

Wildlife Resources

Introduction

The Forest works with the West Virginia Division of Natural Resources (WVDNR) to accomplish wildlife management objectives, including habitat restoration and enhancements, through a cooperative agreement between the U.S. Forest Service and the WVDNR. The Forest conducts inventory and monitoring of federally threatened and endangered species, Management Indicator Species (MIS), and other species groups (e.g., breeding birds, bats). The WVDNR tracks populations of many MIS, including most of the game species. The Forest also cooperates with other federal and state agencies and Universities, through several ongoing agreements and consultations, in developing monitoring plans and developing and implementing conservation strategies for threatened, endangered and proposed species.

2006 Accomplishments

The Wildlife Program accomplishments for 2006 included:

- Budget and work planning, including out-year planning.
- Wildlife surveying for proposed projects that may affect habitat conditions.
- Coordination and consultation with WVDNR, USFWS, and other wildlife organizations.
- Coordination and cooperation with agencies and universities on forest wildlife studies.
- Quarterly coordination meetings for Forest wildlife group.
- Providing input and review for the Forest Plan revision effort.
- Monitoring and evaluation efforts as described below.

Monitoring and Evaluation

1986 FOREST PLAN MONITORING ITEMS FOR WILDLIFE RESOURCES

The Monongahela National Forest Land and Resource Plan (1986) outlines monitoring to address wildlife concerns and population objectives for Management Indicator Species (MIS). In particular, the monitoring item on page 252 of the 1986 Plan says:

Determine whether population trends indicate that viable populations of all wildlife species are being maintained.

In addition, Appendix E of the Threatened and Endangered Species Amendment (2004) to the 1986 Forest Plan, amended the Plan for the nine federally listed threatened and endangered (TE) species on the Forest, including the collection or acquisition of accurate and current information about TE species' life history requirements, habitat needs, threats to survival, and population/habitat status on the Forest. Specifically, the amended monitoring plan has the following items:

- Determine if sensitive species objectives and standards are being met.
- Survey for new populations of threatened, endangered, and proposed (TEP) species.
- Identify and monitor threats to known TEP species' populations. Evaluate the effectiveness of protection and management programs; redirect efforts as necessary.
- Monitor existing populations and new sites of TEP species.
- Monitor federally listed TEP species to meet requirements outlined in any Biological Opinion issued by the USFWS for the MNF as a result of formal consultation.
- Continue to seek Indiana bat maternity sites and evidence of summer use on the MNF on a watershed basis using survey methods and frequencies that follow guidelines and protocols established by the USFWS, in consultation with the USFWS and the WVDNR.

Monitoring results for these items are reported below.

Monitoring Item 1. Determine whether population trends indicate that viable populations of all wildlife species are being maintained.

This item is addressed through the monitoring of MIS. Forest MIS under the 1986 Forest Plan were comprised of ten species, including four federally threatened and endangered species (the Indiana and Virginia big-eared bat, WV Northern flying squirrel, and Cheat Mountain salamander), white-tailed deer, black bear, wild turkey, varying hare, gray squirrel, and wild trout. Monitoring for the threatened and endangered species is addressed under the TEP items below. Game species, such as the deer, bear and turkey, are monitored by the WVDNR via both the collection and analysis of harvest data and ongoing DNR research projects, providing a Forest-wide population index.

The 2006 Forest Plan Revision MIS list includes four species, three of which were MIS in the 1986 Plan (the WV northern flying squirrel, wild turkey, and wild brook trout). In addition, the Plan Revision includes the cerulean warbler. The Forest and WV DNR cooperate in ongoing songbird point count monitoring and breeding bird surveys that are expected to provide Forest-wide data on this species. In addition, the Forest is involved in a Participating Agreement specific to the Cerulean Warbler.

White-tailed deer harvest was down from the previous year (2004-05). In addition, Chronic Wasting Disease (CWD) was discovered in Hampshire County, WV in September of 2005. The WVDNR conducted extensive sampling efforts immediately following this finding; of 1,404 deer tested for the disease, only nine tested positive. The state is initiating management efforts to reduce the prevalence and/or slow the rate of spread of the disease. Black bear harvest was higher for bow hunters than the previous year, and the highest on record for firearms bear hunters in WV. Mast abundance in 2005-06 was slightly above average, with good acorn production presumed to be a contributing factor in the black bear harvests.

