Planning for the Future of Local Forests

A Guide for New Hampshire Towns Using the Forestland Evaluation and Site Assessment Process (FLESA)

RC&D

Resource Conservation & Development Councils

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Purpose

Remember your last walk along one of New Hampshire's many wooded paths. Hear the sounds…smell the sweet air...feel the sense of solitude...delight in the scenic beauty that surrounds you. Forests are valued for many things; timber, wildlife habitat, recreation, and scenery. They significantly add to the open space and rural character expected by New Hampshire's citizens and its millions of annual visitors.

In each of the last three decades, New Hampshire's population has increased at least twenty percent. As a result, more pressure has been placed upon the forested areas in the southern and central portions of the state and upon the resources they provide. Thousands of acres of forestland have been cleared for development, valuable natural communities have been lost, wildlife habitat has become ever more fragmented, and recreation and scenic values affected. In our "North Country", different pressures are putting in question the ability of industrial forestland owners to maintain large forest tracts for the purpose of timber production. The economics of landholding for timber production is changing and objective methods that can identify places where non-timber forest values could be the principal purpose for management will help forest resource planners and companies make wise land use decisions.

Planning for the Future of Local Forests: A Guide for New Hampshire Towns was written by concerned natural resource professionals to help address these concerns and incorporate them into community planning. The manual is based on a planning model referred to as the Forestland Evaluation and Site Assessment (FLESA) process. Its purpose is to aid cities, towns, and others as they plan for future development and natural resource needs, with careful consideration for what currently and could potentially exist. Specifically, FLESA will help to inventory forest based resources, and assess commercial timberland, wildlife habitat, recreational use, and scenic resources. It relies heavily on public participation to fairly and objectively establish a ranking system for inventoried parcels. **The FLESA process can be an integral part of community master planning because of its focus on forestlands. To be successful it should be tied in with community values and objectives and it must involve objective citizen input, a sincere commitment from a local work group, and the ultimate support from community decision makers.**

Chapters are included in the manual to provide background information as well as instruction in how to implement the FLESA process. Chapter 1 gives a background to the significance of local forest in New Hampshire and the importance of considering FLESA as a planning tool. In Chapter 2 you will begin to explore the FLESA process and the considerations important to understanding how the process can be important to community planning. Chapter 3 outlines the general steps involved in implementing FLESA. Chapter 4 provides specific information and instruction on how to complete the Forestland Evaluation component to determine the land's ability to grow desirable tree species. Chapters 5 through 8 deal with the separate assessments of the timber, wildlife, recreation and scenic resource while Chapter 9 provides some thought on how to analyze the results of the FLESA process and put it to work in community planning. Appendices are included to provide supporting information.

It is hoped that participants in this planning process will recognize that they are key players in directing long-term planning, contributing to the health and well being of the community and are promoting stewardship and thoughtful growth. Indeed, it is today's decisions that will shape the forests of tomorrow.

Chapter 1 - The Importance of New Hampshire Forests

New Hampshire is the second most forested state in the country with trees currently covering almost eighty-four percent of the landscape. Forests provide us with clean water, habitat for a diversity of plants and wildlife, wood and paper products, places for recreation and spiritual renewal, and are an important component of scenic quality and community character throughout the state. Employment opportunities in the areas of forest based recreation, tourism, and manufacturing contribute significantly to our healthy economy with the income generated by forest management activities estimated at close to four billion dollars annually. Healthy, productive forests provide a direct benefit to our quality of life and well being.

The History of New Hampshire Forests

The first European explorers to this area (circa 1524) saw a forest similar to our current wooded landscape. The forest covered ninety percent of the land, but the myth of a "vast-impenetrable wilderness" did not exist everywhere in what is now New Hampshire. Native Americans managed forests with fire to control insects, improve hunting, and promote growth of nuts and berries. Areas along the coastline and rivers were cleared to "park-like" settings.

By the time the first settlers came (circa 1640), windstorms, fires, ice storms, and insect attacks had changed the forest to a mix of softwoods and hardwoods, of varying ages and sizes. In southern/central New Hampshire white pines were king, living up to 300 years and growing up to six feet in diameter and 200 feet tall. In colonial times, the King of England decreed that white pines belonged to him and were to be used for ships' masts. Sawmills along rivers produced lumber for Portsmouth and Boston. At higher elevations and latitudes, dense tangles of spruce and fir made human passage all but impossible.

By 1800, agriculture was well established and resulted in vast amounts of land being cleared. By the Civil War (1860), New Hampshire's agricultural industry had reached its peak and fifty-five percent of the landscape was cleared for pasture and crops. Only northern-most New Hampshire did not see this dramatic land use change where poor soils, long harsh winters and steep slopes were the rule. Remote areas and mountainous regions grew timber uncut and untended.

By the 1880's, farming had started to move to America's West and fields were abandoned. Large-scale timber cutting began in the formerly untouched north of New Hampshire. Loggers felled trees and floated them down rivers to mills. Whole mountains were cleared of spruce, and railroads were built to take the trees to pulp and paper mills. Sparks from the locomotives often set fire to "slash" left on the forest floor. Field pines and mountain softwoods were cut en masse to power the industrial revolution and fill the need of vast amounts of wood for housing, fuel, railroads, and shipping crates. Wholesale commercial lumbering fueled American enterprise as well as the passion of early environmentalists. The White Mountain National Forest was established in 1911 to better manage forest resources and the science of forestry was born.

The 20th Century began a period of re-growth for New Hampshire's forests. New Hampshire's temperate forest can regenerate quickly. Abandoned fields and clear cuts fill up with saplings within a decade. Most of the woods seen today from roadways are agricultural fields reclaimed by trees in the last 100 years. Recently, however, this trend has reversed. New Hampshire is losing important forestland to residential development, especially in the southern part of the state. In 1999, forest cover declined for the first time this century to less than eighty-four percent down from a high of eighty-seven percent in 1983. [1]

Today's Forest Owner

As economic and cultural goals evolve, the reasons people own land also change. The days are gone when farmers who depended on their skill of managing the land for their economic survival owned nearly half of New Hampshire's timberland. Today, except for the "North Country" where industrial timberland companies manage larger land units, private individuals own approximately seventy percent of forestland in relatively small parcels. These woodland owners are more likely to have been raised in a town or small city and are likely to be less physically involved in managing their woodlands than their predecessors. In fact, most landowners cite aesthetic enjoyment, not economic value, as one of their main ownership benefits.

Uses of the Forest

In addition to the ecological benefits we receive from our forestlands, both owners and non-owners use forests for many purposes. Intensive recreation use in and around ski areas, timber harvested from woodlots, and extensive recreation uses such as hiking, hunting, and fishing, are all forest uses that make significant contributions to our state's economy and, in some cases, yield profits to the owners. Maple syrup production and nature study are other examples of forestland uses. Attractive views of forested hillsides also help to create an aesthetically pleasing scene for those who appreciate the forest from distant viewpoints.

We also need to recognize that forested parcels are commonly valued for multiple and overlapping uses. Wildlife habitats are often enhanced by timber cutting, which may lead to more opportunities for wildlife viewing and an improved recreational experience. Clearing for a vista along a trail may provide a small forest opening to benefit wildlife. Logging roads and skidder trails often are used for recreation trails.

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1 "The History of NH Forest" quoted from Discover the Forests of New Hampshire Brochure, North Country and Southern NH Resource Conservation and Development Councils, 2000.

In most cases, forest uses can be put into one or more of four broad categories: timber, wildlife, recreation, and scenic resource. As landowners, these uses are frequently managed to satisfy our needs. From a community standpoint, the management of these four uses affects the character of our environment, economic values, and our quality of life. In both cases, understanding our forest resources and how they work and relate to each other is important to their long-term sustained benefits.

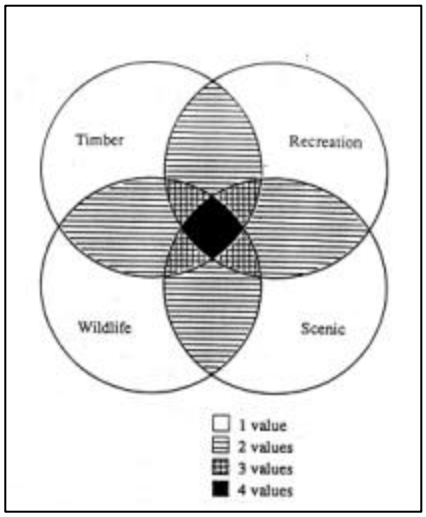

Figure 1.1 Value of Forested Parcels. A forested parcel's value may be derived from a single use or from several complementary uses.

Demands on Our Forests are Increasing

New Hampshire's forests are part of a national and even worldwide economy. As U.S. and world populations increase, demands from outside the region for wood, recreation, home sites, and other uses place increased pressure on our forests.

The Forestland Base is Declining

When attempting to gain the benefits from forests, it must be realized that current trends are decreasing the amount of forestland available to provide all things desired. Subdivisions often result in or create parcels too small to manage for resources such as timber and recreation. Demands on forestlands such as residential development and need for wildlife habitat may not be fully compatible and cause conflict. Fragmentation of landscapes and loss of greenways becomes an issue for wildlife, recreation, and scenic quality. While land use regulations protect some resources, they limit the availability of others.

Change from a rural to a more urban environment threatens traditional forest uses. While recreation, wildlife, aesthetics, pride of ownership, and privacy are now common reasons for owning forestland, protection of these by the landowner often results in restrictions to others, such as hikers, snowmobilers, and hunters who once had ready access to greater amounts of forestland.

