

# MEAD'S MILL PROJECT BIOLOGICAL ASSESSMENT

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# **BIOLOGICAL ASSESSMENT FOR THE MEAD'S MILL PROJECT AREA**

Allegheny National Forest  
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## **I. INTRODUCTION AND PROPOSED ACTION**

This biological assessment (BA) includes a brief description of the habitat for federally Threatened, Endangered (T&E) or Candidate species followed by an analysis of potential effects associated with each alternative being considered in the Mead's Mill Project Environmental Assessment (EA). This assessment evaluates the effects of alternatives in order to:

1. Determine potential effects on federally threatened and endangered species and species proposed for listing (FSM 2670.31).
2. If impacts cannot be avoided, analyze the significance of the potential adverse effects on the population or its habitat within the area of concern and on the species as a whole (FSM 2670.32).

The analysis presented in the Biological Evaluation for Threatened, Endangered and Candidate Species on the Allegheny National Forest (ANF), January 2007 (Forest BE) (USDA-FS 2007) and the analysis in the Fish and Wildlife Service concurrence letter (USDA-FWS 2007) are not repeated in this biological assessment; however, they are incorporated by reference. This assessment will serve as biological input to ensure compliance with provisions of the Endangered Species Act (ESA) as amended. The ESA requires federal agencies to ensure that actions authorized, funded or carried out by the agency are not likely to jeopardize the continued existence of endangered or threatened species or result in destruction or adverse modification of critical habitat. This assessment also provides a process to ensure that endangered, threatened and candidate species receive full consideration in the decision making process. If the scope of the project changes or new information regarding a species changes significantly, this analysis will be updated.

The primary purpose of the Mead's Mill Project is to implement the 2007 ANF Forest Plan, Land and Resource Management Plan (USDA-FS 2007a) by moving the existing forest condition towards a desired condition as outlined in the LRMP. The Forest Plan divides the ANF into Management Areas (MA) with specific goals, objectives and associated standards and guidelines (S&G) for a multitude of resources. The Forest Plan provides programmatic direction of how the ANF is to be managed for sustainable, multiple benefits. The goals and objectives of this project fall under those outlined for MA 3.0, 5.1, 6.1, 7.1, 8.1, 8.2 and 8.4 in the Forest Plan (USDA-FS 2007a, 26 to 29) whether associated with vegetation management, wildlife habitat, non-native invasive plant treatments, or transportation developments.

Management strategies such as critical timing of harvests, site-specific herbicide applications, adjustments of shade intensity (canopy and understory closure), and area fencing (deer exclosures) may be employed to achieve silvicultural (vegetation) objectives. Other opportunities exist to develop a diversity of tree seedlings in areas dominated by fern, grass, or undesirable woody vegetation.

## **DESCRIPTION OF THE MEAD'S MILL PROJECT AREA**

### **Project Area Location**

The United States (U.S.) Department of Agriculture – Forest Service (USDA-FS) is proposing to implement the Mead's Mill Project, which is located on the Bradford Ranger District of the Allegheny National Forest (ANF), Warren County, Pennsylvania (PA). It is generally south and west of the town of Warren. The project area can be defined by the following watersheds; Possum Hollow in the east, Morrison Run and Dutchman Run in the central portion, Grunder Run and Lenhart Run on the west end and the Irvine and Biddle Estates just west of the Allegheny River. The cumulative effect area is the same as the project boundary. It is approximately 20,344 acres in size consisting of 9,933 acres of federal lands and 10,194 acres of private land. The project area is a portion of the "13% area" that drains directly into the unimpounded section of the Allegheny River between Kinzua Dam and Tionesta Dam. Approximately 99% of the project area falls within the North Allegheny Front watershed with portions of the West Branch Tionesta Creek watershed comprising the remaining 1%.

### **Habitat Summary of the Project Area**

Habitat conditions on National Forest System lands within the project area are summarized in Table 1. The project area is predominantly forested (97%), with approximately 81% of the area occurring as mature second growth forest and approximately 14% as young forest less than 50 years of age. There is no old growth timber within the project area. The availability of seedling or young forest has varied over time and between the late 1960's and mid 1990's forest, seedling forest <10 years of age was provided on between 4-10% of the project area. Early successional vegetation has been declining during the last decade and presently <1 % of the project area currently occurs as seedling habitat.

Predominant Forest Types include upland hardwoods (27%), Allegheny hardwoods (9%) and oak (47%). Although the project area has a large conifer component and approximately 7% of the area occurs as conifer or mixed conifer forest, with most of the conifer occurring as hemlock in the Grunder Run and Morrison Run portions of the project area. There is also some red pine dominated stands and a few scattered sites that contain white spruce and white pine, with existing white pine occurring on plateaus and side slopes in the western third of the project area. There is also a very small aspen component. The entire project area is in the beech bark disease killing front and as a result there has been extensive mortality of beech trees throughout. The beech mortality, combined with scattered mortality of white ash and sugar maple, has resulted in a higher density of large diameter snags than is generally found across the ANF. A total of 200 acres or ~2% of the project area occurs within the ANF landscape corridor and includes core areas and connecting corridors that are currently being managed to provide late structural/old growth forest conditions. There are no old growth stands (those greater than 300 years of age) currently within the project area. The remainder of the mature forest in the project area is currently being managed to provide predominantly late structural forest conditions including

older trees, maintenance of a predominantly high forest canopy and increased vertical structure. These lands also contain a large conifer component and as a result are good candidates to provide conditions characteristic of true old growth forest in Pennsylvania.

Non-forested habitat (~6% of MMPA) occurs on over 52 sites (~ 540 acres) across the project area, with most existing openings (85%) being less than 10 acres in size and openings <1 acre making up almost 30% of the total number of sites. There are only 7 sites greater than 10 acres in size, including 1 opening which occurs north of the Allegheny River. The largest opening (156 acres) can be characterized as a maintained grass field opening (the Beanfields) in the northwest quadrant of the confluence of the Allegheny River and the Brokenstraw Creek. The other large opening (61 acres) is the old landfill just south of the river and north of Grunder Road. Shrub openings are found on 55 acres across 5 sites while the rest of the existing openings (91%) are predominantly grass/forb openings. Approximately 210 acres of the existing openings within the project area are being maintained and/or have received past wildlife treatments such as planting, fencing or seeding.

**Table 1:** Mead’s Mill Project Area Habitat Summary

Habitat/Landscape Condition	Amount in Project Area	% of Project Area
<b>Forest Communities</b>	~9,400	94
Deciduous Hardwood	8,760	93
Conifer	640	7
Forested Age Class		
0 to 20 years	605 acres	6
21 to 50 years	770 acres	8
51 to 80 years	1,220 acres	12
81 to 110 years	6,052 acres	61
111 to 140 years	756 acres	8
141 to 300 years	0	0
301 plus years	0	0
<b>Non-Forest Communities</b>	540 acres	6
Grass/forb Openings	485 acres	5
Shrub Openings	55 acres	<1
<b>Stream/Riparian/Wetlands</b>	2,566	
National Wetland Inventory Wetlands <sup>1</sup>	371 acres	
Streams <sup>2</sup> (in miles)	92 miles	NA
Riparian Stream/floodplain <sup>3</sup>	2155 acres	

<sup>1</sup> – Includes federal and non-federal ownership and river habitat

<sup>2</sup> – Includes streams and river across federal and non-federal ownership

<sup>3</sup> - Stream/riparian habitat includes all land within 200’ of a perennial or intermittent stream.

Approximately 11% of the project area (combined private and federal land) has been identified as stream riparian habitat, floodplain and riparian habitats combined. The riparian habitat or area of influence is the area within 200 ft. from any perennial or intermittent stream. This distance

was used because of the number of tributary spring seeps disbursed along most stream corridors are quite numerous and variable in size and shape. Wildlife use of these seeps occurs year round. The area of influence along the Allegheny River is much wider than 200 feet due to the width of the river corridor and variety of adjacent habitats while forest streams are generally similar across the landscape. The project area also includes 371 acres of National Wetland Inventory (NWI) wetlands (including federal and non-federal ownerships). While non-FS lands comprise slightly more than 51% of the project area and contain 51% of the total stream miles, only 30% of the NWI wetlands are on private lands.

## **ALTERNATIVES CONSIDERED**

### **Alternative 1: No Action**

Although 25 acres of removal harvest and 10 acres of reforestation (site prep) that were approved in previous decisions will be implemented, there are no new federal actions proposed under this alternative. Alternative 1 will serve as a baseline or reference point from which effects of the two action alternatives (Alt. 2 & 3) can be evaluated. This is a viable alternative and responds to concerns of those who do not want management activities to occur in the project area.

Alternative 1 will let ecological processes control vegetation development and habitat changes will occur primarily from natural disturbances, although activities remaining within the project area that have been approved in past environmental assessments will still continue. Oil and gas development is expected to continue on private mineral leases (having outstanding sub-surface rights) on both private and federal land within the project area.

