CHAPTER 3 - AFFECTED ENVIRONMENT

Introduction: This Chapter describes the affected environment. It lists all the critical elements of the physical, social and biological resources and, if present, describes briefly the resource values and whether they are affected by the Proposed Action and Alternatives (See Table 3-1).

Table 3-1

Resource	Present	Affected
1. Air Quality	Yes	No
2. Environmental Justice	Yes	No
3. Fire Risk	Yes	No
4. Forest Fragmentation	Yes	Yes
5. Heritage	Yes	Yes
6. Land Use	Yes	Yes
7. Livestock Grazing	Yes	No
8. Minerals	Yes	Yes
9. Noise	Yes	Yes
10. Recreation	Yes	Yes
11. Road Analysis/Transportation	Yes	Yes
12. Socio-economic	Yes	Yes
13. Soils	Yes	Yes
14. Threatened/Endangered/Sensitive Animals	Yes	Yes
15. Threatened/Endangered/Sensitive Plants	Yes	Yes
16. Timber	Yes	No
17. Vegetation	Yes	Yes
18. Visual Resources	Yes	Yes
19. Water Quality	Yes	Yes
20. Wetlands/Riparian/Floodplain	Yes	Yes
21. Wilderness	No	No
22. Wildlife/Fisheries	Yes	Yes

The 4,634 subject acres (63 tracts) are geographically separated from each other but are within three administrative management units (Athens, Ironton and Marietta) of the Wayne National Forest. Federal regulations at 40 CFR 1502.21 encourage agencies to incorporate existing materials by reference, when it is available. A detailed description of the affected environment can be found in Chapter 2, Chapter 3 and Chapter 4 of the August 6, 1992, Record of Decision and Final Supplemental Environmental Impact Statement for Oil and Gas Resources - which is Amendment #8 to the Wayne National Forest Land and Resource Management Plan. The description of the affected environment, where the 63 tracts are located, is based on:

1. Whether the resource is present or affected in the subject area; and
2. Whether issues were raised during internal and external scoping, including appeals.

- *Note: Effects are defined as modifications to the environment, as it presently exists, that are brought about by an outside action. It should be noted that no ground-disturbing activities would result from this stage of the leasing process (see Table 1-1). Only major issues concerning effects to resources will be analyzed further in Chapter 4 - the effects analysis section of this document.*

3-1 AIR QUALITY

The Clean Air Act Amendment of 1970 established National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. Ambient air is that which is accessible to the public. National air quality health standards have been set for six pollutants called “criteria pollutants”. These include ozone, particulates, sulfur dioxide, nitrogen dioxide, carbon monoxide, and lead. Regional air quality within the Forest is greatly impacted by emissions from industries in the Midwestern United States and from the Ohio River industrial corridor. These emissions contribute greatly to the acid deposition problem which has been well documented in recent years. This deposition includes dust, sulfates, heavy metals, and acidic precipitation which can damage the Forest's soils, water, aquatic life, and vegetation. The Wayne National Forest lies within the heaviest sulfate deposition zone in the United States. Localized air quality in the Forest is relatively free of particulate matter and industrial chemicals generated by nearby sources. Existing oil and gas production results in very localized release of natural gas accompanied by some unpleasant odors. Very localized dust is generated along rural roads, on farms, timber harvesting sites, and mining sites during warm months of the year when soils are dry. Because of their remote locations, lack of farms, mines, and roads, local air quality tends to be higher in M.A. 6.2, than Forest wide (1992 Plan Amend#8-FEIS, p. 3-19).

3-2 ENVIRONMENTAL JUSTICE

Executive Order 12898 (1994) requires federal agencies to assess the impact on low income and minority populations as a result of activities within the communities where projects or programs are planned. The objective is to determine if an unfair share of environmentally unfavorable projects/programs would occur in low income or minority communities. Further analysis in Chapter 4 is not warranted since none of the potentially environmental effects identified would disproportionately affect minority or low-income communities.

3-3 FIRE RISK

Much of the Forest area is protected by small rural fire departments. The incidence of fire is relatively low with virtually every fire is caused by arson or escaped debris burning. The incidence of wildfire is highest on the Ironton District. Due to the highly accessible, well-roaded nature of the Forest, particularly those areas with a high level of oil and gas activity, fire departments have easy access for fire control. The possibility of closing roads or limiting access is a concern for these groups (1992 Plan Amend#8-FEIS).

3-4 FOREST FRAGEMENTATION

The landscape of the Forest area, including National Forest and intermixed lands in other ownerships, is a patchwork of forest and openlands, fragmented by a human superstructure of roads, farms, industrial developments, towns, small cities, and utility corridors. The scattered pattern of National Forest ownership, including subsurface mineral rights, results in many access roads and utility lines across National Forest lands for access and services to intermingled private lands and privately-owned minerals. Habitat fragmentation is said to occur whenever a large, contiguous ecosystem is transformed into one or smaller, disjunct areas which are surrounded or separated by disturbed, less suitable or inhospitable habitats or a matrix of different vegetation and/or land use (Crow 1990; Norse et al. 1986; Saunders et al. 1991; Probst and Crow 1991). Although fragmentation can result from natural disturbances, such as fire and wind, it is also caused and aggravated by human activities, such as urban, agricultural, and industrial developments, and by other land management activities, such as forest management (Crow 1990; Probst and Crow 1991). The 1992 Wayne National Forest Plan, Amendment #8 (page 3-31) states that there are about 5,100 existing oil and gas wells estimated to be producing within the National Forest Purchase boundary, including private lands. Wells on National Forest land are about 1,000. Because the average area for a well site and road is about 1.1 acres, about 1,152 acres have been affected by oil and gas operations on National Forest land.

