

## RESULTS FOR SPECIES\*

### Modification to Standard Method

In selecting occurrences for some species, we encountered a problem with the way occurrences are entered into the Biological Conservation Database (BCD<sup>1</sup>). For a significant number of plant and animal species, occurrences may represent only one individual in a local population, an entire isolated local population, a local population which is part of a metapopulation, or an entire metapopulation. Using expert advice from the Natural Heritage Programs, we tried to sort element occurrences and classify them in the portfolio in a manner reflecting which one of these situations was represented. We clustered element occurrences that we felt represented single individuals within a local population. Depending on the species, these occurrences were clustered into isolated local populations or into metapopulations. An isolated local population was counted as one element occurrence. A metapopulation was counted as 2.5 isolated local populations for meeting our goals. Experts felt that a viable metapopulation made a larger contribution to the survival of the species as a whole, because metapopulations are inherently more resilient and usually larger and more robust than isolated local populations.

In order to stratify our selection of element occurrences, we used ecoregional subsections or sections where appropriate. In many cases, however, we recognized significant migratory or other biological barriers as stratifying influences in order to capture as much genetic variation within the species as possible. In those cases, we used these other biological barriers as stratification boundaries.

Another concept used in selecting element occurrences of plants and animals was the idea of “Irreplaceable” occurrences. Irreplaceable occurrences were those identified by experts as the ones that were deemed absolutely necessary to ensure long term survival of the species. Typically, such occurrences were exceptional examples. We selected irreplaceable occurrences first before trying to ensure stratification of occurrence selection. Table 1 summarizes our conservation goals for species occurrences.

**Table 1: Conservation goals for species based on rarity (Element rank) and viability.**

Element Rank	Target occurrences
G1 – Imperiled	all viable occurrences
G2 – Threatened	all viable occurrences
G3 – Rare	All irreplaceable occurrences and 20 occurrences for restricted species, 10 for limited species, and 5 for widespread and peripheral species
G4 and G5 Widespread	Select 5 occurrences of these endemic, disjunct or vulnerable species

\* Anderson, M.G. and S.L. Bernstein (editors). 2003. Results for species. Based on Thorne, J. et al. 2001. Central Appalachian Forest Ecoregional Plan; First Iteration. The Nature Conservancy, Conservation Science Support, Northeast & Caribbean Division, Boston, MA.

<sup>1</sup> The Biological Conservation Database (BCD) is a proprietary product of The Nature Conservancy used by all Natural Heritage Programs in the Central Appalachian Ecoregion for recording data on elements of biological diversity.

## Targets Selected

Most of the data used for assembling the portfolio for the Central Appalachian Forest derived from the participating Natural Heritage programs. These were the Virginia Division of Natural Heritage, the West Virginia Natural Heritage Program, the Maryland Wildlife and Heritage Division of the Maryland Department of Natural Resources and the Pennsylvania Science Office of The Nature Conservancy (a.k.a. Pennsylvania Natural Diversity Inventory-East). The Pennsylvania Natural Diversity Inventory-West Office, operated by the Western Pennsylvania Conservancy, initially contributed data to this planning process, but withdrew that data prior to the assembly of the portfolio. Because of the late date of data withdrawal, no attempt was made to try to assemble an alternative database using local experts. For this reason there are few portfolio sites in western Pennsylvania.

We targeted 74 plant, 30 vertebrate and 110 invertebrate species for conservation within the ecoregion. One Hundred and Forty-two terrestrial and palustrine communities were also targeted within this plan. These conservation targets have been listed in Appendix II of this report. Map 4 (Central Appalachian Ecoregion Element Occurrences) illustrates the full set of element occurrences for these various elements of biological diversity in the Central Appalachian Forest ecoregion. This map includes both viable and non-viable occurrences from the Heritage databases.

All G1-G3 and T1-T2 species were initially considered targets. Based on conservation significance as assessed by Expert Team members, some G3G4 species and some T3 species were considered as conservation targets, also. According to nationally established practice, some G1-G3 species were eliminated as targets based on age of last record. Records for species older than 20 years were dropped, resulting in the elimination of some target elements, especially cave fauna. In West Virginia alone, over 50 species of G1-G3 cave fauna were not included because the records of occurrence were over 20 years old. A list of species dropped from consideration appears in Appendix III. The list of targets was supplemented by G4-G5 species known to be endemic to the ecoregion, vulnerable to decline, currently in steep decline, or occurring as significant disjuncts.

