for oil and gas resources on the Wayne National Forest (USFS 1992). The ROD approved Amendment #8 to the Wayne Forest Plan, which provides specific direction on the management of oil and gas resources on the Forest. The direction in Amendment 8 is taken from 36 CFR Section 228, Parts 107 and 108 (see Appendix A).

Chapter 1509 of the *Ohio Oil and Gas Laws* requires well casing and storage and disposal of brine and other wastes in approved locations. Compliance is included in the Application for Permit to Drill. A copy of these regulations can be found in Appendix A, Regulatory Format.

BLM regulations, including 43 CFR Part 3160 (Onshore Oil and Gas Operating Regulations) and Onshore Oil and Gas Orders No. 1 and 2, establish requirements for drilling operations on federal leases and compliance with state and federal laws for cultural resources and threatened and endangered species. The regulations require conformance with lease terms, stipulations and available technology, efficient resource recovery, protection from drainage, environmental safeguards, reclamation of disturbed lands, protection of underground sources of fresh water, and general protection of the public health and safety. It assigns accountability to the lessees and operators. Lessees shall not commence any operation or construction without the prior approval of BLM

Any surface use plan of operations submitted by an operator shall contain the information specified by the Onshore Oil and Gas Order in effect when the surface use plan of operations is submitted.

### **Other documents/agreements related to this decision**

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Carlton Oil Corporation previously held a reserved mineral rights lease on privately owned minerals on this tract. When the lease expired in 1996, the minerals reverted to federal ownership. The subject lease was issued non-competitively to the operator under the terms of Section 2507 of the Comprehensive National Energy Policy Act (CNEPA) of 1992. The 1996 lease (OH 047683) of federal minerals stipulates that

- Stip A) no surface occupancy is allowed within 100 feet of the Little Muskingum River or within 50 feet of intermittent streams;
- Stip C) a controlled use stipulation within the 100-year floodplain (outside of the 100-foot riparian area) in which the leaseholder should be concerned about placement of developments that could be damaged by flooding in the 100-year floodplain;
- Special Notification #2) in which activities proposed in or likely to affect floodplain will be subject to analysis and identification of alternative sites; a public notification and comment period; and the provisions of any other Federal, State, or local laws and regulations as required under E.O. 11988 for Protection of Floodplains.

A review of the proposal shows that the operator has complied with these stipulations. A copy of the lease can be found in the Project File 4-1.

### **Federal permits, licenses necessary to implement the project.**

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There are no additional documents required to implement this project.

### **Summary of Scoping**

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Public scoping for this project included a letter to over 120 interested parties and a legal notice in the Wayne National Forest's Paper of Record (The Athens Messenger) published on February 22, 2002. In combination with internal scoping among Forest Service specialists, issues were raised concerning

1. **water quality,**
2. **historic resources,**
3. **visual and recreation values, and**
4. **changes to the habitat affecting plants and**
5. **animals endemic to the area**

More specifically, the **water quality** issue concerns the possibility of oil and brine leaking from the well and contaminating the Little Muskingum River (LMR) during flood events and the likelihood of additional sediment moving from the existing access road into the LMR and impacting aquatic life. The concern with **historic resources** is that well development may impact a possible historic site at the confluence of an intermittent stream and the LMR. The potential for a decrease in the recreational experience as the access road follows another several hundred feet of the North Country Trail (NCT) and the development of a well in a visual retention zone create both a Forest Plan compliance issue and a **visual/recreation** experience issue. Biological **habitat** issues are non-native plant invasion, and the impact of clearing the site on habitat needs for riparian wildlife species.

## **Organization of Document**

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Chapter 2 describes the alternatives and makes a comparison of the effects of each alternative. Chapter 3 describes the existing conditions at the well development site and the effects of the proposed action and the other alternatives on the various resources and their associated issues. Chapter 4 lists other agencies and the individuals contributing to the preparation of this analysis. Chapter 5 is a bibliography listing the references used by the specialists in preparing their analysis and by the writer in preparing this document.

## **Chapter 2: Alternatives**

### **Introduction**

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The proposed action and the two alternatives are described. Alternative A is the no action alternative, consisting of a disapproval of the SUPO. Alternative B is approval of the proposed action, which is Carlton's Surface Use Plan of Operations as submitted. Alternative C is the proposed action with mitigations as recommended by resource specialists. See the table following the description of alternatives for a comparison of impacts between the alternatives.

### **Alternative B: The Proposed Action**

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Carlton Oil Corporation proposes to drill an oil/gas well on less than one acre, committing 20 acres of the 156-acre Federal Drake Lease (OHES 047683) to the well's drilling unit per State regulations. This lease is located in Section 31, Township 3 North, Range 5 West, and Section 36, Township 2 North, Range 5 West, in Benton Township, Monroe County, Ohio. A map showing the project location is included below.

Access to the well site is approximately 400 feet beyond the access road to the #4 well. The access road will be approximately 25 feet in width at construction, but will not be maintained at this width. No rock will be placed on the road because limited access (only off-road vehicle use) to the well is expected after drilling is complete. Note that the SUPO lists the access road distance as 725 feet which is an estimate of the distance from the #4 pumpjack to the #4C pumpjack. The actual distance is less than 400 feet.

The access road and well pad will be cleared by removing approximately 60 trees that range from two to 14 inches in diameter. Trees and brush will be placed on the perimeter of the site for wildlife habitat. These trees are not of commercial size or quality, and have no commercial value.

Ground level elevation of the proposed well site is 690 feet, located on the floodplain of the Little Muskingum River. The proposed opening for the well pad lies in riparian vegetation and is

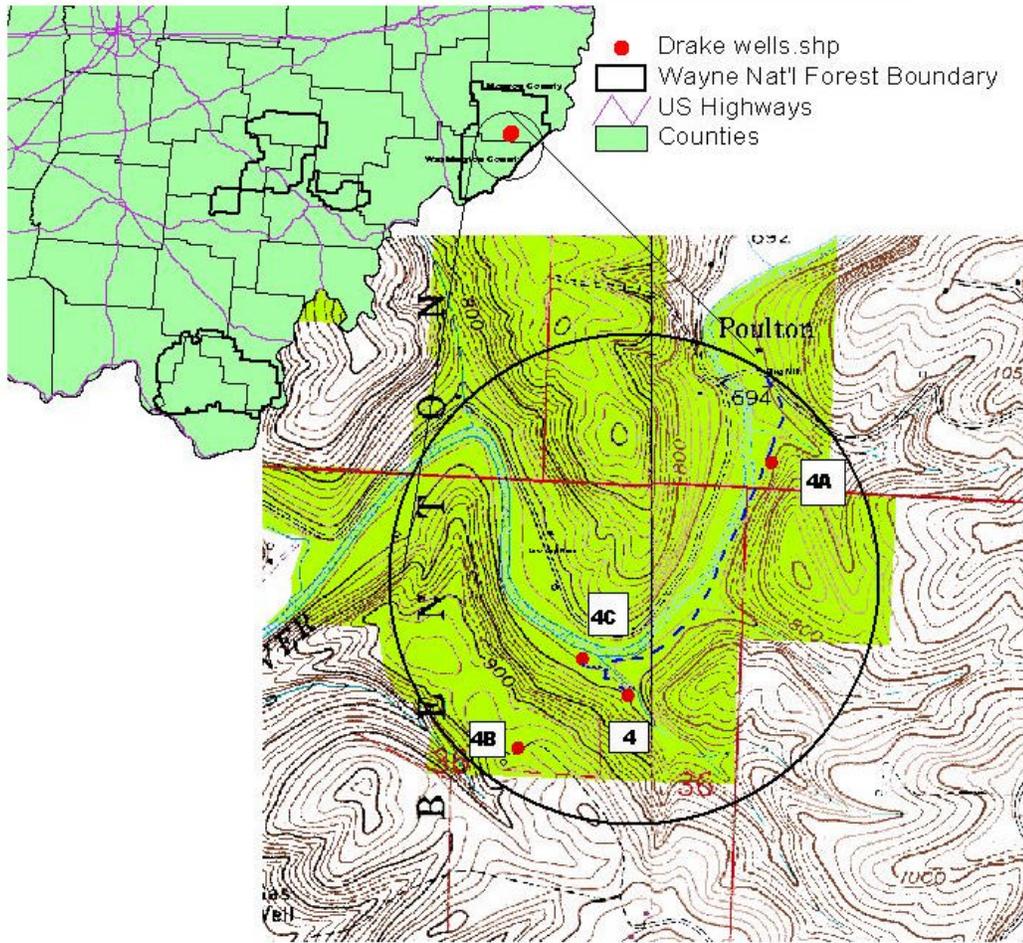
approximately 100 feet by 200 feet. The well pad will consist of water holding tanks, oil storage tanks and production separator, the rig, air compressor pumps, casing racks, drill pipe tub, a kill line, discharge line and a flare choke manifold line, portable toilet, tool shed, and a lined pit which is 25 feet wide by 75 feet long and 8 feet deep. Gas lines and power lines will be installed. About 800 feet of two-inch plastic gas collector line will run to the existing tank battery at well #4. An additional tank will be installed with the existing battery at #4.

Upon completion of the drilling operation, only the well head, pumping unit, and a 2-inch steel flow line leading to the tank battery site will remain on the well pad.

The Drake 4C tank and related equipment for processing crude oil and natural gas will be combined with the current Drake 4 and 4B tanks adjacent to an intermittent stream, requiring reconstruction of the #4 tank battery. 825 feet of 2-inch steel line will run along the surface of the ground to the tank battery. The existing tank site will be re-constructed to allow for the additional equipment.

Under this alternative the deciding official would approve the proposed action as submitted by the operator. The access road and well pad would be graded and seeded with the Wayne seed mixture, facilities will be painted forest green, fluids in the drilling pit would be pumped out but the liner and solids would be buried on site, and woody debris from clearing would be piled on site for wildlife.

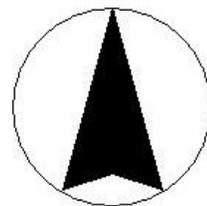
**Drake #4C Well Environmental Analysis  
Rinard Mills - New Matamoras Quads  
Benton Township, Monroe County**



500 0 500 1000 Feet



- 400-ft Access Road to 4C Well**
- Wells on Drake Lease**
- Existing Drake 4 Access Road**
- Ownership**



**Figure 2-1: Map of Project Location**

### **Alternative A: No Action Alternative**

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Under this alternative the deciding official would disapprove the SUPO. No well development in the floodplain of the LMR would proceed under this alternative. No additional access road would be built on the North Country Trail or in the floodplain of the LMR. No floodplain forest disturbance would occur. Visual impacts in the area would consist of the existing Drake 4 well and tank battery. The existing access road would contribute some sediment to the LMR.

