

RESULTS FOR MATRIX-FORMING ECOSYSTEMS*

Matrix forest systems in the High Allegheny Plateau ecoregion are comprised of a handful of dominant forest community types, including Northern hardwoods, Maple-birch- Beech forest, Oak Hickory forest and Allegheny oak forests. Included in the definition of matrix forest systems are also all the early and mid-successional stages of these forest types. Descriptions and technical names of all matrix forest types as well as the (approximately) 100 other forested and non forested community types are available in the High Allegheny Plateau community classification booklet (Lundgren et al. 2001) developed by the Heritage Ecologists in the participating states and region.

Modification to Standard Method

Matrix forest blocks by ELU composition in HAL

Standard methods were used to set the minimum block size (15,000 acres), identify potential matrix forest blocks, determine the composition and quantities of each Ecological Land Unit (ELU) present in each block, and determine which blocks were ecologically interchangeable and which blocks represented very different sets of ecological land features. For the High Allegheny Plateau ecoregion the ELU map was based on a 90 meter digital elevation model using the categories shown in Table MAT-1.

Table MAT-1. Ecological Land Units for the High Allegheny Plateau

Ecological Land Units (ELUs)- High Allegheny Plateau		
<u>Elevation class in feet</u>	<u>Geology</u>	<u>Topographic</u>
1000 1 - 1000	100 Acidic sed/metased	10's steep slopes/
2000 1000 - 2000	200 Acidic shale	10 Cliff
3000 2000 - 2500	300 Calcareous sed/meta	11 Steep slope
4000 2500 - 3250	400 Mod calc sed/metased	12 Slope crest
5000 > 3250	500 Acidic granitic	13 Upper slope
	600 Mafic/intermediate gr	14 Flat summit
	800 Deep sediment	20's Side Slopes
		20 Side slope- N/E
		21 Cove- N/E
		22 Sideslope S/SW
		23 Cove - S/SW
		30's Flats
		30 Dry Flat Till
Example:		31 Dry Flat Fine Grained Sediment
2000 (1000-2000 feet) + 500 (Acidic granitic) + 11 (steep slope) =		32 Wet/Moist Flat
ELU2511 Mid elevation, acidic, granitic steep slope		33 Slope Bottom
		34 Dry Flat Coarse Grained Sediment
		35 Dry Flat Residuum, Colluvium, Alluvium
		36 Dry Flat Patchy Sediment
		37 Dry Flat Exposed Bedrock
		40's Aquatic
		40 Stream
		41 Wide River
		42 Lake

* Anderson, M.G. and S.L. Bernstein (editors). 2003. Results for matrix-forming ecosystems. Based on Zaremba, R.E. 2002. High Allegheny Plateau Ecoregional Plan; First Iteration. The Nature Conservancy, Conservation Science Support, Northeast and Caribbean Division, Boston, MA.

The analysis initially partitioned the blocks into three groups. Group A is made up of blocks occurring on fine-grained shale bedrock. These blocks are all at low to mid elevations within the ecoregion and are found in Western New York extending only slightly into Pennsylvania. The Group B blocks are all primarily on coarse-grained sandstone bedrock with a broad range of elevations. These blocks occur in Pennsylvania, New Jersey, and in the extreme eastern part of New York. Group C consists of a small subset of blocks located in the localized portion of HAL with calcareous bedrock. Descriptions of each of these block groups follow.

Group A blocks

Group A1a consists of three low elevation blocks, each currently with moderate forest cover (81-85% cover). These blocks include scattered NY State Forest land and private forested land, which are actively being logged. There are numerous pine plantations. No Heritage inventory work has taken place in these blocks. Low elevation sites are generally used by small dairy farms. Only one of these blocks is large (Jersey Hill); all are moderately dissected by roads and would require significant restoration to support functional matrix forest characteristics.