3-5 HERITAGE RESOURCES

There are approximately 12,000 years of human history in Ohio. Consequently, the Wayne National Forest harbors the remains of human occupation on any given landform within its boundaries. Prehistoric Native American groups lived on ridgetops, stream valleys, and in rockshelters found on ridge slopes. Within this upland environment, they buried their dead in earthen mounds placed on ridges, and occasionally within the rockshelters. Historic Native American peoples such as the Shawnee, Wyandotte, Delaware, and Miami utilized southeastern Ohio as a vast hunting ground. The Northwest Ordinance of 1787 opened Ohio and the Northwest Territory for settlement, and land-hungry settlers soon flooded into the Ohio territory and cleared and farmed the land. Remnants of early farmsteads and log cabins are still present across the Forest landscape. Ohio's natural resources allowed exploitation of its mineral wealth and made it one of the nation's industrial leaders during the 19th and early 20th centuries. Numerous remains of coal, iron ore, oil and gas, salt, and clay extraction activities and associated company towns are widespread across the Wayne National Forest. As a steward of the public's heritage, the Forest is charged with preserving the past for the future.

The National Historic Preservation Act (NHPA) of 1966, as amended, established:

- (1) a National Register of Historic Places (NRHP) to be maintained by the Secretary of the Interior;

- (2) the position of State Historic Preservation Officer (SHPO); and

- (3) the Advisory Council on Historic Preservation (ACHP).

Cultural resource significance evaluations are made with reference to the ability of a site or related group of sites to meet the criteria for eligibility to the NRHP. Section 106 of the NHPA requires federal agencies to provide the SHPO and ACHP an opportunity to comment on any project on federal lands within their state that would affect properties included in or eligible for inclusion in the NRHP. Section 304 directs federal agencies to withhold from disclosure to the public information relating to the location or character of eligible properties whenever disclosure of such information may create risk or harm to such resources. NRHP eligibility criteria are specified in 36 CFR Part 60.4 and Table 3-2.

The advisory council regulations outline procedures to be followed by federal agencies (51 Federal Register, 31118; 9/2/86). Federal agencies are required to consult with the SHPO to determine if a proposed undertaking encompasses any property included in or eligible for inclusion in the NHRP. For each eligible property identified, the federal agency must determine if the proposed undertaking would have an effect. If there could be an effect, the Criteria of

Adverse Effect are applied, and treatment measures are developed for resources that would be adversely affected. The regulations provide for consultation with the SHPO and ACHP to develop conditions for a Memorandum of Agreement for mitigation of potential adverse effects. Appendix 7, Table 6 contains a list of the tracts and the status of Section 106 process.

Table 3-2

Cultural resource significance evaluations are made with reference to the ability of a site or related group of sites to meet the criteria for eligibility to the NRHP.
As stated in 36 CFR Part 60.4, these criteria are as follows:
The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association, and: (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack distinction; or (d) that have yielded, or may be likely to yield, information important to prehistory or history.

3-6 LAND USE

As of 2002, the total acreage administered by the United States Forest Service in the Wayne National Forest is 233,070 acres. Land Use is described as follows: The intermingled ownership contributes added costs to management such as land line location, and makes access to the land more difficult than if it were more consolidated blocks. The scattered ownership pattern along with the diverse subsurface ownership also contributes to high management costs through inadvertent trespass and the need to provide special use permits for access, electric lines, and other services to intermingled private lands. In addition to this, access rights to private minerals must be recognized." All oil and gas operations, on federal subsurface minerals or private subsurface minerals, within the state of Ohio are regulated by the Ohio Department of Natural Resources' Division of Oil

and Gas in accordance with the Ohio Oil and Gas Laws (ORC 1509 and OAC 1501) (Wayne Forest Plan DEIS, p. 3-1).

In 1987, there were approximately 800 oil and gas wells on National Forest system Lands within the Wayne National Forest. In 1992, there were about 1000. Of this number, 70 wells are located on federal leases with the remainder on tracts with reserved or outstanding (private) rights. Most wells are producing from lands whose oil and gas mineral rights are owned by private entities. Production from these wells (subsurface private mineral rights) often occur from operations located on publicly-owned surface managed by the Wayne National Forest. Forest wide, about 20 percent of the parcels are encumbered by access rights of private oil and gas operators. These access rights include oil and gas flowlines, access roads, and/or powerlines. Few of the parcels on the Ironton Unit are encumbered (1992 Plan Amend#8-FEIS, p. 3-1).

3-7 LIVESTOCK MANAGEMENT

There are no current grazing permits within the subject lands

3-8 MINERAL RESOURCES

Oil and gas resources in SE Ohio are found within thick sedimentary rocks situated below the surface of the Wayne National Forest. Significant quantities of oil and gas has been found throughout the stratigraphic section in distinct geologic formations. These formations (the Berea, the Clinton-Medina, and the Ohio Shale) are commercially-proven to host oil and gas production. Despite the large number of wells drilled in the area, the stratigraphy of eastern Ohio remains poorly understood and consequently it is impossible to accurately predict production rates, and the life expectancy of any given well. However, the depth and thickness of these geologic formations is well known from existing well logs and, therefore, can provide a reliable model for future estimation of the scope of oil and gas drilling operations.

The physical deposition structure of the Berea, the Clinton-Medina, and the Ohio Shale formations determine the type and depth of drilling operations. The Berea-type drill holes are usually shallow (less than 1500 feet from the surface). While the Clinton-Median and the Ohio Shale-type wells are greater than 1500 feet.