### **Alternative C: Proposed Action with Mitigations**

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Under this alternative, the deciding official would approve the proposed action as submitted but with mitigations as proposed by the specialists. While there are concerns about allowing another well development in the 2.1 Management Area, within the 100-year floodplain of the LMR and in a visual quality retention zone, the development is legal within the stipulations of the federal lease. As specialists reviewed the Surface Use Plan of Operations and issues emerged, a list of mitigations was proposed. The mitigations include the following:

- *In response to SUPO, Well location:* complete an investigation for archaeological evidence before proceeding with drilling. (Note: investigation was completed on June 18 and no evidence was found.)
- *In response to SUPO, Well Location:* recommend all trees and brush be removed to a disposal site off Forest Service ownership.
- *In response to SUPO, site restoration:* recommend that site be allowed to seed naturally to avoid introduction of seed not native to site.
- *In response to tank battery location:* recommend that the ephemeral drainage behind the existing tank battery be captured in a culvert and allowed to flow to the intermittent stream at the battery site.
- *In response to the Surface Use Plan of Operations (SUPO), Plan for Storage and Disposal of Brine:II. B. 2)* recommend removal of all pit contents and lining materials to an approved off-site location and restoration of pit after drilling.
- *Addition to reclamation plan:* recommend that unnecessary portions of well pad be planted with native seedlings as provided by Wayne National Forest after drilling and re-grading is complete.
- *Addition to reclamation plan:* construct a diversion channel with culvert for the ephemeral stream behind the tank battery.
- *Additional mitigation:* recommend that drill rig and accompanying vehicles coming from outside Washington or Monroe counties be washed before entering the site to prevent the introduction of non-native seed.
- *Additional mitigation:* recommend that concrete stream crossings on existing access road be maintained so that stream crosses on concrete.
- *Standard mitigation:* do not cut any butternuts, if found.
- *Standard mitigation:* removal of trees over 6: in diameter and exhibiting loose bark, cavities, or crevices, should only occur between September 16 and April 14.
- *Standard mitigation:* do not cut any tree containing an eagle's nest.
- *Standard mitigation:* if archaeological resources are found on site during development, operations will stop and the Forest Archaeologist will be notified.

**Table 2-1. Alternative Comparison Table**

|  | <b>Alt A: No Action</b>   | <b>Alt B: SUPO as Submitted (Proposed Action)</b>  | <b>Alt C: SUPO w/mitigations</b>  |
|--|---|--|---|
| Purpose: To allow development of a well extracting federal minerals on the Drake Lease   | Disallowing this well does not meet the purpose of this project and might infringe on the legal rights of the operator. | Meets purpose  | Meets purpose   |
| Need: to meet the nation's need for energy   | Disallowing this well does not meet the nation's need for energy.   | Meets need   | Meets need  |
| Compliance with Forest Plan: Amendment 8 on availability of federal minerals   | Disallowing this well does not make federal minerals available for development.   | Complies with Amendment 8  | Complies with Amendment 8   |
| Compliance with Forest Plan: Mgmt Area 2.1 guidance  | Disallowing this well meets Mgmt Area 2.1 guidance to protect and enhance the visual quality along the LMR              | Painting the facilities green only partially obscures them from sight of the river. They will still be visible from the North Country Trail (NCT). Only partially meets this standard. | Painting facilities green and planting trees on the well pad will help to retain visual quality. Activity will still be visible from River and Trail, so standard is partially met.             |
| Compliance with Forest Plan: guidance for the 2.1 area to protect and enhance visual quality and protect high quality recreation experiences | Disallowing this well meets the Plan guidance for adhering to standards for national recreation trails                  | Development of the access road on a designated portion of the NCT does not meet the guidance for national recreation trails.   | Allowing the road and other disturbed areas to revegetate naturally and planting native species trees on the well pad will help minimize the impact, but not prevent the impact from occurring. |
| Compliance with CFR 228 on federal mineral development   | Disallowing this well meets the requirement in CFR 228  | Proposal meets CFR 228.  | Proposal meets CFR 228.   |

**Table 2-2. Comparison of Response to Issues by Alternative**

| <b>Issue</b>  | <b>Alt A: No Action</b>  | <b>Alt B: SUPO as Submitted</b>   | <b>Alt C: SUPO w/mitigations</b>  |
|---|--|---|---|
| Concern about oil and brine leaking into LMR during flood events and causing contamination  | No well development would occur so no leakage would occur.   | Prevent contamination during flooding by pumping all fluid materials out of drilling pit, bury pit, solid materials, and liner. Elevate pump jack above normal flood levels.              | Remove pit liner and solid contents to off-site location to further prevent contamination during flooding.  |
| Concern that additional traffic on the access road and soil exposure at the well site will allow more sediments to move into the LMR.               | Additional maintenance is needed based on existing use. Can request this in existing operating plan.                               | No maintenance proposed.  | Re-construct concrete stream crossings so stream crosses them.  |
| Well development could impact a site with high potential for historic occupation.   | No site impact would occur with no new development.  | No sites found during survey.   | No sites found during survey.   |
| Clearing debris left in the floodplain could cause downstream damage to property improvements and could create scouring along river banks.          | No new debris, only naturally occurring debris would build up in the floodplain.   | Woody debris left as wildlife habitat could potentially damage downstream improvements or scour river banks during flood events.  | Clearing debris would be removed from floodplain to an off-Forest disposal site to prevent potential damage or bank scouring.                                 |
| Recreational experience decreases with additional trail/access road occurrence and visibility of well.  | 200 feet of existing trail would not be replaced by access road.   | Two hundred or more feet of trail will now be on the new access road. Road will be allowed to re-vegetate and will have minimal vehicle use. All facilities will be painted forest green. | Plant native species trees on unused portions of well pad during reclamation to minimize visual impact.   |
| Site disturbance creates an environment for non-native seeds to grow. Vehicles from outside the area bring non-native seeds with them.              | Site remains undisturbed and is only vulnerable to seed input through flooding or other normal dispersal methods.                  | Seed disturbed areas with Wayne seed mixture.   | Require vehicles coming from outside the area to be washed before entering the well site to prevent NNIS seed input. Allow disturbed areas to seed naturally. |
| Clearing for site development creates another artificial opening along the LMR corridor, changing the environment for both small and large mammals. | No new clearing occurs. Forest changes over time to benefit species preferring larger trees in the canopy of longer-lived species. | Different species of wildlife benefit from riparian habitat with small openings.  | Planting trees in opening minimizes the opening size, thus favoring closed canopy species.  |

## Alternatives Considered but Not Analyzed in Detail

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Several alternatives were considered but will not be analyzed in detail

**Moving the well location outside the floodplain.** The Forest Service pursued this alternative with the proponent. The proponent's proposed location in the floodplain meets the stipulations on the Drake Lease, which were generated in 1996 when the mineral rights reverted from private to federal ownership. These stipulations require the well site to be no closer than 100 feet to the LMR. New developments should be no closer than 50 feet to intermittent streams. The existing well and tank battery at Well #4 were in place prior to reversion of the lease.

The proponent was also required to place the well 600 feet from existing wells based on the depth of the well. The location is also constrained by both the 100-foot riparian zone along the LMR protected by Special Stipulation C and a state requirement that the well location be inset 300 feet from his lease boundary. The following 3 alternatives were locations considered in order to move the well out of the floodplain.

- **Locating the well across the River.** A location across the LMR was considered, but this tract is not currently available for lease, is not included in the upcoming lease sale, and also contains floodplain along the LMR.
- **Placing the well on a bench above the floodplain.** A bench on the slope 200 feet south of the proposed well was considered as an alternative location. The archaeological investigation determined that the bench was a rock quarry which was probably used by the Ring Family for construction of buildings at their farm site approximately one mile from the well site. The quarry site has potential for listing on the National Register of Historic Places.
- **Directional drilling from the #4 well.** This alternative was proposed to the proponent and BLM. BLM did not consider this alternative feasible, based on the history of drilling on Federal oil and gas leases in SE Ohio and the proponent's economic and technical concerns for this well. To date, no operator has performed directional drilling to develop Federal oil and gas resources in SE Ohio. Directional drilling introduces significantly increased costs and increases the potential for downhole technical problems
- **Reduced footprint of well pad.** It was proposed to reduce the footprint of the well pad by replacing the pit with a temporary tank. BLM did not approve this alternative because the tank might not accommodate unexpected drilling fluids.

## Chapter 3: Affected Environment and Environmental Consequences

This chapter describes the environment affected by this proposal and the impacts of each of the alternatives on the resources. The effect of each alternative on each issue is discussed.

### Resources Irretrievably Committed

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The development of the Drake 4C well commits less than one acre to development for the life of the well. There are no irretrievable resources committed related to surface occupancy, as the site could be reclaimed if well development ceases.



**Figure 3-1 : Well stake is left of BLM employee Becky Metz. Power line is cleared area in background.**

### Issue 1: Impacts to Water Quality

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#### ***Affected Environment***

The proposed oil/gas well, and the associated access road on National Forest land, would be located within the Little Muskingum River (LMR) floodplain. The existing access road crosses three ephemeral streams on Forest Service land. Low water crossings were installed on these streams during an Environmental Protection Act Section 319 Clean Water Act demonstration project in 1996.

***Aquatic Life and Habitat Quality***

The current aquatic life use classification for the Little Muskingum River mainstem, just downstream of the project, is considered exceptional warmwater habitat (per Ohio EPA, 2000). This classification is based on the large variety of fish and benthic invertebrate species found in the watershed, and the mainstem's high water quality and aquatic habitat quality. In the 1800's the streams and rivers of south central Ohio were considered to be "teeming" with fish (Hildreth 1848, as cited by Trautman, 1977, as cited in the LMR Watershed Assessment, (USFS 2002), pg 4-17). Muskellunge, drum, walleye, pike, and flathead and channel catfish were all caught in great sizes and found in abundance (Trautman, 1977).

Recent data show that the Little Muskingum River watershed supports a moderate diversity of freshwater fish and mussel communities (Rice and Michael 2001; Hoggarth 2001). Fish community data are summarized in 12 ecological metrics to create an ecologically based index called the Index of Biotic Integrity (IBI). Based on the IBI calculations from ODNAP (2001,a), the Little Muskingum mainstem supports an aquatic community of exceptional condition. Thirty-one species of fish and 16 species of mussels were found during the inventory. No hellbenders were observed (Pfungsten 2001). Two Regional Forester Sensitive Species, the eastern sand darter and round hickorynut, were collected within this stretch of the river. In addition, the Ohio muskellunge, an Ohio Special Interest species, is located in this stretch of river

Ohio EPA has developed an index to assess those physical factors of a river or stream which are most important to aquatic life. The Quality Habitat Evaluation Index (QHEI) provides a general description of in-stream habitats and is based on six physical elements that affect the aquatic habitat. QHEI scores range from generally good (over 60) to poor in quality (around 45). Based on the most recent OEPA 305(b) report (OEPA, 2000c), the Little Muskingum River attained an overall QHEI value of 72.4 and an aquatic life use designation of exceptional warm water habitat (USFS 2002, pg 4-17).