Wild Turkey (*Meleagris gallopavo*). WVDNR collection of harvest data showed that the 2005 fall wild turkey harvest was 17 percent lower than the previous year, continuing a 4-year long decline. The primary reasons for the decline were considered to be fewer counties open to fall hunting, and the abundant oak mast in many areas, which made it more difficult for hunters to locate birds. However, the spring 2006 gobbler harvest was ~10 percent higher

than in 2005, and brood production was 12 percent above last year and slightly above the 5-year average. The WVDNR is presently researching the gobbler population to find answers to better regulate the wild turkey resource.

Varying (snowshoe) hare, *Lepus americanus*. A Participating Agreement was initiated with West Virginia University in 2004 to assess the current Management Indicator Species program for the Monongahela National Forest, and to make recommendations regarding the maintenance or modification of potential indicator species, and associated monitoring protocols. In particular, the study focused on the snowshoe hare. Snowshoe hare tracking and trapping efforts were conducted in the MNF during 2005-2006. Preliminary results from the snowshoe hare efforts indicated that this species would not serve well as a MIS, in part because of the difficulty of obtaining an adequate sample size. Despite its inapplicability as a MIS under the revised Forest Plan (2006), the snowshoe hare is a species of interest both because of its habitat needs and its status as a game species. Thus, following final data collection, analyses will focus on the feasibility and reliability of potential census methods and the ability of the Forest to support viable hare populations across the landscape.

Cerulean Warbler, *Dendroica cerulea*. Breeding Bird Survey data from 1966-1988 indicate a decline of an estimated 3.6 percent per year throughout this species' breeding range. West Virginia is in the core of the species' breeding range, with relatively high densities, though numbers have been steadily declining in the state's breeding populations as well. The Partner's In Flight plans for the three physiographic areas located in West Virginia (Ohio Hills, Mid-Atlantic Ridge and Valley, Northern Cumberland Plateau) all identify cerulean warblers as the species of highest conservation concern within mature deciduous forest habitats. This species was proposed for listing as a federally threatened/endangered species, with a final decision expected in late 2006.

In addition to data gained from our breeding bird point count surveys regarding cerulean warbler (CEWA) occupancy on the Forest, a study is being conducted on the MNF through a Participating Agreement with West Virginia University and the West Virginia Cooperative Fish and Wildlife Research Unit to assess the responses (e.g., densities and nesting success) of CEWA populations and other forest bird species to various silvicultural treatments and differing levels of timber harvesting intensity. This proposed study is part of a larger effort involving several researchers and states throughout the species' breeding range.

The study calls for pre-treatment, immediate post-treatment and longer term post-treatment monitoring of CEWA populations responses to differing harvest activities. The pre-treatment phase included background GIS work, site selection and the collection and analysis of baseline, pre-harvest vegetation and bird survey data. The planned harvest treatments included: 1) reference stand undisturbed by harvesting, 2) single-tree selection harvest, 3) shelterwood harvest, and 4) regeneration (clearcut) harvest. Harvest of the three disturbance units began in August 2006, and work is expected to be completed by November 2006. The immediate post-treatment phase will include the collection of two years of post-treatment data, focused on territory mapping techniques, nest monitoring to determine nesting success, and the collection of habitat metrics. Data analysis and the production of an interim Final Report will follow, providing important information regarding CEWA populations and habitat use on the MNF

and enhancing the ability of the MNF and other National, State, and Private forest managers to better manage for the species' viability.

Monitoring Item 1. Evaluation, Conclusions, and Recommendations

Many factors affect harvest success (e.g., hunting season variations, changes in hunting regulations, weather, hunter participation, access) that have little to do with the overall populations of game animals. It is also difficult to assess how much harvesting affects populations without accurate baseline population data. Although harvest data is a fairly good indicator of hunter success rates, the harvests only complicate the Forest's ability to determine what effects Forest activities or management may be having on game populations. For this reason and others, the Forest began taking a serious look at whether game animals were the most appropriate to use as MIS. The change in MIS species contained in the Forest Plan Revision reflects this thinking, with only one game species remaining (the wild turkey).

Monitoring Item 2. Determine if sensitive species objectives and standards are being met.