Group A1b consists of five blocks at mid elevations for the ecoregion with good forest cover (87-92%). The dominant forest type is Allegheny oaks with oak hickory on south facing and drier sites. There are some remnant silver-maple swamp along some stream corridors. Both *Trollius* and *Carex schweinitzii* occur within this area reflecting local influence of alkaline substrate. All blocks under consideration are large, but moderately dissected by roads. The blocks near the Allegheny River are mainly privately owned and managed for timber production with few farms. These forests produce high quality cherry. The Bristol Hills block is a mosaic of public and private land with dairy farms at low elevation.

Group A2a blocks occur in glaciated areas and have shallow soils on dry flats. Because the area was glaciated there are scattered wetland and glacially derived upland features. These blocks have not been inventoried by Heritage. The dominant forest types are believed to be Allegheny oak with oak hickory on drier sites. There are three blocks included in the assessment of this group; two of these are small (Connecticut Hills and Red House Run). All three have relatively low public ownership compared to many other blocks in HAL. All are moderately dissected by roads. Red House Run has low forest cover.

Group A2b is made up of six blocks, all within the non glaciated part of HAL. These blocks have few wetlands and deeper soils at low elevation. Dominant forest types include Beech maple forest and Hemlock northern hardwoods. On drier sites Allegheny oaks are found; richer sites with deeper soils support Rich mesophytic forests. These blocks are locally dominated by cherry and have been managed for high quality hardwoods. There are a few areas of old growth. Cerulean warblers are found in good concentration along the Allegheny River. Swainson's thrush is also found within these blocks. Four of these blocks are large; one is small (Kinzua East-10K acres), but in great condition (99% natural cover and high percentage of managed area-99.8%). Allegheny State Park is primarily owned by NY State, has high natural cover and has not been logged for many years. There is currently no logging going on in the park. There are numerous interior roads which dissect the forest into smaller units. The two Kinzua blocks are both within the Allegheny National Forest designation boundary. Kinzua West is in good forest cover, but has a low percentage of land in managed area.

Group B blocks

Group B2 consists of six blocks in the Catskills that have the greatest abundance of mid elevation features in HAL and the only high elevation feature in the ecoregion. All of the B2 blocks are in great condition with a high percentage of managed area. The NY State has designated that all state owned land in the Catskills will be held as Forever Wild with no cutting of trees. This assemblage of six blocks constitutes that largest mass of natural area within HAL.

Group B1a is made up of low elevation blocks that have been glaciated. These blocks have the highest concentration of glacial features and associated wetlands in HAL. This group is by far the most heterogeneous of all block groups in HAL. Tobyhanna in the Poconos supports only 13 ELU types, the second lowest in all of HAL, Kittatinny supports 82 ELU types, second highest in all of HAL. Vegetation types include shale cliff communities and talus slopes, ridgetop woodlands, Northern Appalachian shale barrens, a range of pine barrens, and chestnut oak forests. There are numerous wetlands, including black spruce bogs, Northern conifer swamps, kettlehole bogs, and Inland Atlantic white cedar swamps. Size and public ownership percentages also vary widely.

Blocks within **Group B1b2** are all located within the non glaciated part of HAL. These blocks have greater development of eroded features (residuum) at low and mid elevations than the blocks in B1b1 (orange). Many of the blocks in B1b2 have deeply cut narrow valleys established by the West Branch of the Susquehanna River. Dominant forest types include Hemlock northern hardwoods, Northern hardwoods and Appalachian oaks. There are scattered pockets of old growth. There are several woodrat sites. Introduced elk are in some blocks. Many sites are owned by Pennsylvania state forestry. Like the six Catskills, the forest blocks around Emporium constitute a significant forest matrix fragmented only by scattered state roads. There are, however, numerous smaller interior roads and scattered roads supporting gas wellfields. Group B1b2 includes some of the largest Pennsylvania state forest units and Tionesta and Hickory Creek within the Allegheny National Forest. In sum these blocks present great opportunities for forest matrix conservation.