Forests Can Be Managed

The adaptability and resilience of our woodlands enable us to manage them to meet many goals on a sustained basis. Successful forest management relies upon using knowledge of forest ecosystems and their response to change in order to provide the many things we desire. However, there are limits to what the forests can provide. As some soils will grow excellent crops and others will not, forest soil quality determines woodlands' potential productivity for plants, animals and a variety of uses. Though natural resource managers can influence forests and help landowners maximize a forest's potential for a variety of resources, these resources should not be used faster than they can be replenished nor should they be managed through poor planning for conflicting uses.

A shrinking forestland base that is facing increasing and often incompatible demands makes citizen involvement and forest planning imperative**.** Community planning that evaluates the ecological, social, and economic contributions of the forestland can favorably influence the care and management of forested land within the community. By considering the value forests bring to the quality of life, towns have the opportunity to understand the current and potential needs of the forest and to plan for its future. Increasing demands on our forests and fewer acres available to meet these demands are reasons for communities to include the forest into their planning process. Methods that identify locations where non-timber values are most important will help industrial forestland owners work with conservation and land protection interests to preserve the integrity of their own managed working forest as well. When planned and managed properly, most forest based resources will continue to provide benefits well into the future.

Local Forest Planning in New Hampshire

RSA 674, Local Land Use Planning and Regulatory Powers, provides the basic enabling authority to municipalities for local land use planning and regulation in New Hampshire. RSA 674:2, VIII specifies that one of the elements in a local master plan should be a conservation and preservation section that includes the preservation, conservation and use of natural and man-made resources. Local land use planning is a potentially powerful tool to manage and/or conserve forestland. Unfortunately, few municipal master plans in New Hampshire address land conservation or forestry in more than a token manner. The New Hampshire Forest Resources Plan recommends that communities be encouraged to incorporate forest components as part of the natural resources chapter of municipal master plans and that they consider revisions to zoning to promote the protection of forests and related resources.

A study of twelve North Country communities was carried out in 1993, along with subsequent interviews with local officials to determine the extent to which forest resource protection and management concerns are reflected in town master plans. With few exceptions, forest resources

were not addressed comprehensively. Only one community had completed a natural resource inventory. The ecological relationship between the forest cover and specific resources was not usually established. Where natural resources were identified and assessed, connections were not always made to how that information could or should be used. In a few cases resources were discussed in relation to the visual setting of the community, as part of its present economic base and in terms of environmental quality. The value of the forest as a community resource for the present and future were not addressed in most cases.

The uniqueness of each North Country town was reflected in the plans when local issues were addressed, some of which were related to forestry. The town with a ski industry needed the attractive forest backdrop. The town with large acreages of industrial forest was interested in future ownership patterns. The steep slopes in one tourist town needed protection. Flood control was a concern of a town located on a river. Resource protection components frequently emphasized water quality, open space, agricultural land, wildlife and endangered species, but not forests.[2]

In 1994, a Forestland Evaluation and Site Assessment pilot project was performed in Bath, New Hampshire, which attracted a variety of federal, state and local organizational support. The project exemplified a multi-agency steering committee approach and became an important component in developing this current manual for New Hampshire.

Master plans that incorporate planning for forestlands and forest uses have real strengths. Through the planning process, townspeople learn about their community and some of its unique natural areas. This can stimulate interest in conserving irreplaceable forestlands through acquisition of land for town forests and through the purchase of development rights or other measures. A better understanding of a community's forest resources that include timberland, wildlife, recreation and scenery, along with their economic values, can be an incentive for planning boards to evaluate land use regulatory controls and impacts on forestry.

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2 *North Country Community Master Plans and the Forest Resource*, Natural Resources Network, UNH Cooperative Extension.

Chapter 2 – Forestland Evaluation and Site Assessment

Forestland Evaluation and Site Assessment (FLESA) is a process to help a community or region inventory and evaluate its forest based resources. It provides a first step toward planning forest uses and protection as well as incorporating related values into overall community needs and long range plans. FLESA uses a comparative scoring system to assess the viability of individual forested parcels for timber management, wildlife habitat, recreational use, scenery, and other uses such as development potential.

Public involvement is an important and critical component throughout the process. FLESA combines objectivity, public concern, and a comprehensive assessment of varied resource criteria into a package that assists communities in evaluating their forest resources. By determining the current forest resource conditions within a community, residents direct a long-term planning process that promotes stewardship, thoughtful growth, and avoids, wherever possible, conflicts between competing resource uses. It is important in the process to address the broad interests and concerns of all affected citizens.

How FLESA Can Be Used

The first FLESA project was implemented in Granby, Vermont in 1991 and it has since been used in several other Vermont towns. The process came to New Hampshire in 1994 as a pilot project in the town of Bath. In these applications, FLESA has been successful in providing useful input into town plans regarding natural resource issues and identifying significant forest parcels that were awarded permanent protection. A town planning board has also used FLESA to review a proposed subdivision to assess natural resource concerns.

Other potential uses of FLESA are numerous and include:

- Open space planning and conservation.
- Identifying land units as candidates for conservation easements or other land protection efforts.
- Identifying important wildlife habitat.
- Using as an educational tool to inform local residents about natural resources available within the community and their value.

- Creating a conservation perspective in the planning process by identifying and relating to what is found on the ground and thus improving the manner in which decisions are made.

- Forming the basis for a conservation and resource plan for the community, focusing on the economic development of renewable natural resources and associated uses such as recreation.

Using FLESA to Help Make Objective Decisions

The output of the FLESA process may be utilized to change the town master plan to better reflect the concerns of residents and how the resources actually found on the ground impact those concerns. FLESA can be used to support non-regulatory efforts such as land conservation. Individual landowners that need help making important decisions about the management of their own properties may also use the process and results.

It is important to understand that the FLESA process is not a regulatory tool. It is simply an inventory and information system used by the community to make objective decisions about resource issues. It is a tool designed and controlled by the community to assist in making better land use and land planning decisions.

How FLESA Works

The FLESA process has two basic components. The first is referred to as **Land Evaluation**. This part of the process is a technical evaluation of a parcel or site's ability to grow desirable species based on soils information. The Land Evaluation considers the inherent productivity potential of the soil as well as the probability that tree species presently growing on a site will produce quality trees. The Forest Productivity Matrix, based on Important Forest Soil Groups and Forest Cover, is the key tool used with this element. The Land Evaluation component is discussed in more detail in Chapter 4.

The second component of FLESA is **Site Assessment**. Site Assessment applies selected criteria to determine the quality of a site as it relates to specific resource areas. The criteria are chosen by a task force of local citizens who have various backgrounds and perspectives, as well as a working knowledge of the community. The Site Assessment criteria focuses on factors related to primary forest resource areas that make the forestland important. These resource areas include timber, wildlife, recreation, and scenery.

Chapters 5 through 8 address these specific resource areas in greater detail and include exhibits at the end of each chapter that provide suggested criteria and point values to complete the assessment process. Each exhibit provides an example and starting point from which to establish criteria that are relevant to specific goals and objectives. Under the FLESA process, the community through public involvement determines the specific assessment criteria applied.

Appendix B provides an outline for a different application of the assessment. Rather than rate a parcel for a resource value, it is rated for potential development use. This application shows how the process can be used to address specific needs or concerns. Assessment for development potential may not be important to every community.

FLESA works through numerical comparison based on the criteria and related point values established for each resource area. The design of the scoring system creates relative, not absolute, values for the various criteria. The result of the process is a series of scores for forested parcels that show how one parcel compares to another in each of the four primary resource areas and in total score. Planning decisions can be made based on the interpretation of the assessment results. Chapter 9 provides a brief discussion on how to interpret FLESA results and put it to work in community planning.

Skills Required

In each case to date, the application of FLESA by a community has involved a natural resource management consultant working with a community task force to complete the process. For the community of Bath, the project was undertaken with oversight provided by a forestry consulting firm, assistance from USDA Natural Resources Conservation Service, UNH Cooperative Extension, and a community task force.

It is possible for a community to undertake the process on its own. However, it will be more successful if the overall FLESA team includes skills related to forest and natural resource management activities as well as recreation and scenic assessment expertise. An understanding of the planning process is also beneficial. Whether a consultant is hired or other alternatives for completing the process are explored, skills specific to the various resources involved should be considered and utilized. These may include a forester or soils scientist for the basic site evaluations and forestry assessment, a wildlife biologist for the wildlife component, or a landscape architect for the recreation and scenery assessments. Often, professionals within the community will be interested in contributing to the FLESA process.

The community FLESA task force itself should include a good cross-section of interested residents who desire to be involved. Their combined interest and involvement is very important in helping to develop the process in a way that is specific to their community's needs and values, and because they have an intimate knowledge of its resources. The conservation commission can be the major driving force and the group often responsible for undertaking FLESA within the community. In other cases, it may be the planning board or a group of concerned and interested citizens. Whatever the manner in which FLESA is developed in the community, the conservation commission and planning board should be an integral part of the process.

Help is Available

As part of the FLESA process, technical workshops have been provided to train natural resource professionals and support agencies and organizations so that help and guidance will be available to towns wishing to implement the FLESA process. The primary agencies and organizations that offer basic assistance in natural resource inventory and management activities are listed in Appendix D. Most agencies and organizations are only staffed and equipped to assist communities with initial planning and providing basic direction. Cost may be involved for some services. Responsibility for completing the inventories and assessment work will lie with the community.

Alternatives for Application

FLESA can be applied to either an entire town or to specific areas within the community. In some situations a decision may be made to apply the process just to parcels above a given size. FLESA lends itself to different variations depending on the needs identified. Another important factor in the process is that a decision can be made to only apply certain components of the process, i.e. only apply the Timber Management Assessment to the desired land base to determine timber management potential and the ability to produce a commercial timber product.

