An Ecoregional Vision for the Berkshire Taconic Landscape ***1/18/2003***

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This document represents the fresh development of a site-based vision for the Berkshire Taconic Landscape and the necessary conditions for achieving the desired status. It is intended to form part of a comprehensive vision for the entire Massachusetts portfolio: one that helps focus resources, prioritize actions, and coordinate efforts where needed to greatest effect. It was inspired by a divisional effort to set priorities for our work and define clear expectations for return on investment of resources. It also presumes that once a vision is clearly articulated, working backward from the desired status can identify appropriate strategies with review and consultation with peers and partners.

Vision:

- We envision a landscape capable of absorbing even significant shifts in climate or development pressure without losing its overall ecological integrity. Key ecological factors will maintain their function to sustain the critical elements of biodiversity within BTL at appropriate scales.
- There will be no net decline in conservation value of the critical elements of biological significance in this landscape. The portfolio will be secure, and those targets of highest biodiversity value will maintain their viability and improve their overall condition.
- The Taconic Plateau forest will remain intact and have sufficient size and condition to continue to serve its critical ecological functions as healthy matrix and as watershed buffer.
- The seepage wetland complexes will sustain a broad mix of natural community types and successional stages supporting viable occurrences of ecoregionally important targets.
- The critical aquatic systems, floodplains, hydrologic linkages and drainages that sustain BTL as a functional landscape will steadily improve in quality both within the program area and throughout their larger watersheds.
- The BTL program area will anchor a chain of ecologically significant conservation areas within the divisional Taconic Ridge Landscape Conservation Area (LCA #6) which together will constitute a functional network of landscapes.
- The human communities of this landscape will value their shared ecological heritage, making choices and taking actions that enhance its long-term conservation as their legacy for generations to come. Sustainable rural communities and biodiversity conservation will be the driving objectives of regional planning, development and conservation within this region.

Justification: Conservation by Design provides the overall filter of ecoregional planning to determine the portfolio of sites in LNE/NP where the Nature Conservancy takes a conservation interest. How the ecoregional portfolio is conserved, in what sequence and through whose efforts, is not made specific during ecoregional planning. The Nature Conservancy uses the Conservation Area Planning (CAP) to assess the needs of discreet conservation targets in a given area and to identify strategies for threat reduction.

This visioning exercise is not a replacement for CAP, but instead a refinement of that planning process. It allows the Massachusetts chapter to set priorities based on the importance of a site and its target occurrences to the entire ecoregional portfolio (biodiversity value), and to evaluate

strategies based on urgency, feasibility and leverage. Together, these four factors constitute measures of return of investment of resources.

Working back to develop strategies also places actions in sequence. Long-term restoration efforts therefore receive appropriate and timely attention when it is possible to make an impact, rather than viewing prioritization as a sort of triage that would pursue conservation of those things we might successfully accomplish in the short term at the expense of those that will require more time and effort.

Scope and Methodology:

We used our broad vision to articulate strategies that will maintain key ecological factors and achieve the desired status for its ecoregional targets. Working back from the vision forces us to evaluate the state of the ecoregional portfolio targets occurring within BTL, place them in biological and social context, and determine the sequencing of actions and strategies to reach their desired status. Conservation by Design provides for both single-site and multi-site strategies, and it is presumed that where similar results are needed within BTL or across the Commonwealth, MAFO will develop chapter-wide strategies for maximum efficiency and scale of effort.

We accept a prioritization process based on biodiversity value, urgency, feasibility and leverage. These were weighted as 35%, 25%, 20% and 20% respectively of the total score for overall importance of conservation action.

For the purposes of this exercise, <u>biodiversity value</u> is a measure of viability and irreplacability.

- Viability is determined based on CAP criteria (size, condition, landscape context), EO rank where known, best available information on minimum viability criteria and restoration potential, and local knowledge of the target occurrence.

