IIA. Introduction to Ecosystem Targets in the North Atlantic Coast Ecoregion

Coarse-filter and Fine-filter Targets

The conservation of biodiversity encompasses all aspects of the natural world from complete ecosystems with all their associated species, structural components and ecosystem functions down to a single rare species. This comprehensive approach to conservation is referred to as "coarse-filter / fine-filter" strategy. The coarse-filter targets are the ecosystems that characterize a region and define its landscapes. These targets not only implicitly conserve up to 99% of the species present in an ecoregion, but also maintain the larger ecological context and processes. "Fine-filter" targets are the relatively few species that will not be adequately conserved through the protection of ecosystem, but require individualized conservation attention.

Ecosystem Definitions

The classic definition of an ecosystem is an ecological community, together with its environment, functioning *as a unit*. On the ground an ecosystem is delineated by an area having a distinctive biota and characteristic physical setting. The term, however, does not imply any particular size or scale. Floodplain forests, salt marshes, kettle-hole bogs and dune and beach complexes are examples of moderately sized ecosystems. At smaller scales, ecologists recognize ecosystems such as rocky shores, sea level fens, coastal plain pondshores and rocky summits. These relatively discrete systems are associated with a discernable topographic setting, geologic situation or a dominant process and occur across the landscape in distinct *patches*. For this assessment we treated the *patch-forming ecosystems* using the standard Natural Heritage approach of defining "occurrences" based on the distinguishable boundaries of the feature. The analyses completed for these systems are discussed in the small scale ecosystem chapter. In contrast, a few ecosystem types dominate the natural land area forming a continuous background *matrix* surrounding the patch systems. We treated these *matrix-forming ecosystems* somewhat differently by defining boundaries using roads and fragmenting features or in the case of tidal wetlands, hand-delineated occurrences out of a continuous background with no inherent natural boundary. In the North Atlantic Coast ecoregion, matrix systems were primarily inland forest types, but large tidal wetlands had many matrix-like characteristics and we approached them in a similar way. The analyses completed for matrix forming systems are discussed in the large scale ecosystem chapter (however, the tidal wetlands are included in the small scale chapter).

Our approach to locating and selecting critical occurrences explicitly recognized this spatial hierarchy. For example, a large area dominated by pitch pine or oak forest (a matrix-forming system) may contain a network of bogs, swamps and/or barrens (large patch systems) and even smaller settings of cliffs, outcrops and/or pondshores (small patch systems). Similarly tidal wetland complexes contained smaller scale features such as tidal flats, salt marshes, and/or salt ponds as well as small patch examples of beach-dune systems and rocky shores. Patch-forming ecosystems are often richer in species diversity than the matrix-forming ecosystems that surround them and are often of high interest to conservationists as "special habitats." Regardless of scale, all ecosystems are still coarse-filter targets. They are composed of many individual species populations and conservation activity is best directed at maintaining the entire system.

For this assessment, it was the charge of the ecology team to identify the vegetation types, landscape features, geologic formations or natural process that formed distinct ecosystems. Toward this end a list of all potential ecosystems was compiled for the ecoregion based on natural community records from the state Natural Heritage programs and the U.S. National Vegetation Classification (NVC[1]) which is a hierarchical

[1] Grossman et al. 1998; Anderson et al. 1998; Maybury 1999. The NVC itself was developed from the classification work of state ecologists that has been reviewed and compiled into a single overarching framework. The framework is based on a modified version of the UNESCO world vegetation classification.

classifications organized by vegetation structure, composition and hydrologic regime. Natural Heritage community element occurrences (mapped locations) are named according to each state's classification so it was necessary to tag all of these records to the NVC system or similar scheme to enable assessment across state lines. Preliminary units for ecoregional targets were identified at the taxonomic scale of the NVC system with a list of corresponding *associations* defined by the full floristic composition of the unit. Descriptions of the species composition, the physical setting, the typical size range of an occurrence and its distribution in the ecoregion were available from NatureServe's classification and the first iteration of the NAC plan completed in 1999.

