

**Appalachian Northern Flying Squirrels**

*(Glaucomys sabrinus fuscus)*  
*(Glaucomys sabrinus coloratus)*

**Recovery Plan Update**

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in cooperation with the:

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for:

Region 5  
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Approved:

**ACTING**

  
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Regional Director, Region 5  
U.S. Fish and Wildlife Service

Date:

SEP - 6 2001  
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**Amendment to  
APPENDIX A  
Appalachian Northern Flying Squirrels Recovery Plan (1990)**

**Guidelines for Habitat Identification and Management  
for  
*Glaucomys sabrinus fuscus***

August 2001

**Introduction**

The U.S. Fish and Wildlife Service's West Virginia Field Office (Service) has worked closely with the Monongahela National Forest (MNF) and the West Virginia Division of Natural Resources (WVDNR) to develop a Programmatic Biological Assessment of the MNF's existing Land and Resource Management Plan (LRMP) on nine Federally listed species that occur on the Monongahela National Forest (MNF). With regard to the endangered West Virginia northern flying squirrel (WVNFS), *Glaucomys sabrinus fuscus*, the MNF contains greater than 90% of the known habitat within its range. A small amount of habitat (one to two percent) is located in Virginia on Allegheny Mountain, which is adjacent to the MNF on the George Washington/Jefferson National Forest. This area, known as the Laurel Fork Area, is considered a semi-wilderness/backcountry area. The rest of the squirrel's habitat is located on non-Federal lands.

During the course of the MNF consultation, the Service recommended the development of new habitat identification and management guidelines to be adopted for the WVNFS, resulting in this amendment to Appendix A of the 1990 Appalachian Northern Flying Squirrels (*Glaucomys sabrinus fuscus*, *Glaucomys sabrinus coloratus*) Recovery Plan. It should be noted that although this amendment replaces Section 2 of Appendix A with respect to WVNFS, it does not apply to the Carolina northern flying squirrel, *Glaucomys sabrinus coloratus*.

These guidelines are based on an increased knowledge of the ecological requirements and associates of the WVNFS. They are intended to enable the MNF and other Federal land stewards to fulfill both their affirmative conservation responsibilities under Section 7(a)(1) and their consultation responsibilities under Section 7(a)(2) of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) (ESA), thus promoting more effective

recovery of this endangered species on Federal lands. With respect to WVNFS conservation on non-Federal lands (also addressed in Appendix A of the Recovery Plan), the Service urges all landowners with WVNFS habitat to adopt these proactive habitat identification and management guidelines whenever possible. Nonetheless, it must be recognized that for non-Federal projects, the landowner's sole legal responsibility under the ESA is to avoid "take" of a Federally listed species as defined in Section 9 (a narrower responsibility than that of Federal agencies), and current trapping and nest box survey methodologies will continue to be considered an adequately reliable and appropriate tool for determining if a project poses a likelihood of take of WVNFS. For this reason, these amended guidelines will not be considered prescriptive for either those Federal projects that have completed the planning stage and are proceeding on the basis of trapping and/or nest box survey results or those projects lacking a Federal nexus, which are not subject to Section 7 of the ESA.

The following habitat identification and management guidelines are based on more than ten years of new information, summarized below. Further, they are fully supported by the Service, MNF, WVDNR, and the Appalachian Northern Flying Squirrel Recovery Team.

## History

In 1985, when the WVNFS was listed as endangered, only ten specimens were known from West Virginia in Randolph and Pocahontas counties, and two specimens were known from Highland County, Virginia. At the time the Recovery Plan was completed, approximately 187 squirrels had been captured in six West Virginia counties: Tucker, Randolph, Pendleton, Pocahontas, Webster, and Greenbrier. As of 2001, over 1,000 WVNFS have been captured, including a small number of recaptures, in West Virginia in the same general six-county area. In addition, a total of ten specimens of the WVNFS have been captured on the Allegheny Mountain just over the West Virginia state line in Highland County, Virginia, primarily on the George Washington/Jefferson National Forest.