- Irreplacability is largely determined using analysis of data generated during ecoregional planning, and includes global rarity, ecoregional distribution by subsection, and contribution of the occurrence to the overall portfolio for this target.

<u>Urgency</u> is a measure of threat status and the timeliness of action required to abate the threat.

- The CAP assessment of the greatest stresses and sources of stress determine Threat status. Across this program area, the five greatest sources of stress to our ecoregional targets are

    1. invasive species, including introduced pests and pathogens
    2. habitat destruction and fragmentation
    3. nutrient loading in calcareous wetlands
    4. altered successional regimes
    5. altered hydrology

- Timeliness reflects the sequence and intensity of actions and their potential contribution toward the desired status of the target as measures of threat abatement.

Feasibility is a measure of the irreversibility of the threat, the amount of time, effort and resources needed to implement a strategy, and its anticipated likelihood of success.

- Irreversibility reflects the restoration potential of the target and the degree to which the known threats compromise the ability of the target to reach desired status at this site.

- The amount of time, effort and resources needed may be modified by the scale at which the strategy needs to be applied, the degree of difficulty that needs to be overcome, and the opportunities for leverage.

- Likelihood of success concerns the degree to which threat abatement strategies are expected to make an impact in time to reverse the decline of target viability.

We define leverage at its most basic level as a greater ratio of product over the amount of resources required to produce it. Sometimes measured in terms of partner resources applied to TNC priorities, and therefore of lower costs to our organization, leverage has other values. A key indicator of a leveraged strategy is one that identifies and utilizes the best placement of the fulcrum to produce the greatest degree of lift. Leverage also includes the multi-site impacts of a given strategy.

Biological Value within BTL

The Berkshire Taconic Landscape (BTL) is blessed with one of the highest concentrations of biologically significant species and natural communities in the Lower New England / Northern Piedmont ecoregion (LNE/NP). Spanning 155,000 acres across portions of Massachusetts, Connecticut and New York, BTL contains a remarkable 7% of the terrestrial portfolio of this ecoregion for targets occurring below coarse-scale. The Taconic Plateau, a core forested area of 36,000 acres, provides essential ground and surface water linkages to a surrounding mosaic of calcareous wetlands and important lowland forests, while also serving as a coarse filter or matrix to capture the habitat requirements of a full array of southern New England forest species.

BTL lies at the ecotone between Northern and Central Hardwood Forests, and encompasses portions of three ecoregional subregions (Western NE Coastal Hills and Plains 221AE; Taconic Mountains M212CB; and Taconic Foothills 221BB). Over time, though the cycles of natural succession or due to external factors such as global climate change, the composition and location of species and community types within this landscape are expected to shift and change within a sustaining matrix of wetland complexes and forested uplands. Maintaining ecological integrity will require active protection and management of this integrated matrix, along with strategic intervention to control for the effects of the greatest threats to this landscape and its viable target elements.

We gathered data from all three TNC operating units and heritage programs to determine ecoregional targets occurring within BTL with portfolio designations of Y or M. We were

compelled to crosswalk the various community classifications used in each state to corresponding TNC classifications in current usage. This process highlighted numerous flaws in the LNE/NP ecoregional plan and gaps in the database, particularly in relation to the goals set and occurrences identified for target community types. Wherever possible, we identified the correct goal and occurrence numbers and distribution by ecoregional subregion for each target community found within BTL.

According to this analysis, BTL's portion of the current LNE/NP ecoregional portfolio contains one highly ranked matrix forest block (Mt. Everett / Mt. Riga), 5 species targets and 10 broadly defined community type targets (totalling 14 natural communities). Within BTL are 74 target occurrences at 51 ecoregionally-identified sites. In addition, 5 aquatic targets of ecoregional significance have been identified within the program area and more are anticipated in the coming months as new aquatic data is incorporated into the LNE/NP ecoregional plan.