The blocks within **B1b1** are quite varied with elevation features and low abundance of deep soils on dry flats. Dominant vegetation varied considerably from site to site, but includes hemlock northern hardwoods, chestnut oak forest, ridgetop pine barrens, spruce rocky summits, and oak hickory forest. Locally there are steep cliffs and talus slopes. Woodrats were found throughout the areas with talus slopes. There are numerous wetlands including bogs. These blocks are as varied as the Northern Gunks block in NY which supports a pine barrens on thin high elevation sites to Blooming Grove in Pike County PA. These blocks currently support a varied group of forest types. One of the largest Pennsylvania State Forest units- Sproul is within this group.

Group C blocks

Group C consisted initially of four blocks that are located in the only significantly calcareous part of HAL. These blocks are clustered in the north-central part of the ecoregion and are a low to mid elevation extension of a band of calcareous bedrock exposures that runs along the northern border of HAL, primarily in the Great Lakes Ecoregion. These blocks are all low and mid elevation and are currently covered with second and third growth forests on upper slopes and summits. Most of these blocks were at one time completely cleared and used for agriculture, including row crops on low elevation areas with good soils and pastures at higher elevation. Dominant forest types include oak-hickory and sugar maple-dominated hardwoods with high

diversity spring ephemerals. There are large patches of hemlock northern hardwoods and Allegheny oak forest. These blocks have numerous wetlands including some of the only fens and other alkaline communities in HAL. Some of these wetlands have affinities to more northern communities, including spruce-fir swamps and black spruce tamarack swamps. The lower elevation parts of these block are primarily covered with small-scale dairy farms, many of which are abandoned. Some the state-owned tracts in these blocks are planted to pines which are known for their use by crossbills. All candidate blocks in this grouping would need significant restoration to become functional matrix forest blocks. Only one block was chosen for consideration in the portfolio.

Matrix Forest Block Selection Results

Each of the 57 candidate forest matrix blocks was evaluated during a meeting of the HAL Core Team. Members from each state in each block group evaluated blocks based on size, condition, ELU composition, biodiversity, and conservation opportunity.

Fifty-three matrix forest blocks were selected for the HAL portfolio. Twenty six of these were identified as Tier 1, defined as preferred blocks in an ELU block group; twenty seven were selected as Tier 2 blocks, defined as alternatives to Tier 1 blocks. Four proposed blocks, all within the calcareous part of the ecoregion (Group C) were rejected entirely for the portfolio as unsuitable for matrix forest conservation.

Five matrix block ELU Groups met the goal of two Tier 1 blocks for the portfolio; selections exceeded goals for three of these groups (Table MAT-2).

TABLE MAT-2. Goals and Status of Portfolio for Matrix Forest Block Groups in HAL

Block Group Code	Goal	# Tier 1	# Tier 2	# Needed for Portfolio
A1a	2	1	2	1*
A1b	2	2	1	1
A2a	2	1	2	1*
A2b	2	2	2	Goal met
B2	2	6	0	Goal exceeded
B1a	2	2	3	Goal met
B1b2	2	4	8	Goal exceeded
B1b1	2	6	6	Goal exceeded
C	2	1	0	1*

* All matrix blocks in these groups need extensive restoration

The Catskills (B2- 6 Tier 1 selections) and the blocks located in the mass of Pennsylvania state-owned land (B1b2 and B1b1- 10 Tier 1 selections) present unusual opportunities for matrix forest conservation in the Northeast. Several other blocks were added to Tier 1 for their groups because they included an assemblage of ELUs that were considered important to capture in the ecoregion. These blocks include Kittatinny, Northern Gunks, and Blooming Grove. Several Tier 2 blocks, which were marginal in terms of size, fragmentation, or forest quality, were also added to the portfolio because they included unusual ELU composition or significant conservation potential. These blocks include Tobyhanna, Mongaup, and Buckham Mountain.

