



## **Management Indicator Species – Effects as Related to the Consent to Lease Oil and Gas Project**

The USDA Forest Service is mandated under Code of Federal Regulations (CFR) 200.3(b) (2) “to administer and manage lands...in accordance with ...the National Forest Management Act (NFMA)”. The NFMA does not mention Management Indicator Species (MIS) or monitoring wildlife populations. Direction for MIS is located in 36 CFR 219.19, which establishes the basis for managing and maintaining viable populations of existing native and desired non-native vertebrate species. It states that for planning purposes a viable population shall be regarded as one, which has the estimated numbers, and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. Specifically, 36 CFR 219.19(a)(6) states “population trends of the management indicator species will be monitored and relationships to habitat changes determined. This monitoring will be done in cooperation with state fish and wildlife agencies to the extent practicable”.

The USDA Forest Service Manual (FSM) provides further direction on MIS both in the Wildlife, Fish, and Sensitive Plant Habitat Management directives (FSM 2600) and the Planning Directives (FSM 1900). 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” (FSM 2600). The FSM further states that species selected will be those “that best represent the issues, concerns, and opportunities to support the recovery of Federally-listed species, provide continued viability of sensitive species, and enhance management of wildlife and fish for commercial, recreational, scientific, subsistence, or aesthetic values or uses” (FSM 2600).

The Wayne National Forest Land and Resource Management Plan integrates MIS into its planning process consistent with USDA Forest Service Manual direction under Resource Integration Requirements (FSM 1900: 1922.15 items 10 and 11). The FSM states “10. Ensure that the set of management indicator species includes Resources Planning Act (RPA) and regional wildlife and fish indicators and represents all significant forest level wildlife and fish diversity and resource production issues, concerns, and opportunities.”, and “11. Ensure that management prescriptions will provide for the habitat capability to meet demand for management indicator species and provide access for recreational and commercial uses with minimal disturbance to species use of suitable habitats”.

The manual further requires that plans “Ensure the plan provides for the kinds, amounts, and distribution of habitat needed for the recovery of threatened and endangered species and needed to maintain viable, well-distributed populations of all existing native and desired non-native species” (FSM 1900).

Analysis of project level effects is used to determine an activity’s 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 the Forest, and documented population conditions and trends.

The following list displays the Wayne National Forest Management Indicator Species, along with a brief description of the habitat components the MIS represent:

<b><u>Species</u></b>	<b><u>Habitat Component</u></b>
Cerulean warbler	Close-Canopied, Mature/Over-Mature Hardwoods
Pileated woodpecker	Mature Hardwoods
White-eyed vireo	Late Succession
Common yellowthroat	Middle Succession
Field sparrow	Early Succession
Pine warbler	Conifers
Ruffed grouse	Early Hardwoods
Eastern bluebird	Park Like
Wood duck	Beaver Ponds, Oxbows
Virginia rail	Marsh
Western chorus frog	Fishless Ponds In Fields
Wood frog	Vernal Ponds in Hardwoods
Bluegill	Artificial Impoundments
Southern Redbelly Dace	Small/Intermittent Streams
Redfin Shiner	Medium Streams with Sand/Gravel Pools
Blackside Darter	Medium Streams with Silt Pools
Rainbow Darter	Medium Streams with Riffles
Golden Redhorse	Large Streams with Pools
Sand Shiner	Large Streams with Sand Pools
Banded Darter	Large Streams with Riffles

The Forest Service and other cooperating agencies and organizations have conducted inventories of appropriate habitats for these species. No trend data is available for these species on any of the specific tracts at this time. The following provides a description of the species habitat association, along with other general habits. Forest biologists have reviewed inventory data for their presence in the project area, and has made predictions as to the effects on each MIS as a result of implementing any of the alternatives.