Table 1 : LNE/NP Ecoregional targets recognized within BTL

Target Name (matrix, community or species)
Matrix Forest Block (Mt. Everett / Mt. Riga)
Acidic Talus Slope / Woodland
Acidic Rocky Summit / Outcrop
Calcareous Forest / Woodland
Limestone Outcrop
Black Spruce / Sheep Laurel Swamp
Poor Fen
Medium Fen
Sedge Meadow
SNE Calcareous Basin Fen
SNE Calcareous Sloping Fen
Rich Shrub Fen
Red Maple / Black Ash Calcareous Seepage Swamp
SNE Small River Floodplain Forest
Transitional Floodplain Forest
Highly Alkaline Lake / Pond
Bog Turtle
Timber Rattlesnake
Piedmont Groundwater Amphipod
Schweinitz's Sedge
Ogden's Pondweed

Analysis by this Program of the status of these ecoregional targets both within the full portfolio and across BTL reveals that several wetland community types have the greatest total biological value based on viability and irreplacability.

- The calcareous wetland complexes of BTL contain sloping fens, seepage swamps and a sedge meadow that together constitute what we believe to be the Program's greatest overall contribution to the goals of the LNE/NP portfolio.
- Ranked slightly below these targets is the matrix forest block, which provides the landscape context for 22 portfolio target occurrences, several small patch communities (Transitional Floodplain Forest, other types of fen or bog), and three species targets (Bog turtle, Schweinitz's sedge, and Ogden's pondweed).

Urgency of Action:

We ranked urgency of action to conserve these targets by overall threat status and timeliness of action.

- Those targets with the greatest urgency values were basin fen; sedge meadow; medium fen; transitional floodplain forest; acidic talus slope woodland; highly alkaline lake/ pond; Ogden's pondweed; Schweinitz's sedge; and piedmont groundwater amphipod. Two of these targets (piedmont groundwater amphipod and basin fen) received high urgency ranking because their portfolio status within BTL is in doubt and the action required is a timely reevaluation or inventory.
- The other very high urgency targets have very few occurrences within BTL and these are often poorly protected or managed.
- Targets at moderate to high urgency include the matrix block; calcareous forest or woodland; calcareous seepage swamp; calcareous sloping fen; rich shrub fen; timber rattlesnake; and bog turtle.

Table 2: The five greatest threats to achieving the desired status of BTL targets

1.	invasive species, including introduced pests and pathogens
2.	habitat destruction and fragmentation
3.	nutrient loading in calcareous wetlands
4.	altered successional regimes
5.	altered hydrology

The most urgent threats to the ecoregional targets within BTL are mainly those that affect target condition. Habitat destruction and fragmentation is a real concern in some portions of the program area but not for all targets. Invasive species, however, affect the condition and viability of targets across BTL. Small patch targets also are impacted by size, and restoration may have an enhanced role in achieving viability for these communities.

Table 3: The greatest social challenges to overcoming greatest threats

1.	building support and taking effective action at scales that transcend geo-political boundaries at county, state and region levels.
2.	transforming institutional and community relationships, changing perspectives of key partners and local decision-makers to leverage conservation action at appropriate scales to achieve the conservation vision.

3.	transcending barriers to regional planning modeled on sustainable rural communities and biodiversity conservation.

Feasibility and Leverage of Potential Strategies:

The actions needed to address these challenges and to achieve our vision are wide-ranging and occur at multiple spatial and time scales. They include securing core habitat, ensuring biodiversity management, influencing both public and private decision-making, and ultimately broadening the constituency for conservation action toward these ends.

We assessed the total feasibility of potential strategies to achieve the vision based on the irreversibility of the threats, the resources required and the likelihood of success (necessarily a more subjective judgement where strategies are new or more time is needed to demonstrate significant results). Strategies addressing threats at finer scales tended to rank higher in terms of overall feasibility, but are intended to be part of an overall strategic approach that integrates action at multiple scales. Strategies that could be completed in shorter timeframes likewise ranked higher.