Although aquatic habitat quality is generally good in the Little Muskingum River watershed, potential sources of future impairment may include nutrient loading and siltation from agricultural runoff, bank instability due to non-forested riparian corridors, and the close proximity of roads to stream banks. According to OEPA (OEPA, 2000c), habitat destruction is now the number one major cause of aquatic life impairment in Ohio streams and rivers, overtaking dissolved oxygen impairments and organic enrichment.

***Threatened and Endangered Species***

There are no federally listed aquatic species in the Little Muskingum watershed (Ewing, July 17, 2002, Project File 5-4).

***Regional Forester Sensitive Species (RFSS)***

There are nine aquatic animals listed on the Wayne's Regional Forester Sensitive Species list. Several species occur in the mainstem of the Little Muskingum River, but suitable habitat for these species is found only in the middle and lower reaches of the river where water levels are more stable (eastern hellbender, Ohio lamprey, salamander mussel, round hickorynut).

Suitable habitat exists for two of the species in the stretch of the Little Muskingum River adjacent to and downstream of the project. Neither has been collected in this area of the river, although fisheries surveys and macroinvertebrate surveys have been conducted (Ewing, July 17, 2002).

**Table 3-1. Regional Forester Sensitive Species Habitat in Project Area**

| Species   | Occupied Habitat in the Project Area | Suitable Unoccupied Habitat in the Project Area | No Suitable Habitat in the Project Area |
|---|--------------------------------------|---|---|
| Eastern Hellbender<br><i>Cryptobranchus alleganiensis</i> |                                      |   | X                                       |
| Ohio Lamprey<br><i>Ichthyomyzon bdellium</i>              |                                      |   | X                                       |
| Western Lake Chubsucker<br><i>Erimyzon sucetta</i>        |                                      |   | X                                       |
| Eastern Sand Darter<br><i>Ammocrypta pellucida</i>        |                                      | X   |   |
| Salamander Mussel<br><i>Simpsonaias ambigua</i>           |                                      |   | X                                       |
| Round Hickorynut<br><i>Obovaria subrotunda</i>            |                                      |   | X                                       |
| Lilliput<br><i>Toxolasma parvus</i>                       |                                      |   | X                                       |
| Little Spectaclecase Mussel<br><i>Villosa lienosa</i>     |                                      |   | X                                       |
| Wabash River Cruiser<br><i>Macromia wabashensis</i>       |                                      | X   |   |

**Eastern Sand Darter**

The eastern sand darter inhabits sandy areas of streams of moderate- to larger-sized streams. The darter buries itself into the sand, with only its eyes exposed. It will wait for passing prey and will dash out to capture it, after which it reburies itself (Trautman 1981). Within the Wayne National Forest, two stream systems possess suitable habitat for the species: the mainstem of Symmes Creek and Little Muskingum River. Individuals have been captured from each of these systems. Rice and Michael (2001) captured sand darters as far upstream in the Little Muskingum River as Knowlton Bridge. A sampling site was located at Ring Mill, just upstream of the project area, but no sand darters were captured.

**Wabash River Cruiser**

The Wabash river cruiser, a federal species of concern, is a dragonfly that uses streams with patches of water willows (*Justicia americana*). The adults will also fly over streams or be on woodland trails or old logging roads. Currently, the only record of this species found near the WNF was on a dammed stream reservoir at Burr Oak State Park in Morgan County (near the Athens unit) in August 1982 (Heady 1994). Slow water with aquatic vegetation is present downstream of the project.

**Management Indicator Species**

MIS are defined as “plant and animal species, communities, or special habitats selected for emphasis in planning in order to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent”.

Analysis of project level effects is used to determine an activities contribution to meeting forest-wide objectives for providing for well-distributed, viable populations. Management activity effects are examined in light of the existing habitat conditions, both within and outside of the Forest, and documented population conditions or trends.

Following is the status of habitat, population, monitoring and for the aquatic management indicator species

**Bluegill** – Bluegill prefer slow or non-moving clear water with only small amounts of suspended clayey silts, a stream bottom made of sand, gravel or soft muck containing organic debris with scattered beds of aquatic vegetation.

**Southern redbelly dace** - The primary habitat of the southern redbelly dace is clear, slow moving streams with long pools.

**Redfin shiner** – Redfin shiners live in streams of all sizes with pools flowing slow to moderate over sand, gravel, or rock, often with aquatic vegetation.

**Blackside darter** – The blackside darter generally lives in pools of creeks and small rivers with slow moving current and bottoms consisting of gravel and sand.

**Rainbow darter** – Moderate streams and small rivers with long swift riffles, clear water, and sand or gravel bottoms are the perfect habitat for the rainbow darter. Rainbow darters spawn in swift riffles above sand and gravel

**Golden redhorse** – The golden redhorse lives in riffles, runs, and pools of streams over mud to rock bottoms.

**Sand shiner** – Sand shiners inhabit pools and runs of creeks with sand and/or gravel bottoms. It has also been found in large rivers as well as sandy lake areas.

**Banded darter** – This darter typically inhabits clear high gradient streams with strong current flow. It tends to live in riffles that are rocky with algae covered boulders and current strong enough to prevent silt deposition.

All of these aquatic management indicator species have been collected in the Upper Little Muskingum River watershed (i.e., the 5<sup>th</sup> level watershed in which this project is located) (Rice and Michael 2001). All species, except the southern redbelly dace, have been found in the mainstem of the Little Muskingum River near the project, or have suitable habitat there (Rice and Michael 2001). Southern redbelly dace are a headwater species, representing a habitat that is not present near the project site.

### **Impacts by Alternative**

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**Issue:** Concern about oil and brine contamination into the LMR during flood events.

**Issue:** Additional sedimentation from increased use of the existing access road and clearing for new development.

### **Alternative A: No Action**

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With no new well development, there would be no opportunity for contamination or increased sedimentation from this well. There is some opportunity for contamination from 113 other wells in the Little Muskingum river valley and from the existing access road contributing some sediment from current use.

Alternative A (the no action alternative) should have no impact to any Regional Forester Sensitive Aquatic animal species, or to any aquatic management indicator species.

**Alternative B: Approve SUPO as submitted.**

Accidental leaks of oil products or brine from well sites or transmission lines could have a direct effect on aquatic organisms. Chemicals associated with the oil products and brine can affect the physiological processes of fish and invertebrates. The creation of a new well site using large machinery in close proximity to streams could indirectly affect these species if sediment entered the waterway. An increased sediment load can have a negative effect on the survival and reproductive success of eggs and larvae.

The well site is located within the 50-year floodplain of the Little Muskingum River. If a high water event occurred during or immediately after drilling was conducted, it would be possible for high water to wash loose soil from disturbed areas, and materials captured in the drilling pit, into the Little Muskingum.

The operator would prevent future damage to his well and potential contamination by leaving the surface casing at the surface, cementing the production casing in place to a height of 4 feet, and elevating the pumping unit by welding it to the top of a 4-foot high pipe sub-structure. This would place the pumping unit above the 100-year flood level. The surface casing head is sealed against leakage of oil or gas. The surface casing and production casing are constructed of high strength steel.

Protection of the area is required by state and federal laws (Ohio Revised Code, PF 10-5). In summary, Chapter 1509 of Ohio Law requires that the well shall be encased and that brine and other wastes shall be disposed of in approved locations (approved wells). 43 CFR Part 3162 of Onshore Oil and Gas Order No. 2 (BLM, 43 CFR 3162, PF 10-4) establishes the minimum standards BLM requires of operators for conducting drilling operations on Federal oil and gas leases, including standards for safety equipment and well control. The operator has complied with state and federal laws on other oil and gas developments.

Stipulations were placed on the tract when it was analyzed during the programmatic analysis of the lease package. These stipulations were designed to reduce potential direct and indirect effects to aquatic organisms. The proponent's lease requires No Surface Occupancy (NSO) of riparian areas (i.e., NSO within 100 feet of the Little Muskingum River; NSO within 50 feet of all intermittent streams). This stipulation helps protect riparian values such as canopy cover/shade for streams and nutrient sources/organic material required by aquatic organisms. No surface occupancy of these areas along streams also ensures bank stability and helps to trap any pollutants before they can enter a stream (i.e., sediment, brine, petroleum products).

Alternative B could have minimal, short-term effects to aquatic organisms that are present in the vicinity of the project, or immediately downstream. The stipulations should reduce the potential for sediment to enter any watercourses; however there is a concern that materials in the temporary reserve pit could be washed into the Little Muskingum River during a high flood event (the well is within the 50-year floodplain). The reserve pit may contain liquid and solid materials from the drilling process. Liquid materials are pumped from the pit and removed off-site. Solid materials represent soil and rock cuttings from the drilling process. When work is completed, the solid materials are typically buried on-site.

Past experience with exploration drilling in this area and throughout the 2.1 management area has shown that drilling can take place with few observable environmental effects (Thompson 2002, PF 10-1). The proposed location of the well is not in the active flowing channel for either the

LMR or the intermittent tributary at Drake #4. The existing Drake lease has two producing wells within 1000 feet of the proposed well location, and there are 12 producing oil and gas wells within a radius of two miles of this location. In the last 10 years this location has flooded approximately 5 times. There has been no spillage of toxic substances into the LMR (Thompson 2002, PF 10-1). There is also recent experience in the Conemaugh River Lake area of Pennsylvania and the floodplain of Monday Creek in Perry County, Ohio, where BLM has approved gas or oil wells in the floodplain. BLM and representatives of the Ohio Division of Minerals Resource management report no problems with wellheads leaking during flood events (Metz 2001, PF 10-2).

Under Alternative B, the operator has proposed taking any woody debris resulting from the development of the site and windrowing it on the floodplain. Loose woody material can dislodge during a high water event and enter the main stem of the river. Loose woody debris can cause logjams and can damage improvements such as livestock fences and bridges

Oil and gas activities and other ground disturbing activities have occurred in this watershed for decades. However, there has been a trend for the watershed to become more forested, including along streams. Improved regulations on oil and gas development have also been put in place over the years. The Ohio EPA, through their fish community and invertebrate monitoring, has found stretches of the Little Muskingum River mainstem (just downstream of the project) to meet Exceptional Warmwater Habitat Use Designations. Attainment of this life use designation equates to a higher degree of ecological integrity in these sections of the river.

Oil and gas activities, as well as other ground disturbing activities, are likely to occur in the foreseeable future. The project has protective measures built in to reduce the likelihood of pollutants entering watercourses: (1) there are stipulations protecting riparian values and (2) there are strict regulatory requirements and inspections tied to all federal leases. The operator has experience in well development and has taken precautions in the design of the well because it is located near the Little Muskingum River.

### **Alternative C: Approve SUPO with Mitigations**

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Alternative C has added measures to further protect aquatic organisms from the direct and indirect effects identified in Alternative B. Because the well is in close proximity to the Little Muskingum River, the operator will be required to remove the pit liner and contents after the well is drilled. Normally, the operator buries this material at the site. Removing the material will eliminate the potential for this material to be washed into the stream during a flood. Alternative C also calls for the operator to re-construct concrete stream crossings on the existing access road to ensure sediment is not moving off-site.