**Cerulean warbler** (*Dendroica cerulea*) – This bird is associated with mature deciduous woodlands. Eastern Ohio is in the core area of this species breeding range. In southeast Ohio, breeding pairs occupy extensive mixed mesophytic forests and floodplain woods. Nests are placed 30-60 feet high among the outer branches of tall trees. Cerulean warblers were reported in 50.7% of block data during the statewide breeding bird survey and 48.6% of these were in the unglaciated plateau. Trend analysis on state data shows that the Ohio population of the cerulean warbler has not shown a significant overall trend of change and detections have remained even and constant for a thirty year period from 1965 to 1995 (Earnst and Andres 1996). Breeding bird surveys conducted on the Wayne National Forest from 1992-1994 recorded cerulean warblers at all thirty transects. Transects were placed in interior hardwood forests. Ceruleans are known to occur throughout all units on the Wayne National Forest. Suitable habitat is available for this species on some tracts included in the analysis. Consent to leasing, which is included in Alternatives A, C, and D at varying degrees, would have no effect on the species because consent to leasing is just an administrative decision. Effects to the species and its habitat would occur if and when exploration and drilling on a leased tract occurs in the future. At that time, where suitable habitat is present, effects to the species and habitat would be related to removal of trees for access, exploration and drilling. However, Alternative A has a stipulation on tracts with suitable cerulean warbler habitat that restrict vegetation removal during its breeding season. Alternatives C and D have a stipulation that provides the wildlife biologist the opportunity to place timing restrictions on any lease development if deemed necessary. Alternative B would have no effect on this species since none of the tracts would be leased. The overall impact to this species would be insignificant because only a very small area is actually expected to be affected by exploration and drilling as a result of any leasing accomplished in Alternatives A, C, and D (i.e., 4 wells in 5 years according to the BLM). A large amount of suitable habitat is available for this species on the Forest.

**Pileated woodpecker** (*Dryocopus pileatus*) – This bird 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 25-50 feet high in large dead deciduous trees. Breeding bird surveys in the state show that this bird has increased significantly at 2.4% annually and are much more common in the eastern part of the state (Earnst and Andres 1996). Pileated woodpeckers were reported in 54.8% of block data during the statewide breeding bird survey and 48.0% of these were in the unglaciated plateau (Peterjohn and Rice 1991). Breeding bird surveys conducted on the Wayne National Forest from 1992-1994 recorded pileated woodpeckers at all thirty transects. Transects were placed in interior hardwood forests. Suitable habitat is available for this species on some tracts included in the analysis. Consent to leasing, which is included in Alternatives A, C, and D at varying degrees, would have no effect on the species because consent to leasing is just an administrative decision. Effects to the species and its habitat would occur if and when exploration and drilling on a leased tract occurs in the future. At that time, where suitable habitat is present, effects to the species and habitat would be related to removal of trees for access, exploration and drilling. Alternatives C and D would provide greater protection to the species and its habitat than Alternative A. The reason for this statement is because the protection measures in the Biological Opinion (for the Indiana bat) would offer protection to this species habitat as well, on all tracts. Protection would also be afforded by stipulations placed on

the tracts which protect riparian structure and function. Alternative B would have no effect on this species since none of the tracts would be leased. The overall impact to this species would be insignificant because only a very small area is actually expected to be affected by exploration and drilling as a result of any leasing accomplished in Alternatives A, C, and D (i.e., 4 wells in 5 years according to the BLM). A large amount of suitable habitat is available for this species on the Forest.

**White-eyed vireo** (*Vireo griseus*) – This bird prefers shrub stage successional habitats, especially old fields where woody vegetation is interspersed with herbaceous patches. They may also be found in woodland edges and openings, and along fencerows. Damp and dry habitats are equally suitable, but not swamps. Nests are usually placed six feet high or less in dense bushes. White-eyed vireos were reported in 66.4% of block data during the statewide breeding bird survey and 41.5% of these were in the unglaciated plateau. Trend analysis on state data for the years of 1965 thru 1995 show a rise in the average number of individuals detected per route. More birds per route are detected in the southeastern unglaciated plateau than the rest of the state (Earnst and Andres 1996). In 1995, a breeding bird inventory was undertaken in 39 stands, ranging in age from 5 to 21 years of age, on all three units of the National Forest. Eighty-five detections of White-eyed vireos were made in 21 of these stands. The majority of detections were made on the Ironton Unit. Consent to leasing, which is included in Alternatives A, C, and D at varying degrees, would have no effect on the species because consent to leasing is just an administrative decision. Effects to the species and its habitat would occur if and when exploration and drilling on a leased tract occurs in the future. At that time, activities which involve tree cutting, brush removal or soil disturbance could harm individual animals, especially if completed during the breeding season. Stipulations placed on tracts to protect wildlife openings and riparian areas would help protect habitat for this species. Furthermore, Alternatives C and D would provide greater protection to the species and its habitat than Alternative A. The reason for this statement is because the protection measures in the Biological Opinion (for the Indiana bat) would offer protection to this species habitat as well. Alternative B would have no effect on this species since none of the tracts would be leased. The overall impact to this species would be insignificant because only a very small area is actually expected to be affected by exploration and drilling as a result of any leasing accomplished in Alternatives A, C, and D (i.e., 4 wells in 5 years according to the BLM). Suitable habitat is available for this species across the Forest.