At 20% of the overall score, total feasibility in our ranking is balanced by biological value (35%), urgency (25%) and leverage (20%). We combined the totals for feasibility and leverage, considering leverage worth evaluating on its own but recognizing that it can significantly modify and enhance the feasibility of a strategy.

In broad terms, the highest priority strategies were those that addressed the most urgent threats to the elements of highest biological value, wherever possible at multiple scales and leveraging resources. For each of the elements of the vision statement, we suggest integrated strategies with actions required at less than 1 year, between 1-2 years, at 5 years, and at 10 or greater year timeframes.

Priority Strategies with Timetables to Achieve the Vision

"We envision a landscape capable of absorbing even significant shifts in climate or development pressure without losing its overall ecological integrity. Key ecological factors will maintain their function to sustain the critical elements of biodiversity within BTL at appropriate scales."

This part of the vision relates to the factors or processes that make BTL a functional landscape, and to those that may connect this landscape to others in a functional network. It refers primarily to what maintains the matrix-forming systems that sustain our targets, but can also be considered at finer scales.

Some of the key ecological factors are fixed and unlikely to change significantly over long periods (Geology, Topography, Geomorphology). The following table shows potential impacts to key ecological factors from the greatest threats and gives timeframes in which these impacts will likely be felt. This Program does not at this time have a clearly defined strategy to address the threats to all of these key ecological factors, but some have greater urgency than others do.

Table 4: Threat Status of Key Ecological Factors within BTL

Key Ecological Factor	.>10 years	10-50 years	50-100 years	100< years
Hydrologic regimes	Development affecting seepage wetlands, aquatics	Nutrient impacts degrading key wetland target communities	Climate Change impacting precipitation, aquifers	Climate change impacting water temperature, loss of aquatic connectivity
Disturbance	Beavers flooding at unsustainable Levels in some wetland types	Loss of early successional wetland types	decline in composition and structure of forest types	Climate Change increasing storm frequency and intensity
Soil / Vegetation complex	Invasives outcompeting natives	Invasives changing community types	Climate and invasives changing community types	Climate and invasives changing matrix composition
Size	Decline in wetland complex connectivity, core habitat, loss of potential restoration land to development	Decline in edge to area of matrix forest, loss of small patch sites, build out of most local communities	Increasing pressure to convert open space for municipal development	Increasing pressure to drain wetlands to address climate enhanced , insect caused diseases
Characteristic, Keystone Species	Loss of Ogden's pondweed, Schweinitz' sedge,	Loss of bog turtle, timber rattlesnake, piedmont groundwater amphipod, eastern hemlock, American elm	Loss of neotropical migrants, native pollinators, decline in oak forest, fire adapted pitch pine ridgetops	Loss of native trout, coldwater stream species, amphibians, sugar maple, aspen, yellow birch
Natural Community Structure	Invasive species, nutrients altering seepage wetland types	Pests and pathogens and invasive species affecting forest types	Climate change, pests and pathogens and invasive species dominating community types	Climate change, pests and pathogens and invasive species eliminating community types
Succession	Decline in early successional wetland types and some associated species due to altered succession.	Loss of early successional wetland types, decline in some forest types due to altered succession, loss of key species	Potential for stand replacing wildfire in matrix forest with conditions that eliminate fire sensitive communities	Potential for stand replacing high wind event affecting ¼ of matrix forest area with associated impacts.

Geology, Topography, Geomorphology	Only changes anticipated due to gravel extraction near key seepage wetlands	Only additional changes anticipated affect former hemlock ravines and north facing slopes devoid of this species, including erosion	Some alteration of floodplain topography due to changes in precipitation, impervious surface development	Some alteration of floodplain topography due to increase in storm intensity

"There will be no net decline in conservation value of the critical elements of biological significance in this landscape. The portfolio will be secure, and those targets of highest biodiversity value will maintain their viability and improve their overall condition."