Ecosystem Models: Defining and Delineating the Ecosystem Targets

The NatureServe and Natural Heritage classifications supplied a vision and understanding of the types of ecosystems that occurred in the ecoregion. However these taxonomies were created primarily for the purpose of cataloging ground inventory data collected in the field. In order to comprehensively locate, identify and assess examples of every ecosystem type across the entire region we needed to develop new ecosystem mapping and modeling techniques consistent with the classification systems. For NAC we relied on a combination of physiographic modeling and existing wetland and shoreline coverages to represent the vegetation systems.

Data Sources and Mapping Conventions

The raw materials needed to comprehensively map and model ecosystem types now exist. Land cover was available at the 30 meter scale (National Land Cover Data (NLCD)) as were digital elevation models (DEM). Detailed wetland mapping has been done by many state programs as well as nationally by the National Wetlands Inventory (NWI; Cowardin et al. 1979). Only recently was the NWI dataset available in a continuous digital coverage across the region. Despite some inconsistencies in photo-interpretation consistency, accuracy and coding across state lines, the NWI provides the most detailed ecoregion-wide GIS based wetland data available. Other more detailed state wetland data cannot be used for ecoregion-wide analysis due to differences in scale and methods from state-to-state, however, this data will be useful to states as they move forward on further prioritization or site planning.

Detailed shoreline land cover was available for several states with marine rocky shore ecosystems (e.g., Maine Coastal Mapping project). Shoreline data was also compiled in part from the National Wetlands Inventory were it was mapped as Estuarine or Marine Intertidal Rocky Shore (E2RS, M2RS). Regionally, the Environmental Sensitivity Index (ESI) compiled from NOAA (ESI and Fedana et al. 2004) provided a more detailed picture of the exposure and stability of the shoreline and separated out those areas that were dominated by man-made features such as seawalls and reinforced boulder shores. Lastly, adjacency of a shoreline to a mapped Aquatic Bed (NWI code E1AB, E2AB, M1AB or M2AB) was evaluated.

Uniform maps of landforms and topological features were derived from 30 meter digital elevation models using methods described elsewhere for other ecoregions (Anderson 1999). We classified and mapped the landform coverage into 14 topographic settings (not all occur in the NAC ecoregion) that collectively covered 100% of the landscape:

- *Flat summit* — *Slope crest*
- *Upper slope* — *Cliffs and steep slopes*
- *NE facing side slope* — *SW facing side slopes*
- *NE facing bowls & ravines* — *SW facing bowls & ravines*

- *Gently sloping hills* *Dry flats and valley bottoms*
- *Wet flats and wetlands* *Slope bottom flats*
- *Lakes and ponds* *Rivers and streams*

Relationship between the mapped features and the classification

Relationships between the mapped/modeled units and the NVC/NatureServe community classification units were studied and made explicit through the overlay of over 5,000 ground inventory points for community types provided by the Natural Heritage programs. Some relationships were directly synonymous (e.g. rocky shore ecosystem = NatureServe Atlantic rocky coast system) others were more complex and we characterized them quantitatively. These relationships are discussed in the individual ecosystem sections.

After examining the relationship between the models and the Natural Heritage element occurrences we simplified the models and mapping units to encompass key settings that were highly correlated with, and logical surrogates for, patch-forming ecosystems in this ecoregion. The final set of mapped units included:

<u>Uplands</u>

Beach-dune ecosystems
Rocky shore ecosystems
Maritime woodland, heathland, grassland ecosystems
Cliff and steep slope ecosystems
Summit ecosystems
Bowl, ravine and cove ecosystems

<u>Wetlands</u>

Tidal wetlands
Freshwater forested wetlands
Freshwater open wetlands
Riparian and floodplain ecosystems

Other topographic settings, particularly side-slopes, gently sloping hills, dry flats and valley bottoms were associated with matrix-forming forest. Matrix forest was treated in a customized way described in the large scale ecosystem section of this plan. Some systems could not be modeled with the precision we required (e.g. coastal plain pond shores, salt ponds and heath barrens), and these were identified solely from the ground inventory data from Natural Heritage records and local knowledge.