Political Boundaries

Although FLESA will generally be applied within the boundaries or area of a specific community, consideration should be given to the relationship of natural resources along the boundaries of adjacent towns. Often, greenways for wildlife, recreation, and scenery go beyond political boundaries. Working and coordinating with adjacent communities in applying the FLESA process can enhance the overall results.

Using GIS to Assist in Conducting FLESA

The job of carrying out the FLESA process can be greatly facilitated if Geographic Information Systems (GIS) technology is used. For much of the state, resource information needed to map the criteria identified in this manual is available in digital form from the NH GRANIT (Geographically Referenced Analysis and Information Transfer System) database. Examples of the information that can be obtained are:

- Base map features including roads, trails, surface waters and town boundaries
- USDA Natural Resources Conservation Service County Soil Maps
- NH Natural Heritage Inventory Maps
- National Wetlands Inventory Maps
- Recreation Facilities Inventory Maps
- Land Cover Maps
- Elevation/Slope
- Conservation Lands

NH GRANIT utilizes the USGS 1:24,000 scale topographic map base, to which all digital data are registered so that they "fit" together when overlaid with each other. Certain criterion utilized in the FLESA site assessments can be applied and scored by GIS. For example, the accessibility factor, or distance of a parcel to a public road with adequate weight limits for transporting forest products can be calculated. Adjacent parcels sharing a common feature, such as forest cover, can be identified and aggregated for purposes of the analysis. And distance of a parcel to population centers can be calculated. Thus many of the features involved in FLESA can be assembled for a community with GIS and combined by computer to facilitate the inventory process.

The degree to which a town uses GIS tools is somewhat dependent upon whether or not the town parcels or tax maps have been digitized and how well they align with the NH GRANIT data. If the parcel map has not been digitized, then GIS is useful in producing a set of town maps which display GRANIT resource data, e.g., productive forest soils, roads, surface waters, land cover, etc., at a scale which matches the town parcel map. The FLESA committee can then proceed with its analysis by overlaying these maps on a light table and manually carrying out the necessary calculations.

If the town parcel map has been digitized, then the GIS can be used to do much of the analytical process as well. For instance, the GIS can select the set of parcels to be evaluated based on parcel size and extent of forest cover. It can then identify environmental factors such as wetlands and steep slopes in, or adjacent to, a parcel and the presence and extent of prime forest soils. Data collected in the field for parcels can be entered as attributes and included in the assessment. Upon completing the evaluation of the four resource components, the results can be displayed both in tabular form and as a map of the town.

NH GRANIT data can be obtained through the regional planning commissions or by accessing the NH GRANIT Web Site (www.granit.sr.unh.edu). The regional planning commissions can assist a town in assembling the necessary data needed to conduct a FLESA and, if the digital parcel map is available, can carry out much of the analysis called for in this manual. This approach relieves the town committee of much tedious work and allows them to concentrate their energies on collecting parcel specific data and on evaluating the results of different criteria scoring alternatives.

Computer Software Application for the Forestland Evaluation and Timber Resource Assessment

A computer software extension for ArcView® GIS, called *FLESA-Tools*, has been written specifically to demonstrate and complete the Forestland Evaluation and Timber Resource Assessment components of the FLESA process that is outlined in Chapter 4 and 5 of this manual. A disk and user guide for this extension can be obtained by contacting the Southern or North Country Resource Conservation and Development Area Council.

FLESA and Other Natural Resource Inventories

New Hampshire is fortunate to have a high concern for its natural resources as well as have a considerable number of public and non-profit organizations that offer supporting services or do work in this area. The results of this combination are numerous natural resource planning and inventory efforts occurring within the state. In many cases, these efforts are well documented or have resulted in reference material and data that can be of significant value to the FLESA process.

For any community undertaking a FLESA project, it is important to determine if other natural resource inventory work has occurred within or adjacent to their town that will be of value to the planned FLESA process. The efficiency, acceptance and success of the project will most likely be enhanced through recognition and coordination with other efforts. A good example is checking with the Society for the Protection of New Hampshire Forests in the application of their Linking Lands Program. This is natural resource inventory work that they are completing for lands adjacent to their reservations. The Society is also applying the GIS technology to larger land bases in cooperation with selected Land Trusts throughout the state. Other considerations might include checking to see what inventories have been completed for specific resources, such as wildlife, recreation or scenic values. Communities adjacent to large blocks of public land such as the White Mountain National Forest or state forestlands may be able to benefit from the numerous inventories that have been completed for these lands. Managing agency specialists can also offer resource knowledge.

Regional planning commissions are often the source of related land use planning information that will be of value. An example is the Regional Open Space Plan completed by the Rockingham Planning Commission.

References used in development of the FLESA Manual are included in Appendix F. However, there are a few publications related to natural resource management in New Hampshire that should be reviewed by FLESA users to enhance their understanding of natural resource inventories. They will also provide a reference in helping to understand specific resource areas and in identifying criteria related to their community needs. Recommended references are:

- *Natural Resources Inventories: A Guide for New Hampshire Communities and Conservation Groups*; Revised and updated by Amanda J. Lindley Stone; University of New Hampshire Cooperative Extension

- *Open Space for New Hampshire: A Toolbook of Techniques for the New Millennium;* Dorothy Tripp Taylor; New Hampshire Wildlife Federation

- *Identifying and Protecting New Hampshire's Significant Wildlife Habitat: A Guide for Towns and Conservation Groups*; J. Kanter, R. Suomala, E. Snyder; New Hampshire Fish and Game Department

- *Town of Bath Forestland Evaluation and Site Assessment (FLESA)*; Round Top Woodlot Management (Available from NH Resource Conservation and Development Area Councils)

Chapter 3 – Implementing FLESA

The consideration to utilize FLESA as a tool to address local forest planning will generally come from the conservation commission, planning board, or perhaps a group of town residents concerned about forest resources within the community and are familiar with the FLESA process. Most likely, those individuals having some knowledge of FLESA will have attended an awareness session, technical training workshop or a conference presentation on FLESA. To gain support from others and help assure success in the understanding and implementation of this process, it is important from the beginning to adequately define FLESA and describe what the process will provide for the town and its residents. Since FLESA's success depends on public participation, residents not only need to support the effort but become active participants. Ideally, FLESA should be a part of the master planning process. However, FLESA can be done as the master plan is updated or its results added to an existing master plan.

This chapter provides a detailed outline of the key steps involved in establishing FLESA as a planning tool and carrying out the process. A good starting point for those involved in promoting FLESA is to be very familiar with this manual. It will also be helpful to review the related publications listed in Chapter 2 and have them available to others interested in the process.

Steps in Completing FLESA

1. Develop interest / Establish a work group.

- Conduct an initial informational and planning meeting introducing FLESA and the benefits of utilizing this process.
- Invite local boards, town officials, interest groups, adjoining communities, and members of the community.
- Solicit interested volunteers.
- Establish work group to oversee and direct the project.
- Elect project leader / coordinator.
- Consider the need for a consultant to work with the FLESA task force
- Seek assistance from Southern NH or North Country Resource Conservation and Development Area Councils or consultant knowledgeable of FLESA for presenting information and answering questions at initial meeting (A list of consultants who have attended FLESA technical training workshops or have implemented FLESA projects is available from NH RC&D Area Councils).

The first action is to determine if the townspeople that are concerned about natural resource management and/or involved in town planning efforts think it is a good idea to perform a FLESA evaluation. It will be impossible to get everyone to agree to the same thing, but in spirit, the majority of those involved should be in favor of performing the inventory. A series of public informational meetings, questionnaires, and meetings with target groups in town such as the selectmen, civic organizations, sportsman's, garden or other outdoor clubs, etc. would be an excellent way to gain overall community support. Explaining FLESA can take time, but no one will support something he or she does not understand. Use of a fact sheet (available from NH RC&D Area Councils) outlining what FLESA is and the benefits to the community will help people better understand the significance of the process. Important points to mention are that FLESA is flexible, can be changed to fit the needs of the community, can be updated as needed, and is not regulatory.

As part of the presentation to a group, it usually helps to show the variety of federal, state, and local organizations that support FLESA. Explain New Hampshire's experience, the Bath Pilot Study, and the multi-agency steering committee's work to develop the process for New Hampshire. Include information about available technical assistance and the use of natural resource management consultants.

After initial informational meetings, the next step is to choose a group of active citizens who will serve on a task force to actually carry out the FLESA process. If the town is hiring a consultant, the task force will work with that person very closely. If the town has decided to use volunteers to perform the FLESA process, the task force will provide the manpower.

Representatives from various groups, backgrounds, occupations, and experiences should be chosen, with at least some of the individuals having knowledge of the forest based resources of the town. These citizens should be prepared to help decide on the criteria to use, scoring values, which parcels to inventory, and be willing to talk about the process with other townspeople on a regular basis, through meetings, newsletters, or other communication channels. The task force needs to describe what is being done and answer concerns that arise. The time commitment is extensive, but anything worth doing takes time. After the final FLESA report and maps are completed, the task force should have a final community meeting to explain the results and how the product will be used and monitored. Knowing that the results of the work will not be put on the shelf and forgotten will help people accept the importance of doing a FLESA in the first place.

2. Identify goals and needs of forest resources to be addressed.

- Review community needs and goals.
- Determine how FLESA will be used to help meet community needs and goals.
    - As a component of overall natural resource planning work.
    - As a component of overall community master planning.
    - To address a specific land use planning issue such as potential development on selected parcels of forested land.