The best strategy to achieve this part of the vision is to prioritize actions that have the greatest biodiversity impact. These include:

- Use the portfolio assessment that informs this planning process to guide protection, ecological management and restoration for the Program.
- Reassess and inventory those targets whose status is in doubt (basin fen, piedmont groundwater amphipod) , and incorporate the results of research occurring since the first iteration of the LNE/NP plan in 1999 (BTL hardwater lake survey, lowland matrix survey, LNE/NP aquatic data, NYS fen and bog turtle surveys, known portfolio oversights).
- Prioritize land protection strategies towards unprotected core habitat with high urgency and biodiversity value (sedge meadow; floodplain forest; acidic talus slope woodland; sloping fen seepage swamp), restoration strategies with multi-site applicability (joint TNC / DFW restoration crew using federal funding; Weed It Now), and outreach toward changes in land use, best management practices, biodiversity management, and regional planning.

"The Taconic Plateau forest will remain intact and have sufficient size and condition to continue to serve its critical ecological functions as healthy matrix and as watershed buffer."

Although the forest core of the Taconic Plateau (Mt. Everett/ Mt. Riga block) is both literally and figuratively central to landscape function within BTL, an assessment of the threats it faces over the next decade suggests that the matrix forest is not at high risk of widespread degradation or destruction during that time frame. It should maintain its size, general condition and landscape context during the next decade provided that two key strategies now in place continue: Weed It Now to control invasive species across 9,000 forested acres, and the strategic protection of large forest parcels to create a 23,000 acre core conservation area within the larger forest. Pests and pathogens, cumulative development pressure, integrated biodiversity management of public lands and climate change are issues that will require near term actions to produce longer term results.

- Land Protection (in fee or easement) of key parcels within the core forest conservation area and as buffer to target occurrences where appropriate. Significant parcels include Camp Hi-Rock, Northrop Camp, Camp Sloan, Ney, Van Deusen, Hunt Club (Hallig); Liebeskind;

Masters; Mt.Riga Corporation; Sabin, Perry; Pickert; Chapnick, McMennamin. Some of these projects will take longer to conclude than others, but all should be active projects.

- Leveraged partnerships that strengthen the management of lands in both public and private ownership at intermediate or coarse scales. Examples include Weed It Now, Taconic Plateau Alliance, regional Rattlesnake Council.

"The seepage wetland complexes will sustain a broad mix of natural community types and successional stages supporting viable occurrences of ecoregionally important targets."

Over half of the terrestrial target occurrences within BTL are at high or very high risk of widespread degradation or destruction in the next ten years. Those that are considered highly irreplaceable and viable with appropriate management should have priority emphasis for conservation. In cases where targets have multiple occurrences within BTL, consideration will be given to the most viable examples or those with the greatest restoration potential.

While it is tempting to include all examples of a target that is under-represented in the portfolio or has particular rarity, it is not always the case that every example will be a conservation priority. Among the LNE/NP targets represented within BTL, only the timber rattlesnake and bog turtle have the desired number of occurrences region-wide that are specified by the ecoregional plan, and some of these are very marginal populations with questionable viability.

The calcareous seepage wetland complexes of BTL (Dutchess Sedge Meadows; Northern Oblong; Drowned Lands; Karner Brook; Willard Brook; Schenob Brook; Moore Brook; Bauer/Beeslick) contain nearly 2/3 of the terrestrial ecoregional portfolio targets within this landscape. Most of these species and community types are regionally rare and of high biodiversity value.

- Protection and restoration plans should focus on those wetland complexes where there is the greatest biodiversity value, urgency, and feasibility. These are Dutchess Sedge Meadows and Schenob Brook.
- Single site restoration plans, leveraging state and / or federal resources and partnerships, should be prioritized at Bauer Woods and Jug End Wetlands.
- Drowned Lands and Moore Brook should be partner lead sites (Columbia Land Conservancy and Salisbury Association), and the most urgent priority here should be to actively engage with and build partner capacity to secure these systems.
- While an excellent example of its kind, the calcareous seepage swamp at Willard Brook does not provide the same level of conservation value as these other sites and should be considered an alternate calcareous wetland complex in terms of prioritization.