3-9 NOISE

Due in part to the scattered land base of the Wayne National Forest, there are many sources from which noise is generated. Examples include the sounds of farm machinery, vehicles on roads, animal and human sounds near farmsteads, aircraft passing overhead, occasional logging operation sounds, ORV'S, mining operations including blasting, riverboats, trains, and industrial noise. Sounds are obviously most intense when a person is in the immediate area of an activity,

such as vehicle traffic, farm machinery, logging or active oil and gas wells. Sounds travel farther in the winter when the leaves are off the vegetation. An exception is the sound made by the older single piston, natural gas, or gasoline fired engine. The thump-thump-bang! of these engines can be heard great distances. In comparison the newer engines are similar to lawn tractors, and those powered by electric motors are scarcely heard (1992 Plan Amend#8-FEIS, p. 3-20).

State laws pertaining to well siting, mufflers, and sparks arresters provide for noise mitigation. These often rust out in a short time and commonly are not replaced. The Forest, on a site by site basis, has used other options (1992 Plan Amend#8-FEIS, p. 3-20).

3-10 RECREATION

Recreation developments on the Wayne National Forest districts have been in existence for many years. Most trails are also well established, although some minor changes are made occasionally. Lake Vesuvius Recreation Area, on the Ironton District, is a multi-facility development which has camping, picnicking, boating, swimming, interpretive programs, and trails. There are other picnic areas and campgrounds on the Forest. In addition to developed sites, the Forest provides for many dispersed recreation activities, such as hiking, hunting, nature study, horseback riding, fishing, boating, and gathering forest products. Through repeated use, off-road vehicle riders have developed a system of routes throughout much of the Forest. Most of the recreational use is located in the "Roaded Natural" area which is predominantly natural appearing environment with moderate evidences of the sights and sounds of man which harmonize with the natural environment. Evidence of other users is prevalent (2001 Oil & Gas EA).

The 63 tracts proposed for leasing were reviewed to determine if any fell within recreational 6.2 areas or were visible from recreation sites or trails. Appendix 7, Table 12 identifies those tracts which interface with recreation sites on each unit and recommend mitigation if a well is proposed in the area. The Record of Decision for the 1992 Wayne National Forest Amendment #8 (see Appendix 2) sets a desired future condition to prevent intrusions upon the environment within Management Area 6.2. This management area can potentially provide core areas of closed-canopied old growth forest beneficial to forest interior plant and animal species.

3-11 ROAD ANALYSIS/TRANSPORTATION

Roads on the Wayne National Forest are discussed extensively in the Wayne Forest Plan DEIS, pages 3-12 though 3-14. In some cases, problems with soil erosion are evident on access roads and trails associated with oil and gas developments as well as on the extraction operations themselves. Poor location,

lack of erosion control measures, lack of maintenance, and ill-advised construction and use during wet weather may cause problems with access roads. The Wayne National Forest has 95.6 miles of road that are inventoried and maintained by the Forest Service. In addition, there are about 200 miles of special-use roads on National Forest System land. The majority of these roads have been constructed and maintained for access to oil and gas wells, coal mines, or rural homesites. In addition there are an estimated 250 to 500 miles of lease roads; of which, an estimated 180 result primarily from oil and gas operations where the operator holds the mineral rights. These lease roads have been constructed and maintained to various standards. The majority of these roads remain ungated, so considerable public traffic occurs on them regardless of the standard of maintenance. The majority of oil and gas access roads (about 220 miles total) fall into the lease road category. Roads used to access oil and gas wells comprise about 10 percent of the total estimated 2,000 miles of road within the Forest boundary. However, most of the oil and gas roads are used for a variety of reasons and are public roads used for general Forest access and by the local populace (1992 Plan Amend#8-FEIS, p. 3-22).

3-12 SOCIO-ECONOMIC

The economies of local communities are based primarily on heavy industry (iron, glass, and chemical), natural resources (coal, oil, and gas), and small-scale agriculture. The educational component of the Athens local economy is high with the presence of Ohio University and Hocking Tech. Recent trends of low prices for fossil fuels and farm products, and the continuing decline of domestic heavy industries, suggest that the overall economic situation in the local communities will continue to be depressed. Demand for oil and gas is fairly high, but is cyclic as the price of oil floats on the world market. The oil and gas produced from private wells on National Forest System lands, and from federal wells, is a significant factor in the local economy. In 1981, Washington County, Ohio was ninth in the nation in the number of oil wells. In that year, oil and gas activities pumped as much as $100,000,000 into that county's economy. It is estimated that about 180 jobs in the area are dependent on the oil and gas produced from the wells in the Wayne National Forest. Of these jobs, only about 20 are dependent on federal lease wells. Most of these jobs are within the Athens and Marietta local economy. These jobs are in various sectors such as petroleum refining, transportation, and retail trade. A more complete description of the socio-economics can be found in Chapters 2, 3 & 4 of the 1992 Wayne National Forest Plan Amendment #8.

3-13 SOILS

The physiography of southeastern Ohio consists of a continuous pattern of narrow ridges and U-shaped valleys. The forested slopes are seldom smooth or of uniform gradient from crest to toe. The slopes are benched and segmented with portions exhibiting moderate and steep slopes. Slope benches are common

features that result when one rock bench is more resistant to erosion than those above or below. Weak rock layers, such as shale or mudstone, weather more rapidly than resistant sandstone. Soil types on the Wayne National Forest do not differ between management areas. The surface texture of most soils is silt loam, or sandy loam, but the texture of subsoils ranges from sandy loam to clay. Because of the steep slopes and silty surface soil, the area is susceptible to rill and sheet erosion. Soil mass movement is evident in the steepest areas of the forest. Concave slopes at the heads of valleys are most susceptible to landslides, while convex slopes at ends of spur ridges are least susceptible. Slopes at the heads of valleys are very sensitive to disturbance (1992 Plan Amend#8-FEIS, p. 3-14).