Depending on the context in which FLESA is being implemented, sources for this information could come from a combination of the community master plan and vision statement, from the initial public meetings held to determine the need to implement the process, or through specific information gathering efforts such as surveys, interviews, and focus groups. These public forums can be used to broaden local awareness of forest resource related issues and to start identifying key resources on a map, especially from the perspective of the community residents. This step alone could be helpful to the planning board or conservation commission in identifying perceptions and needs of the community whether one carries out FLESA or not.

This step is important in helping to determine specific inventory and other data that will be needed to adequately evaluate and assess the forest resources with respect to the goals and needs identified. Thought can also be given at this time to the importance of different inventory data and the scoring values that will be assigned later in the process.

3. Identify the scope of the FLESA process and lands it will be applied to.

- Determine whether FLESA will be applied to all forestland within the town boundaries or only to selected parcels based on specific land use planning issues.
- Determine the extent of past inventory work completed or other town planning documents available that will help in making decisions in the application of FLESA.
- Determine whether all four assessments (timber, wildlife, recreation, and scenic resources) will be applied or only those assessments needed to address specific goals and needs.
- Consider optional assessment for development potential (Appendix B).

This step focuses on where the evaluation will take place and what assessment components of the FLESA process will be implemented. Based on Step 2, decisions can now be made whether to apply the process to all forestland within the community, specified areas such as those experiencing development pressure, or to land parcels of a certain acreage. Other decisions to consider at this point could relate to whether only selected components of the process, such as Timber and Wildlife Resource Assessments, will be completed. The goal is to make decisions that are based on the public involvement that occurred earlier in the process.

4. Determine the availability of a town tax map or other land units map.

- Check with town offices to determine if a town tax map showing distribution of identifiable land units is available in hard copy or digital format.
- If GIS technology will be used and a digital tax map is not available, make arrangements for the tax map to be digitized.

It is important to have a land units map with identifiable parcels of known location as a base map to implement FLESA. These land units serve as the basis for applying the factors related to the Forestland Evaluation and Assessment criteria and resulting scores. Usually, the town tax map will best serve this need as it is readily available and identifies parcels of known size and

location. It is also important to identify whether the maps are available in digital format. If not,

a decision will need to be made to have them digitized for use in GIS applications. If a map does need to be digitized, regional planning commissions or engineering/drafting firms providing GIS services can provide this service for a cost.

5. Develop a project work plan / Time line.

- Develop an outline that addresses the project goals, maps to be obtained, fieldwork required, task and assignments, and an expected time line to complete the project.

6. Develop a budget.

- Evaluate cost, develop a budget, and identify potential funding sources.

Costs to consider in developing a budget include purchase of maps and other data, digitizing maps, GIS services if not available within the community, reproduction cost, and use of a consultant to help oversee the process or to complete specific inventories.

7. Collect data and maps to complete the Forestland Evaluation and Assessment steps.

- See specific chapters for map and data requirements.

  - Chapter 4 – Forestland Evaluation
  - Chapter 5 – Timber Resource Assessment
  - Chapter 6 – Wildlife Resource Assessment
  - Chapter 7 – Recreation Resource Assessment
  - Chapter 8 – Scenic Resource Assessment

- See Appendix B if Development Potential Assessment is being considered.
- See Appendix C for sources of maps and data.
- Verify / collect data in the field if required.

Important Forest Soil Group Maps critical to the Forestland Evaluation component of the process (Chapter 4) are available from the Natural Resources Conservation Service. NH GRANIT will be a key resource for much of the inventory data needed to complete FLESA. Additional sources of information include regional planning commissions, state government agencies (DRED, OSP, Fish and Game), and numerous other agencies or organizations supporting natural resource management activities. A complete list of potential data needs along with their source is included in Appendix C.

Some information may be site specific or needed in such detail that fieldwork may require the skills of a consultant. These requirements could include a more detailed vegetation and wildlife habitat survey, or perhaps to identify and inventory important scenic views and specific visual resource attributes of the project area. Even for inventory data that is available from the sources outlined in Appendix C, fieldwork to verify the data may be needed.

Chapters 5 through 8 provide more detailed discussions of specific inventory attributes that should be considered for each of the resource areas associated with the FLESA process. Review of these chapters will help give the user additional ideas of what data to collect and its importance in completing the assessment.

8. Decide on specific criteria to be scored in each of the resource areas selected for assessment. Determine scoring values to be assigned to selected criteria.

- Review Chapters 5 – 8 for general discussion and suggested criteria relative to the individual basic resource areas addressed by FLESA.
- Determine whether adjustments are required to the suggested criteria and scoring sheets.

  - Timber Resource Assessment / Exhibit 1
  - Wildlife Resource Assessment / Exhibit 2
  - Recreation Resource Assessment / Exhibit 3
  - Scenic Resource Assessment / Exhibit 4

At this point in the process, specific criteria needed to address the more important issues, concerns and needs of the community should stand out. This step will involve listing the criteria and assigning point values to be applied to each specific criterion used. If a consultant is providing oversight to help a community work through the FLESA process, that consultant may initially present a range of criteria options based on what they hear at task force and public meetings along with their own initial investigations and observations of the town.

Exhibits 1 through 4 outline criteria and point values suggested for each of the individual resource areas. They are based on the Bath Pilot Study. <u>These exhibits are suggested criteria and scores only and may need to be adjusted to reflect the needs and values of the town</u>. Critical thinking on the part of the community is important to identify appropriate criteria and point values to be used. As FLESA is a community driven process, each individual community will be different in what it identifies as important criteria to be utilized to achieve its needs. It is important that the criteria be objective and measurable as well as resident based to address their concerns.

For the Bath application the consultant and task team divided each of the resource assessment areas they addressed in the study into a range of criteria where the assigned point values totaled a potential high score of 300. Using 300 total points for each of the assessment areas allowed for consistent relative scores. <u>It is important to remember that the scores created are not intended to be absolute but to demonstrate the relative differences between one parcel and another for the resource area being assessed</u>. Again, a consultant providing oversight can be instrumental in providing suggested point values to be applied to the criteria identified for each of the resource assessment areas. After a presentation to the overall team or task force adjustments can be made and the final criteria point values agreed upon.

As emphasized, assigned points could vary widely, thus indicating the importance of public involvement. A simple illustration of how the point values could change from one community to the next to reflect local or regional conditions is in the allocation of points for parcel size. A parcel size of 50 acres may be very significant in an urban community and have a higher number of points assigned in comparison to a more rural community where 200-acre parcels may be the more common occurrence.

Other important timber management factors or criteria that may be vastly different between communities concern the ability to access the forestland and how the community values related to environmental concerns are interpreted and prioritized.

9. Conduct a test FLESA application on selected parcels.

- Conduct a test application of the established criteria and values to check their validity in providing a range of scores for parcels of diverse characteristics.
    - Conduct the Forestland Evaluation according to the specific steps outlined in Chapter 4.
    - Conduct individual resource assessments according to the specific steps outlined in Chapters 5 – 8.
- Adjust criteria values as needed to create a cross-section of scores.

After the initial criteria and scoring values have been developed in Step 8, conduct a FLESA test on several parcels to determine if the model developed for your community adequately distinguishes between parcels or whether adjustment in the scoring values is needed. The purpose in assigning points for scoring is to reflect important locally determined criteria that relate the value of one parcel to another for each resource area.

The goal is to identify a range of scores across the community. Plotting of the scores should result in only a few parcels scoring very low or very high. Most parcels should be in between and closer to the median score. The results will not be meaningful if all parcels receive similar scores.

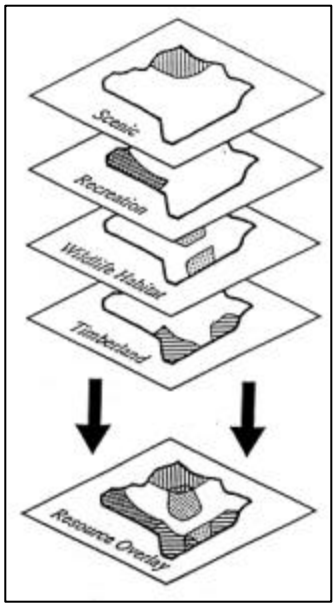
After application on the test parcels has been completed, evaluate the scoring results and adjust the scoring values as needed to achieve the desired distribution results.

10. Proceed with a full scoring application.

- Once the criteria and scoring values have been tested and adjusted to achieve the desired distribution results, a full-scale application can be completed for the land base identified in Step 3.

11. Document the FLESA inventory /Analyze and put the FLESA inventory results to work.

- Document results of FLESA application by individual parcel units identified on tax map.
- Document results in table or map format.
- Reference Chapter 9 for thoughts on analysis of the FLESA application and results.



When the FLESA application is complete, scores will be produced for Forestland Evaluation and under the four forest resource areas for parcels evaluated. The end result is a range of scores by individual parcels identified on land unit map. Scores can also be reflected on a base map for the community that gives an overview of values of forestland for timber, wildlife, recreation, and scenery. The final product can be in the form of individual overlays or a single map showing multiple values (See Figure 3.1). Another option in using GIS is to create shaded or color coded maps that reflect different ranges of scores.

Figure 3.1 GIS Overlay. Individual data layers can be combined to provide a broader view of the resource values of forestland.

12. Report results to the town.

- Make a formal presentation of the project results. Invite local boards, town officials, interest groups, adjoining communities and town residents.
- Make results available to others that will benefit from its use.
- Display inventory maps in prominent locations such as the town hall.

Chapter 4 – Forestland Evaluation Component

The Forestland Evaluation component of the FLESA process provides an indication or rating of the land's ability to grow desirable tree species. This can be an important factor for all resources areas, particularly timber. The Timber Resource Assessment outlined in the next chapter does use the ratings completed in this phase as an important criterion in completing that specific assessment. Forestland Evaluation scores are based on 1) **Important Forest Soil Groups**, (IFSG) which show soil potential for growing commercially important tree species, and 2) **Forest Cover Type**, which is a shorthand method of listing the species of trees actually growing on a site. This evaluation considers soil factors such as depth, texture, moisture holding capacity, temperature, drainage, slope, rocks and ledge that influence the productivity and manageability of a forest, and past history which influences the species and quality of trees now growing on the site.