Consequently, we now have a much better understanding of the WVNFS's habitat and distribution. Although the general understanding of preferred habitat of the WVNFS has not changed significantly, we now know that the relative abundance of the conifer component can be small and, in some cases, totally confined to the understory. Additionally, the minimum elevation at which the WVNFS was known to occur, originally set at 3,300 feet above mean sea level (MSL), has changed. The WVNFS is now known to occupy mixed northern hardwood/hemlock stands at approximately 2,640 feet MSL along the North Fork

of the Blackwater River near the northern end of the squirrel's range. This implies that elevation is only one indicator, and that local climate, soil, and aspect are also strong influences on the presence and maintenance of the preferred habitat.

Prior to completion of the Recovery Plan in 1990, WVNFS management on the MNF was conducted in accordance with the 1986 LRMP's Forest-wide Standards and Guidelines, and more specifically the LRMP's *Interim Standards For the Virginia Northern Flying Squirrel* (Appendix X). The Recovery Plan incorporated the guidelines from Appendix X of the LRMP into its Appendix A, *Suggested Guidelines for Habitat Identification and Management*. Once finalized, the Recovery Plan provided, and continues to provide, the primary direction for management of the WVNFS on all non-Federal and Federal lands, including the MNF.

Both the 1990 Recovery Plan and the 1986 LRMP guidelines describe "occupied habitat" as any area where the WVNFS is known to exist through positive identification such as through trapping. The size of the occupied area was defined as all areas within ½ mile of the trapping or identification site (*regardless of the habitat characteristics of the surrounding area*). The Recovery Plan and LRMP guidelines further defined "potentially occupied habitat" for the WVNFS as: (1) all stands containing spruce or fir, *or* (2) all stands above 3300 feet containing hemlock or northern hardwoods in any combination, *and* (3) stands with at least some 10-inch diameter at breast height or larger trees present and at least partial canopy closure (e.g., in mixed conifer/hardwood stands with a minimum basal area of 100 square feet per acre).

The Recovery Plan and the LRMP also outlined factors to determine if potentially occupied habitat had high or low potential suitability. As part of the Section 7 consultation process in the past, habitat determined to have high potential suitability was surveyed by live trapping and/or the placement and monitoring of nest boxes for a predetermined time period to identify occupied habitat. If the WVNFS was found, the habitat was treated as occupied. If the squirrel was not found during these surveys, the area was treated as unoccupied and projects, such as timber harvest or road construction, could proceed. The same procedures applied to project reviews within the MNF and on non-Federal lands.

In addition to new data regarding WVNFS habitat preferences, a number of concerns have emerged with the 1990 management guidelines for the WVNFS. A central concern is that the burden of proof was placed on live trapping and/or the placement and monitoring of nest boxes to determine if potential habitat is occupied. The Service, WVDNR, MNF, and the Recovery Team agree, based on the data gathered over the past 10 years, that this

approach may not have protected WVNFS habitat to the fullest extent possible. The Service and others believe that the WVNFS is less likely to use nest boxes or enter traps in good quality habitat due to the natural presence of numerous den sites and an abundance of preferred foods. The indication that the WVNFS has a strong preference for natural versus artificial habitat elements could theoretically result in some degree of under-representation of occupied habitat when using these methods of sampling, although this cannot be empirically demonstrated. Therefore, a key concern regarding the 1990 habitat identification and management guidelines involves the potential for determining suitable habitat to be unoccupied as the result of a single survey attempt. Conversely, under the 1990 guidelines, managers and developers had to designate habitat as "occupied" in their planning and management processes if it occurred within a ½ mile of a trapping or identification site, even if it would not support the WVNFS (i.e., was "unsuitable habitat"). In some cases, this resulted in classifying areas as occupied (and, therefore, protected) based solely on proximity to a capture site, even when few or none of the habitat elements required by WVNFS were present.

It is explicitly stated in the Recovery Plan that "guidelines are subject to change as more data are gathered on the ecological requirements and associates of these flying squirrel subspecies" and in the LRMP that "modifications may be made after consultation with USFWS in order to comply with the Recovery Plan developed for the species or to reflect new research data." Based on the need for change explained above, the following habitat identification and management guidelines for the WVNFS will be henceforth adopted in both the Recovery Plan and the LRMP.