Stratification across Gradients

To develop specific conservation goals for the patch-forming ecosystems, the models were stratified across a spectrum of biophysical settings encompassing the important ecological gradients identified for the ecoregion. To allow for this, consistent ecoregion-wide data layers were compiled for three physical factors (state and national data sets provided the data sources):

- Ecoregional subsections
- Bedrock and surficial geology
- Elevation zones (where relevant)

Geologic units were simplified from local taxonomies to single regionally uniform units. For instance all types of calcium-bearing rocks (limestone, dolomite, dolostone, marble etc) were mapped as "calcareous bedrock" and its presence coincided with fertile soils associated with certain rare species, ecosystem types, and agriculture. The compiled maps of each factor are presented in the map atlas section of this document.

Some systems were stratified only across geographic gradients (e.g. subsections) whereas bedrock dependent models such as summits and basin wetlands were stratified across substrate types and elevation zones. The stratification scheme used for each model is described in the corresponding ecosystem section. In all cases the decisions on stratification were guided by the distribution of the various natural communities across the ecoregion to insure that important biotic variation was captured by the ecosystem models.

Data on known ecosystems and communities locations were tagged to a standard classification before being overlaid on the modeled occurrences. This allowed for confirmation of fine-scale ecosystem types. Our objective was for each model to closely approximate a taxonomically defined ecosystem target. An ecosystem target was defined as an occurrence in a specific biophysical and geographic setting (Table 1).

We tried to minimize the inevitable confusion between classification and stratification. Classification was used to group the ecosystems into broadly similar types approximating the level of the NatureServe "Systems." We then used stratification to ensure coverage of finer-scale types approximating the NatureServe "Association" level.

A detailed example of how these relationships coincide is shown in Table 2. This example, although not from the North Atlantic Coast ecoregion, illustrates the basic principal – e.g. if you protect examples of cliffs across all elevations and all bedrock types you should, in theory, be covering all the various types of cliffs in the classification system. This is shown in the table by comparing the left half with the right half. For instance, in the first row a cliff at low elevation on acidic sedimentary rock is equivalent to the NatureServe System named "acidic cliff/talus" and to the NVC Association named "Sandstone dry cliff sparse vegetation." Ecoregional goal information is given in the middle columns.

We used this method of identifying examples of ecosystems types across geographic and ecologic gradients to cover all biophysical variants of the ecosystem. There was an unavoidable reduction in certainty but the confirmation of ecosystems with a ground inventory point from a community or a species occurrence gave us confidence in the approach. Further, several authors have argued that the biophysical approach may give better results given the dynamic nature of the region and the changes expected to result from shifts in climate and hydrology.

Table 1. Relationship between ecosystem models and their biophysical settings with NatureServe ecological system taxonomy and National Vegetation Classification associations in the North Atlantic Coast

