

RESULTS FOR MATRIX-FORMING ECOSYSTEMS*

Modification to Standard Methods

Matrix forming communities in the Central Appalachians include 8 terrestrial forest types and their various successional stages. The minimum size goal for a viable occurrence was set at 15,000 acres based on the size necessary for an occurrence to absorb and recover from characteristic, large, infrequent disturbances (e.g. tornadoes, fires, insect outbreaks—see *Figure 1*) and to maximize the probability that the occurrence retains and maintains a full complement of all its associated fauna with multiple breeding populations. This included, in particular, forest dwelling birds, a diverse canopy, soil insect fauna, various herptiles, and mammals. Black bear and bobcat were not considered in the evaluation of minimum block size, because they use multiple blocks, which can be relatively fragmented. In addition to size the qualifying criteria for a matrix community site also specified that the occurrence be in good or recoverable condition, have an old growth core area if possible, and contain high or complementary diversity of both species and landscapes as determined by the *Ecological Land Unit* approach (intact watersheds were viewed as a plus but were not a requirement).

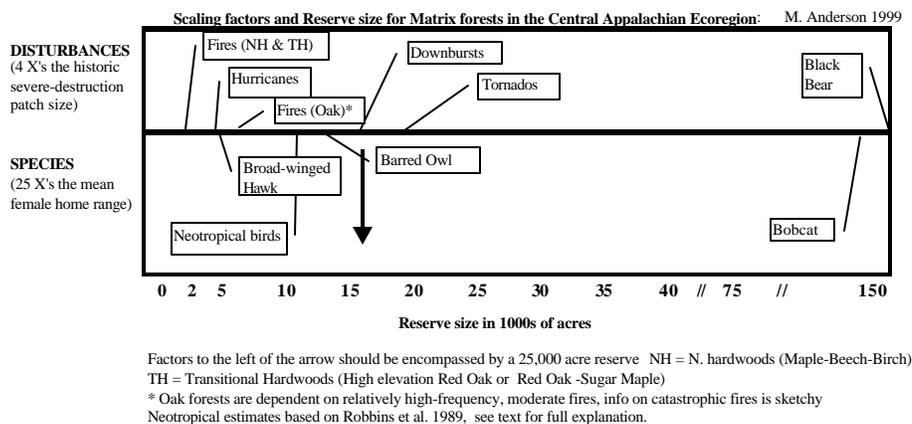


Figure 1. Illustrative justification for selecting matrix blocks of at least 15,000 acres in size.

The issue of representativeness

By examining the distribution patterns of matrix forest and comparing this pattern to the pattern of Ecological Land Units, it appears that the full range of ecological variation within the ecoregion may not be captured in the matrix forest occurrences. We know that these occurrences in most all cases have as their cores managed areas occupying steep slopes or other rough terrain (See Map 4, Central Appalachian Ecoregion Managed Land)

In order to examine representativeness, we summarized the amount of area for each ELU occurring within management areas. We then examined the difference between the expected distribution of ELUs, based on their relative proportion within the ecoregion, and the observed distribution across the managed areas. For example, the expected aerial

* Anderson, M.G. and S.L. Bernstein (editors). 2003. Results for matrix-forming ecosystems. 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.

extent of “low elevation, acidic flat summits” should equal its proportional occurrence in the entire ecoregion times the actual area for the whole ecoregion. As managed areas covered 9,979 ha of this ELU, there is less (2%) of the ELU in managed areas than would be expected from proportional representation. Some patterns are dramatic. For example, 59.7% of mid-elevation acidic shale cliffs and 93.8% of high elevation, calcareous dry flats (93.8%) fall within managed areas. In total, 86 of the 252 ELUs found in CAP were covered disproportionately less than expected. Managed areas disproportionately represent high and mid elevation, acidic ridges and slopes.

Managed areas disproportionately avoid low elevation calcareous substrates, wet and dry flats, lakes and rivers. These are not surprising trends, given the history of land use and conservation in the ecoregion. Managed areas are located where soils are less fertile and, therefore, agriculture has not been the dominant land use. Therefore, the ELUs with which agriculture has a strong relationship will be disproportionately under-protected. The typical ELU description for agriculture is: low elevation (73%), calcareous sedimentary or shale (60%), and dry flat (68%). Most of these ELUs are found in the Northern Great Valley and Great Valley of Virginia, where a majority of the subsections are in agriculture (52% and 68% respectively) and few managed areas exist. Experts noted that viable forest communities for these types no longer exist and we would need to consider landscape scale restoration of forest in order to address this gap in portfolio coverage.

Numeric Goals

For matrix communities we set an initial goal of at least two matrix blocks for each of 7 of the subsections: Northern Allegheny Mountains, Southern/Central Allegheny Mountains, Western Low Mountains, Eastern Low Mountains, Northern Ridge and Valley, Southern Ridge and Valley, and Northern Blue Ridge and the Allegheny Mountain Plateau subsections. However, we modified our goals according to the level of stratification suggested by our ELU analysis. With the modified goals, we were able to select sufficient matrix forest in each subregion.

Portfolio Results

Based on an initial screening for minimum area, 213 blocks were assessed both quantitatively and qualitatively as to their current condition (see Map 6). The original 213 sites were reduced to 57 qualifying potential matrix blocks, with these blocks further ranked as **Preferred** or **Alternative** (See Map 7), using the methods described in the *Matrix-forming Ecosystems Methods* chapter. The final set of Preferred sites consisted of 28 matrix forest examples distributed across the ecoregion.

These 28 matrix forest occurrences represent one solution to the question of “What portfolio of sites will conserve multiple viable examples of the 8 matrix communities?” Other solutions are possible and it is very likely that, as conservation activity moves forward, substitution will occur among the matrix forest sites within the portfolio.

Collectively, the 28 matrix “sites” total 2.5 million acres, accounting for about 10.6% of the 23.9 million-acre ecoregion. These matrix forest occurrences contain 824 viable occurrences of conservation targets (47% of the known viable occurrences in the ecoregion).

Ownership/Management Status Of The Portfolio

The approximate area covered by the total portfolio is 3,011,000 acres. Of this area, 2,530,000 acres occurs within matrix blocks. Therefore, standard sites cover an additional 481,000 acres. The Federal government manages approximately 46% of matrix block acreage and various state governments an additional 18%. The majority of the remaining area of matrix block sites is privately-owned. For standard sites the ownership and management status pattern is almost exactly reversed. Two-thirds of standard sites are in private ownership and one-third is publicly owned.