### **Alternative 2: Proposed Action**

This alternative was based on the site specific purpose and need for the project area and proposed activities are intended to move the project area from the present condition, to the desired future condition identified in the Forest Plan. Alternative 2 uses a variety of even-aged timber harvest treatments, wildlife habitat improvement work and understory treatments to achieve a more balanced age class distribution, improve stand structure and diversity, and enhance wildlife habitat conditions in MA 3.0 and 6.1. This alternative also proposes activities to increase the mast production in oak stands and enhance the existing white pine component. Transportation activities include construction of one new road totaling 0.6 miles, road reconstruction and decommissioning, gravel pit expansion and development and limestoning of roads within 300 ft. of any stream. This alternative includes 1,000 acres of NNIS treatment – a combination of manual/mechanical and/or herbicide treatments. Table 2 summarizes activities proposed under this alternative.

### **Alternative 3:**

This alternative focused on addressing water quality issues in the project area. It responds to public concerns related to minimizing even-age timber harvest and eliminating 0.6 miles of new road construction within the exceptional value watershed, Dutchman Run. Stands being accessed by the new road would be dropped from vegetation activities. Harvesting would not take place on 27 acres proposed for a commercial thinning, shelterwood, nor final harvest, respectively. It also eliminates a 13 acre hemlock release due the concern of increased sedimentation potential while hauling logs on a road needing upgrades. All other action items

would remain the same as alternative 2 for this alternative. Table 2 summarizes activities proposed under this alternative.

**Summary of Alternatives**

Table 2 summarizes activities for each of the action alternatives identified above (Alternatives 2 and 3). Alternative 1 (no action) is also displayed because OGM activities will likely occur even if there are no treatments proposed under this alternative. For clarity, the estimated time of completion (2006 – 2026) for proposed timber harvest is also displayed in Table 2. Those activities that will involve removal of suitable roost trees and potential harassment and harm to the Indiana bat are displayed in Table 9.

**Table 2:** Proposed Activities by Alternative in the Mead’s Mill EA

Activity	Alt. 1 No Action	Alt. 2 Proposed Action	Alt. 3
<b>Timber Harvest</b>	<b>acres</b>		
Commercial Thinning	0	433	388
Shelterwood seed cut/Removal Harvest	25	449	421
White Pine Release - Non-commercial	0	5	5
Hemlock Release	0	9	0
Delayed Shelterwood Removal Harvest	0	82	82
Aspen Regeneration <sup>1</sup>	0	18	18
Opening Construction	0	1	1
Salvage Shelterwood/Final Harvest	0	25	25
<b>Total Vegetation Management (acres)</b>	25	1022	940
<b>Timber Outputs</b>			
First Entry	0	3.9	3.6
Second Entry	0.2	3.8	3.6
<b>Total Volume (MMBF)</b>	0.2	7.7	7.2
<b>Reforestation</b>			
Site Preparation	10	657	630
Herbicide Application	0	566	539
Fence Construction and Maintenance	0	556	529
Release - only	0	1,025	1,025
Release - regeneration	0	571	544
Planting	0	39	39
Mechanical scarification	0	408	408
Prescribed burn	0	421	421
Pile slash and burn	0	128	128
<b>Wildlife Habitat Improvement</b>	<b>acres</b>		
Restore and maintain openings	0	140	140

<b>Activity</b>	<b>Alt. 1 No Action</b>	<b>Alt. 2 Proposed Action</b>	<b>Alt. 3</b>
Plant & mow warm & cool season grasses	0	141	141
Plant & fence mast/fruit trees	0	89	89
Burn to reestablish grassland and burn yearly to maintain	0	100	100
Herbicide interfering vegetation & non-native, invasive species in openings	0	138	138
Regenerate aspen trees for an early age class <sup>1</sup>	0	18	18
Thin & release white pine and butternut to promote growth	0	6	6
Prune & release apple trees to promote production of apples	0	18	18
Girdle trees to create snags for roosting	0	10	10
Release opening to promote desirable trees & shrubs	0	22	22
Install structures (nesting & roosting)	0	72	72
		<b>number</b>	
Construct brush piles to provide wildlife cover	0	14	14
Rehabilitate vernal ponds mechanically to improve aquatic habitat	0	2	2
Install interpretive sign for wildlife education	0	1	1
		<b>acres</b>	
<b>NNIS Treatment</b>			
A combination of herbicide applications, manual and mechanical treatments for NNIS	0	1,000	1,000
<b>Road Maintenance</b>			
Road construction – new corridor	0	0.6 miles	0
Road construction – existing corridor	0	5.7 miles	5.0 miles
Decommissioning non-system roads	0	0.6 miles	0.6 miles
Apply limestone surfacing on potential haul roads	0	0.7 miles	0.7 miles
Road maintenance on existing system roads needed for hauling	0	12.5 miles	12.5 miles
<b>Pit Development</b>			
Gravel pit expansion (resulting in the conversion of forest habitat to an opening)	0	Up to 9 ac. (7 sites)	Up to 9 ac. (7 sites)
Gravel pit restoration	0	Up to 5 ac (1 site)	Up to 5 ac (1 site)

<sup>1</sup> Listed under both timber harvest and wildlife sections of this table

## II. THREATENED AND ENDANGERED SPECIES

### SPECIES STATUS, OCCURRENCE AND HABITAT

Table 3 summarizes the status of Federally Threatened, Endangered or Candidate species in the project area. Each species is placed in one of the following three categories depending on their known occurrence and available habitat: 1) species occurrence has been documented in the recent past and there is occupied habitat in the project area, 2) occurrence has not been recently documented in the project area but suitable habitat is present and 3) occurrence has not been documented in the recent past and suitable habitat is not present.

**Table 3:** Federally Threatened, Endangered and Candidate Species for the ANF

Species	Species Status	Distribution Relative to the Project
<b>Mammals</b> Indiana bat ( <i>Myotis sodalis</i> )	Endangered	Suitable habitat but presence of species not documented in project
<b>Plants</b> Small whorled pogonia ( <i>Isotria medeoloides</i> )	Threatened	Suitable habitat but presence of species not documented in project
Northeastern bulrush ( <i>Scirpus ancistrochaetus</i> )	Endangered	Suitable habitat but presence of species not documented in project
<b>Invertebrates</b> Clubshell mussel ( <i>Pleurobema clava</i> )	Endangered	Suitable habitat but presence of species not documented in project
Northern riffleshell mussel ( <i>Epioblasma torulosa rangiana</i> )	Endangered	Suitable occupied habitat
Rayed-bean ( <i>Villosa fabalis</i> )	Candidate	Suitable habitat but presence of species not documented in project
Sheepnose ( <i>Plethobasis cyphus</i> )	Candidate	Suitable habitat but presence of species not documented in project

Special Note: The USFWS announced that the bald eagle is off the Endangered Species List effective August 9, 2007. The bald eagle will continue to be protected under the Bald Eagle Protection Act and the Migratory Bird Treaty Act, and will automatically be placed on the Regional Forester Sensitive Species list. Bald eagle standards and guidelines will not change as a result of this status change and no change in the design and implementation of this project is needed

### Critical Habitat

There is no officially designated critical habitat for any federally listed T&E or Candidate Species within the Mead's Mill project area (16 U.S.C. 1532 (5) (A)).

The following is a discussion of T&E and candidate species with suitable habitat in the project area, but no individuals have been documented. The ANF BE (USDA-FS 2007), which includes a BA contains the life histories, species distribution and distribution of habitat, habitat suitability and population dynamics, forest habitat, threats to recovery and limiting factors, effects analysis and standards and guidelines for all ANF T&E and Candidate Species. This information is available in the BE (USDA-FS 2007, 47 to 132) and is incorporated by reference.

## **Cumulative Effects Analysis Area and Period**

**Analysis Period:** Analysis of cumulative effects includes identification and evaluation of direct and indirect effects, that when considered cumulatively over time, and/or in combination with effects on private land, may result in significant effects to federally listed species or their habitats. Because only final harvest treatments that have occurred in the last 10 years are readily apparent on aerial photographs, 1996 was chosen as the start of the analysis period. However because final harvest treatments on private industrial forest land often use a 2-step cutting method, including a shelterwood treatment within the next 10 years followed by a final harvest treatment in 10-20 yrs out, 2026 was chosen as the end of the analysis period. As a result, the cumulative effects analysis period for regeneration or final harvest spans a period of 30 years (1996-2026).

**Analysis Area:** The geographic scope or cumulative effects (CE) analysis boundary used to evaluate effects to all the federally listed species is the same as the Mead's Mill project boundary. This area totals 20,344 acres and includes 10,400 acres of private land and river and 9,944 acres of National Forest System lands. Rationale for selection of the CE boundary includes the following:

- Both non-federal and federal lands within this area have had intensive oil and gas development, including a recent increase in development. Adjacent lands surrounding the project area generally contain reduced or comparable levels of oil and gas activity and adding these lands will not identify any new cumulative effects and/or may “dilute” potential cumulative effects.
- The level of even-age regeneration harvest within the project boundary is at or above levels that would be expected on adjacent lands.
- The Southern, Eastern and Northern borders follow identified boundaries (watershed and proclamation).
- Oak is the dominant forest type within much of the Meads Mill project area and greatly influences wildlife distribution and use. Extending the boundary away from the Allegheny River and the oak forest type would result in habitat conditions that are dissimilar from that of the project area.

## **SPECIES WITH SUITABLE OCCUPIED HABITAT FOUND IN THE PROJECT AREA**

### **NORTHERN RIFFLESHELL MUSSEL (*Epioblasma torulosa rangiana*)**

#### **Background**

The life history, population trends, threats, and habitat status related to this mussel is located in the Forest Biological Evaluation (USDA-FS-2007, 47 to 78 and 203 to 204).