Descriptions of Important Forest Soil Groups are provided in **Table 1**. County legends that show what soil map units are in each Important Forest Soil Groups are available in printed and electronic form from the Natural Resources Conservation Service (NRCS) and GRANIT (See Appendix C). **Table 2**, Forest Productivity Matrix Reference Table, developed by NRCS, provides basic values for the Important Forest Soil Groups and the updated statewide Forest Cover Types that will be available from GRANIT in late 2001. These values may vary from one region in the state to another and even from town to town. In some cases, more specific cover type data may be available for a community or may be obtained through detailed field inventories performed by a consultant. When the values are adjusted or developed for a different soil group/cover type mix, the expertise of a local forester, soil scientist, or other qualified natural resource management specialist will be required to determine which tree species have the highest commercial value when growing on a particular Important Forest Soil Group.

By using Important Forest Soil Groups and actual Forest Cover Type, soil potential is married with reality. A parcel with excellent soils indicating a high potential for productivity, but having low value trees growing on it would receive a reduced score. On the other hand, a less productive site indicating a lower potential for productivity with high value trees growing on it might receive a higher score. Productive soils with site limitations that restrict management and harvesting, such as steep slopes, boulders, and rock outcrops, are found in Important Forest Soil Group IIA. These restrictions increase the cost of forest management and render these sites less desirable for producing timber. Logging costs are unusually high for Group IIA soils. The value of the tree species growing on these sites is the overriding factor in determining their Forestland Evaluation scores for FLESA.

Scoring for the Forestland and Evaluation Component

Scoring for the Forestland Evaluation Component requires the following data:

1) A map of Parcel Boundaries, usually a Tax map.

2) An Important Forest Soil Groups map overlay or a soils map along with the Important Forest Soil Groups legend.

3) A Forest Cover Type map.

4) Table 2 or equivalent matrix developed for the project.

5) A means to measure acreage of the combinations of the Important Forest Soil Groups and Forest Cover Types occurring within the Parcel Boundaries.

Scoring for Forestland Evaluation is completed by overlaying the three layers of data (Important Forest Soil Groups, Forest Cover Type, and Parcel Boundaries). Based on the combinations delineated, assign the appropriate value from Table 2 or other similar matrix developed for the project.

Note that when overlaying the maps associated with the Important Forest Soil Groups and Forest Cover Type, two or more combinations will most likely occur within the parcel boundaries. Each combination, when applied to the matrix in Table 2, will produce a different score that will need to be averaged out by the consultant or FLESA team to provide an average single score for the parcel. This is why it is important to be able to calculate the acreage of the different overlay combinations.

The maximum points, which a parcel can receive, are 100. This would be for a parcel growing White or Red Pine that had all of its soils in Important Forest Soil Group IA. Conversely, the lowest amount of points is 10 for a parcel that was growing Paper Birch/Aspen or Other Hardwoods in Important Forest Soil Group IIB.

Computer Software Application for Forestland Evaluation

The use of the ArcView® GIS Extension, *FLESA-Tools*, developed for this segment of the FLESA process will greatly reduce the handwork involved in the Forestland Evaluation component. Digitized Important Forest Soil Groups maps are available for most of the state and digitized tax maps are becoming available in many towns. Forest Cover Type maps are also available from NH GRANIT.

Table 1

Description – Important Forest Soil Groups

Soil Group	Description	Climax Stands	Successional Stands
IA	Deeper, loamy textures, moderately well and well drained soils. Ex. Marlow, Berkshsire, Charlton, Paxton, Plaisted. Primarily Hardwood sites. Few limitations for forest management.	Sugar Maple, Beech, Red Oak, (Southern NH)	Aspen, Red Maple, Gray Birch, Paper Birch, Yellow Birch, White Ash, Red Oak, Red Spruce, White Pine, Hemlock
IB	Sandy and loaming over sandy textures. Moderately well and well-drained soils. Ex. Canton, Gloucester, Hermon, Monadnock. Primarily hardwood sites. Few severe limitations for forest management.	Beech, Red Oak (Southern NH)	Aspen, Red Maple, Gray Birch, Paper Birch, Yellow Birch, Hemlock, Red Spruce, White Pine
IC	Sands and gravels derived from deposits of glacial outwash. Excessively, somewhat excessively, well drained, moderately well drained soils. Ex. Windsor, Adams, Hinckley, Colton, Deerfield, Masardis. Soils well suited for softwood production, especially White Pine. Few severe limitations for forest management.	Red Spruce, Hemlock, White Pine/Oak (Sub-climax Southern NH)	Aspen, Gray Birch, Paper Birch, Red Maple, White Pine, Balsam Fir
IIA	This diverse group includes many of the same soils as in Groups IA and IB. However, these soil mapping units have been separated because of physical limitations which may influence forest management i.e., steep slopes, erosive textures, surface boulders, excessive surface stones, and bedrock outcrops. Usually, productivity to these soils is not greatly affected by their physical limitations. However, management activities such as thinning, harvesting, and tree planting are frequently more difficult and costly.		
IIB	The soils in this group are poorly drained. The seasonal high water table is within 12 inches of the surface. Productivity is generally less than the above groups and management activities are severely restricted by soil wetness. Abundant natural Red Spruce/Balsam Fir reproduction makes these stands desirable for pulpwood production in Northern New Hampshire. Ex. Ridgebury, Monarda, Pillsbury.	Red Spruce/Balsam Fir (Northern NH), Hemlock, Red Maple (Sub-climax, Southern NH)	Elm, Aspen, Red Maple, Yellow Birch, Gray Birch, Paper Birch, White Ash, Brown Ash

Table 2
Forestland Evaluation

FOREST PRODUCTIVITY MATRIX

IMPORTANT FOREST SOIL GROUP		**FOREST COVER TYPES**													
Group	Points	Beech/Oak	**Combined Score**	Paper Birch/ Aspen	**Combined Score[1]**	Other Hardwood	**Combined Score**	White/Red Pine	**Combined Score**	Spruce/Fir	**Combined Score**	Hemlock	**Combined Scores**	Pitch Pine	**Combined Score**
IA	50	40	**90**	25	**75**	40	**90**	50	**100**	40	**90**	30	**80**	0	**0**
IB	40	35	**75**	20	**60**	30	**70**	50	**90**	35	**75**	25	**65**	0	**0**
IC	30	20	**50**	15	**45**	15	**45**	50	**80**	30	**60**	20	**50**	0	**0**
IIA	10	30	**40**	20	**30**	30	**40**	50	**60**	35	**45**	25	**35**	0	**0**
IIB	5	20	**25**	5	**10**	5	**10**	30	**35**	35	**40**	25	**30**	0	**0**

FOREST COVER TYPE	
Beech/Oak	Deciduous stands comprising at least 30% beech/oak basal area per acre
Paper Birch/ Aspen	Deciduous stands comprising at least 20% paper birch/aspen basal area per acre
Other Hardwoods	Deciduous stands not meeting the Beech Oak or paper birch/aspen definitions
White/Red Pine	Conifer stands in which white/red pine constitutes a plurality of the coniferous basal area
Spruce/Fir	Conifer stands in which spruce/fir constitutes a plurality of the coniferous basal area
Hemlock	Conifer stands in which hemlock constitutes a plurality of the coniferous basal area
Pitch Pine	Conifer stands in which pitch pine constitutes a plurality of the coniferous basal area

Chapter 5 – Timber Resource Assessment

For over three centuries, the manufacturing of wood products has been a constant in many New Hampshire communities. Forest based businesses, including primary processing and value-added manufacturing, provide necessary diversity to New Hampshire's economy. In New Hampshire in 1996-1997, forestry directly contributed approximately $1.2 billion of income to the state's economy. When direct and indirect income from forestry is combined, the resulting income is almost four billion dollars.[1]

The long-term survival of a strong forest based economy relies on the maintenance of productive forests. Likewise, forest management options are severely limited without markets for forest products. Forests, and the industries relying upon them, are capital assets that grow in value in proportion to the amount invested in them.

Fragmentation, the subdividing of large parcels into smaller ones, is an important issue in forest management and decreases the natural and economic value of a forest. Without a plan that identifies and provides for maintaining certain large, unbroken, or adjoining parcels, towns are less prepared to respond to individual development or management proposals that could affect fragmentation. Viable parcel sizes for forest management vary around the state based on their location and on the value of the trees growing on them. In general, larger parcels have higher potential for timber management because they are more economical to manage and offer more management options. Towns need to determine which lands are best able to sustain commercial forestry.

Primary Site Assessment Criteria for the Timber Resource

In addressing the Timber Resource Assessment component, there are several criteria that are suggested. Decisions made as to which criteria are utilized as well as their importance are determined by each individual community based on specific issues and needs. Suggested criteria are:

Forestland Evaluation Component – The Forestland Evaluation step previously completed (Chapter 4) is an important factor in determining the potential for management of the timber resource. The ability to grow quality trees has a direct effect on the economics related to this management area.

Accessibility for Management – Accessibility is the ease with which a parcel can be entered for management, especially by large trucks and harvesting equipment. A parcel's proximity to public roads with adequate weight limits for transporting forest products and its distance from suitable markets are important. Other factors affecting access could include stream crossings and right-of-way limitations. Access through thickly settled residential neighborhoods might also create limitations due to objections to traffic or noise.