Final Ecosystem Set	# Strati-fications	Ecological Systems (NatureServe)
Bowl, ravine, and cove ecosystems		Sugar Maple – Hardwoods Forest (rich)
Cliffs and steep slope ecosystems		Acidic Cliff & Talus Circumneutral Cliff & Talus
Rocky shore ecosystem		Atlantic Rocky Coast
Beach-Dune ecosystem		Beach-Dune ecosystem
Coastal Plain Pondshore		Coastal plain pondshore
Salt and Brackish marsh		Estuary Marsh Salt Marsh Brackish Marsh Salt pond
Freshwater open wetlands		Acidic Open Fen Alkaline Open Fen Sea level fen Wet meadow Kettlehole Fen Patterned Acid Fen Patterned Alkaline Fen Shoreline Marsh
Freshwater forested wetland		Acidic Swamp Circumneutral Swamp Enriched Seepage Forest Forested Fen
Matrix forest		Oak and Oak-hickory forest Pine – Oak and Pitch Pine forest White pine- hemlock forest Oak-Pine-Hemlock Forest Sugar Maple – Hardwoods Forest
Maritime woodlands, heathlands and grasslands		(no NVC system for maritime grassland and shrublands)
Riparian and floodplain ecosystems		Ice-Scour Rivershore Inland Rocky Shore Alluvial Grassland Temperate Floodplain
Summit ecosystems		Acidic Rocky Outcrop Circumneutral Rocky Outcrop Oak-Pine Woodland

Table 2. The relationship between the ecosystem model stratification and the NVC classification. Targets were identified as a landform model (column 1) stratified across elevation and bedrock (column 2 and 3). Columns 4-7 provide information on the number of occurrences in the ecoregion, the conservation goal set and the total selected for the portfolio. Columns 5-6 show the equivalent ecological system type and corresponding association(s). This example is from the Northern Appalachian Ecoregion.

Cliff, Talus and Steepslope Ecosystems

LAND FORM	ELEV.	BEDROCK	Total in Region	% in Region	Goal	Total Selected	Nature serve System	NVC association: most likely type or types
Cliff and Steep slopes	0-800’	Sedimentary	424	10%	37	100	Acidic cliff/talus	Sandstone Dry Cliff Sparse Vegetation
		Granites	223	5%	19	41		Q. rubra – B. alleghaniensis / P. virginianum Woodland
		Mod Calc/ Mafic	168	4%	14	12		Igneous - Metamorphic Northern Dry Cliff Sparse Vegetation
		Calcareous	27	1%	2	14	Calcareous cliff/talus	Thuja occidentalis Cliff Woodland
	800-2500’	Sedimentary	1399	32%	121	268	Acidic cliff/talus	Sandstone Dry Cliff Sparse Vegetation
		Granites	717	16%	62	78		Granite - Metamorphic Talus Northern Sparse Vegetation
		Ultramafic	9	0%	2	4		Serpentine Cliff Sparse Vegetation?
		Mod Calc/ Mafic	428	10%	37	98		Igneous - Metamorphic Northern Dry Cliff Sparse Vegetation
		Calcareous	96	2%	8	32	Calcareous cliff/talus	Limestone - Dolostone Midwest Dry Cliff Sparse Vegetation
	2500-4000’	Sedimentary	255	6%	22	46	Acidic cliff/talus	Sandstone Dry (or Moist) Cliff Sparse Vegetation
		Granites	376	9%	32	67		B. papyrifera – P. glauca / A. spicatum/ P. virginianum Talus
		Ultramafic	24	1%	2	17		Serpentine Cliff Sparse Vegetation?
		Mod Calc/ Mafic	244	6%	21	39		Igneous - Metamorphic Northern Dry Cliff Sparse Vegetation
	4000+	Sedimentary	11	0%	1	8	Alpine cliff	Lichen Fellfield Sparse Vegetation
		Granites	1	0%	1	1		Lichen Fellfield Sparse Vegetation
		Mod Calc/ Mafic	5	0%	2	4		Lichen Fellfield Sparse Vegetation
			4407	100%	380	829		

Stratification | **Classification**

After developing a map of ecosystems, individual examples of each ecosystem type were converted to discrete polygons or "modeled occurrences" using GIS region-group techniques allowing for assessment of each target across the ecoregion. Subsequently 100 to 100,000 examples of each described ecosystem were located and extensive information was assembled for each example relative to condition, landscape context and verification by other data sources (e.g. Natural Heritage element occurrences) (Table 3). Each modeled occurrence was individually screened as to its potential contribution towards conserving biodiversity using methods described below. The best examples were selected for the portfolio using representation goals to ensure that the selected examples were located across a spectrum of environmental settings.