#### **Project Area Habitat**

The Allegheny River likely provides the only suitable habitat because it drains glaciated lands making the river productive. Other streams on the ANF drain unglaciated lands and are less suitable. The pigtoe has been documented in the Allegheny River just south of Crulls Island.

Aquatic and riparian systems are linear, connected, and form larger systems. Any impacts to the perennial or upper reaches (intermittent sections) of any of the streams within the project area could have an impact on suitable habitat further downstream.

### **Direct and Indirect Effects**

#### **Alternative 1 – No Action**

Potential effects to the Northern riffleshell could occur as a result of no activities to address runoff concerns. Specifically, there would be no limestone surfacing on dirt and gravel roads at areas identified as a concern for runoff into streams. Sedimentation rates would continue into two streams that flow into the Allegheny River. Similarly, the non-system dirt and gravel road that parallels a portion of Dutchman Run would not be decommissioned, allowing sedimentation to the stream to continue. Dutchman Run also flows to the Allegheny River where suitable habitat exists for the Northern riffleshell.

#### **Alternatives 2 & 3**

The northern riffleshell and clubshell section in the ANF Biological Evaluation (page 69) identifies activities with negligible effects, potential beneficial effects, and potential adverse effects. These effects not only apply to the two endangered mussels, but to the other mussel and aquatic species as well. These effects are incorporated here by reference and are also summarized below with specifics of the proposed activities.

Affects are primarily associated with land-disturbing activities within the 13% Area, as well as from the introduction of zebra mussels into the Allegheny Reservoir or Allegheny River at Forest Service boat launches. Activities with potential beneficial effects include Road Decommissioning and Non-native Invasive Species Control. The primary, potential adverse effect from land-disturbing activities is sedimentation and/or degradation of water quality. Activities with the potential to cause these effects include: Road Construction and Maintenance, the construction, maintenance and operation of motorized trails in Intensive Use Areas, and Herbicide Treatment. For the possible introduction of zebra mussels, the Operation of Boat Launches is the primary activity that could have an affect on the Northern riffleshell.

Within the Mead's Mill project area, the activities that would have potential beneficial effects include road decommissioning and the treatment of non-native invasive species. A total of 0.6 miles of non-system road are proposed for decommissioning, of which 0.5 miles parallel and cross the headwaters of Dutchman Run, an Exceptional Value stream and one that drains to the Allegheny River. With the decommissioning, a long-term sediment source will be eliminated. The treatment of non-native invasive species within riparian areas, including areas along the river and on Crulls Island, will help maintain native vegetation along these critical areas.

The proposed activities that could adversely affect the Northern riffleshell include road work and use on dirt and gravel roads within 300' feet of a stream, operation and use of motorized trails, herbicide treatments, as well as the introduction of zebra mussels from boats launching at the Buckaloons launch site. Specifically, 0.56 miles of two roads will be surfaced with limestone to reduce sediment runoff. These include a road crossing an unnamed tributary to the Allegheny River, and a section of road that parallels a tributary to Grunder Run. Although not part of the decision document, routine maintenance of the Rocky Gap ATV trail continues to address runoff

concerns when they are identified. Several sections of the trail have been surfaced with limestone recently in areas where runoff is a concern. As for herbicide treatments, buffers along waterways will be implemented following Forest Plan S&G's. And lastly, the threat of zebra mussel introduction is low from launches taking place at Buckaloons. The boats that typically launch are canoes and occasionally small motor boats. These normally are not high risk boats because of how they are used, e.g., are primarily day-use boats in smaller bodies of water. In addition, signage posted on the bulletin boards at the launch will continue to alert boaters of the zebra mussel threat and how they can help prevent their spread.

As a result of the implementation of Forest Plan S&G's, and conservation measures outlined by the ANF and USFWS, there are no adverse direct or indirect effects anticipated for this species or its habitat under Alternatives 2 and 3. However, potential effects could continue to occur under Alternative 1 in the short term, until such time that surfacing with limestone and road decommissioning can be addressed separately outside of the Mead's Mill EA decision.

### **Cumulative Effects**

The analysis boundary and time period were previously described on page 11 above.

### **Alternatives 1-3**

The cumulative effects described in the Forest BE (page 72-74) for the clubshell and northern riffleshell also apply to all the mussel species, and because Mead's Mill is within the 13% Area. These effects relate to the potential zebra mussel infestation from areas outside the ANF, cooler water and flow releases from Kinzua Dam into the Allegheny River, and oil and gas development. These are not ANF actions, but can have an affect on the species and its suitable habitat. These effects are summarized below.

The zebra mussels have been documented in the Conewango Creek, as well as the Allegheny River just downstream of the Conewango. As the mussels continue to move downstream into the river and their numbers increase, their impact on suitable habitat and existing Northern riffleshell populations could become adverse. Riffleshell numbers appear to be very low in the section of river within the Mead's Mill area, and any incursion of zebra mussels could result in a further decline of the species depending on the severity of the infestation.

One factor that appears to have been affecting the Northern riffleshell for many years is the cooler waters released from Kinzua Dam. While the water temperature tends to moderate the further downstream of the dam you travel, the temperature within the section of river within Mead's Mill are still not as warm as the riffleshell would prefer and appear to have affected their life history requirements. On the other hand, the minimum flow releases from the dam have likely provided a more stable environment for the riffleshell, actually providing more habitat over a longer period of time.

The potential for cumulative effects from private oil and gas activity has increased in recent years as a result of increased drilling. Within the Mead's Mill area, numerous private leases exist both on ANF and non-ANF land. It is reasonable to assume that new and existing private oil and gas developments within the 13% Area will continue to result in sedimentation to streams, primarily from dirt and gravel roads.

Many of the new wells and associated roads could be constructed on National Forest System lands and although these roads may be constructed to a lower standard at more sensitive areas than ANF roads, the ANF works closely with developers to minimize sedimentation and water quality impacts. To avoid significant effects, site specific mitigations would be implemented. Additionally, as more wells are developed, the potential for oil spills increases. To minimize impacts that could occur from a spill, a Pollution Prevention and Spill Response Plan is filed with Pennsylvania DEP and with the ANF that provides emergency actions that would take place should a spill occur.

Based on the analysis presented above, adverse cumulative effects are likely to occur within the Meads Mill area of the Allegheny River by the year 2020 as a result of the likely zebra mussel infestation. It is unclear at this time how heavy a zebra mussel infestation would be, but depending on the rate of spread and realizing that Northern riffleshell numbers already appear very low in this section of river, even a low number of zebra mussels could result in an adverse affect to the remaining riffleshell numbers. This affect though is not a result of ANF activities.

### **Northern Riffleshell Determination and Rationale**

The determination made for the Northern riffleshell after consideration of the proposed ANF activities and the implementation of Forest Plan S&G's and conservation measures within the project area is 'may impact individuals but is not likely to cause a trend toward federal listing'. The likely zebra mussel infestation from Conewango Creek is not considered in the determination because it is not an ANF activity. The following rationale as outlined on page 74 of the Forest BE, apply to this determination:

- Forest Plan standards and guidelines, as well as any site-specific mitigation measures, would be implemented during project implementation, resulting in insignificant effects from any potential ANF sediment and runoff producing activity, such as from dirt and gravel roads and motorized off-highway trails. The standards and guidelines in the Forest Plan were developed to minimize impacts to water resources on the ANF, and ultimately to the mussels in the Allegheny River. The basis for the rationale is the findings from the USGS mussel and habitat surveys of the Allegheny River that sediment is not impacting mussels, and therefore the continued implementation of standards and guidelines and site-specific mitigation measures would continue this level of protection from Forest Service activities.
- Forest Plan standards and guidelines, as well as any site-specific mitigation measures, would be implemented during vegetation management activities such as herbicide application. This primarily involves the implementation of buffers and the use of surfactants approved for aquatic use.
- Conservation measures would be implemented to provide information and education to the boating public to maintain and/or further increase public awareness about the prevention of zebra mussel introduction into the Allegheny Reservoir and Allegheny River. Periodic trailer and water vessel screening at high risk boat launches on the Allegheny Reservoir will continue to heighten public awareness about preventing zebra mussel introduction.

- Dirt and gravel roads, motorized off-highway vehicle trails, timber sales, and oil and gas operations will continue to be monitored to determine effectiveness of standards and guidelines or site-specific mitigation measures used to address runoff concerns. Where standards and guidelines or site-specific mitigation measures are not meeting their intent, corrective action will occur.
- A large number of anticipated private oil and gas developments could occur on National Forest System Lands and potential adverse effects will be reduced or minimized through close administration by the ANF, as well as the implementation of Forest Plan standards and guidelines as outlined previously. The developments are not a federal action, but rather an exercising of mineral rights by private lease holders.
- Sedimentation and potential adverse effects to water quality resulting from timber harvest would be minimized through implementation of State Best Management Practices, Forest Plan standards and guidelines and site specific mitigation measures during individual project implementation.

**SPECIES NOT DOCUMENTED BUT SUITABLE HABITAT IS FOUND IN THE PROJECT AREA**

**INDIANA BAT (*Myotis sodalis*)**

**Background**

The life history, population trends, threats, and habitat status related to the Indiana bat is located in the Forest Biological Evaluation (USDA-FS-2007, 79 to 105).