All blocks selected for the portfolio, both Tier 1 and Tier 2, will require restoration to create minimum standards for disturbance regimes, area-sensitive species, and legacy features. Several blocks included in this portfolio will require extensive restoration to establish a functional matrix

forest. These include all of the blocks in the northern part of New York, in Groups A1a, A2a, and C. These block groups include unique ELU groups and fragments of recovering forest with a mosaic of public ownership in a landscape with abandoned farms. There is potential with focused conservation effort within these areas for the reestablishment of functional forests.

A second goal in HAL for matrix forest conservation was that one block be selected within each subsection, reflecting the differences in physical settings captured by the Forest Service subsection divisions. Table iii. reviews the distribution of selected matrix blocks by subsection. For those blocks that occur in two subsections, the block is assigned to the subsection in which most of the block occurs. At least one block was chosen in each subsection. The greatest number of blocks was selected in the three westernmost subsections, primarily in the areas with large Pennsylvania state land holdings and in the vicinity of Allegany State Park. Nearly all of the Catskills high elevation subsection is included in matrix block units. All the matrix blocks selected in the northern Allegheny Plateau subsection (212Fb), which is primarily a mosaic of farms and small forest tracts, will require extensive restoration.

General statistics of the 53 matrix forest blocks in the HAL portfolio appear in Table MAT-3. The total acreage for Tier 1 blocks is 1.4 million acres, or 8 % of the entire ecoregion. Combined Tier 1 and Tier 2 blocks total 2.5 million acres or 15 %. Block size ranges from 10,000 acres at Kinzua East to 176,000 at Chittenango Highlands. The meaning of the acreage of these matrix blocks should be cautiously interpreted. Kinzua East is below the 15,000 acres standard for HAL matrix blocks, but is included because of high forest cover, nearly complete public ownership, and interest on the part of the Allegheny National Forest in matrix forest conservation.

Conversely, Chittenango Highlands at 176,000 is highly fragmented with roads, has low public ownership (23%), and moderate forest cover (78%). The large size of this matrix block reflects an area in which matrix forest conservation will be considered in a site conservation plan. There is no implied intention that all 176,000 acres will be subject to restoration. All other HAL blocks fall between these two extremes.

Table MAT-3. Basic Statistics for Matrix Forest Blocks in HAL

Tier 1 Matrix Forest Block												
Matrix Block Name	Acres	ELU Group	Subsection	State 1	State 2	% Managed Area	% Forested	% Wetland	% Natural Cover	% Agriculture	% Developed	Miles of Interior Roads
Kittatinny	28051.1	B1a	221Bd	NJ		41.3	84.9	1.5	88.5	10.1	11.5	126.4
Allegheny State Park	88760.6	A2b	212Ga	NY	PA	78.1	97.6	0.0	97.8	1.8	2.2	170.7
Bone Run	30271.9	A2b	212Ga	NY	PA	21.6	95.9	0.0	96.1	3.6	3.9	92.8
Bear Pen Vly	48807.6	B2	M212Eb	NY		19.9	94.7	0.0	94.7	5.1	5.3	115.1
Beaverkill	136172.8	B2	M212Ea	NY		53.0	97.5	0.2	98.0	2.0	2.0	241.6
Bristol Hills	24880.2	A1b	212Fb	NY		2.7	88.6	2.5	91.1	8.8	8.9	98.9
Bucktooth State Forest	29897.9	A1b	212Ga	NY		7.8	90.9	0.0	91.0	8.8	9.0	90.1
Cannonsville	18762.2	B1b1	M212Eb	NY		3.8	97.7	0.1	98.0	1.7	2.0	50.9
Catskill Escarpment	40547.6	B2	M212Ea	NY		55.0	97.2	0.2	97.9	1.6	2.1	102.0
Chenango Highlands	176380.0	C	212Fb	NY		22.9	77.6	0.5	79.5	20.1	20.5	589.3
Connecticut Hill	19998.7	A2a	212Fb	NY		55.6	89.5	0.9	90.5	9.1	9.5	68.2
Neversink Unique Area	30364.0	B1a	212Fc	NY		17.3	97.0	1.4	98.8	0.3	1.2	80.3
Nine Mile Creek	35758.4	A1b	212Ga	NY		11.6	91.9	0.0	91.9	8.0	8.1	104.9
Northern Gunks	32263.1	B1b1	221Bd	NY		59.7	97.5	0.3	98.5	0.9	1.5	108.4