Table 3: Example of a data compiled for one modeled occurrence of a coastal beach-dune system

Wetland id#	Beach 433	**In Matrix Block?**	No
Target type	Beach – dune on coarse sediments	**In Coastal Unfragmented block**	No
Size in Acres	5,910	**# of Dams**	0
Size class	4 (Largest)	**Housing density pressure**	0.0012
State or Province	MA	**Land cover index**	11
Subregion	Cape Cod Coastal Lowlands & Islands	**% in GAP 1 or 2**	83
Adjacency	Adj. to Herring river	**% in GAP 3**	0
Geology	Coarse sediments	**Distance to road: min**	76
% Deciduous	NA	**Distance to road: mean**	76
% Conifer or Mixed	NA	**Nearest road class**	Water body
% Swamp	NA	**Site name**	Cape Cod seashore
% Emergent	NA	**EO communities**	Maritime Dune and other communities
Elevation Zone	Very low 20'-800'	**EO species**	45 breeding species occurrences – plants, birds, reptiles, inverts.
Aquatic targets	None listed	**EO rank**	Various A-C

During the screening process described below, quantitative methods were used to maximize the stacking of fine-scale targets within larger scale targets, but the co-occurrence of targets was not a requirement for inclusion in the portfolio. A key tenet of this effort was to maximize the utility of our data products to others by providing a comprehensive, transparent and objective analysis of the biodiversity targets in the ecoregion. We expect that other organizations will access the data, study the analysis and draw their own conclusions.

Identifying Critical Examples: Screening Occurrences and Determining Their Relative Importance

Is it possible to permanently conserve all the biodiversity of an ecoregion using only a small proportion of the landscape? The answer to this question has not been scientifically established. While The Nature Conservancy, and many of its partners, recognizes the futility of trying to protect every acre of land or body of water, current research offers convincing evidence that certain places, and particular occurrences of key features, play a more important role in maintaining regional biodiversity than other places and features. Thus the question driving this analysis was - *which sites are the most critical to protect to insure the conservation of all biodiversity across the ecoregion*?

The influence of a particular ecosystem example on maintaining regional biodiversity may be due to its being particularly complete with respect to its component species or the occurrence may serve as source habitat for characteristic species and thus play a pivotal role in exporting individuals to the larger landscape. Ecologically complete occurrences contain all necessary parts of the ecosystem such as a full complement of associated species, key structural components and functioning processes that maintain dynamics.

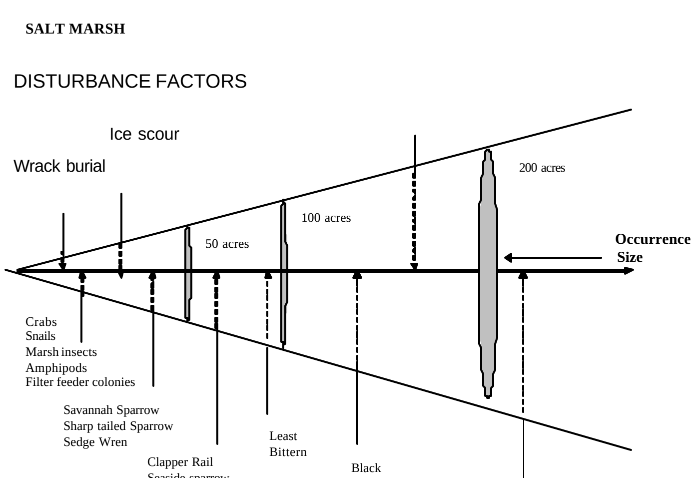
High quality examples contain habitat, in which the component species thrive because the habitat provides adequate resources, minimizes mortality and facilitates reproduction. Source areas consistently produce surplus individuals (juveniles or propagules) that emigrate to the larger landscape. The antithesis of source habitat, sink areas, are habitat patches where species subsist but are not reproducing or where mortality rates are very high. Populations in sink areas may persist over time, but they are generally subsidized from the source habitats. High quality habitat may also serve as refugia or strongholds of rare or uncommon species that have already disappeared from much of the surrounding.