There are no specific sensitive species objectives in the 1986 Forest Plan, although there is a Wildlife goal (IV) to: *Manage habitat to help recovery of threatened and endangered species on the Forest. Protect sensitive and unique species until their populations are viable.*

The 1986 Forest Plan also has the following standards/guidelines related to sensitive species:

- *A survey for sensitive species will be done during and as part of normal project design.*
- *If sensitive species are found, mitigation measures will be made part of the project design.*
- *Data will be collected on sensitive species to determine if they should (1) be dropped from the sensitive species list, (2) be recommended for consideration as a Regional Forester's sensitive species, or (3) be recommended for Threatened and Endangered Status.*

Sensitive species' surveys, project mitigation, and data collection are done on an ongoing basis as part of Manual/Handbook and Regional direction. Because of the general lack of large projects that were planned or implemented, there were few project-related surveys, mitigation efforts, or data collected for sensitive species in 2006. However, the RFSS list for the Monongahela National Forest was reviewed in detail based on information collected during Forest surveys and a detailed literature review conducted as part of the Forest Plan Revision. As a result, several changes were made to the Forest's sensitive species list in September 2006, including the addition of seven vertebrates (Table WL-1).

Table WL-1. RFSS Changes on the MNM as of September 2, 2006

<i>Scientific Name</i>	<i>Common Name</i>	<i>Changed status as of 9/2006</i>
Mammals		
<i>Myotis leibii</i>	Eastern small-footed bat	
<i>Microtus chrotorrhinus caroliniensis</i>	Southern rock vole	
<i>Neotoma magister</i>	Allegheny woodrat	
<i>Sorex palustris punctulatus</i>	Southern water shrew	
<i>Spilogale putorius</i>	Eastern spotted skunk	Added
Birds		
<i>Accipiter gentilis</i>	Northern goshawk	
<i>Falco peregrinus anatum</i>	American peregrine falcon	
<i>Ammodramus henslowii</i>	Henslow's sparrow	Added
<i>Pooecetes gramineus</i>	Vesper sparrow	Added
<i>Contopus cooperi</i>	Olive-sided flycatcher	Added
<i>Lanius ludovicianus migrans</i>	Migrant loggerhead shrike	
<i>Melanerpes erythrocephalus</i>	Red-headed woodpecker	Added
<i>Vermivora chrysoptera</i>	Golden-winged warbler	Added
Amphibians		
<i>Aneides aeneus</i>	Green salamander	
<i>Cryptobranchus alleghensiensis</i>	Hellbender	
Reptiles		
<i>Glyptemys (Clemmys) insculpta</i>	Wood turtle	Added
<i>Crotalus horridus</i>	Timber rattlesnake	

Northern Goshawk, *Accipiter gentilis*. The Northern Goshawk is also a species of concern for the State and the Fish and Wildlife Service as an indicator of healthy forested habitats. The Forest surveys for northern goshawks to determine if and where the species occurs in order to protect and manage for the species and its habitat when making land management decisions. The Forest also entered into a Challenge Cost-Share Agreement with the Maryland Department of Natural Resources to develop a better understanding of the movement patterns of Northern Goshawks on the MNF. As part of that agreement, satellite radio transmitters (PTTs) were acquired in 2004 for use on birds found during annual inventory and monitoring surveys. Adult goshawks are fitted with satellite radio transmitters (PTTs) and the subsequent satellite data is retrieved to monitor breeding and non-breeding habitat use and home range size. This information will provide insight into a variety of basic biological questions that have not been addressed in an eastern population of Northern Goshawks.

In 2006, MNF biologists inventoried approximately 10,000 acres for northern goshawks using standard survey protocol along transects in potential habitat; all known historic nest sites also were surveyed to determine if those nests were currently active. In addition, posters were placed near trails and campgrounds asking the public to report any sightings, which were then investigated by Forest biologists. No goshawks were observed by sight or sound at historical nest sites or along pre-planned survey transects. However, call-back tapes played in the vicinity of a reported sighting did reveal a new nest site, including a breeding pair and four chicks. In the summer of 2006, the adults were banded and fitted with satellite transmitters (as part of the cost-share agreement noted above), and satellite information was received for approximately 5 ½ months. In addition, observational data was collected at the nest site on a regular basis throughout the nesting season.

Breeding Bird Point Count Surveys. With the addition of five bird species to the MNF RFSS list, that taxa now contains more species than any of the other vertebrate groups. While annual surveys are conducted for the northern goshawk, most of our information for the other bird species comes from breeding bird surveys (point counts and breeding bird survey routes). Point count surveys are conducted, among other reasons, to document species habitat use, gather information regarding TES and other species' trends, and assess population responses to habitat management across the Forest. Point count transect routes were surveyed across the Forest by biologists from the MNF, WVDNR, and several contracted ornithologists. These surveys were conducted using standard protocol and data sheets were sent to the WVDNR for inclusion in a statewide database.