There are over 44 soil series on the Forest. Some of these soils are on steep slopes with severe limitations for roads and rill pads. The more common soil with mass movement potential are Brookside, Belpre, Rarden, Upshur, and vandalia. (See 1992 Plan Amend#8-FEIS, Appendix F).

Table 3-3 Soil Disturbances, Water, Forested Land Within National Forest Boundary (1992 Plan Amendment #8 EIS)

Disturbance Type	NFS Lands	Total Land Including Private Lands within the NFS Boundary
Cropland Acres **Cropland %**	1 .00006%	102,094 12.27%
Pasture Acres **Pasture %**	182 .1%	131,726 16%
Roads Acres **Roads %**	3,500 .075%	16,000 .42%
Developed Recreation Sites **%**	1,226 .6%	1,226 .14%
Mined Land Acres **Mined Land %**	1000 .5%	5000 1%
Developed Land, towns, Powerlines etc.. **%**	2,700 3%	12,000 2.1%
Subtotal **%**	8,609 4.5%	268,046 32%
Water **Water %**	268 0.13%	1,577 0.19%
Forest land Acres	183,854	562,524

Forest land %	95%	69%
Total Acreage	**192,731**	**832,147**

3-14 THREATENED, ENDANGERED & SENSITIVE ANIMALS

Five federally listed animal species have been identified as being present on or near the Wayne National Forest (USFS 2001; USFWS 2001). In 2001, the Forest Service completed a Biological Assessment, which addressed the potential effects of Forest Plan implementation on federal threatened and endangered species (USFS 2001). The U. S. Fish and Wildlife Service issued a Biological Opinion, which addressed effects on three of the five species (i.e., only those species which received a "may affect" determination by the U. S. Fish and Wildlife Service were addressed in the Biological Opinion) (USFWS 2001). These three species included the Indiana bat, bald eagle, and American burying beetle. Table 3-5 describes whether or not the species occur in the project area, or whether there is suitable habitat available for the species in the project area (Ewing, July 12, 2002). The project area is defined as the 63 tracts included in the lease package. There are twenty animal species included on the Wayne National Forest's Regional Forester Sensitive Species list. A biological evaluation was conducted to evaluate the presence of suitable habitat and what the effects of the four alternatives would be to the species. Table 3-6 summarizes whether or not the species occurs in the project area, or if there is suitable habitat present in the project area. The project area for this analysis is defined as the 63 tracts included in the lease package.

Table 3-4

The federal Endangered Species Act of 1973, as amended (ESA), provides the general regulatory framework for the protection of threatened or endangered (T/E) plant and animal species and critical habitat which are formally listed under the ESA.
The ESA defines the following terms:
• Endangered species: "... any species which is in danger of extinction throughout all or a significant portion of its range ..."
• Threatened species: "... any species which is likely to become an endangered species within the foreseeable future..."
• Critical habitat: "... the specific areas within the geographical area occupied by the species ... on which are found those physical or biological features
(I) essential to the conservation of the species and
(II) which may require special management considerations or protection ..."

On March 12, 2001, the Wayne National Forest completed a Programmatic Biological Assessment, which addressed the potential effects of forest plan implementation on federal threatened and endangered plants and animals, and proposed additional mitigation measures to minimize adverse impacts. On September 20, 2001, the US Fish and Wildlife Service issued a Biological Opinion which addressed impacts on the three species which are likely to occur on the forest: Indiana bat, American burying beetle, and bald eagle. Terms and Conditions were presented which the Forest Service must apply when implementing projects, in order to protect these species.

Table 3-5 Species Occurrence

Species	Species Status	Occupied Habitat in Project Area	Suitable Unoccupied Habitat in the Project Area	No Suitable Habitat in the Project Area
Indiana Bat Myotis sodalis	Endangered	X	-	-
Bald Eagle Haliaeetus leucocephalus	Threatened	-	X	-
Fanshell Cyprogenia stegaria	Endangered	-	-	X
Pink Mucket Pearly Mussel Lampsilis abrupta	Endangered	-	-	X
American Burying Beetle Nicrophorus americanus	Endangered	-	X	

Table 3-6 Species Occurrence & Suitability

Species	Occupied Habitat in Project Area	Suitable Unoccupied Habitat in the Project Area	No Suitable Habitat in the Project Area
Allegheny Woodrat Neotoma magister	-	X	-
Black Bear Ursus americanus	X	-	-
River Otter Lutra canadensis	X	-	-
Bobcat Lynx rufus	-	X	-
Evening Bat Nycticeius humeralis	-	X	-
Rafinesque's Big-Eared Bat Plecoyus rafinesquii	-	X	-
Cerulean Warbler Dendroica cerulea	X	-	-
Henslow's Sparrow Ammodramus henslowii	-	-	X
Timber Rattlesnake Crotalus horridus	X	-	-
Eastern Hellbender Cryptobranchus alleganiensis	X	-	-
Green Salamander Aneides aeneus	-	-	X
Ohio Lamprey Ichthyomyzon bdellium	X	-	-
Western Lake Chubsucker	-	-	X

Erimyzon sucetta			
Eastern Sand Darter Ammocrypta pellucida	X	-	-
Salamander Mussel Simpsonaias ambigua	X	-	-
Round Hickorynut Obovaria subrotunda	-	X	-
Lilliput Toxolasma parvus	-	X	-
Little Spectaclecase Mussel Villosa lienosa	X	-	-
Wabash River Cruiser Macromia wabashensis	-	X	-
Grizzled Skipper Pyrgus wyandot	-	X	-
Olympia Marble Euchloe olympia	-	X	-
Regal Fritillary Speyeria idalia	-	X	-

3-15 THREATENED, ENDANGERED & SENSITIVE PLANTS

While no Federally Listed plant species have been documented on Wayne NF lands, four Federally Listed species have been documented in Counties containing NF lands, namely Lawrence, Scioto and Hocking Counties (Appendix 8). Furthermore, eleven Regional Forester Sensitive Species have been designated for the Wayne NF, four of which have been found on NF lands in the vicinity of the 63 tracts being analyzed for potential oil and gas leasing (Appendix 8). Numerous State Listed Species and Forest Service Species of Concern have been discovered in these areas, as well (Appendix 8).