We established and applied **screening criteria** to every ecosystem example to determine if it was likely to be a **critical** occurrence and qualify for the portfolio. Those that did not meet the criteria were classified as **supporting** occurrences – important but not crucial to the conservation of biodiversity in the ecoregion. The criteria we used to separate the critical occurrences from the supporting ones were:

- Size of the occurrence.
- Landscape context surrounding the occurrence.
- Condition of the occurrence.

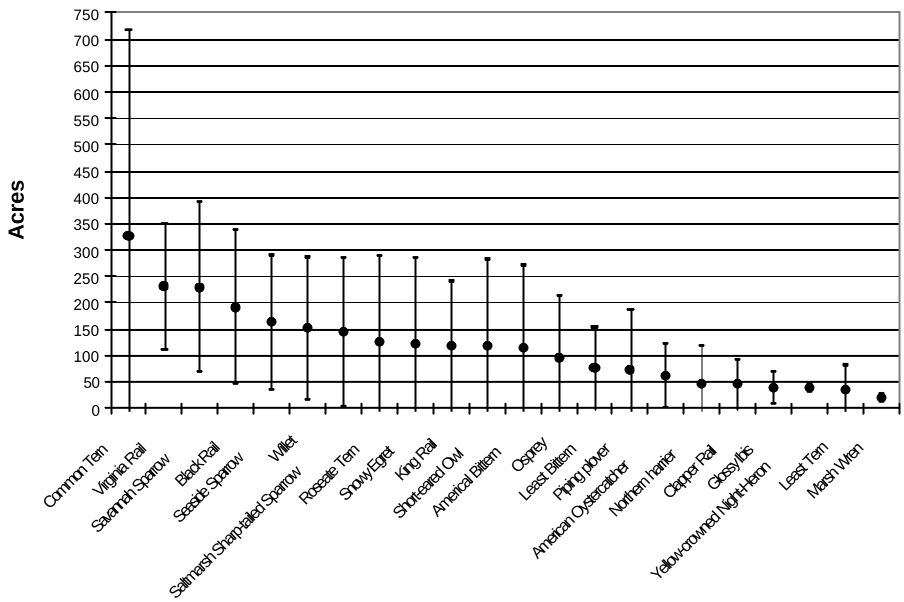
Criterion 1. Size of the occurrence: Acreage thresholds for ecosystems were based on the minimum dynamic area needed for a modeled occurrence to absorb and recover from typical disturbances. Additionally we used the minimum area requirements of associated species and the average territory size of breeding species associated with the ecosystem. The latter allowed us to estimate whether a given species would likely be present and whether there was physical space for at least 25 breeding territories to allow the population to persist (Figures 1 and 2). Details on this approach may be found in Anderson (1999).

Figure 1. Minimum dynamic area and breeding territory sizes for North Atlantic Coast salt marshes.



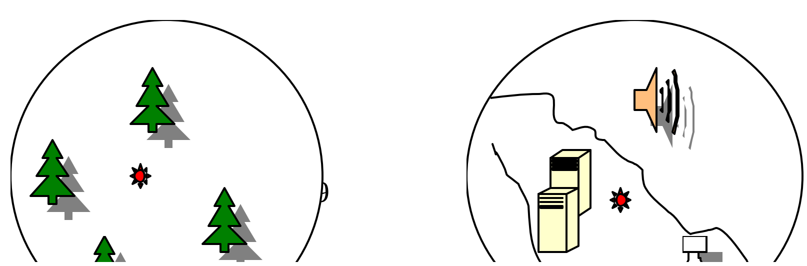
Using ground survey information provided by the Natural Heritage programs we assembled evidence on the relationship between occurrence size and species presence by calculating the average size of an ecosystem occurrence in which a particular species, or group of species had been found (Figure 2).