**Common yellowthroat** (*Geothlypis trichas*) – This bird inhabits 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 (Peterson and Rice 1991). During survey efforts within earlier successional 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. This low number may be due to the amount of available aquatic habitat located within them. Earnst and Andres (1996) report the common yellowthroat as being more than

twice as common in eastern Ohio than the western part of the state. Consent to leasing, which is included in Alternatives A, C, and D at varying degrees, would have no effect on the species because consent to leasing is just an administrative decision. Effects to the species and its habitat would occur if and when exploration and drilling on a leased tract occurs in the future. At that time, activities which involve tree cutting, brush removal or soil disturbance could harm individual animals, especially if completed during the breeding season. Stipulations placed on tracts to protect wildlife openings and riparian areas would help protect habitat for this species. The overall impact to this species would be insignificant because only a very small area is actually expected to be affected by exploration and drilling as a result of any leasing accomplished in Alternatives A, C, and D (i.e., 4 wells in 5 years according to the BLM).

**Field sparrow** (*Spizella pusilla*) – This bird occupies a wide variety of brushy successional habitats, such as old fields and cutover hillsides where herbaceous vegetation is interspersed with brushy tangles and scattered small saplings. They inhabit brushy pastures, woodland edges and openings with shrubby undergrowth, and narrow brushy corridors along fencerows, roadsides, railroads, and streams adjacent to open fields. Nests are generally placed 1-3 feet high in shrubs and small saplings. Field sparrows were recorded on 99.5% of the Ohio breeding bird survey blocks reporting detection of the species. Approximately, 80.8% of these detections were listed as confirmed breeding. Every block surveyed in the unglaciated plateau had field sparrows detected (Peterjohn and Rice 1991). Even with the high detection rate Earnst and Andres (1996) state that the field sparrow is on an annual decline of 1.2%. This is thought to be a result from habitat loss due to intensive agricultural practices and to maturation of the eastern Ohio forests. It should also be noted that the severe winters of 1976-77 may have contributed to their decline but numbers were dropping before this event. In 1995, a breeding bird inventory was undertaken in 39 stands, ranging in age from 5 to 21 years of age, on all three units of the National Forest. Thirty-four detections of field sparrows were made in 9 of these stands. Detections were made on the Ironton Unit only. Consent to leasing, which is included in Alternatives A, C, and D at varying degrees, would have no effect on the species because consent to leasing is just an administrative decision. Effects to the species and its habitat would occur if and when exploration and drilling on a leased tract occurs in the future. At that time, activities that involve tree cutting, brush removal or soil disturbance could harm individual animals, especially if completed during the breeding season. Stipulations placed on tracts to protect wildlife openings would help protect habitat for this species. Alternative B would have no effect on this species since none of the tracts would be leased. The overall impact to this species would be insignificant because only a very small area is actually expected to be affected by exploration and drilling as a result of any leasing accomplished in Alternatives A, C, and D (i.e., 4 wells in 5 years according to the BLM).