According to the US Fish and Wildlife Service (2002), The Wayne National Forest comprises part of the potential range of four Federally Threatened or Endangered species: northern wild monkshood (*Aconitum noveboracense*), small whorled pogonia (*Isotria medeoloides*), running buffalo clover (*Trifolium stoloniferum*), and Virginia spirea (*Spirea virginiana*). Northern wild monkshood generally grows in humid environments that are exposed to either continuous cold air drainage from subterranean vents or cold groundwater flow from neighboring bedrock. Cliff faces, talus slopes, and headwaters of streams provide such habitat. Small whorled pogonia generally grows in mid-successional forests with a sparse understory and herb layer. Proximity to physical features, like streams, which tend to create long semi-permanent breaks in the forest canopy, encourages the growth of this species. Furthermore, evidence of human disturbance (e.g. selective cutting; old homesteads) is generally present at most known pogonia sites. Virginia spirea is generally found in riverine and riparian habitats along rocky banks or low sandbars, and thrives in geologically active areas that are subject to erosion, deposition and scouring. 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). The species will generally not tolerate full-shade or full-sun habitats, or severe disturbance, and almost all of the known Ohio populations are near streams and rivers.

Both the monkshood and pogonia have been found in Hocking County, which contains 5 potential lease tracts for a total of 287 acres. Similarly, running buffalo clover has been found in Lawrence County, which contains 23 of the 63 potential tracts for a total of 2,188 acres. Surveys for the clover were conducted on approximately 320 acres in Lawrence County, some of which were in or near tracts 52, 54, and 58. No individuals were found. Three populations of the spirea were found in neighboring Scioto County, but no tracts are proposed in this area. Habitat for these four species is sure to exist somewhere within the 4,634 acres of the potential lease area, especially in the Counties listed above. According to the most recent revision of the Regional Forester Sensitive Species list (February 2000), eleven RFSS have been designated for the Wayne National Forest. For habitat requirements and County occurrence records see Appendix 8.

At least one RFSS has been found in each of the five Counties (Gallia, Hocking, Lawrence, Monroe, and Washington) containing a potential lease sale, where butternut (*Juglans cinerea*) has been found in all counties within the Wayne NF proclamation boundary. Habitat for the eleven RFS species is sure to exist somewhere within the 4,634 acres of the potential lease area, especially in these five Counties.

According to the maps provided, tracts 50 and 51 are located within Caulley Creek Special Area, the boundary of which encompasses the entire watershed (150 acres). According to the Evaluation Report for Special Area designation, the area " contains a population of Cypripedium calceolus var. pubescens (Large

yellow ladyslipper, state potentially threatened) and contains Appalachian oak and mixed mesophytic forest types with evidence of some old growth characteristics (numerous windthrows and pit-and-mound formations)." Most of the canopy trees are 30-50 cm dbh (blackgums reach 60 cm), and there is a well-developed herb layer containing an abundance of goldenseal (*Hydrastis canadensis*). While goldenseal is not listed federally or at the state level, it is a socio-economically important species that is becoming increasingly less common in Ohio due to over-collection pressures.

Thompson Cemetery Woods, a 193 acre Special Area is located approximately 1 mile from the Caulley Creek Special Area across Route 46, and may coincide with tracts 46 and 47. This area, like Caulley Creek, is characterized by a complex Appalachian oak forest with canopy trees 30-50 cm dbh, and contains a population of the state endangered yellow crownbeard (*Verbesina occidentalis*).

Tract 38 on the Athens Ranger District lies less than a quarter of a mile from Paine's Crossing, a 328 acre Special Area consisting of a variety of wetland communities (oak-maple swamp, river birch-sphagnum moss, sedge meadow, and cattail marsh). The presence of these wetlands in the area is especially significant due to an extensive history of coal mining, and subsequent acid mine run-off, in the surrounding landscape. Wetland plant communities have the remarkable ability to filter out water pollutants (including heavy metals), the extraction of which results in water outflow from the wetlands that is significantly less acidic than the water inflow. According to the "Evaluation Report" for Paine's Crossing, "disturbances that cause soil erosion or siltation of the wetland or stream [should] be eliminated" to prevent degradation and dysfunction of the wetland ecosystem. Therefore, not only should oil/gas development within the Special Area be prohibited (see "No Surface Occupancy" stipulation above), but also, any oil/gas development in the surrounding area that may cause erosion or sedimentation to the wetland should not be permitted.

Tracts 57 and 58 lie along the Hollow of Handley Branch, which has been designated as the Handley Branch Wildlife Management Area. "This tract of National Forest land has a mixture of ridge and valley habitats, forest and early successional habitats, stream and riparian habitats, and a fishing pond" (Johnson, USFS 1998), and has been subject to a variety of restoration and improvement activities, including streambank stabilization along Johns Creek, riparian area tree plantings, wildlife opening maintenance, and prescribed burning of a barren community. The latter activity was initiated, in part, to enhance populations of blue scorpionweed (*Phacelia ranunculaceae*), a Regional Forester Sensitive plant species, and to restore the post-oak community.