Figure 2. The average size and size range of salt marshes where confirmed occurrences of characteristic species were found. Data is from Natural Heritage programs, restricted to species with five or more occurrences. Note that this table represents presence at sites rather than species area requirements.



Criterion 2. Landscape context: This measure refers to the relative amount of development, agriculture, quarries, roads or other fragmenting features within an area directly surrounding a specific modeled ecosystem occurrence. It provided an estimate of the isolation of the occurrence as well estimates of future encroachments on the occurrence. To assess landscape context we developed a landscape context index (LCI) based on these features within a one kilometer radius surrounding the occurrence (Figure 3). Base data layers included roads, high intensity developed lands, low intensity developed lands, agriculture, quarries and natural cover.

Figure3. Schematic of Land Cover Index (LCI). An LCI below 20 indicated that the occurrence was surrounded primarily by natural cover. Higher LCIs indicated increasing amounts of roads, development and agriculture, Occurrences with LCIs above 50 were usually rejected as critical occurrences.



Criterion 3. Condition: This measure refers to the internal state of the modeled occurrence. Had the example been ditched, dredged, mined, clear-cut, or otherwise degraded? Was it overrun with exotic pest species? We evaluated condition by requiring that every selected modeled occurrence be corroborated by an independent source such as a Natural Heritage ground inventory point. Other acceptable evidence was if the modeled occurrence was coincidence with a described Audubon or Fish and Game important bird area or if it received expert confirmation by a recognized authority. For this verification we are greatly in debt to the Natural Heritage programs who contributed over 8,000 ground inventory points.

Our screening process filtered out many examples that may be capable of persisting through time, particularly if augmented by management, but our intent was to identify the most crucial examples of each target necessary to protect to maintain biodiversity across the ecoregion. Selected examples were judged to be extremely significant and vital to the resolution of the biodiversity crisis in this region. To avoid confusion *we opted NOT to use the term **viable**, in reference to these examples instead referring to them as **qualifying** and to those selected for the portfolio as **critical** occurrences.*

Setting Numeric Goals

Minimum numeric and distribution goals were set for each target based on the factors of representation and replication. Goals were used primarily to identify and measure gaps in portfolio sufficiency, however the numeric goal also represents the smallest number of examples we think are needed to represent the target across all important gradients with a minimal degree of redundancy. Minimum acreage goals were calculated by multiplying the numeric goals times the minimum size criteria. For instance, if ecosystem "A" had a goal of 100 examples and if each example had to be at least 50 acres than the minimum area needed is 5,000 acres.

Replication and Redundancy: The objective of the replication goal was to minimize the risk of a given target disappearing by insuring that we had more than one example in the portfolio. Like back-up engines on an airplane, reliability theory suggests that many moderate quality/small examples might have the same probability of persisting over a century as fewer high quality/large examples. Thus we adjusted the numeric goal according to the scale of the target. For matrix forest blocks, which are huge in size, we required only 2 or 3 replicates whereas small features like cliffs needed 20 to 30 replicates.

Replication for Patch forming ecosystems: Global range and distribution pattern: To assess and highlight the importance of a particular ecosystem with respect to this ecoregion, each type was tagged with one of four range-wide distribution categories — Restricted, Limited, Widespread, Peripheral — all measured relative to the ecoregion. The ecology technical teams accomplished this by using global distribution estimates available from the state Heritage Programs, NatureServe and other sources available at the Eastern Conservation Science center. The definitions listed below were treated as approximations allowing for a certain amount of acceptable error. Determining and clarifying the true range-wide distribution of each community type is a long-term goal of the classification authors.