Soil and water mitigations include planting trees to restore canopy cover when drilling is complete, increased maintenance at the intermittent stream channels on the existing access road, providing a culvert to re-route an ephemeral stream around the tank battery, and removing large woody debris from the floodplain.

Implementing these actions will reduce raindrop impact on the site as newly planted trees grow on the disturbed area, provide tree roots to hold soil on the disturbed area, reduce sediment loss at each intermittent stream crossing, restore an ephemeral stream channel and reduce standing water at the tank battery, and prevent damage downstream from woody debris during flood events.

## **Direct, Indirect and Cumulative Impacts**

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With the implementation of the recommended mitigation proposed above, this alternative is not likely to have any direct, indirect, or cumulative effects to aquatic organisms, including the Regional Forester Sensitive aquatic animals and the aquatic management indicator species.

## **Issue 2: Heritage Resources**

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**Issue:** Well development could impact a site with high potential for historic occupation.

### ***Affected Environment***

The floodplain at the junction of an intermittent stream and a major river (the Little Muskingum River) has a high probability of historical use and the presence of artifacts. Sites are not uncommon along the Ohio River, but little investigation has been done along the Little Muskingum.

## **Effects of Alternative B and C**

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A field survey was conducted on June 17, 2002. Two pits were dug in the well pad site and shovel tests were conducted at 50-foot intervals along the access road. No artifacts or evidence of prior native American occupation were found during the dig, thus resolving this issue.

## **Direct, Indirect and Cumulative Impacts**

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Since no native American sites were found and the well development does not impact the early European evidence, there are no direct, indirect, or cumulative impacts on archaeological resources from this project.

## **Issue 3: Visual and Recreation Resources**

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**Issue:** Recreational experience decreases with additional trail/access road occurrence and visibility of well.

### ***Affected Environment***

From the Wayne National Forest Plan (USFS 1988, Page 4-63): this area will emphasize a vegetative condition along canoe-able and fishable streams that:

- Protects and enhances visual quality
- Protects high quality recreation opportunities.

Mineral exploration and extraction may occur in this area (USFS 1988, Page 4-63). Viewing scenery, hunting, trapping, fishing, canoeing, and hiking are key recreation activities. Portions of [this area] appear as an unbroken mixture of shade tolerant trees such as sugar maple, silver maple, beech, paw-paw, river birch, buckeye, sycamore, and box elder. The vegetation is characterized by a continuous tree canopy and a variety of tree sizes. The forest is accessible by canoe-able streams, hiking trails, and a low density of roads open to public travel. Utility corridors occur here only when it is not in the public interest to locate them elsewhere.

Visual Quality Standard for Retention is that at the completion of a project, management activities shall not be evident to the casual forest visitor when viewed from trails, roads, waterbodies and developed recreation areas. (USFS 1988, PF 7-3)

## Impacts by Alternative

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### **Visual Impacts**

**Alternative A:** No Action, there would be no additional visual impact to the 2.1 Management Area under Alternative A, the No Action Alternative. 113 other wells already exist in this management area.

**Alternative B:** the well facilities would be painted forest green but would still be visible from some parts of the river, mostly during leaf-off. The access road is visible during all seasons.

**Alternative C:** some native species trees would be planted on the well pad after drilling. This would partially, though not completely, obscure the well from view. Numerous other wells are visible from both the LMR and the NCT.

### **Recreation Impacts**

The North Country Trail is approximately 4,200 miles long and travels from New York to North Dakota. The Marietta Unit includes 40 miles of the trail, partially on private land. According to the 1994 topographic maps, about 10 miles of the 40 miles is located on roads (PF 7-5). The trail passes several of the 1000 wells on FS ownership on the Marietta Unit.

The Desired Future Condition of the NCT is that “the trail will be administered and managed as a path whose use is primarily for hiking and backpacking. (MOU between the National Park Service, the US Forest Service, and the NCT Trail Association)

**Alternative A:** Implementation would not impact the NCT in any way.

**Alternative B or C:** Implementation would increase the amount of road that coincides with the NCT by 200 feet. The road portion of the 40 miles of NCT within the Marietta Unit would increase by less than 1 percent. The addition of this well to the viewshed of the trail adds one more to numerous others. The operator’s plan to paint the well facilities forest green helps them to blend in with the natural environment, but does not obscure them from view of the trail. There are numerous other wells in the Little Muskingum corridor and along the trail. Therefore, implementation of Alternatives B or C would result in a recreation experience similar to the current condition.

### **Mitigation**

Since the Drake lease allows well development in the floodplain of the LMR, it is proposed under Alternative C to plant native species of trees on the unused portions of the well pad after drilling to mitigate the visual effect and to paint the facilities forest green to blend in with the surrounding environment. The portion of the access road overlapping the North Country Trail will not be stoned and will be as natural as possible with occasional off-road vehicle traffic to service the well.

## Issue 4: Impacts to Biological Environment - Plants

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**Issues:** Site disturbance creates an environment for non-native seeds to grow. Vehicles from outside the area bring non-native seeds with them.

### **Affected Environment**

The floodplain and its adjacent northeast-facing slope contain a relatively high diversity of plant species, most of which are native and indicative of rich, fertile habitats.

The proposed well location is in a forested stand of box elder, green ash, tulip poplar, sycamore, black cherry, American elm, yellow buckeye, and various species of maple, hawthorn and apple. Snags and at least one live tree have characteristics such as cavities, crevices, and loose bark which make them potentially suitable for bat roosting (Schultes, 2002a). The access corridor and well pad site both have a well-developed understory. The two areas are separated from each other by a maintained powerline corridor in which there are many shrubs, grasses, and forbs growing. The forbs include multiflora rose and berry bushes (*Rubus* spp).

Herbaceous vegetation along the North Country Trail, which is fully vegetated, includes: butter cup, violets, spring beauty, gill-over-the-ground, dead nettle, jewelweed, *Monarda* spp., cleavers, wild onion, sweet cicily, dandelion, goldenrod, chickweed, lady's thumbprint, mayapple, squirrel corn, blue-eyed Mary, false nettle, avens, cut-leaved toothwort, toothwort, *Eupatorium* spp. And rattlesnake root. Additional herb species in the floodplain adjacent to the trail was similar with the addition of broad-leaved and Virginia waterleaf, trout lily, *Coreopsis*, jack-in-the-pulpit, grape fern, wild geranium, Celandine poppy, and twinleaf in the more remote areas. False mermaid and various graminoid species were pervasive throughout the site. There was some evidence of non-native invasive species including multiflora rose and garlic mustard in the more disturbed, open areas such as the power line (Larson)

### **Federally Threatened or Endangered Plant Species**

The Wayne National Forest comprises part of the potential range of four Federally Threatened or Endangered species. Suitable habitat likely exists in the project area for **Virginia spirea** and **running buffalo clover**, but not for the northern wild monkshood or small whorled pogonia.

Southeast Ohio was surveyed in 1991 for Virginia spirea and no individuals were found on the Wayne National Forest. The greatest threats to this species are habitat loss due to stream channelization or other improvements, insect damage, and competition from non-native plant species (USFWS 1992b).

Running buffalo clover can be found in a wide variety of habitats, but prefers semi-shaded, edge regions that have been subjected to some sort of moderate, periodic disturbance over an extended period of time (e.g. light grazing or old trails). Populations in Ohio are centered around the limestone-underlain region near Cincinnati and Lawrence County, with all the known populations near streams and rivers (NatureServe Explorer 2001; Wayne NF Biological Assessment 2001). No individual plants of running buffalo clover have been found on the Wayne National Forest to date.

Threats to this species include habitat destruction from road construction, canopy closure, over-grazing, competition from non-native invasive plant species, and a reduction of hooved mammals that once contributed to habitat disturbance and plant dispersal.

### **Effects of Alternative A: No Action**

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Since no clearing would occur on the floodplain, the canopy would remain closed, and would continue to provide shade and temperature control to understory and herbaceous vegetation. The shaded conditions would likely prevent the spread of multiflora rose, which exists in the exposed powerline corridor. Garlic mustard, a shade-tolerant species, would likely spread along the floodplain regardless of disturbance pressures unless measures are taken to control its proliferation.

## **Effects of Alternative B: Proposed Action Direct and Indirect Impacts**

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Clearing a portion of the floodplain during drilling operations changes the environmental conditions for plant species. Removing shade trees increases sunlight exposure and temperatures to both the floodplain floor and the adjacent mesic slope, which would result in substantial drying of these areas. Such a change in conditions would likely eliminate many species accustomed to more cool, mesic habitats, like twinleaf, listed as vulnerable or imperiled in neighboring states. Rock skullcap, an RFSS which has been found in similar habitats along the floodplain, requires shaded woods. Slope exposure resulting from clearing would likely eliminate any existing individuals, or any potential future establishment of this species in the project area.

Such a change in conditions would also increase the likelihood of introducing and spreading NNIS, which could displace native species on the floodplain over time. Non-native invasive species pose a serious threat to plant and animal community health and diversity. Exotic species often lack natural controls, which allows them to out compete and eventually replace more sensitive native species. With any management activity that creates soil disturbance combined with canopy opening, or that requires the use of heavy equipment brought in from off-site, there is a high risk of introducing and spreading NNIS into the project area. The project area contains several small populations of very formidable invasive species, including multiflora rose, garlic mustard, and gill-over-the-ground that thrive in disturbed open habitats.

During the drilling operation, mineral soil would be exposed and the canopy removed, which would create prime conditions for the expansion of these existing NNIS. New non-natives would likely also be introduced from mud and vegetation debris tenant on drilling equipment brought in from areas outside of Monroe and Washington Counties.

Reseeding the area with a Wayne NF approved seed mix, which contains NNIS, would aid in the re-vegetation of bare mineral soil, but would not likely hinder growth of the more aggressive NNIS. Reseeding would do nothing to provide canopy shade to the floodplain and adjacent slopes, leaving the area exposed to high light and high temperature conditions. Over time the project area could become inundated with NNIS, thereby drastically reducing native plant species diversity. This reduction of native species could affect wildlife species dependent on them for food and/or habitat. Furthermore, the newly infested area would serve as a seed source for non-natives, and potentially contribute to the spread of NNIS through the floodplain. However, overall impacts to resident wildlife populations are likely to be mostly short-term, localized, and small in extent in the big picture.

### **Direct, Indirect and Cumulative Effects to T&E Plant Species**

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**Virginia spirea** is most likely to occur on the banks or low-lying outwash areas within the 100-foot buffer along the LMR, not in the project area. Therefore, the proposed action would not likely directly affect this species. Alternative A would not allow the well development, thus would not have the potential to compromise habitat for this species. Debris that would be left on site in Alternative B could cause severe scouring of the river banks, and thus potentially compromise habitat for this species. Since major flooding events usually occur in the spring, debris would not likely indirectly affect this late-flowering species.