**Pine warbler** (*Dendroica pinus*) – This bird is restricted to woodlands dominated by pines. In Ohio, they prefer mixed woods with a pine canopy and an understory of various deciduous species. However, they may nest in pure pine plantations. They occupy mature forests and second growth woods with scattered large pines, and are equally likely to be found within the interiors and along the edges of these habitats. Most pairs are found in large wooded tracts but may also inhabit isolated woodlots. Nests are normally placed 20-50 feet high among the outer branches of tall pines. Breeding bird surveys conducted on the Wayne National Forest from 1992-1994 recorded very few pine warbler occurrences. However, transects were placed in

interior hardwood forests. Out of the thirty transects pine warblers were detected at five and three of the five were on the Ironton unit. No pine warblers were detected on the Athens Unit. Consent to leasing, which is included in Alternatives A, C, and D at varying degrees, would have no effect on the species because consent to leasing is just an administrative decision. Effects to the species and its habitat would occur if and when exploration and drilling on a leased tract occurs in the future. At that time, activities that involve tree cutting, brush removal or soil disturbance could harm individual animals, especially if completed during the breeding season. Alternatives C and D would provide greater protection to the species and its habitat than Alternative a. The reason for this statement is because the protection measures in the Biological Opinion (for the Indiana bat) would offer protection to this species habitat as well. Alternative B would have no effect on this species since none of the tracts would be leased. The overall impact to this species would be insignificant because only a very small area is actually expected to be affected by exploration and drilling as a result of any leasing accomplished in Alternatives A, C, and D (i.e., 4 wells in 5 years according to the BLM).

**Ruffed grouse** (*Bonasa umbellus*) – This bird prefers second growth deciduous woods where dense understories, shrubs, vines, and other tangles provide suitable cover. They prefer extensive tracts but may also occupy isolated woodlots. Nests are placed on the ground, usually near woodland edges and clearings. Breeding records of the ruffed grouse show that they occur almost exclusively in southeastern and northeastern Ohio. During the Ohio breeding bird survey approximately 73.5% of breeding bird data blocks detecting the ruffed grouse occurred in the unglaciated plateau (Peterjohn and Rice 1991). Ruffed grouse numbers are cyclic in nature, which seem to be independent of habitat changes and hunting pressures (Peterjohn 1989). In 1995, a breeding bird inventory was undertaken in 39 stands, ranging in age from 5 to 21 years of age, on all three units of the National Forest. Twenty-four detections of ruffed grouse were made in 11 of these stands. Detections were made on all three units. The ruffed grouse was also detected during interior forest bird surveys in 7 of the thirty transects. The Ohio Division of Wildlife has been conducting drumming count surveys since 1973. The long-term average of these counts is 20 drumming males heard/100 stops. Drumming counts for 2001 are 30% below the long-term average in southeastern Ohio (Dave Swanson, personal communication with Lynda Andrews). Consent to leasing, which is included in Alternatives A, C, and D at varying degrees, would have no effect on the species because consent to leasing is just an administrative decision. Effects to the species and its habitat would occur if and when exploration and drilling on a leased tract occurs in the future. At that time, activities that involve tree cutting, brush removal or soil disturbance could harm individual animals, especially if completed during the breeding season. Alternative A would have no effect on this species since none of the tracts would be leased. The overall impact to this species would be insignificant because only a very small area is actually expected to be affected by exploration and drilling as a result of any leasing accomplished in Alternatives A, C, and D (i.e., 4 wells in 5 years according to the BLM).

**Eastern bluebird** (*Sialia sialis*) – This bird inhabits open country, such as large grassy pastures, fields, and rights-of-way along roads bordered by fencerows and woodland edges. They also occupy weedy fallow fields, but avoid woodland interiors. They nest exclusively in cavities, primarily bird boxes, but they also use old woodpecker holes and natural cavities in fence posts and trees. The preferred bird box height is 3-5 feet; most nests in natural cavities are less than 10 feet high. Bluebirds were detected in 85.2% of the breeding bird survey blocks and 32.3% of

these were found on the unglaciated plateau which had an average of 6.1 individuals detected per route. This was the highest detection rate per route in the state (Peterjohn and Rice 1991). Earnst and Andres (1996) say that the Eastern bluebird is common and widely distributed in the state and that population levels appear to be stable after a decline in the population due to the severe winters of 1976-1978. Bluebird boxes are erected and maintained on appropriate habitat on the Athens and Ironton Districts. Consent to leasing, which is included in Alternatives A, C, and D at varying degrees, would have no effect on the species because consent to leasing is just an administrative decision. Effects to the species and its habitat would occur if and when exploration and drilling on a leased tract occurs in the future. At that time, activities that involve tree cutting, brush removal or soil disturbance could harm individual animals, especially if completed during the breeding season. Very little habitat is available for this species on the tracts in the lease package. Alternative B would have no effect on this species since none of the tracts would be leased. The overall impact to this species would be insignificant because only a very small area is actually expected to be affected by exploration and drilling as a result of any leasing accomplished in Alternatives A, C, and D (i.e., 4 wells in 5 years according to the BLM).