**Project Area Habitat**

The project area was evaluated to determine the amount and distribution of Indiana bat habitat. The analysis of habitat is based on the Habitat Suitability Model (H.S.I.) developed by Romme et al. (1995) and includes an evaluation of canopy closure conditions, as well as an assessment of the availability of potential roost trees. The habitat analysis in this BA, the Forest BA (USDA-FS 2007) and the Concurrence Letter (USDI-FWS 2007) are based on the best available science at this time.

Using canopy closure criteria identified by Romme et al (1995), Tables 4 and 5 display present condition Indiana bat maternity roost and foraging habitat within the project area. A description of the habitat conditions that exists is also displayed.

***Maternity Roosting Habitat***

**Table 4:** Indiana Bat 2006 Roosting Habitat in Mead’s Mill (measured by canopy closure)

<b>Habitat Description</b>	<b>Habitat Features Present</b>	<b>Present Condition</b>
<b>Openings</b>	Overall, less than suitable condition. Scattered trees are present which could be used for roost purposes.	6%

<b>Habitat Description</b>	<b>Habitat Features Present</b>	<b>Present Condition</b>
<b>Seedling/Sapling Stands</b>	Overall, less than suitable condition. Reserve trees and clumps are present which could be used for roost purposes.	6%
<b>Suitable habitat - Open crowns</b>	Forested stands with <54% canopy closure. Forest average dead and live tree distributions apply.	7%
<b>Optimal habitat</b>	Forested stands with 54-80% canopy closure. Forest average dead and live tree distributions apply.	34%
<b>Suitable habitat - Closed crowns</b>	Forested Stands with > 80% canopy closure. Forest average dead and live tree distributions apply.	47%

**Table 5:** Indiana Bat 2006 Foraging Habitat in Mead’s Mill (measured by canopy closure)

<b>Description</b>	<b>Habitat Features Present</b>	<b>Present Condition</b>
<b>Openings</b>	Overall, less than suitable condition. Scattered overstory trees remaining.	6%
<b>Seedling/Sapling Stands</b>	Overall, less than suitable condition. Reserve trees and clumps are present which provide minimal habitat requirements.	6%
<b>Suitable Habitat - Open Crowns</b>	Forested Stands with < 50% canopy closure. Forest average dead and live tree distributions apply.	3%
<b>Optimal Habitat</b>	Forested Stands with 50-70% Canopy Closure Forest average dead and live tree distributions apply.	18%
<b>Suitable Habitat - Closed Crowns</b>	Forested stands with > 70% canopy closure. Forest average dead and live tree distributions apply.	67%

Based on the information presented in Tables 4 and 5, approximately 89 percent of the project area currently provides canopy closure conditions that are considered suitable for Indiana bat maternity roost and foraging habitat. The distribution of available habitat conditions is also a consideration and suitable Indiana bat habitat is widespread across the project area. Optimum roosting and foraging habitat occurs as both concentrated areas and scattered stands in the eastern half of the project area, whereas the western half of the project area consists almost exclusively of closed canopy roosting and foraging habitat conditions.

There are no known maternity colonies in the project area and although hardwood mortality and decline are somewhat common, there are no concentrated areas of potential roost trees. Suitable levels of snags (providing potential roosts) appear to be well distributed across the analysis area. Field surveys found that many standing-dead trees have cavities, crevices, or exfoliating bark.

Edge habitat exists along Forest Service, State, and lease roads, pipelines, a variety of openings, and utility corridors. These environments along with the stream corridors appear to provide the most suitable foraging conditions in the project. The project area provides an ample amount of preferred summer range for the Indiana bat.

## Direct and Indirect Effects

Direct effects include effects of federally proposed actions that may directly result in harm or harassment of the Indiana bat under each alternative. Proposed activities that may result in direct effects to the Indiana bat include any activity that results in removal of suitable roost trees. These activities are displayed in Table 6.

**Table 6:** Alternative Summary of Anticipated Direct Effects

Activity	Dates Implemented	Alt. 1	Alt. 2	Alt. 3	Type of Harvest
<b>Commercial Timber Harvest</b>			acres	acres	
Commercial Thinning	2006-2011	0	433	388	Thinning
Shelterwood (Seed Cut)	2006-2011	0	449	421	Shelterwood Seed/Prep
Shelterwood Harvest Final Harvest	2016-2021	25	449	421	Shelterwood Removal
White Pine Release (non-commercial)	2006-2011	0	5	5	Thinning
Hemlock Release	2006-2011	0	9	0	Thinning
Delayed Shelterwood Removal Harvest	2006-2011	0	82	82	Shelterwood Removal
Aspen Regeneration	2006-2011	0	18	18	Clearcut
Opening Construction	2006-2011	0	1	1	Clearcut
Salvage Shelterwood Final Harvest	2016-2021	0	25	25	Shelterwood Removal
<b>Reforestation</b>					
Prescribed burn/Pile slash & burn <sup>1</sup>	2011-2026	0	549	549	NA
<b>Road and Misc. Activities</b>					
Road Construction – new corridor	2006-2011	0	0.6 miles	0	NA
Construct or Expand Gravel Pits	2006-2011	0	Up to 9 ac	Up to 9 ac	Clearcut
<b>OGM – Future Development</b>	2006 – 2026				
ANF Pit Development - OGM		15 acres	15 acres	15 acres	Clearcut
Non-Forest Pit Development - OGM		15 acres	15 acres	15 acres	Clearcut
<b>ANF – Current OGM</b>		912 wells	N/A	N/A	
<b>Non-Forest – Current OGM</b>		953 wells	N/A	N/A	
ANF – Future		684 ac	105 ac	105 ac	Clearcut
Non-Forest – Future		715 ac	110 ac	110 ac	Clearcut

<sup>1</sup> – Burning may be repeated if the first burn does not adequately control competing vegetation

## **Direct Effects of Timber Harvest**

### **Alternative 1**

Since no new treatments are proposed under Alternative 1, there are no direct effects resulting under this alternative. No timber harvest or roost tree removal would take place, therefore harm or harassment of individual bats would not occur. There were 25 acres of removal harvest previously approved under a prior decision.

### **Alternatives 2 & 3**

The treatments in Table 7 have the potential to result in direct effects on the Indiana bat for the action alternatives (2 and 3). Timber harvesting associated with vegetation and road construction activities, including pit expansion to be implemented under Alternatives 2 and 3 has the potential to result in direct mortality or injury to individuals or groups of bats when harvesting removes trees that harbor undetected roosts. Direct effects, or potential harm and harassment vary and Table 8 displays by season, the relative risk to the Indiana bat. While it is anticipated that some of the proposed harvests may occur prior to May, when risks are considered moderate to low, there is no seasonal restriction and cutting could occur at any time of year. Harvest activities that occur when bats are away from the ANF (October 1 - March 31) do not have a direct effect, but an indirect impact of altering roost and foraging habitat.

**Table 7:** Relative Risk to the Indiana Bat

<b>Calendar Period</b>	<b>Relative Risk on the ANF</b>	<b>Activities in Life History</b>
October 1 – March 31	None	Not on the ANF – near or at hibernacula
April 1 – May 14	None to low	Bats in transit between hibernacula and summer habitat
April 1 – April 15	Low	Migration starts
April 16 – May 14	Moderate	Bats in transit and migration peaks
May 15 – August 15	High	Summer habitat – greatest risk overall to maternity colonies
June 1 – July 31	Very High	Pups born & become volant
August 16 - September 30	Low to Very low	Leaves summer habitat - in transit to hibernacula, swarming, and hibernation

Harm or harassment to Indiana bats could happen under this alternative if an occupied roost tree was cut. However the likelihood of cutting a tree containing a maternity colony or individual roosting Indiana bat is considered extremely low because of the rarity of the species (especially on the ANF based on survey results), the wide dispersal of Indiana bats and maternity colonies throughout the species' range, and the large number of suitable roost trees present on the ANF. The ANF has been surveyed for the last nine field seasons (using FWS protocols) and while 366 sites have been surveyed (1,618 net nights), only a single male Indiana bat has been captured. While suitable habitat exists, there has been no documented occurrence of Indiana bats in the project.

If an unknown maternity colony or roosting individuals is present in a harvest unit, the loss of suitable roosting habitat could harm individual Indiana bats. However, this decrease or loss of

suitable habitat of Indiana bats is substantially reduced through the implementation of Forest Plan Standards and Guidelines in the ANF Biological Evaluation (USDA-FS 2007).

### ***Forest Plan Standards and Guidelines for Indiana bat***

In order to reduce or avoid potential adverse impacts, Standards and Guidelines (S&G's) from the Forest Plan (USDA-FS 2007a, 80 to 82) will be implemented. Retention of live, dead, and den trees in all timber harvest, along with clumps (reserve areas) of trees will maintain many important features of summer foraging and roosting habitat while allowing a new forest to regenerate over the long term.

Harvest activities that occur when bats are away from the ANF (October 1 - March 31) do not have a direct effect on the Indiana bat.