Twenty-five point count transect routes were run by the MNF during the spring of 2006, including 21 previously-established transects and four newly-established routes (the WVDNR also conducts surveys along several additional routes on the Forest). Two of the new routes traverse areas that will be undergoing harvest management in the coming year; these and others anticipated in the future should provide important data for adaptive management in a few years. Of the eight birds on the RFSS list, three were detected in point count routes on the Forest, the olive-sided flycatcher, red-headed woodpecker, and golden-winged warbler. Because of the placement of the vast majority of our point count routes in forested habitats, it is not surprising that the other species were not detected as the other passerines are generally associated with grasslands and other open habitats.

Project-related Surveys. Many of the non-avian sensitive species on the Forest are associated with rocky outcrop and ledge habitats. The small-footed bat is addressed as part of the forest-wide bat survey effort; however, the green salamander, timber rattlesnake, and Allegheny woodrat also use these rocky/ledge habitats and are not currently part of a forest-wide effort. As a result, a special attempt is made to locate and survey these discrete habitats in association with planned management activities or other proposed projects. In 2006, survey efforts focused largely on the Gauley Ranger District, in the vicinity of the Lower Williams project. Random transects were walked throughout the project area, particularly in the vicinity of proposed timber work, and observations recorded for project analysis and development of mitigation measures where needed. Several green salamanders were found as part of this effort, as was woodrat sign (i.e., middens or food caches).

Monitoring Item 2. Evaluation, Conclusions, and Recommendations

Sensitive species information collected in 2006 is discussed above. Based on this and other information, the Forest Plan revision team reviewed sensitive species management direction and monitoring in the 1986 Plan and recommended the changes below for the proposed plan.

Recommendations:

- Incorporate sensitive species into the desired conditions for wildlife management.
- Drop repetitive direction from the plan regarding surveys, mitigation, and data collection, as these activities are already covered in National (FSM/FSH) and Regional direction.
- Expand direction to focus more on addressing species habitat management.
- Revise sensitive species monitoring item to reflect maintenance or restoration of habitat.

Monitoring Item 3. Survey for new populations of TEP species. Identify and monitor threats to known TEP species' populations. Evaluate the effectiveness of protection and management programs; redirect efforts as necessary. Monitor existing populations and new sites of TEP species. Monitor federally listed TEP species to meet requirements outlined in any Biological Opinion issued by the USFWS for the MNF as a result of formal consultation. Continue to seek Indiana bat maternity sites and evidence of summer use on the MNF on a watershed basis using survey methods and frequencies that follow guidelines and protocols established by the USFWS, in consultation with USFWS and WVDNR.

The following monitoring was conducted for TEP species on or near the Forest in 2006.

West Virginia Northern Flying Squirrel, *Glaucomys sabrinus fuscus*. The WV northern flying squirrel (NFS) was listed as a federally endangered species in 1985. Since that time, thousands of flying squirrel nest boxes have been placed and monitored on the MNF and live trapping surveys have been conducted in proposed project areas. In 2006, the Forest and WVDNR continued to monitor historic nest boxes across the MNF; the Forest also began a more intensive effort in portions of the Forest as part of a pilot monitoring study.

Following the development of a draft long-term monitoring plan for the NFS on the Forest and presentation of that plan to the USFWS, WVDNR, university personnel, and others at a coordination meeting, a pilot study was initiated on the MNF to determine the most effective monitoring protocol for this species. Ten 100-ha sample blocks included in the pilot study are being sampled using four "treatments", or different sampling techniques, to assess different monitoring protocols. A total of 750 nest boxes were constructed and placed in these sampling areas, and nest box checks and trapping associated with the study was initiated across all areas in 2005-06. All adults captured are measured and pit-tagged (if not recaptures), and selected individuals are fitted with radio-transmitters and tracked to collect information regarding habitat use and home range size; other demographic and habitat information also is collected for all captures and sampling units. In FY2006, 33 NFS captures were made as part of this study, including four recaptured individuals.