It is recommended to not dispose of logging debris on site, as it could cause damage to the sensitive floodplain ecosystem and its associated flora in the event of a major flood. This supports Forest-wide standards and Guidelines (USFS, 1988. 4-31), which state “no logging

debris will be left in any permanent water unless planned to benefit fisheries habitat or protect riparian values.” Alternative C calls for removing the clearing debris from the floodplain, so would not have this effect.

**Running buffalo clover** has not been found on the Forest, so no direct effects would occur to this species. However, since existing populations in West Virginia have been found along off-road vehicle trails on a small sandy floodplain with box elder and sycamore in the canopy, the portion of the proposed access road along the North Country Trail makes prime habitat for this species. The amount of habitat lost in this area is relatively small compared to the amount of similar habitat in the surrounding area; therefore, the proposed action would not likely have indirect impacts or adversely affect running buffalo clover.

It is recommended to not re-seed the impacted areas after the archaeological excavation or drilling activity, so as to allow the area to reseed itself with native vegetation.

### **Regional Forester Sensitive Species**

According to the most recent revision of the Regional Forester Sensitive Species list (February 2000), eleven RFSS have been designated for the Wayne (Table 2, PF 6-2, pg 6). Suitable habitat likely exists in the project area for **blue scorpionweed**, **butternut**, and **pigeon grape**, and potentially for **rock skullcap**.

A survey of the site was conducted on April 26, 2002. No **scorpionweed** was found in the project area, therefore, the proposed action would have no direct effect on this species. The approximately 2 acres of suitable habitat that would be lost as a result of clearing for the well pad would be minimal compared to the amount of habitat remaining along the rest of the floodplain.

The cumulative effects of potential future habitat destruction along the floodplain due to development on private lands are unknown. Since the scorpionweed is sensitive to full sun, efforts should be made to reforest the impacted area as soon as possible following the cessation of drill pad construction, so as to re-create habitat for sensitive species like scorpionweed. It is recommended that the cleared areas (i.e. well pad on floodplain and access road) be replanted with native trees following project completion and equipment removal to accelerate the restoration of the closed-canopy habitat.

**Butternut** has been found in all counties within the Wayne NF proclamation boundary, though in the site survey on April 26, 2002, no butternut was found in the project area. No direct effect is expected on this species. Habitat loss along the floodplain would be temporary, lasting only as long as the pad equipment remains on site. Since butternut is a shade-intolerant species, clearing this small area along the floodplain could actually promote butternut growth if one were to establish on site. It is recommended not to cut any butternuts if found.

A population of **rock skullcap** was found within three miles of the project area on a north-facing slope above a tributary of Rockcamp Run. Presence or absence of this species could not be determined with certainty during the April 26, 2002, field survey, however, the only likely suitable habitat in the project area for this species is at the toe of the north-facing slope, or on the slope itself. The direct impacts from drilling would avoid most of the plant’s suitable habitat. However, due to edge effects, opening the canopy on the floodplain would expose vegetation on the slope to higher light and temperature levels, conditions unfavorable to skullcap growth. If the species were not present in the project area, the amount of suitable habitat lost would be minimal compared to the remaining suitable habitat in the surrounding area. The cumulative effects of management on private lands along the floodplain are unknown and cannot be

controlled. The duration of habitat loss in the Federally managed project area could be lessened if trees were planted in the floodplain after project completion.

Due to the similarity in young plant characteristics between species of grape, it is extremely difficult to determine species identification with accuracy, so presence/absence of **pigeon grape** could not be resolved. However, most of the Ohio populations of this species are located in the southernmost portion of the state in Lawrence, Jackson, and Scioto Counties, making the likelihood of its current and future presence in the project area low. The amount of suitable habitat lost as a result of the proposed action would be minimal compared to the amount of remaining habitat along the floodplain. However, the duration of habitat loss could be reduced if trees were planted in the floodplain after project completion. The proposed action would not likely impact pigeon grape.

### **Effects of Alternative C: Proposed Action with Mitigations Direct, Indirect and Cumulative Impacts**

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Allowing the area to reseed with native vegetation from the surrounding area would help to reduce the number of non-native species along the floodplain. Washing all equipment coming from outside of Monroe and Washington Counties of soil and vegetation debris prior to entering the project area would help to reduce the introduction of NNIS not already present on site (e.g. Japanese honeysuckle). Planting the area with native tree species would expedite canopy closure, helping to eliminate some of the more shade-intolerant invasives that are present on site.

Non-native invasive species (NNIS) pose a serious threat to plant and animal community health and diversity. Since exotic species, by definition, have been transplanted outside their original range, they often lack natural controls, which allows them to outcompete and eventually replace more sensitive native species. Once NNIS become established, they are extremely difficult to eradicate, and the resulting change in community plant composition can alter ecosystem dynamics and functions over time. With any management activity that requires the use of heavy equipment brought in from off-site, there is a high risk of transporting NNIS into the project area.

If the NNIS were allowed to establish, they could easily compromise habitat quality, and thus jeopardize any existing or future populations of rare plant species in the project area.

### **Summary of Effects**

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The proposed action would not likely adversely affect Virginia spirea or running buffalo clover, nor would likely negatively impact blue scorpionweed, butternut or pigeon grape. Planting trees in the opening should mitigate the impact to rock skullcap, if it is present in the project area.

### **Summary of Recommendations**

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1. Do not cut butternuts, if found.
2. Do not seed the cleared well pad site or access road so as to allow the area to reseed itself with native vegetation from the surrounding area.
3. Replant the cleared areas with native tree species to accelerate the restoration of a closed-canopy habitat.
4. Require that all operating equipment and heavy machinery be washed of mud, soil, and vegetation debris prior to entering the project area. Equipment cleaning could be done at any commercial car wash facility or other facility with a high-powered water hose. The contract administrator should inspect vehicles on-site.

## Monitoring

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1. Survey richness and density of non-native invasive species in the disturbed area in the spring and summer for 3 years to see how well native species revegetate the area and to control NNIS populations during establishment.
2. Survey the planted trees for 3 years to determine survival and replanting needs.

## Issue 5: Impacts to Biological Environment - Wildlife

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**Issues:** Clearing for site development creates another artificial opening along the LMR corridor, changing the environment for both small and large mammals.

### **Affected Environment**

The Wayne National Forest (WNF) provides a variety of habitat types for over 300 species of vertebrates and a large array of invertebrates. The desired future condition for the 2.1 Management Areas is for forest “characterized by a continuous tree canopy and a variety of tree sizes in generally long corridors up to one miles or more in width” (Plan 1988). One hundred thirteen oil wells are currently in MA 2.1 on the Marietta Unit, which encompasses 5,562 acres of the total 42,664 acres (13%) of the Forest ownership at Marietta. (Schultes 2002b, Project File 5-3).

The proposed well site is in a wooded riparian floodplain adjacent to the LMR in the Straight Fork sub-watershed (as identified in the Little Muskingum Watershed Ecosystem Analysis, USFS 2002), which is 12% of the larger Little Muskingum watershed of 201,347 acres. Nearly 17% of the Little Muskingum watershed is used for agriculture, concentrated in five of the 10 sub-watersheds described in the analysis, including Straight Fork, in which 15% of the acreage is in agriculture. Road density is 3.2 miles of road per square mile. These facts are important because most development (e.g. roads) and agriculture occurs within stream valleys and floodplains where the terrain is flatter and easier to occupy. In addition to the loss of wooded riparian habitat, roads and agriculture in riparian areas also contribute to sedimentation and erosional effects in streams. Most of the watershed that is forested (83%) is in the uplands. (Schultes 2002b, PF 5-3)

The forested riparian area of this proposed project is a mixed bottomland hardwood forest comprised mainly of boxelder and ash, but sycamore, tulip poplar, American elm, black cherry, red maple, and a few other species also occur. Forest data indicate the stand is about 47 years old with a lot of seedlings and sapling present. Few snags exist in the overstory, and dead wood on the ground is present but scattered. The proposed access corridor and well pad site are separated from each other by a maintained powerline corridor, in which there are many shrubs, grasses, and forbs, including multiflora rose and berry bushes growing. (Schultes 2002b, PF 5-3)

There is some vertical and horizontal stratification of vegetation present on the floodplain. The access corridor and well site both have a well-developed understory. Combined with the thicker undergrowth and more variable tree composition on the adjacent lower slope of the hill rising off the river with a northeast exposure, the effect is a mosaic of habitat types available to a large variety of wildlife with varying habitat needs. (Schultes 2002b, PF 5-3)

The natural riparian corridor along this stretch of the LMR has been highly disturbed and fragmented by roads on each side and by other developments along it. The Drake #4 well site, County Road 68, Ring Mill home site (camping area), and a township bridge are within ¼ mile of the proposed 4C well site.

A variety of both neo-tropical migrant and year-round resident birds use the proposed project area and surrounding habitat. During an on-site visit in April, several species were seen or heard, including (but not limited to): American Redstart, Yellow-throated Warbler, Blue-winged Warbler, Red-eyed Vireo, Scarlet Tanager, Wild Turkey, Eastern Towhee, Red-bellied Woodpecker, Northern Cardinal, American Robin, and Carolina Chickadee. These species are all often associated with woodlands, but there is much variation in the specific microhabitat needs of each within woodlands, indicating that a variety of habitat components are present at the project site.

Although not directly observed, a variety of other common woodland wildlife, including many species of mammals, reptiles, amphibians, and invertebrates, likely occur at the site because suitable habitat is present. Examples of potential residents include gray squirrel, gray fox, raccoon, opossum, white-tailed deer, black rat snake, common garter snake, copperhead snake, American toad, gray tree frog, a variety of salamanders, countless insects, spiders, butterflies, moths, dragonflies, and others.

### ***Threatened, Endangered, and Sensitive Wildlife***

Potential suitable habitat exists for threatened, endangered, and forest sensitive species at the site as well. These species include Indiana bats, American burying beetle, Bald Eagle, black bear, river otter (documented suitable habitat present), bobcat, evening bat, Cerulean Warbler, timber rattlesnake, Wabash river cruiser, southern grizzled skipper, and regal fritillary. The habitat and status on the Wayne National Forest of each of these species is addressed more fully in the Biological Evaluation (Schultes 2002a, PF 5-2). Potential suitable habitat also exists at the site for some of the Wayne's management indicator species, including Cerulean Warbler, White-eyed Vireo, Common Yellowthroat, Pileated Woodpecker, and Wood Duck.

### ***Federally Threatened and Endangered Species***

#### **Indiana Bat**

The Indiana bat is a state and federal endangered species that uses upland and riparian forests for roosting, maternity sites, and foraging activities during the summer. Indiana bats roost underneath loose bark of snags and exfoliating bark of live hickories (*Carya* spp.) and other shaggy-barked tree species, and in cavities, splits, and crevices of damaged or dead trees and in hollow limbs and boles. Foraging Indiana bats have been documented flying in and around forest canopies that have open understories, and along forest edges and over ponds. These animals migrate to caves and mines in the fall for winter hibernation.