- According to the maps in Appendix 12, tracts 50 and 51 are located within Caulley Creek Special Area, the boundary of which encompasses the entire watershed (150 acres). According to the Evaluation Report for Special Area designation, the area " contains a population of Cypripedium

calceolus var. pubescens (Large yellow ladyslipper, state potentially threatened) and contains Appalachian oak and mixed mesophytic forest types with evidence of some old growth characteristics (numerous windthrows and pit-and-mound formations)." Most of the canopy trees are 30-50 cm dbh (blackgums reach 60 cm), and there is a well-developed herb layer containing an abundance of goldenseal (*Hydrastis canadensis*). While goldenseal is not listed federally or at the state level, it is a socio-economically important species that is becoming increasingly less common in Ohio due to over-collection pressures.

- Thompson Cemetery Woods, a 193 acre Special Area is located approximately 1 mile from the Caulley Creek Special Area across Route 46, and may coincide with tracts 46 and 47. This area, like Caulley Creek, is characterized by a complex Appalachian oak forest with canopy trees 30-50 cm dbh, and contains a population of the state endangered yellow crownbeard (*Verbesina occidentalis*).

- Tract 38 on the Athens Ranger District lies less than a quarter of a mile from Paine's Crossing, a 328 acre Special Area consisting of a variety of wetland communities (oak-maple swamp, river birch-sphagnum moss, sedge meadow, and cattail marsh). The presence of these wetlands in the area is especially significant due to an extensive history of coal mining, and subsequent acid mine run-off, in the surrounding landscape. Wetland plant communities have the remarkable ability to filter out water pollutants (including heavy metals), the extraction of which results in water outflow from the wetlands that is significantly less acidic than the water inflow. According to the "Evaluation Report" for Paine's Crossing, "disturbances that cause soil erosion or siltation of the wetland or stream [should] be eliminated" to prevent degradation and dysfunction of the wetland ecosystem. Therefore, not only should oil/gas development within the Special Area be prohibited (see "No Surface Occupancy" stipulation above), but also, any oil/gas development in the surrounding area that may cause erosion or sedimentation to the wetland should not be permitted.
- Tracts 57 and 58 lie along the Hollow of Handley Branch, which has been designated as the Handley Branch Wildlife Management Area. "This tract of National Forest land has a mixture of ridge and valley habitats, forest and early successional habitats, stream and riparian habitats, and a fishing pond" (Johnson, USFS 1998), and has been subject to a variety of restoration and improvement activities, including streambank stabilization along Johns Creek, riparian area tree plantings, wildlife opening maintenance, and prescribed burning of a barren community. The latter activity was initiated, in part, to enhance populations of blue scorpionweed (*Phacelia ranunculaceae*), a Regional Forester Sensitive plant species, and to restore the post-oak community.

3-16 TIMBER

There are no current timber harvesting activities on the subject area.

3-17 VEGETATION

The Wayne National Forest area is classified as a mixed mesophytic forest region located in the Southern Unglaciated Allegheny Plateau (Braun 1950). Natural forest communities are mainly comprised of oak dominated types, including oak-pine forests, Appalachian oak, oak-hickory-chestnut, and oak-maple-tulip tree. Other associations also occur, including hemlock and beech-oak-maple. Steep ravines, draws, seeps, rock outcroppings, cliffs, rock faces, and rock shelters contain locally unique communities that occasionally harbor rare or endangered plants and animals. Plant communities in Ohio have been significantly impacted and altered by past human activities, including farming, grazing, road building, mining, and development. Most of the hardwood forests on the Athens and Marietta units were cutover more than once prior to becoming National Forest, and much of the Ironton District was repeatedly clearcut for charcoal wood from the Civil War period to about 1900. As a result of past and current land use practices, the landscape of the Forest area (including National Forest and intermixed lands in other ownerships) is a patchwork of forest openlands, fragmented by a human superstructure of roads, farms, industrial developments, towns, small cities, and utility corridors. Therefore, remaining acreage of native and relatively natural ecosystems is essential to the diversity of plant and animal communities in the area, as well as to ecological processes that are not found in other, more disturbed areas.

The Wayne NF has recognized approximately 5,560 acres of land diversity [2 Research Natural Areas (M.A 8.1), 12 Special Areas (M.A. 8.2) and 8 Candidate Special Areas (M.A. 9.2)] in the three districts as having unique geological, ecological, or cultural qualities important to the maintenance of ecosystem. Management in these areas is limited to protection of their natural resources and of public health, safety, and property. No surface disturbance (i.e., No Surface Occupancy) is permitted by the Forest Service for mineral exploration or development on land with USA-owned minerals in Management Areas 8.1, 8.2, and 9.2 (Wayne National Forest Plan, pages 4-52, 4-148, 4-152, and 4-160). Several of the proposed tracts are in, or near, Special Areas or candidate Special Areas.

- Tract 51 is located within Caulley Creek Special Area, the boundary of which encompasses the entire watershed (150 acres). According to the Evaluation Report for Special Area designation, the area " contains a population of *Cypripedium calceolus var. pubescens* (Large yellow ladyslipper, state potentially threatened) and contains Appalachian oak and mixed mesophytic forest types with evidence of some old growth characteristics (numerous windthrows and pit-and-mound formations)." Most of the canopy trees are 30-50 cm dbh (blackgums

reach 60 cm), and there is a well-developed herb layer containing an abundance of goldenseal (*Hydrastis canadensis*). While goldenseal is not listed federally, or at the state level, it is a socio-economically important species that is becoming increasingly less common in Ohio due to over-collection pressures.