Restricted/Endemic: Occurs primarily in this ecoregion; it is either entirely endemic to the ecoregion or generally has more than 90% of its range within the ecoregion.
Limited: Occurs in the ecoregion of interest, but also within a few other adjacent ecoregions (i.e., its core range is in one or two ecoregions, yet it may be found in several other ecoregions).
Widespread: Is distributed widely in several to many ecoregions and is distributed relatively equally among those ecoregions in which it occurs. An ecosystem that is widespread is not necessarily "common" in the ecoregion.
Peripheral: The ecosystem is more commonly found in other ecoregions (generally less than 10% of its total distribution is in the ecoregion of interest). The distribution in the ecoregion of interest is continuous with that in adjacent ecoregions. *Disjunct* ecosystems were considered a special case, where the occurrence of the ecosystem in the ecoregion was disjunct from its core distribution outside the ecoregion.

We incorporated this information into a set of general guidelines shown in table 4.

Table 4. Guidelines for setting goals for patch-forming ecosystems. In this table a large patch ecosystem that was restricted to the ecoregion had a numeric goal of 15 viable examples distributed across the major subregions of the ecoregion.

PATCH–FORMING ECOSYSTEMS	LARGE PATCH Stratification goal in parentheses	SMALL PATCH Stratification goal in parentheses
Restricted/Endemic	15 (high)	20 (high)
Limited	10 (medium)	15 (medium)
Widespread	5	5
Peripheral	5*	5*

*****Objectives modified on a case by case basis.

Representation: The objective of the representation goal was to insure that we captured all the compositional variability inherent in the ecosystem. Some systems vary in their species composition across elevation zones, bedrock types, climatic regions and soil moisture levels. Our solution was to protect a set of examples selected from across the various gradients using the customized stratification schemes described in the ecosystem sections. This is captured in the stratification goals that may be high for ecosystems restricted to the ecoregion or for those with high compositional variability.

Portfolio Status: Definitions and Codes

Every occurrence of each ecosystem was assigned a final portfolio status and given a portfolio code based on the definitions given below. Only those examples termed "critical occurrences" were considered to be included in the portfolio and only those examples were used to calculate progress towards ecoregional goals.

1) Critical occurrence: a modeled occurrence crucial to the conservation of biodiversity in the ecoregion. The occurrence met all screening criteria for size, landscape quality, and verification. Critical occurrences are the only type counted towards meeting portfolio goals.

2) Candidate occurrence: a modeled occurrence that met the size and landscape context criteria, but was not corroborated or verified by an expert or ground inventory point. These occurrences were not considered part of the portfolio or used to meet goals. They are a priority for further inventory work to verify their condition and importance.

3) Supporting occurrence: a modeled occurrence that is below the screening criteria for size or landscape context or has poor condition as verified by a third party. These occurrences are not considered part of the portfolio although they may contribute towards biodiversity in the ecoregion.

Technical Definitions

YES – in the portfolio
Critical = Larger than the size criteria, below LCI 20 (30 for coastal features) and confirmed by a ground inventory point. Candidate and provisional candidate modeled occurrences that had their significance corroborated and verified with appropriate ground inventory information (EO point) or expert knowledge.
NO – not in the portfolio, but tracked in this assessment and status could change in the future
Candidate = Larger than the size criteria and below LCI 20 (30 for coastal).
Provisional Candidate= Larger than the size criteria and above 20 but below 50 LCI.
Supporting = Smaller than the size criteria and any LCI or any size but greater than 50 LCI.
Protected = Term applied if 50% or greater of the occurrence area was found on land with a GAP status 1 or 2.

Identifying the critical occurrences was a relatively straightforward process except for those occurrences in the grey area where borderline occurrences were sorted through on a case-by-case basis with more subjectivity than at the two ends Adjustments to the final selection of modeled occurrences were made via expert caveats based on knowledge of the site. Expert opinion generally overrode the assigned category and this came into play for approximately 5-10% of the selected critical modeled occurrences.