A short list of migratory birds (Table 2) was considered as secondary targets. The Bird Expert Team developed this list by first identifying birds occurring in the Central Appalachian Forest which are of conservation concern as measured by having a Partners in Flight risk score of 18 or over. The Expert Team then considered whether or not the habitats of the Central Appalachian Forest ecoregion made a significant contribution to the survival of a particular species at risk. Only this subset of 10 birds that fit both criteria appears as the secondary bird target list.

Based on the professional opinion of the other Expert Teams, other G4-G5 species were also included as secondary targets (Table 3).

**Table 2. Central Appalachian Forest birds—secondary targets.**

Wood Thrush	Worm-Eating Warbler
Golden-Winged Warbler	Kentucky Warbler
Black-Throated Blue Warbler	Bobolink
Prairie Warbler	Henslow's Sparrow
Cerulean Warbler	Saw-Whet Owl

**Table 3. List of other secondary targets in the Central Appalachian Forest.**

<b>Scientific Name</b>	<b>Common name</b>
<i>Abies balsamea</i>	Balsam fir
<i>Juniperus communis</i>	Old-field juniper
<i>Taxus canadensis</i>	Canadian yew
<i>Carex collinsii</i>	Collin's sedge
<i>Anthroba mommouthia</i>	
<i>Calephelis borealis</i>	Northern Metalmark
<i>Calopteryx amata</i>	Superb Jewelwing
<i>Erynnis persius persius</i>	Persius Dusky Wing
<i>Ophiogomphus alleghaniensis</i>	Allegheny Snaketail
<i>Stylurus scudleri</i>	Zebra Clubtail
<i>Pseudosinella gisini</i>	
<i>Phanetta subterranea</i>	
<i>Stygobromus sp.7</i>	Shenandoah Spinosid Amphipod
<i>Pseudotremia alecto</i>	A Millipede
<i>Pseudotremia fulgida</i>	Greenbrier Valley Cave Millipede
<i>Pseudotremia princeps</i>	South Branch Valley Cave Millipede
<i>Pseudotremia sublevis</i>	A Millipede
<i>Trichopetalum packardi</i>	Packard's Blind Cave Millipede
<i>Tricopetalum weyerensis</i>	Grand Caverns Blind Cave Millipede

### **Portfolio Results**

After selecting occurrences based on the standards described in Table 1, minimal goals were met for 37 plant species out of 73, 73 invertebrate species out of 103, and 13 vertebrate species out of 20. However, most of these species where goals were met were for G1 and G2 species, where the team specified that the goal was met if all viable occurrences were conserved. Therefore, for G1 and G2 species, goals were automatically met. If a goal of 20 viable occurrences had been used for G1 and G2 species, the totals for goals met drop to 15 species of plants (out of 73), 4 species of invertebrates (out of 103), and 4 species of vertebrates (out of 20). See Appendix VI for goals set for each species and the extent to which goals were met.

Our list of target species included 12 plant, 4 invertebrate, and 7 vertebrate species listed under the Federal Endangered Species Act. According to the standards we set for long term species survival, 18 of the 23 Federally-listed species would be adequately conserved in the Central Appalachian Forest portfolio. See Appendix VII for a list of these species and notation on which species were adequately or inadequately represented in the portfolio.

The group of secondary targets included 4 plants, 15 invertebrates, and 10 vertebrates. Of these secondary targets, goals were met for none of the plants, one of the invertebrates and six of the vertebrates. The plant secondary targets should receive consideration by the Core Team as primary targets, because they were not swept in by the portfolio. The same could be said for the invertebrate secondary targets, except for the one species where goals were met. The ten vertebrate secondary targets were all birds. The Bird Expert team

felt that six of the bird species were adequately conserved by the portfolio of sites, especially considering the habitat offered by matrix block forests. However, the bird secondary target list included four species found in grasslands and early successional scrublands. Since the portfolio did not capture these community types adequately, the Bird Expert Team felt that Golden-winged warbler, Prairie warbler, Bobolink, and Henslow's sparrow should be considered for primary target status by the Core Team.

For the next iteration of the portfolio the planning team needs to review the goals set for species and possibly modify them. If better information allows the team to relax goals, the number of species meeting goals could increase. In many cases, additional inventory may yield more occurrences for the portfolio. Also, many occurrences were left out of the portfolio based on insufficient information on the current quality of the occurrence. Gathering more information on these species should help meet ecoregional goals.