### **WVNFS Habitat Identification and Management Guidelines**

The basic premise of these amended guidelines is that protection of suitable WVNFS habitat, whether or not the squirrel's presence can be demonstrated, is needed. Recovery of the WVNFS must go beyond protecting only those areas where the squirrel can be located through trapping and nest box placement and monitoring. These new guidelines will aid in recovery of the WVNFS by protecting suitable habitat even if not known to be presently occupied, particularly on the MNF and for other Federal projects. Furthermore, the guidelines provide relief from protection of unsuitable habitat just because it is located within a ½ mile of a known capture site. These habitat identification and management guidelines stipulate two basic types of habitat: **suitable** and **unsuitable**.

## Suitable Habitat

Suitable WVNFS habitat is defined as areas that have the habitat characteristics (overstory and understory composition and structure, climate, soil, and aspect) required by the squirrel as indicated by known capture locations. Capture locations indicate that the WVNFS's preferred habitat is basically as stated in the Recovery Plan and the LRMP, with the exception of the following: (1) elevation guidelines do not accurately reflect where the WVNFS has been found; (2) the relative abundance of the conifer component can be small and, in some cases, totally confined to the understory; and (3) the spatial distribution of habitat components is now also recognized as an important characteristic, with the presence of squirrels closely correlated to proximity of spruce in the overstory. Many of the known WVNFS capture locations occur in transitional zones between northern hardwood forests and montane boreal forests. This zone occurs at an elevation from approximately 2,600 feet MSL to 4,600 feet MSL and is typified by a mixed and highly variable overstory species composition of American beech, yellow birch, black cherry, sugar maple, red spruce and eastern hemlock. Across the range of the WVNFS, stands with known populations generally exhibit an open to dense understory with scattered, large-diameter conifers, deciduous trees, and snags with cavities that serve as nesting sites. Several species of fungi consumed by the northern flying squirrel appear to be highly associated with red spruce in the central and southern Appalachians.

To effectively delineate suitable WVNFS habitat, particularly the strong spatial correlation of associated habitat variables, a map of suitable habitat will be produced, reviewed periodically, and refined collaboratively among the Service, the MNF, and the WVDNR. Suitable habitat includes buffers of approximately 150 feet and corridors to provide linkages for habitat areas where deemed necessary to prevent barriers to movement.

All mapped suitable habitat, as defined and displayed in the most recent map version, is assumed to be potentially occupied by the WVNFS, and emphasis will be placed on protecting this habitat. No projects or activities that would adversely affect suitable habitat on the MNF (or otherwise have a Federal nexus) will be allowed unless authorized under Section 7 or, in the case of scientific permits, Section 10(a)(1)(A). For projects on non-Federal lands, protection of all suitable (i.e., potentially occupied) habitat will be promoted; however, confirming or disproving squirrel presence vis-a-vis current trapping and/or nest box survey protocols will continue to be an acceptable practice, and only those projects that evidence a likelihood of take will require a Section 10(a)(1)(B) permit or, in the case of scientific permits, Section 10(a)(1)(A).

## Unsuitable Habitat

Unsuitable habitat does not currently have any of the habitat components preferred by the WVNFS and must, therefore, be assumed to be unoccupied by the WVNFS. Consequently, management activities planned in unsuitable habitat will not affect the WVNFS and will not require consultation or permits pursuant to the ESA.

## Monitoring

Monitoring for the WVNFS as described in the 1990 Recovery Plan is still an essential task, especially on the MNF, and will continue. Rather than focusing limited resources on project clearance, however, greater emphasis will be placed on larger "geographical recovery areas", or GRAs, to monitor populations and further refine habitat definitions. The MNF and the WVDNR should continue monitoring population trends using nest boxes in GRAs and other selected areas. In some cases trapping has been an effective tool, especially in telemetry research. Trapping, handling, and use of nest boxes should continue to follow the procedures recommended in Appendix B of the Recovery Plan.