**Wood duck** (*Aix sponsa*) – This bird prefers 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 natural ones in large trees or in nest boxes. Most nests are near or over water, but some are over 500 feet from water. Nest height ranges from 2-3 feet above water in boxes to more than 50 feet in mature trees. The Ohio Division of Wildlife conducts an active banding program on the wood duck. Two of the swim-in brood traps are regularly placed on wooded wetlands on the Wayne National Forest. The Division's wood duck coordinator feels that this species numbers are stable if not increasing in the state (Steve Barry personal communication). Earnst and Andres (1996) had the same findings. Numerous wood duck nest boxes have been placed in various wetlands and along streams on the Wayne National Forest with great success. Consent to leasing, which is included in Alternatives A, C, and D at varying degrees, would have no effect on the species because consent to leasing is just an administrative decision. Effects to the species and its habitat would occur if and when exploration and drilling on a leased tract occurs in the future. At that time, activities which involve tree cutting, brush removal or soil disturbance could harm individual animals, especially if completed during the breeding season. Stipulations placed on tracts to protect riparian areas would help protect habitat for this species. Furthermore, Alternatives C and D would provide greater protection to the species and its habitat than Alternative A. The reason for this statement is because the protection measures in the Biological Opinion (for the Indiana bat) would offer protection to this species habitat as well. Alternative B would have no effect on this species since none of the tracts would be leased. The overall impact to this species would be insignificant because only a very small area is actually expected to be affected by exploration and drilling as a result of any leasing accomplished in Alternatives A, C, and D (i.e., 4 wells in 5 years according to the BLM).

**Virginia rail** (*Rallus limicola*) – This bird prefers dense marshy vegetation. They occupy shallow marshes dominated by cattails or other tall emergent vegetation. This species is not known to occur in southeastern Ohio. The proposed action or alternatives will not affect this species.

**Western chorus frog** (*Pseudacris triseriata*) – This frog can be found in a variety of habitats including marshes, meadows, swales, and other open areas. Breeding occurs in early spring in the edges of shallow ponds, flooded swales, ditches, wooded swamps, and flooded fields. They usually remain close to the breeding grounds throughout the year, hiding from predators (and hibernating also) beneath logs, rocks, leaf litter, and in loose soil or animal burrows. Frog and Toad calling surveys are conducted within various wetland areas on the Wayne National Forest. This frog has been heard calling from one wetland on the Athens Unit and has not been detected during calling surveys on the Ironton Unit. Consent to leasing, which is included in Alternatives A, C, and D at varying degrees, would have no effect on the species because consent to leasing is just an administrative decision. Effects to the species and its habitat would occur if and when exploration and drilling on a leased tract occurs in the future. However, stipulations placed on tracts to protect riparian areas would protect habitat for this species. There should be no effect to this species of any leasing accomplished in Alternatives A, C, and D (i.e., 4 wells in 5 years according to the BLM).

**Wood frog** (*Rana sylvatica*) – This frog is most commonly found in moist woodlands during the summer. They hibernate under stones, stumps and leaf litter in the winter. Breeding occurs in very early spring in woodland ponds. Numerous sites on the Forest have been identified as wood frog breeding habitat areas, in part from the annual frog and toad calling surveys. Consent to leasing, which is included in Alternatives A, C, and D at varying degrees, would have no effect on the species because consent to leasing is just an administrative decision. Effects to the species and its habitat would occur if and when exploration and drilling on a leased tract occurs in the future. However, stipulations placed on tracts to protect riparian areas would protect habitat for this species. There should be no effect to this species of any leasing accomplished in Alternatives A, C, and D (i.e., 4 wells in 5 years according to the BLM).