### **Direct Effects of Prescribed Burning**

Prescribed burning is proposed on 549 acres under Alternatives 2 & 3 respectively. Proposed burning will also occur over a 15-year period and the initial burning will not start until at least 2011, since oak seedlings need to get established prior to the burn. Burning will occur in the spring of the year. Also if adequate oak regeneration is not established following the first burn, burning may be repeated a second time on each site. While the exact time of burn will vary somewhat from year to year depending on site-specific weather and fuel conditions, all burning will be conducted between April 15th and May 30th. Since parturition occurs in late June to early July (USDI-FWS 1999b), proposed burning will only occur when volant bats are present.

As described in the Forest BE (USDA-FS 2007, 109), prescribed burning during the summer could result in Indiana bat mortality due to the actual roost tree being incinerated, or death or injury to bats being caused by smoke inhalation. Although this could result in take of Indiana bats, the likelihood of this happening is remote due to the small amount of acreage proposed for treatment annually, and the timing of burning (only Volant bats will be present).

### **Indirect Effects**

Potential indirect effects include changes in Indiana bat habitat conditions. Analysis of indirect effects includes a discussion of the effects of individual treatments, as well as an evaluation of both stand level and landscape level changes in habitat.

### **Alternatives 1**

There are no new direct or indirect effects anticipated under this alternative since no treatments are proposed that would adversely affect Indiana bat habitat. There were 25 acres of removal harvest previously approved under a prior decision.

### **Alternatives 2 & 3**

Although activities such as new road construction and gravel pit expansion and construction will result in some removal of vegetation, these occur as small inclusions within individual stands and will only slightly alter habitat conditions within the affected stand. Proposed reforestation treatments are not expected to adversely affect Indiana bats or their habitat because site preparation, herbicide application, release and fencing will not alter the structure preferred by bats. None of the herbicides approved for use on the ANF will bioaccumulate in bats (USDA-FS 2007d, Appendix G). Activities that will result in indirect effects, or changes in habitat conditions for the Indiana bat, include proposed timber harvest, opening construction, burning

and non-commercial release treatments proposed under these alternatives (displayed in Table 2). Indirect effects or changes in Indiana bat habitat that results from these treatments are discussed below.

### **Timber Harvest**

Although there is a variety of different timber treatments proposed, many of these are expected to have similar indirect effects on Indiana bat habitat. In order to more clearly describe potential effects, timber treatments will be placed in one of the following categories:

*Final Harvests* – Final harvests include removal harvests, clearcutting, aspen regeneration, salvage 2-age harvest and salvage removal. These treatments are all even-aged prescriptions and will involve regeneration of the entire stand being treated. Proposed clearcutting to create a wildlife opening is also considered a final harvest treatment, although rather than allowing forest regeneration to occur following harvest, the site will be seeded with grasses and forbs to create a permanent opening.

*Partial Harvests* – Partial harvest treatments include even aged prescriptions and include; shelterwood seedcuts, thinning, and salvage shelterwoods.

The following is a discussion of effects of proposed timber harvest on Indiana bat habitat:

**Partial Harvest** – These treatments will reduce the existing canopy closure on the site and generally result in optimum crown closure conditions for Indiana bat roosting and foraging. On sites receiving a shelterwood treatment, optimum crown closure conditions will be maintained for up to 5 years, after which a final harvest treatment will be implemented (see below discussion).

**Final Harvests** – Although Indiana bat telemetry data collected on the ANF indicates that final harvest stands are utilized for foraging (USDA-FS 2003b), with the exception of 2-age harvest, these actions will result in; 1) the removal of most of the mature overstory trees, 2) create temporary, open canopy conditions (with live and dead reserve trees), and 3) result in the establishment of early successional forest habitat. As a result, the quality of roost and foraging habitat will be reduced over the short term in stands receiving this treatment.

While 2-age harvest will result in removal of much of the mature overstory, 20-30% crown closure will be retained on sites receiving this treatment. Sites receiving these treatments will continue to provide suitable Indiana bat roosting and foraging habitat. This is based on the availability of live and dead trees and residual crown closure.

### **Wildlife Habitat Improvement Work**

Opening construction, aspen regeneration and non-commercial release are the only wildlife habitat improvement treatments that are expected to indirectly affect Indiana bat habitat. Opening construction is considered a final harvest treatment and is discussed above. Non-commercial oak, butternut and white pine treatments (See Table 2) consist of releasing suppressed oak, butternut or white pine trees, by killing adjacent hardwood trees through girdling. Girdling involves using a chainsaw to cut a ring (@ ½ inch wide) around the tree at breast height. This creates a break in the cambium layer, which results in the death of the tree within 1-2 growing seasons. All trees girdled will be left standing on site and there will be no

disturbance to the tree other than where the girdle is made. This treatment will increase the availability of snags and potential roost trees on the sites proposed for treatment, as well as create small canopy gaps that will help to improve the suitability of these snags as a maternity roost site. Although accurate predictions of crown closure conditions resulting from this treatment can not be made, the increase in snags and canopy gaps resulting from this treatment is expected to improve maternity roost and foraging habitat diversity on the site. No direct, indirect, or cumulative effects are expected.

#### ***Stand Level Effects on Roosting Habitat***

Based on the H.S.I. model specifications for crown closure, optimum habitat conditions will result on sites proposed for partial harvest activities (identified above). However with the exception of 2-age harvest, seedling stands resulting from final harvest treatments under Alternatives 2 and 3 no longer meet the criteria for suitable maternity roost habitat (as defined by the H.S.I. model). Adverse effects to Indiana bat habitat on sites receiving final harvest treatments are reduced through implementation of the mitigation measures listed above. These mitigation measures help to ensure that a variety of tree species and sizes are retained in final harvests including snags (dead trees), selected individual trees (live), trees containing cavities and patches of reserve trees (clumps), all of which continue to provide suitable Indiana bat habitat. Additionally, the newly opened canopy and margins of the harvest units increase the exposure of some potential maternity roost trees to solar radiation, possibly providing improved thermal conditions for raising young.

Like many aspects of Indiana bat habitat, research findings on thermal qualities of roost sites vary across the range of the Indiana bat. In Michigan (similar climate and latitude as the ANF), Kurta et al (1993) found a maternity colony where all roost trees were exposed to direct sunlight throughout the day. To the contrary, in Illinois Garner and Gardner (1992) state that roost sites exposed to intense solar radiation during midsummer may exceed potentially lethal temperatures for Indiana bats. Scientists are continuing to study and evaluate Indiana bat habitat.

#### ***Stand Level Effects on Foraging Habitat***

Both partial and final harvest treatments can affect Indiana bat foraging habitat. Partial harvests reduce canopy closure by reducing the number of trees in the overstory. This generally results in crown closure conditions that are considered optimum for Indiana bat foraging. Final harvests affect Indiana bat foraging habitat by increasing the number of temporary openings (seedling/sapling habitat), by creating edge habitat, and by altering canopy closure. Reserve trees (individuals and clumps, live and dead) in final harvest areas are protected by the implementation of mitigation measures. They create additional edge habitat, as well as improve vertical structure within each stand receiving treatment.

The analysis of foraging habitat is based on the H.S.I. model developed by Romme et al (1995). All stands (with the exception of 2-age stands) receiving a final harvest treatment under Alternatives 2 and 3 will no longer meet the criteria for suitable foraging habitat (as defined by the H.S.I. model). Romme et al. (1995) found that Indiana bats may forage in habitats with canopy closures ranging from 50-70 percent most of the time. However, research and on-Forest telemetry data on foraging habitat indicates Indiana bats will forage in a variety of forest habitats and landscapes with a variety of canopy closures (from 0-100%) are also utilized. In addition to the possible improved thermal conditions for roosting described previously, some Indiana bat foraging takes place over clearings with early succession forest vegetation (Romme et al.1995).

Additionally, the early successional forest resulting from final harvests will provide more habitat diversity in the predominantly closed canopy forest that characterizes both the ANF and the project area. Further, studies have shown that arthropod species diversity (moths and beetles) varies with forest type and age (Burford et al. 1999, Werner and Raffa 2000) and is a consideration, as these insects make up a large portion of bat diets (LaVal and LaVal 1980).

**Landscape Level Changes**

Final harvests at a landscape scale result in an insignificant loss of potential roost trees because millions of potential roost trees are available across the ANF and an average of 0.3 % of the Forest receives this type of harvest in a year. While an assessment of changes in habitat conditions at the stand level is valuable, the availability of suitable habitat across the project area must be considered because management of an area for a perpetual supply of potential roost trees is much more important than trying to manage individual roost trees (Callahan et al., 1997, Clawson 1986, Kiser and Elliot 1996, Romme et al., 1995). Additionally, the assessment of habitat at a landscape scale helps to determine if suitable habitat is adequately distributed across the project area.

The landscape level analysis discussed below is based upon the H.S.I. model developed by Romme et al (1995). Table 8 summarizes the present availability of maternity roosting and foraging habitat across the project area and provides an estimate of the habitat conditions that would develop under each alternative. Many stands proposed for even-aged final harvest treatments will receive two treatments, including a shelterwood harvest in the next 2-5 years, followed by a final harvest treatment (shelterwood removal cut, or 2-age harvest removal) during the next 15 years. Since the habitat conditions resulting from the shelterwood treatment will be short-term in nature, changes in habitat conditions displayed in Table 8 are the conditions that are expected to result following all of the proposed timber treatments on a site, or the habitat conditions that would occur in the year 2026. Although there are no new treatments proposed under Alternative 1 (no action), habitat conditions under this alternative will be slightly altered by implementation of the 25 acres of final harvest treatments approved in previous decisions.