Panther Mountain	122116.2	B2	M212Ea	NY		61.1	98.5	0.1	98.7	1.1	1.3	195.2
Rattlesnake Hill	20631.0	A1a	212Fa	NY		36.5	80.3	0.1	80.6	19.2	19.4	63.6
Sugarloaf	58613.8	B2	M212Ea	NY		50.3	98.6	0.2	98.9	0.5	1.1	125.4
West Kill Wilderness	51359.2	B2	M212Ea	NY		60.1	97.5	0.0	97.6	1.6	2.4	74.5
Blooming Grove	44492.1	B1b1	212Fc	PA		38.7	89.2	7.8	99.4	0.3	0.6	84.0
Emporium	98527.9	B1b2	212Gb	PA		78.3	97.8	0.0	98.3	1.4	1.7	209.3
Hammersley	112744.5	B1b2	212Gb	PA		91.5	98.3	0.1	98.8	1.1	1.2	191.8
Hickory Creek	28093.0	B1b2	212Ga	PA		99.9	98.7	0.5	99.6	0.4	0.4	61.6
Mountain Springs	89513.5	B1b1	212Fa	PA		57.7	96.9	0.8	98.5	1.5	1.5	151.7
Pine Creek	17522.3	B1b1	212Fa	PA		66.2	93.5	0.2	94.4	5.4	5.6	55.6
Tionesta	39167.3	B1b2	212Ga	PA		100.0	96.4	0.0	97.3	2.5	2.7	116.9
Wolf Run/Cedar Run	16075.3	B1b1	212Gb	PA		81.5	98.4	0.0	99.0	1.0	1.0	21.9
Tier 2 Matrix Forest Block												
Alma Hill	56094.5	A1b	212Fa	NY	PA	0.0	89.0	0.4	89.6	10.2	10.4	272.4
Chipmunk Run	30582.7	A2b	212Ga	NY	PA	0.0	92.6	0.4	92.9	5.7	7.1	162.3
Jersey Hill	79013.4	A1a	212Fa	NY		25.5	81.3	0.4	82.0	17.7	18.0	270.8
McCarty Hill	21249.8	A1b	212Ga	NY		27.8	86.8	0.0	86.7	12.2	13.3	86.3
Mongaup	19256.1	B1a	212Fc	NY		30.0	93.4	2.7	98.7	0.9	1.3	58.7
Schuylar County State Land	48050.2	A2a	212Fb	NY		39.8	88.6	0.0	88.8	10.8	11.2	157.2
Turnpike State Forest	19378.7	A1a	212Fa	NY		39.9	84.8	0.0	85.2	14.0	14.8	76.0
East of Chipmunk Run	33453.3	A2b	212Ga	PA	NY	0.0	95.5	0.6	96.2	3.3	3.8	210.8
Kinzua East	10455.4	A2b	212Ga	PA	NY	99.6	98.4	0.0	99.4	0.6	0.6	18.9
Kinzua West	25960.1	A2b	212Ga	PA	NY	35.2	95.2	0.0	96.7	3.1	3.3	77.2
Red House Run	17125.3	A2a	212Fa	PA	NY	0.0	71.0	0.0	71.1	28.6	28.9	54.6
Big Run	19319.1	B1b2	212Gb	PA		2.9	94.3	0.0	94.4	0.5	5.6	70.2
Bogg's Run	31234.8	B1b1	212Gb	PA		78.2	99.0	0.0	99.5	0.5	0.5	61.5
Buckham Mountain	32789.7	B1a	212Fc	PA		39.2	96.7	1.5	98.4	0.7	1.6	78.9
Butternut Hollow	35056.2	B1b2	212Gb	PA		93.3	98.2	0.0	98.3	1.7	1.7	93.5
Catherine Swamp	28701.1	B1b2	212Ga	PA		0.8	93.8	0.7	95.1	3.3	4.9	53.3
Cranberry Swamp	13403.2	B1b1	212Gb	PA		74.7	98.8	0.1	99.6	0.4	0.4	29.8
Dutchman Swamp	28894.1	B1b1	212Fa	PA		63.9	94.3	0.7	96.8	1.9	3.2	50.8
East Branch Dam	78639.4	B1b2	212Ga	PA		21.8	98.3	0.0	98.9	1.1	1.1	181.7
Gray's Run/McIntyre	46815.6	B1b1	212Fa	PA		52.0	95.7	0.1	96.5	2.9	3.5	124.2
Larry's Creek	20380.0	B1b1	212Gb	PA		13.7	95.0	0.0	95.1	4.3	4.9	48.2
Marshburg	37696.0	B1b2	212Ga	PA		72.7	98.7	0.0	99.2	0.7	0.8	92.3
Parker Run	48170.4	B1b2	212Gb	PA		39.7	97.6	0.0	97.8	1.6	2.2	83.2
Quehanna	98671.4	B1b2	212Gb	PA		47.4	99.5	0.0	99.6	0.3	0.4	166.9
Tobyhanna	16203.5	B1a	212Fd	PA		91.7	76.4	21.9	99.5	0.4	0.5	33.5
Trout Run	69475.8	B1b2	212Gb	PA		47.1	97.1	0.0	97.6	1.6	2.4	137.6
West Branch-Sproul	64962.9	B1b1	212Gb	PA		68.9	95.9	0.0	98.4	0.9	1.6	160.2