- Thompson Cemetery Woods, a 193-acre Special Area is located approximately 1 mile from the Caulley Creek Special Area across Route 46. This area, like Caulley Creek, is characterized by a complex Appalachian oak forest with canopy trees 30-50 cm dbh. Tracts 46 through 48, and 50, are located between the two Special Areas, and are thus likely to contain some portion of this habitat type.

- A portion of tract 38 on the Athens Ranger District lies within Paine's Crossing, a 328 acre Special Area consisting of a variety of wetland communities (oak-maple swamp, river birch-sphagnum moss, sedge meadow, and cattail marsh). The presence of these wetlands in the area is especially significant due to an extensive history of coal mining, and subsequent acid mine run-off, in the surrounding landscape. Wetland plant communities have the remarkable ability to filter out water pollutants (including heavy metals), the extraction of which results in water outflow from the wetlands that is significantly less acidic than the water inflow. According to the "Evaluation Report" for Paine's Crossing, "disturbances that cause soil erosion or siltation of the wetland or stream [should] be eliminated" to prevent degradation and dysfunction of the wetland ecosystem. Therefore, not only should oil/gas development within the Special Area be prohibited (see "No Surface Occupancy" stipulation above), but also, any oil/gas development in the surrounding area that may cause erosion or sedimentation to the wetland should not be permitted.

- A portion of tract 39 is located within Young's Branch Special Area, a 453 acre parcel consisting of a variety of habitat types including Appalachian Oak Forest and state significant Mixed Mesophytic Forest. The Special Area contains populations of potentially two state threatened species [few-flowered tick-trefoil (*Desmodium pauciflorum*) and Carolina Ruellia (*Ruellia caroliniana*)], and one state threatened species [spring coral root (*Corallorhiza wisteriana*)]. Sections 7 and 8 are currently part of a USDA Forest Service, Northeastern Experiment Station research project to determine ecological response of mixed-oak communities in southern Ohio to prescribed underburning under a ranger of fire regimes.

The Wayne NF also recognizes a Management Area 6.2, the purpose of which is "to identify lands where the vegetative condition provides 1.) habitat for a variety of native wildlife, primarily for those adapted to old-growth hardwoods, and 2.) recreation opportunities requiring considerable solitude and/or feeling of closeness to nature" (WNF 1988). According to Amendment 8 (1992) of the Land and Resource Management Plan for the Wayne National Forest, "on National

Forest System lands in 6.2 areas, the USDA Forest Service will only issue Federal oil and gas leases that have a No Surface Occupancy stipulation."

3-18 VISUAL RESOURCES

Goals and objectives in the Forest Plan seek to maintain, enhance, and/or restore visual resources in visually-sensitive areas (see Appendix 7-Table 11). In practice, projects should be designed to minimize the visual impact of non-natural features to visitors to the national forest with a special focus on areas of the forest seen from recreation areas or well-travelled roads. The focus of the Visual Quality Objectives on each unit of the Wayne National Forest is summarized for each administrative unit (see Appendix 7, Table 9a for a listing of the visual classification for each tract).

The Wayne National Forest is characterized by rolling, forested hills with deep valleys. Small farms with croplands and pastures provide contrast and interest to the landscape. Areas of significant natural beauty contrast starkly with abandoned mined lands, acid streams, and roadside trash dumps. The existing visual condition of National Forest System land is one moderately free of human disturbance. On about half of the Forest, management practices are not noticeable. The remaining half of the Forest has been modified by management to varying degrees. Timber harvest, road construction, utility lines, oil and gas developments, and developed recreation areas dominate the landscape (1992 Plan Amend#8-FEIS, p. 3-21). Almost every ridge and hollow is or has been roaded in the past. Roads provide a variety of visual experiences. Some people drive roads to view scenery, others walk closed roads for the same reason and still others abhor any evidence of a road. Storage tank batteries, wells, pumps, and transmission lines, some of which are bright orange, provide evidence of oil and gas activity in the landscape. Oil and gas activity is greatest at Marietta with over 3,000 wells, 634 of which are on National Forest System lands. In comparison, 869 and 413 occur at Athens and less than 100 at Ironton with none on National Forest System land (1992 Plan Amend#8-FEIS, p. 3-22).

Marietta Unit:

The Retention zone on the Marietta Unit is based on the primary river corridors, the Little Muskingum and the Ohio Rivers, the corridor of Route 26, and a broad area from Deucher to New Matamoras, selected because it encompasses the routes of the Scenic River, Ohio View and Archer's Fork Trails. Partial retention zones are established along other primary travel corridors including Routes 255, 800 and 260.

Athens Unit:

Retention zones were established on the Athens Unit around the Wildcat Hollow Hiking Trail, the corridor of the Buckeye/North Country Trail across the District,

and the main Route 33 corridor both north and south of Nelsonville. Partial retention zones were established along all the local thoroughfares through the District.

Ironton District:

Retention zones were established along Symmes Creek, Timber Ridge Lake, Lake Vesuvius Recreation Area and hiking/horse trails, Izaak Walton Lake, Lawco Lake and the Ironton Country Club. Partial Retention corridors were established, as on the other units, along most local travel routes.

Many of the wells at Marietta are gas wells. Unless the well has produced oil in the past no pumpjack is present. Quite commonly there are also no storage tanks. A tank may be needed if oil or brine is present. Wells that produce both oil and gas are the norm at Athens and gas wells are the norm at Ironton. Newer wells are powered by electric motors if an electrical line is close at hand. The line to the well may be buried or more likely be on poles. The poles are similar in appearance to small "telephone poles" but lack crossarms. Generally, these lines follow the access roads so no clearing is necessary. When they do go through a wooded area they run beneath the canopy when trees are tall enough. Newer wells are commonly cleaner, better sited and have had more mitigation applied than older wells. Some newer wells have been placed on longer, steeper slopes requiring more earth moving which makes them more obvious. Older wells may have rusted equipment and tanks, evidence of spilled oil, broken equipment and trash around them. Others that are well maintained and have good vegetative growth around them can be difficult to see. Some, such as the cable wells with the one cylinder engine and pumphouse, are quite picturesque (1992 Plan Amend#8-FEIS, p. 3-22).