The results of this study will allow us to implement the most effective sampling strategy for monitoring of this endangered species on the Forest. A long-term monitoring plan will then

be established across the Forest to gather population status and trend information, as well as continuing to collect critical information regarding the species' life history and habitat requirements. The WVDNR reported that a total of 66 WV northern flying squirrel captures were made at fifteen sites across the WV species' range in 2005-06 (WVDNR Endangered Species Federal Assistance Performance Report), this number includes the 33 captures made by MNF biologists as noted above. Other studies continue on the Forest and surrounding lands to gain additional information regarding NFS life history and habitat requirements using radio-telemetry and modeling techniques.

Cheat Mountain Salamander, *Plethodon nettingi*. This salamander is a federally threatened species, whose current range lies primarily within the proclamation boundary of the Monongahela National Forest. Dr. Thomas Pauley of Marshall University has delineated known and potential habitat for the Cheat Mountain salamander (CMS) and has conducted surveys across much of the Forest since the species was listed, in addition to conducting independent research associated with the salamander. Dr. Pauley conducted surveys at the Timberline Four-Season Resort on Forest Service land in Tucker County, continuing a 20-year study to examine effects of the Salamander Run ski trail on a population of CMS.

In addition to Dr. Pauley's work, the MNF entered into a Participating Agreement with the Northeastern Research Station and University of Wisconsin at Stevens Point to develop landscape- and local-level models to identify potential CMS habitat across the Forest and the overall range of the species. These efforts are meant to allow the Forest to better manage potential habitat for the species, target survey needs, and develop forest-wide conservation plans. In FY2006, draft landscape-level models were developed to predict CMS presence in relation to biotic and abiotic habitat variables across the species' range. Data also was collected on potential explanatory landscape and microhabitat variables to inform a more specific habitat model to be developed during 2007.

Bald Eagle, *Haliaeetus leucocephalus*. Monitoring includes searching for eagle nests and protection of known sites, and collaboration with WVDNR to monitor the nest on the MNF and look for new nests. The WVDNR monitors historical nest sites throughout the state and conducts additional search efforts in areas with high levels of reported bald eagle activity. In 2006, three new bald eagle nests were located in the Eastern Panhandle. A total of 21 eagle nests were monitored in 2006. Sixteen of these successfully fledged young, including Smoke Hole, a nest site located on the MNF. The Smoke Hole site fledged three young in 2006 (Endangered Species Federal Assistance Performance Report, WVDNR, 2005-2006).

Endangered bat species. The MNF conducts forest-wide inventory and monitoring for forest bats on an annual basis. The purpose of this program is to inventory watershed areas for all species of forest bats and to clear project areas as part of Sec. 7 consultation, as well as to monitor long-term sites across the forest to ensure continued species viability.

As part of the Forest's bat monitoring program, Sanders Environmental, Inc. conducted mist-netting at 58 sites on the MNF during 2006, including 30 watershed-specific sites and 20 long-term monitoring sites, as well as four additional sites in the vicinity of the Indiana bat maternity colony located on the forest in 2004, and one site near the Indiana bat bachelor

colony. Bats were captured using mist nests, which were set in accordance with the USFWS protocol and the project technical specifications found in the MNF bat monitoring plan and 2006 contract. A total of 1,346 bats were captured as part of this effort; 10 bat species were captured, including 12 male Indiana bats (E), 10 Virginia big-eared bats (E), and 15 eastern small-footed bats (RFSS).

Indiana Bat, *Myotis sodalis*. Indiana bat populations are surveyed in cooperation with WVDNR to track the status of the species, and the MNF has an ongoing program of mist-netting and telemetry work to gather information about habitat use by bats on the Forest. Habitat for Indiana bat on the MNF is assessed and modeled using GIS to inform management recommendations and strategies.

Surveys of West Virginia hibernacula were conducted by WVDNR personnel in 20 caves and one mine during the winter of 2005-06. Based on the se survey data, Indiana bats exhibited a 422 percent increase over surveys from 2003-04 (Endangered Species Federal Assistance Performance Report, WVDNR, 2005-2006). Eleven Indiana bat hibernacula are located within the MNF Proclamation Boundary, but only three (Big Springs Cave, Cave Hollow/Arbogast Cave, and Two-Lick Run Cave) have all or most of their entrances on Forest land. Both Big Springs and Cave Hollow/Arbogast have showed a general increase in *M. sodalis* counts from the early 1980's to the present, while Two-Lick Cave has fluctuated from a high of 12 in 1995, to zero Indiana bats detected in 2003 (one was observed in the 2005-06 survey).