U.S. Fish and Wildlife Service (USFWS) has listed the entire state of Ohio as having the potential for Indiana bat occurrences during the non-hibernating season (April – September) (Kroonemeyer 2000). Individuals have been captured on the Athens and Ironton Units of the WNF within recent years. However, the Marietta Unit was not included in the latest summer surveys. American elm and green ash are among the list of preferred species of trees often used by Indiana bats across their range (Boyer 2001). Elm and ash are located in the project area, but none of these trees currently exhibit characteristics potentially suitable for bat roosting. However, there are six box elder snags and one live box elder exhibiting suitable roosting characteristics located in the project area.

#### **American Burying Beetle**

The American burying beetle (ABB), a state and federal endangered species, was once widely spread throughout eastern temperate North America, but has since experienced a drastic decline in population numbers and is thought to have been eliminated over nearly its entire range (USFWS 1991). The ABB is a carrion beetle that is fully nocturnal and active from late April to

late September. The ABB appears to occur in a broad range of habitats, including grasslands, old field shrubland, and oak-hickory forests with open understories. Carrion availability may be the most important factor limiting the areas in which this species can prosper (USFWS 1991).

The last ABB reported in Ohio was in Hocking County in 1974. The last two records of the ABB on the Marietta unit were from 1920 and 1921 in neighboring Washington County. Extensive surveys were conducted in southeastern Ohio prior to the reintroduction of the species in Athens, Hocking, and Vinton counties in the past several years, and no populations were found. (Schultes 2002a, PF 5-2)

### **Bald Eagle**

Bald Eagles are a state and federal threatened species. They build nests and raise their young along large reservoirs or large riverine situations with open water. They also use this habitat for winter roosting. Eagles have been reported cruising the Ohio River near the Marietta unit during the winter months, and nesting attempts have occurred near the WNF in Noble County and on Blennerhassett Island on the Ohio River near Parkersburg, WV. At this time, the USFWS suggests that Bald Eagles occurring on the WNF are probably migrating through or only wintering there (Boyer 2001). No Eagle nests or major roost sites are known to occur along the Little Muskingum River, none were noted at the project site, and the USFWS does not consider the LMR as prime eagle habitat (Boyer 2001)

### **Regional Forester Sensitive Species**

#### **Black Bear**

Black bear prefer heavily wooded areas with a dense understory, but they will also utilize forests with open areas, like meadows. Black bear have been sporadically found on the WNF. Stream and creek banks are often used as travel lanes because of thick undergrowth and a barrier-free escape route. They often consume berries, flowers, grasses and sedges, herbs, tubers and roots, and nuts of all kind, many of which are found growing in open meadow situations. Black bear also eat small mammals, insects, and honey. There were three confirmed and three unconfirmed black bear sightings in Monroe County from 1999 to 2001 (Swanson 1999a, 2000a, 2001a). Suitable habitat for black bear exists in the general vicinity of the proposed project. (Schultes 2002a, PF 5-2)

#### **River Otter**

A reintroduction program for river otter began in 1986 (DOW 2002b). River otters live in streams, rivers, ponds, marshes, and wetlands. They prefer long, slow-flowing, meandering waterways. They will not be found in areas of poor water quality (DOW 2002b). Good otter habitat contains year-round open water, densely wooded riparian cover along the banks, and abundant fish, their favorite prey. A healthy riparian corridor is probably one of the most important attributes for the continued existence of the river otter.

Ring Mill, located approximately  $\frac{3}{4}$  mile upstream from the proposed project area, was one of two re-introduction sites on the LMR. River otters are now known to occur throughout the Little Muskingum watershed (USFS 2002). Family groups have been sighted in both Monroe and Washington counties (DOW 2002c). Suitable habitat for this species exists at the proposed project site. (Schultes 2002a, PF 5-2)

#### **Bobcat**

Bobcats are found in a variety of habitats and cover types, including swamps, forests, and brushy areas. Their diet consists mainly of hares, rabbits, birds, and small mammals. There have been

recent confirmed sightings in Monroe County (Swanson 1998, 1999b, 2000b, 2001b). Suitable habitat for bobcat exists in the general vicinity of the proposed project.

### **Evening Bat**

Ohio is probably near the northern edge of the evening bat's range. This species is thought to migrate to warmer climates in winter. During summer, evening bats roost in buildings, tree cavities, and under loose bark on trees. They have been found foraging along the edges of mature woods and within clearings in those woods (Belwood 1998). One male evening bat was recorded on the Marietta unit during summer mist net surveys conducted from 1978 to 1981 (Bookhout and Lacki 1981). More recent bat surveys on the Athens and Ironton Units of the WNF failed to document the presence of this bat species (Kiser and Bryan 1997, Kiser et al. 1998, Kiser et al. 1999, Kiser et al. 2000). Some roosting and foraging habitat exists at the project site for this species. (Schultes 2002, PF 5-2)

### **Cerulean Warbler**

Eastern Ohio is in the core of the Cerulean Warbler's breeding range. The Cerulean Warbler prefers large tracts of mature deciduous woods. In southeast Ohio, it is found in mixed mesophytic upland and floodplain forests. Nests are located in the canopy of tall trees (Peterjohn and Rice 1991). They are known to occur throughout all units on the WNF and are relatively common. Cerulean Warblers have been confirmed in two bird survey transects located within 3.5 and 4.5 miles, respectively, of the proposed project area by a forest bird monitoring project conducted on the WNF. The Cerulean Warbler is a Wayne National Forest Management Indicator Species (MIS).

### **Timber Rattlesnake**

The species is currently found in widely scattered areas of southern unglaciated Ohio. Limited numbers occur in Adams, Athens, Hocking, Jackson, Pike, Ross, Scioto, and Vinton counties (Caldwell 2002). Timber rattlesnakes prefer dry, wooded hill country. Summer habitat is described as "mixed deciduous or coniferous forests with nearly closed canopy, heavy leaf litter and little herbaceous cover, and a few rocks or fallen trees" (DOW 2002c). Den sites are usually found in rock outcroppings and on talus, south-facing slopes with relatively open canopy cover. It is thought that human persecution combined with habitat destruction and a low reproductive rate account for the declining population (Caldwell 2002).

There have been two unconfirmed reports of timber rattlesnakes from the Little Muskingum Watershed in neighboring Washington County (USFS 2002). Due to the floodplain nature of the proposed project area and the presence of only some of the preferred habitat elements for this species, habitat at this site is considered marginal for timber rattlesnakes.

### **Wabash River Cruiser**

The Wabash river cruiser is a dragonfly that uses streams with patches of water willows (*Justicia americana*). The adults will also fly over streams or be on woodland trails or old logging roads. Currently, the only record of this species found near the WNF was on a dammed stream reservoir at Burr Oak State Park in Morgan County (near the Athens Unit) in August 1982 (Heady 1994). None have been recorded on or near the Marietta Unit.

### **Southern Grizzled Skipper**

The southern grizzled skipper is a butterfly associated with disturbed openings in mature oak forests, which includes open hillsides, disturbed ridgetops, powerline cuts, and roadsides (Iftner et al. 1992). The host plants for this butterfly (dwarf cinquefoil, *Potentilla canadensis*; coltsfoot, *Tussilago farfara*; wood vetch, *Vicia caroliniana*; and spring beauty, *Claytonia virginica*) all

require open canopy and full sunlight (Gleason and Cronquist 1991). The suppression of fire in our forests has led to the invasion of woody growth in the openings that renders the habitat unsuitable. One small population of this grizzled skipper is known to occur on a maintained pipeline corridor in Hocking County on the Athens Unit. None are known to occur on the Marietta Unit. However, suitable habitat may exist at the project site, especially with the presence of spring beauty at the site (per Forest Botanist) and the adjacent powerline corridor.

### **Regal Fritillary**

Populations of this butterfly are extremely localized, and it is thought to be extirpated from the state. In southeastern Ohio, the regal fritillary occurred in wet fields, pastures, and along roadsides, but usually near a woodland border (Iftner et al. 1992). Violets (*Viola* spp.) are believed to be an important host plant. A *Viola* species was documented at the project site during on-site visits by the Forest Botanist; thus, suitable habitat for the regal fritillary may exist at the project site.

### **Management Indicator Species**

#### **Cerulean Warbler**

The Cerulean Warbler was described in the Regional Forester Sensitive Species section.

#### **White-eyed Vireo**

White-eyed Vireos prefer shrub-dominated areas, such as are found in abandoned fields where woody vegetation is interspersed with patches of herbaceous cover. They also occur along brushy fencerows, stream corridors, and woodland edges and openings (Peterjohn and Rice 1996). Nesting activities are usually initiated in early May, and nests are placed low in dense shrubs (Peterjohn 1989). Suitable habitat is available for this species near the project site, as well as on much of the WNF. (PF 5-6)

#### **Pileated Woodpecker**

The Pileated Woodpecker prefers extensive tracts of mature forests but may also be found in scattered woodlots and along wooded riparian corridors. Nests are most frequently located in cavities 25 to 50 feet high in large, dead deciduous trees. Breeding bird surveys in the state have shown the abundance of this species has increased significantly in recent years (2.4% annually), and the birds are much more common in the eastern part of Ohio than the west (Earnst and Andres 1996 as quoted in Schultes 2002c, PF 5-7). Suitable habitat is available for this species on most of the WNF. (Schultes 2002c, PF 5-7).

#### **Common Yellowthroat**

Common Yellowthroats inhabit dense herbaceous vegetation with scattered brushy thickets and small saplings in damp or wet locations. Most breeding pairs inhabit old fields, corridors along fencerows and streams, woodland edges and openings, and the margins of ponds and marshes. Nests are either on the ground under dense herbaceous cover, or at heights of less than one foot attached to shrubs and clumps of grasses.

Common Yellowthroats are abundant in the state with 99.9% of the Ohio breeding bird survey blocks reporting detection of the species. The unglaciated plateau was the second most abundant region in the state (27.8%) reporting this species (Peterjohn and Rice 1996). During a 1995 breeding bird inventory undertaken on all three units of the WNF in early successional habitat (stands 5 to 21 years old), only a few individuals of this species were detected on the Athens and Ironton Units. None were detected on the Marietta Unit. This low number may be due to the amount of available aquatic habitat located within them, according to Earnst and Andres (1996). Suitable habitat for this species may be present in and around the project site.

During survey efforts within earlier succession habitat (as described in the white-eyed vireo section) only 5 of 39 sampled areas had common yellowthroats detected with all but one detection being on the Ironton unit. It is reported that the yellowthroat is more than twice as common in eastern Ohio as in the western part of the state.