Pipelines carry oil to storage tanks and gas to collection lines. Older wells are served by iron pipe on or in the ground. Today PVC is used. It may be buried or laid on the ground. It is sometimes placed in trees when it is necessary to cross a stream or road. The pipe in use today is dark colored but for several years a bright orange pipe was used. It was much more obvious than today's pipe. All pipes laid on the ground tend not to be seen as they become covered by leaves and vegetation. Those in trees become quite obvious in the winter. Roads to well sites are commonly located on old roadways that accessed the homesteads that were once present. Roads to the older wells are generally narrower and well vegetated. Newer roads are generally wider. Newer roads have more cuts and fills, more rock on them, and less vegetative regrowth (1992 Plan Amend#8-FEIS, p. 3-22).

Visual mitigation techniques are common. State law provides setbacks from roads. Tanks and pumpjacks are usually painted a neutral color. Native vegetation also provides screening. On National Forest System lands mitigation measures are developed on a site by site basis. Special design and reclamation

measures may be required, and can include: transplanting trees and shrubs, fertilizing, mulching, special erosion control structures, irrigation, site recontouring to match the original land contour, low profile equipment, and painting to minimize visual contrasts. Surface occupancy may be further limited or denied in sensitive areas, such as unique geologic features and rock formations, visually prominent areas, and high recreation use areas (1992 Plan Amend#8-FEIS, p. 3-22).

3-19 WATER QUALITY

All streams within the subject lands are tributaries of the Ohio River. The physiography of southeastern Ohio consists of a pattern of unglaciated narrow ridges and U-shaped valleys. Portions of the Marietta Unit near the Ohio River have narrow ridges and narrow V-shaped valleys. Steep slopes and relatively shallow soils combine to cause rapid runoff during heavy precipitation events. Surface and ground water quality in the Forest has been greatly impacted by past mineral extraction operations, primarily coal mining. Many abandoned underground coal mines, the majority of which are drift mines, and abandoned surface coal mines generate large quantities of acid mine drainage. Oil and gas development activities have periodically affected water quality in the past. Accidental discharges of brine and crude oil have occasionally occurred which can deleteriously affect water quality should the discharges reach streams, ponds, or lakes (1992 Plan Amend#8-FEIS, p. 3-17).

Crude oil spills affect water quality by increasing the biological oxygen demand, prevent the transfer of oxygen from the air to the stream, and the oil is toxic if ingested by aquatic organisms. The primary impact of brine spills on water quality is chloride contamination. Increased chloride concentrations are toxic to aquatic organisms, the degree of toxicity being different for each organism. Four documented spills have occurred (within the last fifteen years), with two caused by vandalism. These discharges were of sufficient volume to reach and affect Rock Run, Salt Run, Dorr Run, and Raccoon Creek, all on the Athens District (1992 Plan Amend#8-FEIS, p. 3-18).

Headwater streams on National Forest System lands in wooded, undeveloped, uninhabited areas are generally of high quality. These waters occur in the East Branch Sunday Creek above Burr Oak Reservoir on the Athens District, a few headwaters streams on the Ironton District, and most of the Marietta Unit (1992 Plan Amend#8-FEIS, p. 3-18).

3-20 WETLANDS/RIPARIAN/FLOODPLAINS

Executive Order 11990 provides direction for management of wetlands. Executive Order 11988 provides direction for management of floodplains. In addition, the forest plan provides site specific land use prescriptions to implement the objectives of EO#11990 and EO#11988.

Nearly all riparian areas, floodplains, and most of the wetlands within the Forest have been cleared, drained, and farmed since early settlement. As a natural consequence, small communities became established, and some evolved into larger regional centers. Transportation corridors, both roads and railroads, took early advantage of these riparian areas with their nearly level topography. All of these activities have greatly modified these areas and have caused long-term and deleterious hydrologic effects, elevated water temperatures, accelerated erosion and sedimentation within stream channels, loss of fish and wildlife habitat, and deterioration of water quality.

3-21 WILDERNESS

There are no designated wilderness areas within the Wayne National Forest.

3-22 WILDLIFE/FISHERIES

The Wayne National Forest provides habitat for more than 300 species of vertebrate animals, and countless invertebrate animals. Species diversity, richness, distribution, and population numbers are dependent upon the amount, quality, variety, and arrangement of habitats available. The primary animal species and animal communities are those associated with hardwood forest communities. Less common are those species and communities that are associated with wetlands, native barrens, large areas of relatively undisturbed contiguous forest, undisturbed bottomland communities, and streams of high water quality. Since the area is comprised of a patchwork of forest and openlands, species associated with the openland and transitional (brushy) communities occur here also.

There are twenty animals that are categorized as management indicator species in the Forest Plan. Some management indicator species could likely occur on some of the tracts in the lease package (i.e., cerulean warbler, pileated woodpecker, white-eyed vireo, common yellowthroat, field sparrow, pine warbler, ruffed grouse, wood duck, eastern bluebird, western chorus frog, wood frog, and bluegill). Most of the aquatic management indicator pecies could likely occur in streams that flow through or adjacent to tracts in the lease package (i.e., southern redbelly dace, redfin shiner, blackside darter, rainbow darter, golden redhorse, sand shiner, and banded darter). One management indicator species (Virginia rail) does not occur on the Wayne National Forest. See Appendix 3 for an more detailed description of management indicator species.