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[1] Economic Impact of Open Space in New Hampshire, Resource Systems Group, White River Jct., VT. January 1999.

Environmental Limitations – Often there are environmental limitations inherent to forested parcels that result in restrictions or reduce the opportunity to manage for commercial forest products. Examples of typical environmental limitations are:

1) An unusually large stream or number of streams that must be crossed to harvest timber.

2) Wetlands that require special harvesting precautions or which restrict management.

3) Unique wildlife habitat.

4) Other factors such as steep slopes.

Parcel Size – Large blocks of forested land are important simply because of their size. Larger parcels are more economical to manage and harvest, usually contain more timber volume, and offer more management options. For example, costs associated with moving harvesting equipment to an operation are the same for a 25-acre parcel as they are for a 200-acre parcel. Taxes, which are a major cost of producing timber, are usually less on a per acre basis for larger parcels. These factors make long-term forestry on larger parcels more lucrative, thus favoring these lands for continued commercial forest use.

Contiguous Acreage – Contiguous ownerships create opportunities to manage larger units of forestland. Just as parcel size relates to economics, the potential for long-term forestry is greater when large expanses of forestland exist on the landscape. Though different parties may own a number of adjoining forested parcels, as long as the management objectives of the different owners are compatible, the land could potentially be managed as a unit.

Public/Private Investment in Forestry – Some landowners are committed to forest management and have made considerable investments in their land by applying such practices as site preparation, tree planting, pre-commercial thinning, and pruning. Many landowners have participated in cost-sharing programs. These private and public investments in forest management demonstrate a commitment to long-term forestry. Many landowners have invested in Christmas tree plantations and sugar bushes. Most of these people participate in the Tree Farm Program and the New Hampshire Forest Stewardship Program.

Some landowners have shown an even higher level of commitment by placing conservation easements on their land or by selling their development rights. Many private dollars have been invested in land protection and in some cases substantial public investments have been made through programs such as the Land Conservation Investment Program (LCIP) and its successor Land and Community Heritage Investment Program (LCHIP).

Many forested parcels enrolled in the state's current use program receive a reduction in property taxes in exchange for a commitment to forest stewardship or public access for recreation. These varying levels of commitment to long-term forest management can be reflected in timber assessment criteria scoring.

Other Assessment Considerations

Adjacent Land Use – The amount of land developed within a specified distance of the parcel could indicate land use and social factors that might have an impact upon forest management. The lower the percentage of land developed in proximity to a parcel the higher the potential for long-term management. Parcels next to forestland enrolled in current use or to publicly owned and managed land are significant because they are contiguous to land under long-term management.

Average Stand Size and Quality – The quality of growing stock and the average size of the standing timber are indicators of potential wood and fiber yields and of forest health. In general, New Hampshire has a maturing forest and an overabundance of low quality trees. Young, fast growing, vigorous stands of desirable species are critical to sustaining a forest based economy. Criteria can be used to score these stands higher.

Scoring for the Site Assessment

The process also requires that a scoring value totaling 300 points be assigned to the criteria outlined. Of the total, 100 points are allocated to the Forestland Evaluation component and 200 points to the remaining site factors. **Exhibit 1** outlines the specific criteria utilized for the Bath FLESA Pilot Study as well as the point and weight values assigned to the criteria developed for that project. Future users of FLESA should again note that this is provided as suggested criteria only and that criteria and scoring values need to be developed for each individual community by its FLESA task team. In the case of the Bath Pilot Study, accessibility based on the identifiers outlined was recognized as the most important non-soils criteria and carried the highest weight values. Public investment was the least important criteria and therefore was assigned the lowest weight values.

Once the individual scores have been identified, they are added together to provide a final total score for the Timber Resource Assessment.

Computer Software Application for the Timber Resource Assessment

The use of the ArcView® GIS Extension, *FLESA-Tools*, developed for this assessment will greatly reduce the handwork involved in the Timber Resource Assessment.

Map and Data Requirements

Maps and data required to complete the Timber Resource Assessment include:

1. Road map of the town with road standards indicated.
2. Environmental limits data.
    - Wetlands map
    - Water resources map (Rivers and streams)
    - Wildlife habitat (See Chapter 6)
    - Steep slope
3. Parcel size (Acreage).
4. Data on conservation easements or current use status by land unit.

Steps Required to Complete the Timber Resource Assessment (Exhibit 1)

1. Establish the final criteria and point values for the Timber Resource Assessment and apply the following steps to each forested land unit or parcel.

2. Assign point value for the Forestland Evaluation element.

    a. On Timber Resource Criteria Scoring Sheet (Exhibit 1), insert point value from Forestland Evaluation step previously completed (Chapter 4).

3. Determine parcel accessibility and related point value.

    a. Overlay land unit map with road map to determine proximity of forested parcels to roads.
    b. Assign point value based on proximity and standard of road. Select highest standard of road as basis for point assignment.

4. Determine environmental limits and assign related point value.

    a. Overlay the land unit map with the various maps being used as indicators of environmental limits (wetlands, streams, wildlife habitat, steep slopes, etc).
    b. Based on frequency and/or severity of the environmental factor, assign appropriate point value.

5. Determine parcel size and related point value.

    a. Determine parcel size from tax map data, through GIS calculation, or by hand calculation.
    b. Assign point value based on point allocation by parcel size.

6. Determine contiguous acreage and related point value.

    a. Determine amount of adjacent acreage by relating parcel being rated against surrounding forested land units. Determine acreage from tax map data, through GIS calculation, or by hand calculation.
    b. Assign point value based on allocation by amount of adjacent acreage.

7. Determine current use status or existence of conservation easement and assign appropriate point value.

8. Total all point value allocations to determine parcel score.

Exhibit 1

Timber Resource Criteria Scoring Sheet

(Example Based on Bath, NH FLESA Pilot Study)

Parcel No. _____

Criteria	Assessment Factor	Maximum Factor Points	Point Assignment
1) Forestland Evaluation Component Score	Insert Score Determined From Forest Productivity Matrix (See Chapter 4)	100	
2) Accessibility	(Select Highest Standard) a) Direct Access To Paved Road b) Direct Access To Year Around Gravel Road c) Direct Access To Class 6 Road d) Legal Right-of-Way e) No Legal Access	 70 60 50 30 0	
3) Environmental Limitations	(Select One) a) None Apparent b) Minor c) Average d) Significant e) Restrictive	 42 35 28 7 0	
4) Parcel Size	(Select One) a) > / = 300 Acres b) 200 - 299 Acres c) 100 - 199 Acres d) 50 - 99 Acres e) 25 - 49 Acres f) < / = 24 Acres	 42 36 24 18 6 0	
5) Contiguous Acres	(Select One) a) > / = 300 Acres b) 200 – 299 Acres c) 100 – 199 Acres d) 50 - 99 Acres e) 25 - 49 Acres f) < / = 24 Acres	 28 20 12 8 4 0	
6) Public Investment	(Select One) a) Conservation Easement b) Current Use: Recreational Adjustment c) Current Use: Documented Stewardship d) Current Use: Standard e) No Current Use	 18 14 10 6 0	

Maximum Total Points 300

Total Parcel Score For Timber Resource Assessment _____

Chapter 6 – Wildlife Resource Assessment

Forests are extremely important to wildlife. Large mammals such as bear require large expanses of forested tracts. Many small mammals and birds nest in the cavities of dead or decaying trees, while others make their homes in healthy trees. Deer and moose browse on tender new vegetation and brook trout live in streams cooled by forest cover.

Maintaining this ecological diversity is important. Much study has been done to identify unique natural communities and the locations of rare and endangered species. Many people also enjoy New Hampshire's abundance of wildlife and diversity of natural communities for observation, hunting, and fishing. Even when the primary purpose is not a venture into the field to observe wildlife, many thrill at the sight of a young deer feeding along the roadside or a hawk sitting in a treetop.

Hunting and fishing are also important sources of tourism revenue in New Hampshire. Many residents enjoy passing hunting traditions onto the next generation or spending a Sunday afternoon fly-fishing on a remote stream or pond. Many visitors to the state also enjoy these pursuits, and most conservation groups sponsor wildlife education and conservation programs. The sale of hunting and fishing licenses in New Hampshire, in large part, supports the New Hampshire Fish and Game Department and their ability to manage for wildlife and wildlife habitat.

Recognizing the value of wildlife diversity and wildlife's dependence on forests is crucial to understanding the need to plan for forest related wildlife habitat. Habitat assessment and needs should be considered early in the planning process to avoid conflicts with other forest uses. For example, a forest with threatened and endangered wildlife species and habitat may be identified for special management needs, while areas where ruffed grouse are prevalent may benefit from a different type of timber management activity since logging encourages browse regeneration and can improve ruffed grouse habitat needs.

Significant Wildlife Habitat

Threatened and Endangered Wildlife Habitat

This is a special category for plants and animals that are in danger of extinction if they or their habitat are not protected or managed properly. The US Fish and Wildlife Service, the New Hampshire Fish and Game Department, and the New Hampshire Natural Heritage Inventory have lists and databases that describe the status of the various species of concern (See Appendix C). These lists and databases should be consulted when evaluating the wildlife resources in a FLESA project.