### **Wood Duck**

Wood Ducks prefer mature riparian corridors along streams, quiet backwaters of lakes and ponds bordered by large trees, and secluded wooded swamps. They nest exclusively in cavities, either naturally occurring ones in large trees or in artificial structures (i.e., nest boxes). Most nests are near or over water, but some have been documented over 500 feet from water. Natural cavities and large trees are not abundant in the project area; thus, the site represents only marginal habitat for Wood Ducks.

### **Effects of Alternative A: No Action**

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Since no disturbance of the bottomland hardwood forest will occur with the No Action alternative, the closed canopy, riparian habitat with its associated ecological processes will remain intact and suitable to the wildlife species currently using the area. In time, the character and tree species composition of the forest will change naturally, likely resulting in a shift in the species that can and will use the area. Currently, the riparian corridor is dominated by boxelder, a fast-growing, short-lived species. In 70 or 80 years, these boxelder will be dying off and will be replaced in the canopy by longer-lived species such as green ash, sycamore, American elm, red maple, or yellow buckeye that are also currently present at the site.

Some species will benefit from the natural succession of this relatively young bottomland hardwood forest, while other species will be negatively impacted by the maturing of the overstory canopy and subsequent loss of understory. Indiana bats, evening bats, Cerulean Warblers, timber rattlesnakes, Pileated Woodpeckers, and Wood Ducks may benefit by future changes. Currently, little roosting/nesting habitat exists, but as the present trees grow old and die, more suitable habitat to these species will be created. In contrast, species such as black bear, bobcat, southern grizzled skipper, regal fritillary, White-eyed Vireo and Common Yellowthroat that require dense herbaceous understories, openings, edge habitats, or disturbance may be less adapted to the future mature, intact condition of the riparian forest.

It is difficult to definitively predict the natural future condition of a floodplain forest because of the dynamic nature of the river and its associated habitat. The current mosaic of habitats and the human-dominated uses are likely to continue.

### **Effects of Alternative B: Approve SUPO as submitted.**

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The scale of the proposed project as submitted (Alternative B) is limited. Thus, overall impacts to resident wildlife populations are likely to be mostly short-term, localized, and small in extent by themselves in the big picture.

### **Direct Impacts**

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Removal of trees for the proposed well pad and road results in forest fragmentation and creation of edge habitat. Fragmentation translates to a direct loss of habitat for some forest species. A short-term loss is incurred where the disturbance is temporary, such as along the road and part of the well pad, which would be rehabilitated. Long-term loss is associated with the space occupied permanently by the proposed well. The creation of edge results in more wind and light reaching the adjacent forest interior, leading to a drier forest environment. The opening created, after it is

allowed to re-vegetate, would be brushy, and the vegetation would likely become dense, offering some variation in the local habitat. The creation of brush piles along the edges of the disturbance would provide a source of otherwise scarce habitat in the immediate project area. Many species of reptiles, amphibians, small mammals, and some birds are known to use brush piles for cover or nesting.

### **Indirect Impacts**

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Forest fragmentation and creation of edge have known consequences, which may affect different wildlife species in different ways. Fragmentation can lead to the isolation of populations of animals, because their movement is limited by their size, the distance, or their habits (i.e., some species naturally resist movement to other areas). Fragmentation can exclude species from utilizing previously connected habitats of different types that are required by some species on a day-to-day or seasonal basis. Forest fragmentation can also result in increased competition for resources, a crowding effect, and increased disease, as displaced individuals move to remaining suitable habitat.

Creation of edge in a previously undisturbed forested area may result in an increase in the number of predators and parasites exploiting the forest interior-adapted species. There may also be more competition for limiting resources along edges, since more species are often found exploiting edge habitats. Blowdowns of trees are more common in edge habitat. The invasion of non-native plants, which tend to out-compete native plants, is common along edges and can drastically change the resources and cover available to resident wildlife.

### **Cumulative Impacts**

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Cumulative effects are the effects on the environment which result from the incremental impact of proposed actions when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individual minor but collectively significant actions taking place over a period of time.

Since most oil production on the WNF is from outstanding rights (mineral rights owned in whole by private parties), the additional impact on forest resources from development of this well will be minimal compared to the total impact of oil production on the Forest.

The degree of impact that forest fragmentation has on wildlife resources depends on the location of the activities and the species present. Construction activities in areas that are already altered or largely fragmented will be less disruptive to natural processes than are activities in forest areas that are largely intact. While loss of natural plant communities and ecosystem fragmentation adversely affect many wildlife species, openings created by oil and gas development activities may be beneficial to some species that utilize open land or semi-open land habitats. Effects on species and habitat diversity are dependent upon: location, distribution, and ecological potential of these openings; plant communities and vegetation structure resulting from management treatments in the openings; human activities in and near the openings; and other land uses in the area.

The many small openings created by oil and gas activities throughout the watershed taken together with the other more complete or permanent human disturbances in riparian areas (e.g., permanent roads and agriculture) create magnified effects discussed under Direct and Indirect Impacts. Cumulatively, the changes in riparian corridors result in a loss of an important habitat type across the sub-watershed and watershed. Little continuous, undisturbed bottomland hardwood forest exists in the sub-watershed. Another interruption in bottomland habitat means a

reduction in overall ecological benefits provided by riparian vegetation/riparian ecosystems, such as modification of flood peaks, groundwater recharge, nutrient and water filtration, stream bank stabilization, and stream cover for water temperature control.

### ***Threatened and Endangered Species***

The project as proposed may affect the **Indiana bat**. However, with the incorporation of the mitigation described in Terms and Conditions #5 of the Programmatic Biological Opinion (BO), and due to the small acreage of the area to be affected (0.9 acres), the removal of only a small proportion of trees in an otherwise mostly forested landscape, and the timing of the tree removal, anticipated effects of the proposed action to Indiana bats are minimal and similar to those anticipated for mineral development (pg 26-27) in the Programmatic BO, it is my determination that the proposed project is not likely to adversely affect the Indiana bat.

**Mitigation for this species:** Removal of trees over 6" in diameter and exhibiting loose bark, cavities, or crevices should only occur between 16 September and 14 April.

The proposed project area is outside of the currently recognized range of the **American burying beetle** in Ohio. The project site is also confined to a floodplain, which does not constitute ideal ABB habitat. There is no incidental take anticipated for this species. Thus, the proposed project will have no effect on this species. (Schultes 2002a, PF 5-2)

Potential nesting and roosting habitat is available for the **Bald Eagle** at the project site, but the LMR only offers this species marginal habitat. No trees will be cut if they contain an eagle nest. Based on the small size and location of the proposed project, there is no incidental take anticipated for this species. Thus, the proposed project will have no effect on this species. (Schultes 2002a, PF 5-2)

### ***Regional Forester Sensitive Species***

The opening of the canopy that would be associated with this project could increase the amount and density of undergrowth found at the project site over time, which could positively impact **black bear**, both with regard to food and cover production. However, there is also an associated, negative impact from noise both during the drilling operation (short-term) and after, when the pump is in operation (long-term). The electric pump will be quieter than a gas or diesel pump. Thus, the project may impact individuals but is not likely to cause a trend towards federal listing or the loss of viability of the species. (Schultes 2002a, PF 5-2)

The creation of a new well site using large machinery in close proximity to the LMR could impact stream quality by way of increased sedimentation entering the waterway, thus affecting the **river otter**. Increased traffic after drilling on the main access road to Drake #4 must ford three intermittent streams feeding directly into the LMR. Increased sedimentation leads to elevated turbidity of the water, which impedes an otter's underwater vision, thus decreasing foraging success. An increased sediment load can also affect the survival and reproductive success of the aquatic prey species upon which otters depend for food (Henley et al. 2000). Thus, the project may impact individuals but is not likely to cause a trend towards federal listing or the loss of viability of the species. (Schultes 2002a, PF 5-2)

The installation of an oil/gas well along a currently undisturbed section of riparian corridor can affect **bobcat**. They shy away from human contact and are found most often in areas not accessible by motorized vehicles (Svendsen 1979). Thus, they are impacted by any human encroachment on previously undisturbed habitat. Thus, the project may impact individuals but is not likely to cause a trend towards federal listing or the loss of viability of the species. (PF 5-2)

Limited roosting habitat is available at the site for **Evening bats**. The mitigation required for the Indiana bat would likely benefit this species as well. Therefore, the proposed action is not likely to adversely affect this species.

The proposed project will eliminate one half acre of potential **Cerulean Warbler** nesting habitat. The amount of suitable habitat lost as a result of the proposed action would be minimal compared to the amount of remaining adjacent habitat along the floodplain. Thus, the project may impact individuals but is not likely to cause a trend towards federal listing or the loss of viability of the species. (PF 5-2)

Due to the floodplain nature of the proposed project area and the presence of only some of the preferred habitat elements for this species, habitat at this site is considered marginal for **timber rattlesnakes**. Thus, the project may impact individuals but is not likely to cause a trend towards federal listing or the loss of viability of the species.

No **Wabash river cruisers** have been recorded on or near the Marietta Unit. Thus, the project may impact individuals but is not likely to cause a trend towards federal listing or the loss of viability of the species.

The removal of trees on the floodplain may create more suitable habitat in the project area for the **southern grizzled skipper**. Thus, the proposed project may benefit this species in the short-term.

Opening up of the forest canopy at the project site may increase suitable habitat for the **regal fritillary**. Thus, the proposed project may benefit this species in the short-term.

### ***Management Indicator Species***

The Cerulean Warbler was discussed under the RFSS section. White-eyed Vireo, Pileated Woodpecker, Common Yellowthroat, and Wood Duck are MIS species that potentially have suitable habitat in the project area. Effects to the **Pileated Woodpecker** could occur during the clearing process, although few trees present on-site offer suitable nesting or foraging habitat for this species. The overall impact to the Pileated Woodpecker would be insignificant, because only a small area is affected by the clearing and drilling operation, and suitable habitat is available for this species throughout the Forest. **Common Yellowthroats** have not been documented on the Marietta Unit; however, suitable habitat appears to exist at the site. Individuals may be affected by the clearing of vegetation for the project, but the small scale of the proposed action is unlikely to affect the species. (Schultes 2002c, PF 5-7)

### **Effects of Alternative C: Approve SUPO with Mitigations**

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Impacts are expected to be similar to those described for Alternative B; however, the planting of trees after the drilling operations are finished will expedite the recovery of a more closed canopy environment and result in a smaller well pad clearing than would otherwise be left. As the new trees grow in, a small area of early succession-like habitat will exist for some time, benefitting species that prefer heavier cover and edge habitat.

There is still a change in natural vegetation, and disturbance in the riparian corridor that adds to the cumulative effects described under Alternative B. However, the effects are minimized with implementation of recommended mitigations.

Mitigations to protect the intermittent stream crossings and the ephemeral stream at the tank battery should reduce sedimentation, protecting habitat for the river otter and other aquatic species including fish and mussels.

Potential effects to threatened or endangered species, regional forester sensitive species, and management indicator species would be the same as for Alternative B as stated above. However, benefits derived for some species through the conversion of forest to open space would be more short-term than those for Alternative B. The long-term and cumulative effects to forest species are decreased by the mitigations proposed, especially erosion control mitigations and tree planting.