**Bluegill** (*Lepomis macrochirus*) - The preferred habitat of the bluegill is slow or non-moving clear water containing small amounts of suspended clayey silts, with bottoms made of sand, gravel, or soft muck containing organic debris with scattered beds of aquatic vegetation. Some examples are lakes, ponds, sloughs, reservoirs and moderately deep stream pools. The primary diet of the bluegill consists of insects, insect larvae, small fish, fish eggs, and plant material. Spawning for the bluegill in Ohio usually occurs in mid-May to mid-June, when water temperature reaches 65-70 degrees Fahrenheit. Nests are commonly made in water depths of 1-4 feet on sand or gravel bottoms. They may also be constructed on other bottom materials as well as heavily vegetated areas. The bluegill has been collected from every 5<sup>th</sup> level watershed in the Forest. The bluegill would be expected to occur in waters on a few of the tracts, but not all tracts. Habitat is just not available on many of the tracts. Where habitat is available, the stipulations placed on the tracts that refer to protection of riparian areas and ponds will protect suitable habitat for the bluegill. These stipulations are designed to protect the structure and function of riparian areas, including sediment filtering. Because of this, Alternatives A, B, C, and D should have no effect on the bluegill.

**Southern redbelly dace** (*Phoxinus erythrogaster*) - The primary habitat of the southern redbelly dace is clear slow moving streams with long pools. These streams generally contain wooded undercut banks and are not subjected to frequent flooding. Undercut banks are desired for the sake of safety and shade. Unlike many other species of minnows the redbelly will school in the

middle of the channel when frightened, especially if the cut banks are not present. The primary food source of the dace is algae and other plant debris, however they also eat aquatic insects, and small shellfish. The redbelly spawns in the spring and early summer in swift riffles over gravel bottom nests of other minnows. The southern redbelly dace has been collected from every 5<sup>th</sup> level watershed in the Forest. The redbelly would be expected to occur in waters on some of the tracts, but not all tracts. Headwater streams with perennial flow are not available on all tracts. Where habitat is available, the stipulations placed on the tracts that refer to protection of riparian areas would protect suitable habitat for this species. These stipulations are designed to protect the structure and function of riparian areas, including sediment filtering. Because of this, Alternatives A, B, C, and D should have no effect on the southern redbelly dace.

**Redfin Shiner** (*Notropis umbratilis*) - Redfin shiners live in streams of all sizes with pools flowing slow to moderate over sand gravel or rock, often with aquatic vegetation. Redfin shiners tend to spawn from late spring through mid to late summer. The redfin spawns over nests of sunfishes, which usually consist of sand and gravel. They are attracted to these nests by the scent of a fluid released by the sunfishes during spawning. The redfin shiner has been collected from most 5<sup>th</sup> level watersheds in the Forest, however acid mine drainage has limited its distribution in some parts of the Forest. The redfin would be expected to occur in waters on some of the tracts, but not all tracts. Habitat is not available on all tracts. Where habitat is available, the stipulations placed on the tracts that refer to protection of riparian areas would protect suitable habitat for this species. These stipulations are designed to protect the structure and function of riparian areas, including sediment filtering. Because of this, Alternatives A, B, C, and D should have no effect on the redfin shiner.

**Blackside darter** (*Percina maculata*) - The blackside darter generally lives in pools of creeks and small rivers with slow moving current and bottoms consisting of gravel and sand. This darter's primary food source is small crustaceans and aquatic insects. Spawning for the blackside occurs within the months of May and June. The blackside darter has not been collected in Lake Vesuvius or any stream flowing in or out of the lake. The blackside darter has been collected from most 5<sup>th</sup> level watersheds in the Forest, however acid mine drainage has limited its distribution in some parts of the Forest. The blackside would be expected to occur in waters on some of the tracts, but not all tracts. Habitat is not available on all tracts. Where habitat is available, the stipulations placed on the tracts that refer to protection of riparian areas would protect suitable habitat for this species. These stipulations are designed to protect the structure and function of riparian areas, including sediment filtering. Because of this, Alternatives A, B, C, and D should have no effect on the blackside darter.