Most of the forest matrix blocks are currently in very good condition. Seventy five percent (40 blocks) support forest cover greater than 90%; only 6% (3 blocks) have forest cover under 80%. Only nine blocks that were selected have a percentage of land in agriculture greater than 10%. Seventy percent (37 blocks) have less than 5% acreage in agriculture. Only six selected blocks have residential and commercial development over 1%. Many HAL blocks are currently in great condition and have high potential for successful conservation work.

The ELU composition of Tier 1 and Tier 2 matrix forest blocks appears in each of the block reports.¹ The 53 matrix blocks represent a good cross section of the ELUs within HAL. Of the 353 ELUs in the ecoregion, all but 20 are included within selected matrix blocks. These 20 ELUs are all in either the calcareous region in north-central New York or in the non-glaciated sections of western Pennsylvania where residuum has accumulated along major river corridors. All of these ELUs are suitable for agriculture or developed into villages or transportation corridors. An analysis of elevation for the matrix blocks relative to the ecoregion as a whole revealed that the selected blocks represent all the highest elevation sites: 79% of the areas 2500-3250 feet and 15% of areas 2000-2500. Only the lowest two elevation units (under 1000 feet and 1000-2000 feet) are represented in percentages less than for the whole ecoregion. These are the most developed parts of the ecoregion.

Statistics for managed areas in HAL matrix blocks appear on each block report. The total area of the 53 HAL matrix blocks is 2,466,185 acres. Forty-six percent of this acreage is publicly owned. Twenty-three percent (12 blocks) have greater than 70% public ownership; 9% (5 blocks) are greater than 90% in public ownership. Thirty three (18 blocks) have less than 30% public land; 17% (9 blocks) have less than 10%; 8% (4 blocks) have no public land at all.

This assessment includes matrix forest blocks selected for HAL during the development of this ecoregional plan. There are other matrix forest blocks selected in adjacent ecoregions that extend into HAL. Swartswood in NJ is adjacent to the Kittatinny block and straddles the HAL/LNE boundary. Four blocks were selected during the WAP planning process that extend into the western part of HAL.