Other Unique or Critical Habitat

These are habitats important to specific species of wildlife and may be scarce statewide. For the most part, they are unlikely to be mapped and identification would be through analysis of other map data, field surveys, and local knowledge of the community. The unique habitats include such areas as deer wintering yards important for deer during winter months when snow depths exceed 18 inches. During these periods, deer will yard in conifer stands such as hemlock, balsam fir, and spruce, especially on south or west facing slopes, which provide a dense canopy of shelter against wind and snow. Local people with interest in wildlife such as bird watchers and hunters may know of bear scarred beech tree stands, woodcock singing grounds, and raptor nesting sites important to the Wildlife Resource Assessment. The New Hampshire Fish and Game's list of **Critical Habitats For Special Concern Species** includes:

- Grasslands
- Shrublands/Old pasture
- Wetlands
- Nesting colonies/Rookeries
- Winter roosting areas
- Deer winter areas (Mature conifers)
- Cliffs (If occupied)
- Krummholtz/High elevation conifers
- Floodplain forest (Silver or Red Maple)
- Caves/Mines
- Early successional
- Mature Oak or Beech

Unfragmented Lands

"Unfragmented blocks of habitat are large pieces of land with few or no roads, houses, businesses or other human habitation. Their significance to wildlife varies depending on the location in the state. In southeast New Hampshire, where human population has already spread across a large percentage of the landscape, an unbroken parcel or "block" in the hundreds of acres is significant. In northern New Hampshire, where some of the large timberlands are in single ownership, significant unfragmented blocks are much larger.

Unfragmented land provides some of the most valuable wildlife habitat in the long term. It provides a range of contiguous natural habitats that often encompasses many habitat types, supporting a diverse array of native wildlife and ensuring that species common to the area remain common."[1]

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[1] *Identifying and Protecting New Hampshire's Significant Wildlife Habitat: A Guide for Towns and Conservations Groups,* NH Fish and Game Department, 2001.

Riparian Areas and Large Wetlands

Riparian areas are related to the shorelines of lakes, ponds, and rivers and are very important to wildlife. Wetlands are areas where the water table is at, near, or above the surface long enough to establish the growth of water loving or aquatic vegetation. Forested wetlands add a diverse habitat to the upland areas of a community.

The US Fish and Wildlife Service developed National Wetlands Inventory (NWI) maps to identify and classify wetlands of the United States. The maps are available in GIS form through NH GRANIT. In addition, the NH Office of State Planning can distribute hard copies of these maps for New Hampshire upon request (See Appendix C**).** These maps should be consulted when evaluating the wildlife resources in a FLESA project. Other data sources such as topographical maps, aerial photographs, soils maps and satellite imagery (LANDSAT maps) are valuable for identifying wetlands.

Agriculture and Other Open Land

Open land habitat that includes agricultural fields adjacent to forest, or grassy meadows and shrubland openings in the forest, provide environments for wildlife that are dependent upon these habitat conditions.

Wildlife Travel Corridors

Wildlife travel corridor is a phrase used to describe a variety of different habitats that allow movement of wild animals over both long and short distances. An example is a forested stream that runs through open agricultural land between two unfragmented forest blocks.

Primary Site Assessment Criteria and Scoring for the Wildlife Resource

Exhibit 2 provides suggested criteria that can be used or adjusted to identify important wildlife factors for the Wildlife Resource Assessment. Similar to the other resource assessments, the total score value allocated to the criteria for the Wildlife Resource Assessment is 300 points.

Wildlife criteria can be scored in two ways. The first is to simply determine the presence of Threatened and Endangered Wildlife or Wildlife Habitat. If these are present in any parcel, then the parcel is automatically scored the 300 maximum points. If the parcel being rated were large in size and the endangered habitat or species only occupy a small portion of the parcel, then the affected area could be broken out and the remainder of the parcel assessed based on the broader range of criteria reflected in the exhibit.

For most parcels, the suggested criteria outlined in Exhibit 2 will apply. The criteria and attributes relate to the significant wildlife factors discussed previously and include:

Unique or Critical Habitats Present – The most basic application would be to relate to the unique or critical habitats outlined by NH Fish and Game. These could be scored by specific habitat or perhaps by number of unique habitats present. Another variation would be to establish criteria and score simply by cover type, i.e. relate to the NH GRANIT cover type layer map and the cover types based on their wildlife habitat value.

Parcel Size – Larger parcels will be more valuable because they can provide habitat for animals requiring either a small or large home range and offer a greater diversity of habitat types. Parcels under ten acres may provide wildlife habitat, but from a town planning perspective these parcels may not be large enough to be noteworthy, unless they contain a unique habitat.

Contiguous Acreage – Wildlife does not recognize property boundaries. In fact, New Hampshire's more mobile wildlife residents, such as deer, bear, and turkey, will often travel from one preferred habitat to another via forested corridors across several parcels of land. Parcels that are part of a large, unfragmented habitat block are important. Assessment points should be awarded to contiguous acreage that offers such an increase in wildlife habitat. The criteria could be based on factors related to size, or on factors indicating the potential for a wildlife corridor, such as the presence of public land that is unlikely to be developed, river corridors, ridgelines, or designated greenways that are being created to promote recreation, wildlife, and scenery needs.

Wildlife Attractors – The use of this criteria may be balanced against the presence of unique habitats, i.e. if the unique habitats were not present but there were attributes present such as pond, river, rock ledge, potential den trees, open field adjacent to the parcel, old apple orchard present, etc., then the parcel would achieve an additional point value.

Recommended Wildlife Resource Planning Guide

A recommended guide for any community undertaking the Wildlife Resource Assessment component of FLESA is *Identifying and Protecting New Hampshire's Significant Wildlife Habitat: A Guide for Towns and Conservation Groups* published by the Nongame and Endangered Wildlife Program of the New Hampshire Fish and Game Department. This publication identifies ways in which local conservation and planning efforts may be linked to wildlife habitat management and protection. It outlines map and data needs and the steps to identify, evaluate and protect wildlife habitat. The publication should serve as a companion document in implementing the wildlife component of FLESA and will provide an important reference in selecting criteria and assigning appropriate scoring values for the FLESA Wildlife Resource Assessment.

Maps and Data Requirements

1. USGS Topographic maps, Digital Raster Graphic maps.
2. Land Cover map.
3. Wetlands map.
4. Aerial photographs.
5. Rare species location information (NH Natural Heritage Inventory).
6. Other wildlife information
    - Bat hibernation sites
    - Bird migration stopover sites
    - Deer wintering areas
    - Wildlife mast production areas
    - Vernal pools
    - Local wildlife habitat knowledge
    - Other wildlife resource management initiatives

Steps Required to Complete the Wildlife Resource Assessment (Exhibit 2)

1. Establish the final criteria and point values for the Wildlife Resource Assessment and apply the following steps to each forested land unit or parcel.

2. Determine whether there is threatened or endangered wildlife habitat present. If not, proceed to Step 3.

    a. If present, determine whether to designate entire parcel or to break out identified habitat as a sub-unit.
    b. Assign maximum 300 points to land unit determined to be associated with the threatened and endangered wildlife habitat.
    c. If sub-unit broken out, proceed with the following steps for remainder of parcel.

3. Determine whether unique or critical habitats are present based on reference list on page 30.

    a. Utilize method outlined in *Identifying and Protecting New Hampshire's Significant Wildlife Habitat: A Guide for Towns and Conservation Groups*.
    b. Determine whether one or more unique or critical habitats are present and assign appropriate point value.

4. Determine parcel size and related point value.

    a. Determine parcel size from the tax map data, through GIS calculation, or by hand calculation.
    b. Assign point value based on point allocation by parcel size.

5. Determine type of contiguous area and assign point value.

    a. Select all factors that apply and assign total point value. If both public land and a water body are adjacent to the parcel, each would be selected and a total of 18 points assigned.

6. Determine whether wildlife attractors are present and assign point value.

    a. Select all factors that apply and assign total point value.

7. Total all point value allocations to determine parcel score.

Exhibit 2

Wildlife Resource Criteria Scoring Sheet

(Example Based on Bath, NH FLESA Pilot Study)

Parcel No. _____

Criteria	Assessment Factor	Maximum Factor Points	Point Assignment
1) Threatened & Endangered Wildlife Or Wildlife Habitat Present		(Automatic 300 Points)	
2) Unique or Critical Habitat Present (See Reference List on Page 30)	(Select One) a) Three or More Habitat Present b) Two Habitat Present c) One Habitat Present	 160 125 75	
3) Parcel Size	(Select One) a) > / = 300 Acres b) 200 - 299 Acres c) 100 - 199 Acres d) 50 - 99 Acres e) 25 49 Acres f) < / = 24 Acres	 48 42 36 30 18 6	
4) Contiguous Area	(Select All That Apply) a) Public Land b) Water Body **Maximum Points This Factor**	 10 8 **18**	
5) Wildlife Attractor Present	(Select All That Apply) a) Lake/Pond b) Class 1 Stream c) Class 2 Stream d) Class 3 Stream e) Orchard f) High Elevation g) Open Land/Woodland Opening h) Open/Pasture or Hay Field i) Ledge/Unique Geologic Feature **Maximum Points This Factor**	 12 10 9 7 8 8 8 6 6 **74**	

Maximum Total Points 300

Total Parcel Score For Wildlife Resource Assessment _____

Chapter 7 – Recreation Resource Assessment

New Hampshire provides a very special and unique environment for local residents and visitors seeking forest based recreation opportunities. The extensive size and mountainous terrain of the White Mountain National Forest, Nash Stream Forest, and Franconia Notch and Crawford Notch State Parks in the North Country provide a wide range of recreational opportunities on public forestlands. In the southern portion of the state, smaller parcels of state land also provide recreational opportunities in rural or natural appearing settings. However, a great number of New Hampshire residents and visitors participate in outdoor recreational activities on private forestland as well.

Given the small quantity of available public lands, private landowners provide a significant resource for outdoor recreation. Those participating in outdoor recreation activities that use private lands contribute significantly to local economies and to tourist revenues in the state as a whole. Despite this economic benefit, New Hampshire's forest landowners pay the property taxes and absorb the maintenance costs of these lands regardless of the activities that occur on them. As land changes hands or other issues arise, landowner attitudes are changing. The result is that more lands are being posted, preventing public use.