**Table 8:** 2026 Distribution of Maternity Roost and Foraging Habitat

<b>Habitat Description</b>	<b>Present Condition</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>
<b>Minimally Suitable Habitat</b>				
Openings; less than suitable condition; scattered trees are present which could be used for roosting	6%	6%	6%	6%
Forested Stands with less than suitable conditions for roosting; reserve trees and clumps are present and available for roosting.	6%	5%	11%	10%
<b>Suitable Roosting Habitat</b>				
Forested stands with 26-53% canopy closure; suitable roosting condition; Forest average dead and live tree distributions apply.	6%	4%	4%	4%
Forested Stands with 54-82% canopy closure; optimal roosting condition; Forest average dead	39%	18%	12%	12%

<b>Habitat Description</b>	<b>Present Condition</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>
and live tree distributions apply				
Forested Stands with >82% canopy closure; suitable roosting condition; Forest average dead and live tree distributions apply	43%	68%	61%	61%
<b>Suitable Foraging Habitat</b>				
Forested stands with 16-50% crown closure; suitable foraging condition	3%	3%	3%	3%
Forested stands with 51-70% crown closure; optimal foraging condition	20%	7%	6%	6%
Forested stands with >70% crown closure; suitable foraging condition	65%	80%	75%	76%

### **Alternative 1**

With implementation of pre-approved removal cutting, suitable Indiana bat habitat would be slightly reduced (<1 %). Most of this reduction in suitable habitat would occur primarily in stands that are presently considered optimum foraging and roosting habitat, with a smaller reduction in stands that currently provide open roosting conditions.

### **Alternatives 2 and 3**

Due to the reduction in final harvest treatments, Alternative 3 will maintain the greatest amount of suitable habitat for the action alternatives (Alt. 2 and 3) and under this alternative, approximately 84% of the project area will continue to provide suitable Indiana bat habitat (as measured by crown closure conditions in the H.S.I. model). Additionally, there will be a decrease in optimum roosting habitat (6%) under both alternatives there will also be a small decrease in optimum foraging habitat (1%) under this alternative.

Because the project area is in the beech bark disease killing front, the availability of snags and potential Indiana bat roost trees within the project area has been increasing in the last 3-5 years and this increase is expected to continue to increase in the future under all alternatives. This recruitment in new snags combined with mitigation measures described above that call for retention of roost trees in sites proposed for timber harvest, will result in maintenance of potential roost trees on sites proposed for treatment, as well as result in an increase in available roost trees across the landscape.

### **Indirect Effects of Prescribed Burning**

#### **Alternative 1**

Since no burning is proposed under this Alternative, there are no indirect effects anticipated.

#### **Alternatives 2 and 3**

Indirect effects of burning proposed under Alternatives 2 and 3 include modifications or changes in Indiana bat habitat conditions on the affected site. Habitat changes that result from burning may be either positive or negative, depending on the intensity of the fire. If fire intensity is moderate to low, benefits may result due to the creation of new roosts. Potential roost trees may be directly created by fire mortality, or indirectly, by making them more susceptible to insect

attacks and pathogens (BCI, 2001). Low to moderate intensity fires may also improve bat habitat by opening up travel corridors and foraging areas.

Adverse effects would occur if burning intensity is high because fires will consume existing snags or otherwise render them unusable (BCI, 2001). However, the intensity of prescribed burns such as those proposed is determined largely by the burning prescription. The burn prescription considers fire weather and fuel conditions and sets parameters for burning that ensures the fire intensity is controlled and kept at levels that are consistent with management objectives. Moderate intensity burns will be prescribed on all sites in order to meet management objectives related to establishment of oak seedlings. While this level of burning may result in the loss of some standing snags, this is expected to be offset by creation of additional snags, as some trees are killed by fire (USDA-FS 2007a). Additionally, in order to minimize impacts to existing roost trees, the following mitigation measure will be implemented on all sites proposed for burning:

- Prior to burning, slash will be pulled 10 feet away from all existing snags with sloughing bark and from any live trees that exhibit sloughing bark on 20% or more of the trunk in order to minimize the loss of existing roost trees. A scratch line will be put around the tree once the slash is removed to further reduce the intensity of burning at the base of the tree.

Implementation of this mitigation measure will result in removal of fuels around existing roost trees, which will reduce flame heights and heat intensity around the tree, minimizing the loss of potential roost trees.

### **Oil and Gas Related Effects**

Potential effects of oil and gas development on the Indiana bat and its habitat can be both positive and negative. For example this development often can result in improved thermal conditions of suitable roost trees adjacent to well pads and along road and pipeline ROW's and Indiana bat roosting habitat will be maintained and possibly improved in areas where development occurs. Conversely, the Indiana bat and its habitat can be adversely affected from the actual construction of roads, well pads and other facilities associated with development. Potential effects of oil and gas development to the Indiana bat will be evaluated by looking at the total area disturbed by development within the CE analysis area (described above), as well as by looking at the amount and distribution of available Indiana bat habitat across the analysis area.

Because oil and gas activity has been occurring within the project area for several decades, there is no definitive point in time from which to start the analysis period. As a result, potential effects include all past oil and gas development that has occurred within the analysis area prior to 2006, as well as development that is anticipated to occur between 2006 and 2026. The date 2026 was chosen as the end of the analysis period, because that is the point in time in which anticipated effects of timber harvest (described below) are evaluated.

There are presently an estimated 1943 active wells within the CE analysis area. Using an average 1.3 acre of land impacted per well (including pad, access roads, supply lines, etc) (USDA-FS 2007d, Appendix G), approximately 2,526 acres of forestland has been converted to non-forest habitat. Over the next 20 years, it is estimated that approximately 300 new wells will be

developed on private and National Forest System lands. The oil and gas related disturbance shown in Table 9, displays the physical disturbance associated with past and future development and provides an estimate as to how much area actually occurs in oil and gas related openings. This includes an estimate of the acreage in well pads, roads, tank batteries and associated utility ROW's and is a measure of Indiana bat habitat that has become unsuitable due to oil and gas development within the analysis area.

### **Effects from Timber Management**

While partial harvest activities create near optimum Indiana bat habitat (see discussion under indirect effects), final harvest treatments reduce the suitability of Indiana bat roosting and foraging habitat and as a result have the potential to contribute toward significant cumulative effects. However sites receiving final harvest treatments on National Forest System lands are still considered minimally suitable due to retention of snag, den and other reserve trees. Although private and industrial forestlands use similar silvicultural techniques and harvesting methods to those carried out on the ANF, measures used to reserve residual trees on private forestland generally differ from the ANF and there is no way of knowing if potential roost trees are retained. As a result, for the purpose of this analysis, lands receiving final harvest treatments on private land are considered unsuitable Indiana bat habitat.

Using aerial photos, it is estimated that 250 acres of regeneration harvest have occurred on private land within the analysis area in the last 10 years (1996-2006). Whereas anticipated regeneration on private land was based upon local research, which indicates industrial forestlands around the ANF regenerate approximately 10% per decade, as well as specific estimates that are based on the history of past harvest on both industrial and non-industrial lands. Using these assumptions, it is estimated that will be 296 acres of final harvest activities on private lands per decade, for a total of 592 acres of anticipated future regeneration (2006-2026).

### **Cumulative Effects**

The analysis boundary and time period were previously described on page 11 above.

Table 9 displays past and anticipated future final harvest activity on private land, as well as past and anticipated future private oil and gas development on private and National Forest System land within the CE analysis area. As can be seen from Table 11, approximately 6% of the analysis area will be affected by private activities during the analysis period.

In order to assess the distribution of available Indiana bat habitat, it was necessary to combine past and present activities on private and National Forest System lands, effects expected to occur under each of the alternatives, and anticipated future effects on private and National Forest System lands. Available Indiana bat habitat resulting from past, present and future activities are displayed in Table 9.

Cumulative effect changes in Indiana bat habitat will be evaluated by looking at the amount of unsuitable habitat (openings, OGM development and private final harvest stands), the amount of minimally suitable habitat (forested stands on National Forest that have a standing live and dead tree component but don't provide suitable crown closure conditions as defined by the H.S.I. model) and the total amount of suitable habitat (Habitat that meets all H.S.I. model requirements)

that will be available under each of the alternatives on both private and National Forest System lands in the year 2026.

**Table 9:** Indiana bat Cumulative Effects for Mead’s Mill

<b>Activity</b>	<b>Present Condition</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>
<b>Seedling Stands</b>	505 ac <3%	1,227 ac 6%	1,227 ac 6%	1,227 ac 6%
<b>OGM Development</b>	2,526 ac 12%	3,322 ac 16%	3,322 ac 16%	3,322 ac 16%
<b>Openings</b>	715 ac 4%	715 ac 4%	716 ac 4%	716 ac 4%
<b>Sapling/Pole Stands</b>	1,828 ac 9%	1,356 ac 7%	1,892 ac 9%	1,865 ac 9%
<b>Total Available Habitat</b>	14,769 ac 73%	13,723 ac 67%	13,186 ac 65%	13,213 ac 65%

Based on anticipated cumulative effects, suitable Indiana bat habitat will be reduced by up to 8% under any alternative. Although suitable habitat will be reduced it will still be widespread and will occur in all existing watersheds. Considering the widespread availability of suitable habitat, there are no significant direct, indirect or cumulative effects to bat habitat anticipated.