### **Indicator**

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Impacts from this proposed action can be measured by tracking the number of special use permits and other developments on the Wayne National Forest in riparian corridors within the sub-watershed of Straight Fork, and which involve the removal of canopy trees (e.g., oil/gas wells, roads, pastures).

### **Roads Analysis**

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Alternatives B and C include construction of approximately 400 feet of road for access and administrative use. The construction will be an extension of a low-level maintenance road. The construction would occur on a relatively flat location within a floodplain. This use is similar to other oil well access roads within the floodplain. Due to the limited use and short extent of the construction it is not expected that construction of an additional 400 feet of road would have effects noticeably different than the no action alternative.

Alternative C includes maintenance of concrete structures for the stream crossings in the existing portion of the road. The structures are already in place. However, this mitigation measure would ensure the effectiveness of the structures in maintaining proper stream flow.

### **Summary of Cumulative Impacts**

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While direct effects are caused by a specific action at the same time and place, cumulative effects result from incremental effects of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

### ***Past, Present and Future Activities in the Project Area***

The Wayne National Forest has 44 leases and 113 producing wells within the 2.1 Management Area along the LMR. The Straight Fork section of the LMR in which the project is located is 12% of the Little Muskingum watershed (23,493 acres out of 201,347 acres). 82% of the Little Muskingum watershed is forested, with much of the forested land being on the slopes. 15% of the Straight Fork watershed is in agriculture and 116.8 miles of road with a density of 3.2 miles of road per square mile. Most of this development occurs within stream valleys and floodplains where the terrain is flatter and easier to occupy. Current land use trends in this sub-watershed indicate that farming, mineral extraction and roads will continue to dissect the riparian areas (USFS 2002).

The impact of any single, new activity in the LMR watershed is difficult to assess independently of historic and present activities listed above. Cumulative effects of land management activities past and present on water quality are massive and continuing. The pollution load in Forest streams includes ...sediment from agriculture, roads and trails, timber harvests on private lands,

abandoned mined lands...oil and gas development...agriculture and domestic and community sewage effluent, and pesticides from agriculture (USFS 1992). The cumulative effects of development on private land are unknown. Road building and maintenance, farming, and other well development can cause increased sedimentation, fragmentation of habitat, alteration of micro-climates, and introduction of non-native species. Increased sediment load can have a negative effect on the survival and reproductive success of eggs and larvae, affecting some species directly and other, mainly predators, indirectly.

### **No Action Alternative**

While Alternative A does not allow any new activity, changes will continue to occur in the watershed. Since most oil and gas on the Forest is privately owned, the selection of the No Action alternative will have minimal impact on mineral development on the Forest. The forest will continue to mature, favoring habitat for some species and decreasing habitat for others. Box elder dominates the riparian corridor, but in 70-80 years will die off and be replaced in the canopy by longer-lived species such as green ash, sycamore, and American elm. At the immediate site, the canopy would remain closed, and would continue to provide shade and temperature control to understory and herbaceous vegetation. The shaded conditions would likely prevent the spread of multiflora rose, which exists in the exposed powerline corridor. Garlic mustard, a shade-tolerant NNIS, would likely spread along the floodplain regardless of disturbance pressures unless measures are taken to control its proliferation.

### **Alternatives B and C**

#### **Aquatic Environment: Water Quality**

In the midst of the long history of disturbance in this watershed, there is also a trend for the watershed to become more forested, including along streams. The life use designation of the LMR has risen to Exceptional Warmwater Habitat. Mitigations applied to the proposed project should reduce raindrop impact on the disturbed area, provide tree roots to hold soil on the disturbed area, reduce sediment loss at each intermittent stream crossing, and prevent damage downstream from woody debris during flood events. The total effect is to minimize any cumulative effects likely to occur to aquatic organisms, including RFSS and MIS.

While 400 feet of new road will appear with the selection of Alternative B or C, other mineral access roads will be reclaimed and revegetated due to the plugging of old wells. Vehicular traffic associated with oil and gas activities is presently a portion of traffic volume (USFS 1992). Since the Drake 4 well is already on a regular maintenance schedule, Drake 4C will cause a negligible increase in local traffic. Road maintenance on local roads will continue to allow sediment to move into streams.

#### **Heritage Resources**

Since no artifacts were found at the site, there is no cumulative effect on heritage resources along the LMR.

#### **Visuals and Recreation**

The major change to recreation is the widening of an existing trail to a minimum use access road. This impact will be minimized by the natural re-vegetation of the road. The visual impact of the new well on the road and trail will only be partially mitigated by planting native species trees on the unused portions of the well pad. The placement of another oil well in alternatives B and C will add to the cumulative visual impact along the River. Users of the NCT will pass another well along the route through the forest. Mitigations will lessen the impact, but not eliminate it.

**Environmental Conditions: Plants**

Clearing a portion of the floodplain during drilling operations changes the environmental conditions for plant species, including the amount of sunlight exposure, temperatures, and moisture conditions. These changes increase the likelihood of introducing and spreading NNIS, which could displace native species on the floodplain over time. Non-native invasive species pose a serious threat to plant and animal community health and diversity. A reduction of native species could affect wildlife species dependent on them for food and/or habitat.

**Environmental Conditions: Wildlife**

Some habitat loss is temporary, other loss is minimal compared to habitat available. Some wildlife species are favored by disturbance, early succession, and the variety of habitat types created. Forest fragmentation can result in increased competition for resources, a crowding effect, and increased disease, as displaced individuals move to remaining suitable habitat. Construction activities in areas that are already altered or largely fragmented will be less disruptive to natural processes than are activities in forest areas that are largely intact.

Another interruption in bottomland habitat means a reduction in overall ecological benefits provided by riparian vegetation/riparian ecosystems, such as modification of flood peaks, groundwater recharge, nutrient and water filtration, stream bank stabilization, and stream cover for water temperature control. While these changes seem important, the impacts on individual species are collectively very minimal. There is no anticipated effect on threatened or endangered species, RFSS, or MIS due to the small area affected, the duration of the disturbance, or the presence of other disturbance in the area.

## Chapter 4: Consultation, Coordination, and List of Preparers

Consultation was completed with the US Fish and Wildlife Service, the Bureau of Land Management, the Ohio Historic Preservation Office, and the Ohio Division of Natural Areas and Preserves.

### List of Preparers

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|                   |                           |                       |
|-------------------|---------------------------|-----------------------|
| Ann Cramer,       | Archaeologist,            | Wayne National Forest |
| Erin Larson,      | Botanist,                 | Wayne National Forest |
| Katrina Schultes, | Wildlife Technician,      | Wayne National Forest |
| Tom Thompson,     | Minerals Technician,      | Wayne National Forest |
| Ahmed Mohsen,     | Minerals Program Manager, | Wayne National Forest |
| Marsha Wikle,     | ID Team Leader,           | Wayne National Forest |

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## Appendix A: Regulatory Framework

### 36 CFR Sec. 228.107 Review of surface use plan of operations

(a) Review. The authorized Forest officer shall review a surface use plan of operations as promptly as practicable given the nature and scope of the proposed plan. As part of the review, the authorized Forest officer shall comply with the National Environmental Policy Act of 1969, implementing regulations at 40 CFR parts 1500-1508, and the Forest Service implementing policies and procedures set forth in Forest Service Manual Chapter 1950 and Forest Service Handbook 1909.15 and shall ensure that:

(1) The surface use plan of operations is consistent with the lease, including the lease stipulations, and applicable Federal laws;

(2) To the extent consistent with the rights conveyed by the lease, the surface use plan of operations is consistent with, or is modified to be consistent with, the applicable current approved forest land and resource management plan;

(3) The surface use plan of operations meets or exceeds the surface use requirements of Sec. 228.108 of this subpart; and

(4) The surface use plan of operations is acceptable, or is modified to be acceptable, to the authorized Forest officer based upon a review of the environmental consequences of the operations

### 36 CFR Sec. 228.108 Surface use requirements.

(a) General. The operator shall conduct operations on a leasehold on National Forest System lands in a manner that minimizes effects on surface resources, prevents unnecessary or unreasonable surface resource disturbance, and that is in compliance with the other requirements of this section.

(b) Notice of operations. The operator must notify the authorized Forest officer 48 hours prior to commencing operations or resuming operations following their temporary cessation (Sec. 228.111).

(c) Access facilities. The operator shall construct and maintain access facilities to assure adequate drainage and to minimize or prevent damage to surface resources. (Page 178)

(d) Cultural and historical resources. The operator shall report findings of cultural and historical resources to the authorized Forest officer immediately and, except as otherwise authorized in an approved surface use plan of operations, protect such resources.

(e) Fire prevention and control. To the extent practicable, the operator shall take measures to prevent uncontrolled fires on the area of operation and to suppress uncontrolled fires resulting from the operations.

(f) Fisheries, wildlife and plant habitat. The operator shall comply with the requirements of the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) and its implementing regulations (50 CFR chapter IV), and, except as otherwise provided in an approved surface use plan of operations, conduct operations in such a manner as to maintain and protect fisheries, wildlife, and plant habitat.

(g) Reclamation. (1) Unless otherwise provided in an approved surface use plan of operations, the operator shall conduct reclamation concurrently with other operations.

(2) Within 1 year of completion of operations on a portion of the area of operation, the operator must reclaim that portion, unless a different period of time is approved in writing by the authorized Forest officer.

(3) The operator must:

- (i) Control soil erosion and landslides;
- (ii) Control water runoff;
- (iii) Remove, or control, solid wastes, toxic substances, and hazardous substances;
- (iv) Re-shape and re-vegetate disturbed areas;
- (v) Remove structures, improvements, facilities and equipment, unless otherwise authorized;
- (vi) Take such other reclamation measures as specified in the approved surface use plan of operations.

(h) Safety measures. (1) The operator must maintain structures, facilities, improvements, and equipment located on the area of operation in a safe and neat manner and in accordance with an approved surface use plan of operations.

(2) The operator must take appropriate measures in accordance with applicable Federal and State laws and regulations to protect the public from hazardous sites or conditions resulting from the operations. Such measures may include, but are not limited to, posting signs, building fences, or otherwise identifying the hazardous site or condition.

(i) Wastes. The operator must either remove garbage, refuse, and sewage from National Forest System lands or treat and dispose of that material in such a manner as to minimize or prevent adverse impacts on surface resources. The operator shall treat or dispose of produced water, drilling fluid, and other waste generated by the operations in such a manner as to minimize or prevent adverse impacts on surface resources.

(j) Watershed protection. (1) Except as otherwise provided in the approved surface use plan of operations, the operator shall not conduct operations in areas subject to mass soil movement, riparian areas and wetlands.

(2) The operator shall take measures to minimize or prevent erosion and sediment production. Such measures include, but are not limited to, siting structures, facilities, and other improvements to avoid steep slopes and excessive clearing of land.