Hellhole Cave supports approximately 9,000 Indiana bats during the winter, making it the largest hibernaculum for these bats in West Virginia, and one of the most important Indiana bat caves in the East. Hellhole Cave is located within the MNF Proclamation Boundary, but on private land approximately 1 mile from National Forest land.

As noted above, twelve male Indiana bats were captured as part of our 2006 Forest-wide bat monitoring effort. These bats were fitted with radio-transmitters, and tracked to roosting locations nightly through the life of the transmitters. Roost tree locations were identified, GPS'd and habitat measurements taken for each.

Maternity colony monitoring. The specific purpose of this element of the Forest-wide bat inventory and monitoring program is to monitor the known Indiana bat maternity colony on the MNF, thus meeting Section 7 Consultation requirements and Terms and Conditions identified in the Programmatic Biological Opinion.

In 2004, a lactating Indiana bat was captured at one of our long-term mist-net sites, fitted with a radio-transmitter, and tracked to roosting locations nightly through the life of the transmitter. As a result of this work, an Indiana bat maternity colony of approximately 30 bats was located within the Forest Proclamation Boundary. In the summer of 2006, four net sites were located in the vicinity of the site where that female had been captured and the identified roost site locations. While no female Indiana bats were found during this effort, four male Indiana bats were captured and tracked to roost trees in the surrounding area; tracking was also conducted at night to acquire information regarding foraging and habitat use

patterns for the species. The Forest will continue to coordinate with the USFWS and WVDNR, search for additional maternity colonies in the area, and establish a protective zone centered on the maternity site, as described in the Threatened and Endangered Species Amendment to the Forest Plan (Appendix H, Page 86a.)

Bachelor colony monitoring. Mist-net sites were set to further investigate an area identified as a possible bachelor colony roost site in 2004. That year, several male Indiana bats were captured near this site and fitted with radio-transmitters. These bats were tracked to roosting locations nightly through the life of the transmitters. Biologists from the MNF and Sanders Environmental, Inc. conducted initial emergence counts, documenting approximately 30 bats from a single roost tree. In a cooperative effort including personnel from Sanders Environmental Inc. as well as MNF, USFWS and WVDNR biologists, this site was mist-netted in the summer of 2006 using a triangle set. Nine male Indiana bats were captured as part of that effort, as were nine little brown bats; the total number of bats that emerged was perhaps twice what was captured.

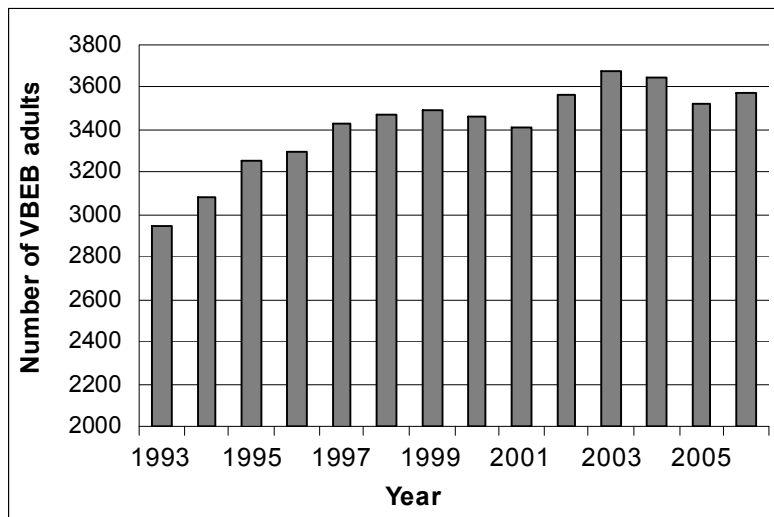
Figure WL-1. Indiana Bat "Bachelor Colony" Roost Tree



Virginia Big-eared Bat, *Corynorhinus townsendii virginianus*. Virginia big-eared bat populations are surveyed in cooperation with WVDNR to track the status of the species, and the MNF has an ongoing program of mist-netting and telemetry work to gather information about habitat use by bats on the MNF. The Virginia big-eared bat (VBEB) is a cave obligate species, with its largest populations located in West Virginia. A census of ten summer VBEB colonies by the WVDNR across the state resulted in an estimate of 6,312 adults; this represents approximately a 5.4 percent higher total than in 2005 (Endangered Species Federal Assistance Performance Report, WVDNR, 2005-2006).