**Indiana Bat Determination and Rationale**

**Alternative 1**

Since there are no new activities proposed under this alternative, there is no adverse affect to the Indiana bat or its habitat anticipated. Although there are no new treatments proposed under Alternative 1 (no action), habitat conditions under this alternative will be slightly altered by implementation of the 25 acres of final harvest treatments approved in previous decisions.

**Alternatives 2 & 3**

A “may affect, not likely to adversely affect” determination is made for the Indiana bat for both of the action alternatives. The likelihood of direct mortality as a result of implementation of the Mead’s Mill Project is negligible. The likelihood of indirect adverse effects to important habitat components of the Indiana bat during implementation of this project is unlikely to occur based on expected changes in the habitat across the project and CE analysis area. The project will not modify or destroy critical habitat or jeopardize the continued existence of the species. This is based on the following rationale:

1. Potential harm or harassment to the IB is reduced with the implementation of Forest Plan Standards and Guidelines described above (USDA-FS 2007, 116 to 118).
2. Repeated surveys were conducted over the project area. Twelve sites were surveyed during 1998, 2000, 2002, 2003, 2004, and 2005. As of 2006, no IB has been caught in the project area even though a sizeable number of mist net sites have been conducted on a wide variety of sites within the project area.

3. Nine years of forest-wide surveys have shown that IB use of the ANF has been very rare and no female IB or maternity roosts have been identified. IB abundance and habitat use on the ANF can be characterized as “limited to occasional summer visits by solitary males”. The chances of an Indiana bat being exposed to any of the activities undertaken in this project are therefore considered very low.
4. Suitable roosting and foraging habitat will continue to predominate across the landscape (over 67%). Additionally, available suitable habitat is well distributed, with optimum habitat conditions occurring in all affected watersheds.
5. The availability of suitable roost trees is expected to increase across the landscape due to anticipated increase in insect and disease related tree mortality.
6. Timber harvest proposed under Alternatives 2 and 3 includes activities that will ensure a perpetual supply of potential roost trees over the long-term.
7. Herbicide application, fertilization, site preparation, crop tree management, release cuts, and fence construction, do not directly affect mature forest habitat (potential roost trees). A review of the other treatments, including wildlife and soil and water treatments, indicates they will have no effect on bat habitat.
8. The ANF is not located near any large concentrations of Indiana bats. There are only 30 known Indiana bat hibernacula within 250 miles of the ANF. These hibernacula support approximately 5,480 Indiana bats, which is only 1.2% of the range wide Indiana bat population.
9. Dispersal of Indiana bats from the Hartman Mine hibernaculum (115 miles from ANF) are generally to the south or east. The longest migration from the Hartman Mine is 89 miles to the south and east. No Indiana bats have been documented heading north towards the ANF. Dispersal of Indiana bats from New York hibernacula have not been documented heading in the direction of the ANF but rather to the Hudson River valley and Lake Champlain valley (south and east).
10. Because the ANF is at a higher latitude and higher elevation with a cooler and wetter summer climate than most of the Indiana bat’s range, summer habitat may be marginal, at best, based on an analysis by five leading Indiana bat experts (Brack *et al.* 2002).

The chances of an Indiana bat being exposed to any of the activities undertaken in this project is very low due to the limited geographic extent of the activities within the project that could affect habitat, and to the timing of activities that would limit exposure of Indiana bats to direct impacts. The potential for indirect impacts on habitat (loss of roost trees or foraging habitat) is limited to a small part of the project area.

### **SMALL WHORLED POGONIA (*Isotria medeoloides*)**

#### **Background**

The life history, population trends, threats, and habitat status related to the small-whorled pogonia is located in the Forest Biological Evaluation (USDA-FS 2007, 125 to 130).

#### **Project Area Habitat**

Of 8,700 acres inventoried in the Mead’s Mill project area, approximately 32% (2,785 acres) of the project area has interfering vegetation from fern, grass, beech and striped maple. Although

much of the project area provides favorable growing conditions for the small-whorled pogonia, the project's well stocked canopy, high level of woody understory vegetation and dense fern and grass (competing ground cover) decrease the potential of finding the small whorled pogonia.

Over 2,500 acres within Mead's Mill were surveyed for the small whorled pogonia or suitable habitat. Surveys included all sites where earth disturbing activities are proposed, all sites on National Forest System lands that contained high priority habitat described by the Forest GIS model, and roadside habitat. Additionally all sites proposed for treatment containing high priority habitat were surveyed during the month of July, when a second wave of non-flowering plants emerge and the likelihood of observing flowering plants is increased. Although several associated species including large whorled pogonia were documented, no small whorled pogonias were observed. The project area is considered suitable, but unoccupied small-whorled pogonia habitat based on project level survey work.

### **Direct and Indirect Effects**

Considering this species has not been documented in the project area, proposed activities in the Mead's Mill project area would have no direct effects on the small whorled pogonia. Forest management activities such as timber harvesting, herbicide application, wildlife opening construction, NNIS treatments, gravel pit expansion, burning, or area fence construction (along the fence line) have the potential to directly and/or indirectly affect the species or potentially suitable habitat. Adverse direct effects such as the destruction of a local population are possible if these activities inadvertently impact an unknown community of plants.

Earth disturbing activities identified in Table 2 have the potential to adversely affect this species as a result of direct mortality or disturbance, if an unknown population exists. Any treatments that result in the conversion of forest to non-forest or timber harvest treatments that maintain forest vegetation but significantly alter site conditions have the potential to result in indirect effects through habitat modification. Final harvest treatments (described previously) can result in a significant change in site conditions due to changes in light, temperature and moisture conditions. A substantial increase in competing vegetation can also occur on the site in addition to the above changes.

The overall result of these changes is the affected site will no longer provide desirable small-whorled pogonia site conditions. Although forest habitat is not permanently lost, suitable growing conditions will be unavailable to the SWP for 40 to 50 years or until tree seedlings grow into more mature trees. Other treatments such as road construction – new corridor could also have adverse indirect effects, since these treatments will result in a permanent loss of forest cover on the site.

In addition to earth disturbing activities, proposed herbicide application could also have a direct effect if it is applied to a site where an unknown population exists. Herbicide application could have a positive indirect effect, since application will reduce competing ground cover and understory vegetation, which could provide more suitable growing conditions for the plant. Similarly, while actual construction of a fence could have an adverse direct effect if an unknown population exists, a positive indirect effect of area fencing could result due to the exclusion of deer and reduced browsing pressure.

Further protection for the pogonia is achieved because prior to ground-disturbing and/or vegetation management activities or during any phase of a project's development, the following Forest Plan Standards and Guidelines (USDA-FS 2007a, 84) will be implemented:

### **Standard**

1. If plants or populations are found, temporarily halt any activities that may cause impact within 300 feet of the area of influence surrounding plants and/or populations. The area of influence includes suitable occupied habitat as well as appropriate area to conserve populations and their habitat. Consideration of site characteristics such as aspect, landform, overstory, midstory and understory shading, site topography, forest cover and hydrologic features will be used to determine this area of influence. Consult with U.S. Fish and Wildlife Service to determine and implement appropriate site-specific conservation measures before resuming activities.

### **Guidelines**

1. Prior to ground-disturbing and/or vegetation management activities, habitat for small-whorled pogonia and northeastern bulrush should be evaluated and/or surveyed to determine suitable habitat and/or occupation.
2. Refine and implement the small-whorled pogonia survey strategy where appropriate.

### **Cumulative Effects**

The analysis boundary and time period were previously described on page 11 above.

Suitable small-whorled pogonia habitat will be reduced on approximately 5% of the CE analysis area that is affected by oil and gas development and final harvest timber treatments on private land. In addition to this, suitable habitat on another 5% (4% more than the no action alternative) of the analysis area could be adversely affected due to proposed final harvest treatments and OGM activity under Alternative 2, which will result in the greatest amount of final harvest activities. Cumulatively, suitable habitat for this species will be lost on approximately 10% of the CE analysis area, while another 25% of the analysis area occurs as unsuitable habitat in the form of existing openings or regenerating forest. Considering this, it is estimated that at the end of the analysis period, approximately 65% or more of the analysis area will continue to occur as potentially suitable small-whorled pogonia habitat under all alternatives. Considering the continued availability of suitable habitat and considering this species has not been found within the project area, no direct, indirect or cumulative effects are anticipated under any alternative.

### **Small-whorled Pogonia Determination and Rationale**

#### **Alternatives 1 - 3**

A 'No Effect' determination is reached for the small whorled pogonia under these alternatives. The Forest BE provides direction for the protection of this orchid if found within the ANF proclamation boundary. Due to the absence of documented occurrence on the ANF and considering all proposed treatment sites have been surveyed and no plants were found, there is no adverse affects to the Small-whorled pogonia anticipated under any alternative.

## **NORTHEASTERN BULRUSH (*Scirpus ancistrochaetus*)**

### **Background**

The life history, population trends, threats, and habitat status related to the northeastern bulrush is located in the Forest Biological Evaluation (USDA-FS 2007, 120 to 123).