**Rainbow darter** (*Etheostoma caeruleum*) - Moderate streams and small rivers with long swift riffles, clear water, and sand or gravel bottoms are the perfect habitat for the rainbow darter. Its food source is primarily aquatic insects such as Diptera, and Trichoptera larvae, as well as Plecoptera naiads. They may also eat Coleoptera and Odonata larva, small crayfish, and the eggs of other minnows, especially the white sucker. Rainbow darters spawn between the months of March through June. They spawn in swift riffles above sand and gravel. Most darters especially the rainbows are sensitive to pollution, therefore it only occurs in streams and watersheds that have moderately low pollution content. The rainbow darter has been collected from a few 5<sup>th</sup> level watersheds in the Forest. Its natural distribution across the Forest is not as widespread as

other MIS, and acid mine drainage has limited its distribution in some other parts of the Forest. Within its normal range, the rainbow would be expected to occur in waters on a few of the tracts, but not all tracts. Habitat is not available on all tracts. Where habitat is available, the stipulations placed on the tracts that refer to protection of riparian areas would protect suitable habitat for this species. These stipulations are designed to protect the structure and function of riparian areas, including sediment filtering. Because of this, Alternatives A, B, C, and D should have no effect on the rainbow darter.

**Golden redhorse** (*Moxostoma erythrurum*) - The golden redhorse lives in riffles, runs, and pools of streams over mud to rock bottoms. They also may live in large rivers and occasionally lakes. The food source of the redhorse consists of Trichoptera, Ephemeroptera, Copepoda, mollusks, Hemiptera and other items. Algae make up the smallest portion of the redhorse diet. The redhorse spawns between the months of May and July when the water temperatures rise to between sixty and seventy degrees Fahrenheit. Swift riffles are chosen by the redhorse for spawning, however, no nest construction has been observed. The golden redhorse has been collected from most 5<sup>th</sup> level watersheds in the Forest, however acid mine drainage has limited its distribution in some parts of the Forest. The golden redhorse would be expected to occur in waters on some of the tracts, but not all tracts. Habitat is not available on all tracts. Where habitat is available, the stipulations placed on the tracts that refer to protection of riparian areas would protect suitable habitat for this species. These stipulations are designed to protect the structure and function of riparian areas, including sediment filtering. Because of this, Alternatives A, B, C, D should have no effect on the golden redhorse.

**Sand Shiner** (*Notropis ludibundus*) - 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. Typically the spawning season of the sand shiner occurs from late May to mid August. Sand shiners have a generalized diet consisting of aquatic insects, small crustaceans, and plant material. The sand shiner has been collected from some of the 5<sup>th</sup> level watersheds in the Forest. Its natural distribution across the Forest is not as widespread as other MIS, and acid mine drainage has limited its distribution in some other parts of the Forest. Within its normal range, the sand shiner would be expected to occur in waters on a few of the tracts, but not all tracts. Habitat is not available on all tracts. Where habitat is available, the stipulations placed on the tracts that refer to protection of riparian areas would protect suitable habitat for this species. These stipulations are designed to protect the structure and function of riparian areas, including sediment filtering. Because of this, Alternatives A, B, C, and D should have no effect on the sand shiner.

**Banded darter** (*Etheostoma zonale*) - 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. Aquatic plants and accumulations of leaves, sticks and other organic debris provide perfect cover for the banded darter. The primary diet of the banded darter consists of immature aquatic insects. Spawning for this darter usually occurs from mid April into June and possibly as late as July. Spawning generally occurs in moderate to high gradient riffles where there is an abundance of algae and aquatic moss on the stones and boulders. Females deposit their eggs on this plant growth and tend to move downstream to deep water for the winter. The banded darter has been collected from some of the 5<sup>th</sup> level watersheds

in the Forest. Its natural distribution across the Forest is not as widespread as other MIS, and acid mine drainage has limited its distribution in some other parts of the Forest. Within its normal range, the banded darter would be expected to occur in waters on a few of the tracts, but not all tracts. Habitat is not available on all tracts. Where habitat is available, the stipulations placed on the tracts that refer to protection of riparian areas would protect suitable habitat for this species. These stipulations are designed to protect the structure and function of riparian areas, including sediment filtering. Because of this, Alternatives A, B, C, and D should have no effect on the banded darter.

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