Changes in summer colony population size at individual caves ranged from -6.8% at Cliff Cave to +26.6% at the Hoffman School Cave. Six of the ten colonies censused have entrances location within the Forest Proclamation Boundary. The total count for those caves in 2006 (3,578) was ~1.6 percent higher than that in 2005 and, while about the same as that observed in 2002, indicates a generally increasing trend in numbers since 1993 (Fig. WL-2); data taken from the WVDNR Endangered Species Federal Assistance Report, 2005-06). The respective change in VBEB estimates, associated with caves within the Proclamation Boundary, from 2005-2006 are: Arbogast /Cave Hollow (+7.7%), Cave Mountain (+10.6%), Mill Run (+4.8%), Mystic (+7.5%), Peacock (-5.7%), and Schoolhouse Cave (-5.3%).

Figure WL-2. Annual Census Totals for Six VBEB Maternity Caves within the MNF Proclamation Boundary



Monitoring Item 3. Evaluation, Conclusions, and Recommendations

Monitoring results depict recent population increases for Indiana bats in hibernacula and Virginia big-eared bats in maternity colonies on or near the Forest. These results would seem to indicate that Forest management practices are not having any large-scale detrimental impacts to these species or their habitats at present. Additional monitoring is needed and planned to determine whether positive population trends continue and to confirm that Forest management is contributing to the recovery of these species.

Although only one bald eagle nest site is currently known on the Forest, the site was active in 2006, with successful fledging of three eaglets. This site will be monitored in the future, and the Forest will continue to search for additional sites in collaboration with WVDNR.

The monitoring of West Virginia NFS (through next box checks, capture sites, and telemetry tracking) will continue to help the Forest determine population trends and suitable habitat. Monitoring data was used, along with potential vegetation mapping and aerial photo surveys, to develop Management Prescription 4.1 in Forest Plan revision. MP 4.1 emphasizes spruce and spruce-hardwood ecosystem restoration, and is designed to aid in the recovery of the WVNFS and other TES species associated with these habitat types. Within suitable squirrel habitat, spruce and spruce-hardwood stands would generally be allowed to grow older and develop uneven-aged structure over time. Research projects would also be conducted to determine whether Forest management practices could help promote these conditions and spruce regeneration. Ground disturbance would be minimized where practical. This strategy should help reduce potential impacts related to acid deposition and also potential impacts to the Cheat Mountain salamander, which has a good portion of its habitat in the same high-elevation spruce and spruce-hardwood forests as WVNFS.

The Forest Plan revision team reviewed monitoring items in the 1986 Plan as amended, and concluded that there were many items related to TES species, some of which were repetitive or already covered by direction in the FSM/FSH and agreements with USFWS; however, there was a corresponding lack of monitoring related to other wildlife species and concerns on the Forest. Also, the team felt that monitoring items should better reflect the role of the Forest as a habitat manager rather than a manager of species, which is the responsibility of WVDNR and USFWS. The team recommended that the 1986 Plan items be replaced by the following:

Item	Monitoring Question to be Answered
Wildlife Management Indicator Species	To what extent is Forest management moving toward desired habitat conditions for MIS and species associated with MIS habitat?
Threatened and Endangered Species	To what extent is Forest management contributing to the protection and recovery of threatened and endangered species?
Wildlife, Fish, and Plants	To what extent is Forest management providing ecological conditions to maintain viable populations of native and desired non-native species?
Wildlife and Fish Non-native Invasive Species	To what extent is Forest management contributing or responding to populations of terrestrial or aquatic non-native species that threaten native ecosystems?
Wildlife Disturbance	How effective are road and trail closures and other access limitations at limiting disturbance of disturbance-sensitive species?
Wildlife Habitat: Retained Features	Is Forest management providing adequate habitat diversity and structure through maintenance or enhancement of snags, culls, leave trees, and down woody debris?
Wildlife Habitat: Social and Recreational Opportunities	Is the Forest providing adequate habitat to meet the demand for wildlife-related social and recreational opportunities?

OTHER INVENTORY AND MONITORING EFFORTS

Breeding Bird Surveys. In addition to the point count surveys detailed above, the WVDNR and private groups (e.g., the Brooks Bird Club) and individuals have conducted Breeding Bird Survey routes and Christmas bird counts on or near National Forest Land. Mist-netting and bird-banding also are conducted at the Allegheny Front Migration Observatory at Dolly Sods in the Cheat-Potomac Ranger District.