### **Project Area Habitat**

A limited amount of potentially suitable habitat is available in the Mead's Mill Project area as 371 acres of wetlands have been identified in the project area according to GIS data based on the National Wetlands Inventory. These wetlands are associated with riparian areas, primarily the Allegheny River and the larger streams across the project area. Field surveys in the project area by district botany and wildlife technicians did not document the northeastern bulrush in wetlands contained within stands to be treated. The majority of the 371 acres of classified NWI wetlands found in the project area are forested wetlands associated with either deciduous or evergreen forest that are temporary or semi-permanent/seasonal in nature. Some are classified as scrub/shrub wetlands with the remaining few acres being emergent or open water. Some of the wetlands are associated with past or present beaver activity.

### **Direct and Indirect Effects**

Management activities identified in Table 2 that have could have potential adverse effects to northeastern bulrush include: gravel pit development or expansion, herbicide application, fertilization, fence construction, intermediate (partial) and final timber harvests treatments, non-native invasive species control, road construction in new or existing corridors, and road decommissioning. Possible effects from these activities include: forest canopy alteration, direct mortality, non-native invasive species introduction or spread, changes to local hydrology, compact soil, nutrient enrichment, trampling and/or improve access for (illegal) collecting.

No adverse direct or indirect effects on the northeastern bulrush would occur because field surveys have failed to document the species on any area slated for earth-disturbing activity and potentially suitable habitat is avoided by implementing project design features protecting wetlands, vernal pools, and riparian areas.

Herbicide applications reduce undesirable ground cover and understory vegetation in other poorly-drained areas (micro sites) and could provide suitable growing conditions for the plant. The other reforestation activities (including fire) have the potential beneficial effects by removing undesirable understory and ground cover species, removing low shade-producing trees and shrubs, and increasing sunlight that reaches the forest floor. Area fencing can benefit the species by excluding deer and eliminating browsing pressure. Control of NNIS species allows native species such as the bulrush to populate areas where the invasive species occupied potential habitat. Reforestation and vegetation management activities that promote forest sustainability, limiting road access, or protection from herbivory are potential indirect beneficial effects to the northeastern bulrush.

An adverse indirect effect could occur when there is a permanent loss of potential habitat such as the conversion of suitable forest habitat into an opening from activities such as new road construction, oil and gas lease development, and gravel pit expansion and development.

However, this adverse effect is not possible since these activities avoid suitable habitat. The most suitable growing conditions for these species in the project area can be found in the riparian zones along perennial streams. The proposed activities in the project will not impact wetland or riparian habitat with implementation of appropriate project design features and Forest Plan S&G's (USDA-FS 2007a, 74 to 79). These activities will have no adverse effect on potentially suitable habitat under all alternatives.

During earth disturbance and/or implementation of vegetation management activities for any phase of a project's development, the following Forest Plan Standard will be implemented:

### **Standard**

1. If plants or populations are found, temporarily halt any activities that may cause impact within 300 feet of the area of influence surrounding plants and/or populations. The area of influence includes suitable occupied habitat as well as appropriate area to conserve populations and their habitat. Consideration of site characteristics such as aspect, landform, overstory, midstory and understory shading, site topography, forest cover and hydrologic features will be used to determine this area of influence. Consult with U.S. Fish and Wildlife Service to determine and implement appropriate site-specific conservation measures before resuming activities.

### **Cumulative Effects**

The analysis boundary and time period were previously described on page 11 above.

The northeastern bulrush depends on an intact, well-functioning wetland and riparian ecosystem. Cumulative effects to this species could result from any approved or future projects that may increase sedimentation, degrade water quality, or (most importantly) physically impact soils or vegetation of these ecosystems. Approximately 50% of the CE analysis area (is under jurisdiction of the ANF the Forest-wide standards and guidelines apply. There are over 371 acres of wetlands designated by the NWI within the CE area.

The major non-federal activities that typically occur on the ANF or within the CE area include: OGM development (reserved and/or outstanding rights), industrial/commercial timber management on private property, and to a lesser degree, the development of private land to non-forest uses. Final harvests maintain forest habitat but the resulting early structural seedling/sapling habitat is unsuitable for some plant species. Intermediate harvests partially open the forest canopy at least for the short-term. Typically these types of treatments on private lands do not occur in wetlands because of operability. Based on current information, no known populations of the northeastern bulrush are found on the private lands ownership. Interpretation of aerial photographs indicates that privately-owned forestland appears to provide habitat similar to that found on the National Forest. In general, except for commercial timber lands, private forestland owners tend not to invest in herbicide applications, site preparation, or area fencing that either increase the risk of adverse effects or provide benefits for the species or its habitat.

Suitable habitat could be reduced (lost) over the next decade as a result of OGM developments on federal or private lands in the CE area. Oil and gas well construction results in a permanent alteration in habitat, specifically the loss of suitable forest habitat and creation of opening and edge habitat. All OGM developments operate under regulations including a permit process

designed to protect and maintain wetland habitat. Based on development rates across the ANF, it is estimated that 300 additional wells would be constructed in the CE area over the next two decades. Using an average of 1.3-acre of impact per well, approximately 390 acres of forestland (federal and private) would be converted to opening habitat that is unsuitable for the northeastern bulrush. Approximately 2% of the CE area is projected to be affected by OGM activity over the next 20 years. Private oil and gas development (ground disturbance from road building, well pads, tank batteries, etc.) could cause direct mortality to unknown populations or habitat alteration or degradation particularly in winter months when vernal pools and other suitable habitat for the northeastern bulrush may not be visible.

The following standard for private mineral development on ANF lands is included in the Forest BA:

- During review of the plan of operation, known occurrences or habitat of federally-listed, proposed, threatened, or endangered species that are located in the vicinity of a proposed mineral development, will be documented in a letter to the operator and copied to the USFWS Field Office in State College, Pennsylvania. This letter will direct the operator to contact the Service to resolve issues related to threatened and endangered species prior to proceeding with any tree cutting or earth disturbance.

Forest Service road construction and reconstruction is currently planned during the CE period. This road construction is planned in the CE area over the next 10 years. Road construction establishes a permanent break in the forest canopy allowing additional sunlight to reach the forest floor (at least on the 'edge' of the roadside). However, similar to the vegetation management activities, no adverse direct, indirect or cumulative effects on the northeastern bulrush would occur because surveys have failed to document the species on any area slated for earth-disturbing activity and potentially suitable habitat is avoided by implementing project design features.

A small change in opening (non-forest) habitat in the CE area is expected over the analysis period. Privately-owned OGM developments and Alternatives 2 and 3 are expected to account for a small increase in opening habitat across the CE area as a result of constructing new wells and anticipated federal actions including future new road construction and pit expansion.

In summary, there are no substantial cumulative effects on the northeastern bulrush or its habitat from non-federal activities within the 20,343-acre CE analysis area. The species would not be adversely affected because a) the northeastern bulrush has not been found on the project or ANF, b) field surveys continue to be conducted on federal land on a project-specific basis on any soil disturbing project proposed on federal land, c) suitable bulrush habitat remains widely distributed and abundant across the riparian and wetland habitat on the Forest, and d) it is very likely that similar growing conditions and limiting factors are found on private land in the CE area. Suitable habitat (wetlands and riparian areas) for the northeastern bulrush is not expected to be affected by these activities. Considering these factors, there are no substantial cumulative effects anticipated on this endangered plant under any alternative.

## **Northeastern bulrush Determination and Rationale**

### **Alternatives 1 - 3**

A ‘No Effect’ determination is reached for the northeastern bulrush under these alternatives. The Forest BA provides direction for the protection of this species if found within the ANF proclamation boundary. Due to the absence of documented occurrence on the forest and considering all proposed treatment sites have been surveyed and no plants were found, there is no adverse affects to the northeastern bulrush anticipated under any alternative. Regardless of the alternative selected, the implementation of Forest-wide standards and guidelines regarding the protection of wetlands, vernal pools, and riparian areas will ensure the project will have ‘no effect’ on the northeastern bulrush.

### **CLUSHELL (*Pleurobema clava*), RAYED-BEAN (*Vilosa Fabalis*) and SHEEPNOSE (*Plethobasis cyphus*)**

The analysis boundary and time period were previously described on page 11 above. The analyses and determination (including rationale) for these species is exactly the same as the Northern riffleshell above (pages 11 to 14). These species have suitable habitat but individuals have not been documented within the Mead’s Mill Project Area.

### **III. SUMMARY OF DETERMINATIONS FOR THE MEAD’S MILL PROJECT**

Based on the above analysis, the following table (Table 10) displays the determinations reached for the species analyzed in this BA.

**Table 10:** Determinations for Federally Endangered and Threatened Species

<b>Species</b>	<b>Alternative 1</b>	<b>Alternatives 2 &amp; 3</b>
<b>Indiana Bat</b>	‘No Effect’	‘May affect, not likely to adversely affect’ Indiana bat, but no effects beyond those addressed in the Concurrence Letter issued to the Allegheny National Forest (1/31/07).
<b>Small Whorled Pogonia</b>	‘No Effect’	‘No Effect’
<b>Northeastern bulrush</b>	‘No Effect’	‘No Effect’
<b>Mussels - N. Riffleshell, Clubshell, Rayed-bean, Sheepnose</b>	‘No Effect’	‘May affect, not likely to adversely affect’ the four mussel species, but no effects beyond those addressed in the Concurrence Letter issued to the Allegheny National Forest (1/31/07).

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