"The critical aquatic systems, floodplains, hydrologic linkages and drainages that sustain BTL as a functional landscape will steadily improve in quality both within the program area and throughout their larger watersheds."

BTL includes four class 2 rivers or streams as well as a portion of the main stem of the Housatonic River (portfolio status unresolved). It also includes one selected example of highly alkaline lake (Twin Lakes), although the program did an extensive inventory of this aquatic

target and determined that there are more sites that should be included. Critical strategies include:

- Integrating and rolling up new data to enhance our understanding of the ecoregional priorities for aquatic conservation within BTL.
- Planning to remove in the next two years the dam at our Mt. Plantain Preserve as an opportunity to develop the Chapter's ability to negotiate the design, permitting and execution of dam removal projects at other, higher priority dams across the Commonwealth not currently in TNC ownership.
- Fostering relationships with Lake Associations at Twin Lakes and Indian Lake that will further their biodiversity health and conservation.
- Lobby to improve the regulations governing alteration of wetlands in NY state and closing some of the more glaring loopholes in existing law (currently, wetlands under 12.4 acres in size are except from protection unless a local ordinance lowers the acreage threshold).
- Link with the divisional freshwater initiative on issues relating to the main stem of the Housatonic and issues of hydrologic policy.

The BTL program area will anchor a chain of ecologically significant conservation areas within the divisional Taconic Ridge Landscape Conservation Area (LCA #6) which together will constitute a functional network of landscapes.

BTL is the standout site within LCA #6. The program should devote 15% of its annual resources to issues relating to the larger LCA in which it occurs. We will lead the delegation in the upcoming divisional forest conservation program's forest effroymson process for the Taconic Ridge, and use our broader connections to look at the long-term forest health and viability issues of greatest regional importance to this landscape (climate change, pests and pathogens, sprawl, invasive species).

BTL staff will continue to lead on invasive species prevention, control and eradication, including participation as a focal landscape in the Eastern Invasive Species Conference, as the Chapter's representative on the Massachusetts Invasive Plant Council, and in support of Project Native and integrated efforts to influence the demand for and support of alternatives to invasive species in the nursery trade.

"The human communities of this landscape will value their shared ecological heritage, making choices and taking actions that enhance its long-term conservation as their legacy for generations to come. Sustainable rural communities and biodiversity conservation will be the driving objectives of regional planning, development and conservation within this region."

Without stakeholder support for strategies that will sustain the biodiversity of this landscape, we will not achieve the vision. Some of this support is quite targeted, while other types include gradual changes in the values and attitudes held in local communities or by key partners. It is critical, for example, that we find a means to overcome the current impasse over conservation restrictions in Sheffield. The widely held perception that Conservation does not pull its weight and causes local taxes to increase is a factor in a number of local communities that impedes our ability to work effectively in these areas.

As a general rule, we do not support broad, untargeted outreach as a program goal. It may be possible to reach a wide audience but have a low impact on our targets and toward reaching the desired status articulated in our vision. Outreach should focus on the leverage points, on building the key relationships and policies that will advance our work. The Taconic Plateau Alliance is moving toward that end and with careful development should create the enabling social context for our work within the Plateau and perhaps beyond.

Over the next two years, we need to address the question of conservation and taxes with a comprehensive, transparent, and fair policy that is perceived locally as providing tangible benefits. Part of this strategy may be to collaborate with researchers looking into the question of community values and conservation, such as one research project currently proposed for Smith Fellowship funding that has expressed interest in working in the program area. We should devote some of our dedicated outreach resources (Hughes) toward this issue in the next fiscal year.

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