Northern saw-whet owls (*Aegolius acadicus*). Saw-whet owls continue to be monitored on the Forest during fall/winter as part of a long-term mist-netting effort on the Forest. This monitoring station, part of a network of five stations in WV and MD coordinated by the Maryland Department of Natural Resources (MDDNR), is located on the outskirts of the Otter Creek Wilderness Area and has been in place since 1997. In 2005-06, 12 saw-whet owls were captured during this mist-netting effort. Kevin Boyle, the lead ornithologist for that mist-net site, also installed and checks nest boxes located in suitable habitat on the Forest. Nest boxes also have been placed throughout the MNF by WVDNR and volunteers. All saw-whet owl nest boxes are monitored annually to gain data regarding the distribution, abundance and reproductive success of this species. Because of the similarity in habitat use between this species and the endangered WV northern flying squirrel, these boxes also have provided habitat for that species, with several NFS captures recorded.

Bird and Bat Migration Study. The MNF entered into an inter-agency agreement with the USGS and USFWS to provide a framework for cooperative activities necessary to monitor migratory birds and bats on the Monongahela National Forest in order to better understand their spatial and temporal distribution patterns during migration through the region, and the potential effects of management or other actions, including wind power development, on these populations.

In 2005-06, MNF biologists assisted USGS and FWS personnel with the construction of monitoring equipment and the establishment of several monitoring sites in high elevation areas of the Forest. Acoustic monitoring equipment was placed in twelve locations within the Monongahela National Forest to monitor bird migration over the forest during the spring and fall migration. Data were collected from April-June and August-Sept in 2006; recordings from last year and this spring are currently being evaluated. In addition, a radar unit was placed in proximity to one of the acoustic sites this year, tracking migratory bird and bat patterns for three day periods at several intervals through the spring and fall.

Information gained as a result of this study will increase the knowledge base available to us for assessment of how activities on or near the MNF may affect migratory bird populations. The data from the MNF also will be combined with that from other regional study sites, contributing to a more comprehensive understanding of nocturnal bird and bat migration through the Appalachians, to identify where, when, and under what conditions migrants may be at risk from proposed and operational wind power projects.

Spruce Community Mapping. The spruce community on the Forest is a unique ecosystem that provides critical habitat for many species, including the federally endangered WVNFS

and the threatened Cheat Mountain salamander. Because of the importance of this habitat, and the reliance of biologists on the Forest and elsewhere on landscape-level mapping and GIS to model species distributions and habitat requirements, the Forest contracted with Photo Science, Inc. to classify spruce and northern hardwoods-conifer cover types on National Forest land within three watersheds. This project was started with several watersheds in 2004. In FY2006, several additional watersheds were mapped, including most of those with a large spruce component. We anticipate the continuation of this process for the remaining Forest watersheds in the coming years, allowing us better information to make informed management decisions and to enhance our abilities to model and monitor species habitats.

Gauley District Red Spruce Habitat Enhancement Project. The project area consists of 400 acres of habitat enhancement in Pocohantas County that has been monitored on a regular basis to determine the success of the young spruce community. Review of this monitoring in 2006 indicated that the density of these sapling and pole-sized trees is too high, restricting wildlife movement through the unit, and failing to provide suitable habitat for species dependent on mature red spruce conditions. This situation can persist for decades as the co-dominant trees slowly mature and compete for resources.

As a result, the District proposed to manually enhance red spruce habitat on 400 acres by reducing the basal area of sapling and pole-sized red spruce (< 5 DBH) in 60 acres of the 18-20 year old regeneration units to encourage the growth of co-dominant red spruce.

Additionally, snags will be created on 340 acres (up to 15 snags per acre) in stands adjacent to the young stands. Basal area reduction of co-dominant red spruce should increase the growth of the remaining trees through reduction of resource competition. This boost in growth and the associated snag creation will greatly reduce the time in which the project area will become suitable habitat for many of the species associated with mature red spruce habitat including the endangered WV northern flying squirrel.

SUMMARY

The Monongahela Wildlife Group will continue to monitor wildlife species and their habitats on the Forest. Most of the monitoring projects noted above will continue, and we expect to both expand on existing efforts and add new monitoring activities and studies as needed to gain information regarding species habitats and life histories and the potential effects that Forest management activities may have on them.