General comments on HAL matrix blocks

The 53 matrix forest blocks in HAL reflect the diversity of ELU types present in HAL and are well distributed throughout the ecoregion. Site conservation planning will be an essential step to identify where within these draft matrix blocks effective forest matrix conservation can be undertaken. Emphasis will be needed on both current good conditions and ELU composition, which will often not correlate. Site conservation planning will need to identify areas that are large enough to sustain important forest processes, configured to maximize area sensitive species needs and capture the broadest possible assortment of ELUs.

This selection of Tier 1 and Tier 2 matrix forest blocks represents a first effort to identify sizable units within HAL where matrix forest conservation might take place. Greater familiarization with these sites and an increased knowledge of the goals of matrix forest conservation in the East, including size, shape, and condition within the conservation unit, will better inform the selection of sites.

This assessment did not directly address issues of wide-ranging species, connectivity, or global climate change. All of these landscape issues should be addressed at a time when these first iteration HAL matrix blocks are combined with blocks selected for adjacent ecoregions. Through this process it has been recognized that within HAL there are greater opportunities for matrix forest conservation than in all adjacent ecoregions (WAP, CAP, LNE, and Great Lakes). The

¹ Block reports are one- or two-page formatted documents that summarize all important descriptive and quantitative information about a matrix block. They are included on the ecoregional data distribution CDs.

value of masses of matrix forest blocks has been recognized in the selection of the Catskills, Western PA, and the area around Allegany State Park as Action sites.

Next Steps for Matrix Forest Blocks in HAL

1. Connect ELUs to communities and assess distribution and groupings in the ecoregion. Do these matrix block selections act as coarse filters and in fact represent the full range of community diversity within HAL?
2. Determine which ELU types are not represented in the portfolio and assess potential for restoration. There are 20 ELUs not represented in any selected matrix forest block. There are also many lower elevation, flatter ELUs that are under represented relative to their abundance in the ecoregion. These ELUs should be identified and located. An assessment should be undertaken to determine the feasibility of creating new blocks or expanding existing blocks to include these features in the portfolio.
3. Recirculate matrix forest selections to the experts for review. Experts were involved in the first phase of identifying potential matrix forest blocks, but have not reviewed the final selections. There will be likely adjustments in block selections and boundaries based on new expert opinion.
4. Become familiar with matrix forest blocks and develop conservation plans. The first step in developing site conservation plans for matrix forests will be to assess current condition, composition, threats, and potential for each block. Rapid ecological assessments should be undertaken for each block to evaluate where more detailed inventories are needed.
5. Continue evaluation of matrix block characteristics. The selection of matrix forest blocks is driven by the characteristics of what are understood to be the important features that need to be conserved in these areas. Disturbance regimes, which define and maintain matrix forests, are poorly known in HAL. More work needs to be done to compile disturbance histories and ecological effects within the ecoregion. There may be geographic differences between far western Pennsylvania and the Catskills that need to be understood to refine the minimum dynamic areas of matrix forests in HAL. The needs of areas sensitive species also are considered in scaling matrix forest. More information is needed on what these species are in HAL. And what do they need within matrix forests? What minimum standards are needed to assure that these selected matrix forests are functioning as source areas of other conservation areas and the general ecoregion?
6. Conduct multi-ecoregional cooperative plans for matrix forests, focused on similar matrix forest types or settings, include assessment of threats, goals, and strategies. There are clear similarities among many of the matrix forest blocks in HAL and in adjacent ecoregions. Field assessments, research on matrix forest characteristics, and development of conservation strategies will benefit from assessments of multiple sites. Similar matrix blocks should be grouped and analyzed base on ELU characteristics, ownership, threats, and restoration needs.
7. Conduct assessment of matrix blocks for wide ranging species and global climate change.