Three trends can be identified that are diminishing the availability of private forestlands for public recreation: increasing population, the rise in liability litigation, and land development. To counteract these trends and issues, forested areas with significant outdoor recreation potential should be identified and the ability to recreate on them addressed. In addition to these trends, the current New Hampshire Outdoor Recreation Plan further identifies several policy issues: access, protection of resources, public education, legal support, control of users, and information.

FLESA can be a useful tool in helping to educate a community in the need to identify areas with recreational potential and related management needs which might otherwise go unnoticed. Through public input, the community has the opportunity to become vested in these areas of high value and support accessibility to, and promote protection for important recreation uses. The FLESA process also helps to enlighten, involve and provide the community with the information needed to become important players in policy formulation on a local and regional level. The community as a whole stands to gain, and collectively its decisions will play a role in developing and maintaining the recreation opportunities important to the health and welfare of its citizens.

Forest Recreation Resource Inventory

The recreation resource component of the FLESA process provides a method to inventory, analyze, and evaluate recreational resources based on criteria that assess the physical character of the land and social needs of the community. Physical attributes of the land, forest, and other site factors affect the setting as well as the types and amounts of recreation opportunities that could potentially occur. Use or demand for an activity is determined by the users' knowledge of the opportunity to participate, the popularity of the activity, and the amount of travel time to the recreation area, and other related factors.

> "Managing for recreation requires different kinds of data and management concepts than managing for other types of resources. While recreation must have a physical base of land or water, the product (recreation experience) is a personal or social phenomenon. Although the management is resource based, the actual recreational activities are a result of people, their perceptions, wants, and behavior" (USDA Forest Service)

A particular user or group of users can develop a value system for forest recreation in many ways. Generally, a person participating in a specific activity attains a satisfactory experience by participating in preferred recreation activities in preferred surroundings or settings.

Communities evaluating forestland for recreation should keep in mind that different settings, the degree of development, and how the land is managed can alter the recreation experience. Two people participating in the same activity may have a different expectation related to the setting, i.e., one person participating in a hiking activity may have expectations for a fairly remote setting to achieve a satisfactory experience while another person may have the same level of satisfaction hiking in a more urban setting. A spectrum of opportunities within a reasonable distance should be provided to meet the needs of all potential users. Parcels can be classified by intensity of use, physical/environmental characteristics, and recreation development level based on Figure 7.1.

Due to the varying meaning of "forest recreation", it is extremely important to have as much public involvement as possible in the rating of parcels. Participants must look objectively at all possible forms of recreation available. The more input obtained from the residents about the recreational resources within the community, the broader the understanding of the uses expected and knowledge of locations currently used within the town. Criteria developed and the values assigned could relate to a variety of community objectives and needs. Perhaps in one community activities related to specific tourism needs are important, while in another the needs are more local and related to traditional woodland recreation activities such as hiking and hunting.

Recreation Opportunity Classification

	Use Level	Physical/Environmental Characteristics	Development Level
I.	Intensive use density and development	High person-per-acre use. Generally, but not always small due to space limitations. Setting may be either natural or man-made	High level of facilities development, which often requires large investment. Managed primarily for recreation. May include recreation related commercial facilities.
II.	Intermediate use density and development	Topographic features may be important. Sizes are variable. Attractive natural environment generally desirable, but may also be man-made. Environmental controls present, but generally not overriding.	Median degree of development. Generally managed primarily for recreation. May include complementary commercial facilities such as hotels, lodges, stores, and ski areas.
III.	Low-use density and development	Very low person-per-acre use. Attractive near natural setting is of primary importance. Topographic features usually important. Varied and interesting landforms, which are aesthetically pleasing.	Minimum developments and facilities for recreation and other purposes. These lands often adjoin, surround, or are surrounded by other classes, thus serving as a buffer. May also serve compatible non-recreation activities such as grazing and lumbering.

Figure 7.1 Recreation opportunities associated with parcels can be classified by use level, physical and environmental characteristics, and development level.

Primary Site Assessment Criteria and Scoring for the Recreation Resource

The following suggested criteria to assess the forest based recreation resource are divided into three sections: the potential demand for recreational activities and facilities; evaluation of existing recreational uses and activities; and the ability of a parcel to provide desired recreation settings as well as opportunities for a range of activities (both existing and potential). The number of points each section receives should be based on its importance determined by the initial objectives, issues and needs identified. Points allocated to each section need to total the 300 points assigned to the Recreation Resource Assessment component of FLESA.

Exhibit 3, based on the Bath FLESA Pilot Study, provides an example format for listing, identifying values, and scoring for the Recreation Resource Assessment. It includes reference to some of the criteria listed below. It is important to note that a community is not expected to select the entire list of criteria. The list is provided to help determine those criteria that will address the objectives and needs identified by the community and FLESA team for undertaking this part of the FLESA process.

Assessment for Demand and the Potential for Recreation Development (Suggested Criteria):

Accessibility – Parcels that are easier to access result in greater recreation participation on those sites. The closeness of a parcel to a primary or secondary road should be considered. In addition, access through residential neighborhoods may create limitations due to objection and traffic or noise. Another consideration for access attributes could relate to whether the parcel is posted or requires permission in order to be used. Site accessibility by people with disabilities would be an added consideration if the topography lends itself to reasonable adaptations. In some cases, lower standards of access may be valued higher if the desired recreation opportunity and related setting lends itself to a more primitive setting. In some respects, criteria describing access could serve as indicators of setting as well as potential to recreation popularity.

Proximity of Parcel to Existing Recreation Areas and Facilities – The proximity to parcels with similar recreational opportunities could either compete with an existing area or help alleviate user problems and conflicts. Towns should evaluate whether it is beneficial or detrimental to have similar opportunities close together. The proximity to a parcel with complementary recreational opportunities would prove beneficial for both parcels.

Proximity of Parcel to Local Population Centers – Proximity to town centers or neighborhoods adds to the potential for recreation use. Parcels not within easy commute are less likely to be intensively used.

Proximity of Parcel to Regional Population Centers – The proximity of parcels to population centers on a regional basis increases the likelihood of recreational use by visitors to New Hampshire as well as by New Hampshire residents. All of New Hampshire is within a one-day drive of Boston, Massachusetts and Montreal, Quebec. However, parcels farther from major population centers are less likely to be used if they are not near areas considered tourist destination points.

Assessment of Existing Recreation Uses and Activities (Suggested Criteria):

Recreation Activities Present – This criterion recognizes the existence of recreation activities currently occurring on the parcel. The priority of the listed uses and activities could be based on the initial objectives identified by the FLESA team and community. Scoring values could potentially be developed around the priority and desirability for the different recreation activities listed with some types of activities and uses rated higher than others. In other cases, a parcel that supports a diversity of uses may be the rating factor and the parcel could be rated on 1, 2, and 3 or more uses and activities present.

General Quality of Activity – Criteria developed should provide an indication of the quality of the experience, setting, and condition of facilities for existing uses. The assessment could be based simply on a community or user survey with low, moderate, and high ratings as the indicator for scoring.

Public Investment – Whether the community already has an investment in the parcel as a result of conservation easements or current use designation should be considered. Status under this classification could be an indication of the desirability of the land for recreation use and whether the land is currently being utilized for recreation activities.

Assessment for Desired Recreation Setting and Opportunities (Suggested Criteria):

Recreation Attractors – Recreational attractors are natural features that have local, regional, or statewide significance. These features either directly or indirectly draw people to pursue recreational activity and include such features as lakes and rivers, geologic features such as cliffs or waterfalls, and other special land features such as ridges and mountain tops that have the potential to offer views and certain recreation challenges.

Parcel Size – Larger parcels are more likely to provide for multiple uses, a buffer from conflicting uses, and a sense of isolation from development. Larger parcels are less likely to be affected by growth in a community, and also provide additional land base should a proposed recreation use need expansion. Size classification will vary from community to community and should be adjusted to best represent individual planning needs.

Contiguous Acres – The location of a parcel in relation to surrounding parcels is important. Parcels contiguous to special sites that people are known to frequent provide additional recreational opportunities and added buffer from development. Contiguous acreage also relates to the potential for greenway development with respect to linear recreation activities such as hiking and biking. It is a criterion that could be tied in with neighboring communities or even statewide recreation corridors. Acreage classification or the presence of public land, river corridors, or designated greenway could also be used as attributes for the criterion.

Remoteness – This attribute looks at the proximity of the parcel to other developments as well as the roads that access the site. This criterion addresses the factor of solitude from other people and activities. It is used as an indicator of the opportunity to experience greater or lesser amounts of social interaction and whether the site lends itself to more primitive recreation opportunities or to more urban related ones. Criteria selected for this category can have values attached that would weight the criteria either way depending on the objectives and needs identified. If road standard were utilized as the indicator and the desire were for recreation activities with a high level of solitude, then values that provide higher scores for lower standard roads with less traffic in the vicinity would be assigned. If the desire were for recreation activities in a more urban-forested setting, than higher values would be attached to the proximity of higher standard roads.

Criteria based on the direct evidence of other activities or developments present or in the vicinity could be used in similar ways to indicate remoteness. The less the evidence of development, the more solitude. Greater presence of development would indicate the opportunity for less solitude and a higher probability for occurrence of the sights and sounds of people.

Environmental Limitations – General evaluation of the parcel to support recreation activities based on environmental factors or limitations similar to the Timber Resource Assessment could be utilized. These could relate to general soil factors such as wet or dry soils, slope and terrain factors that might prohibit or make certain recreation activities a high risk, factors that would prevent access, and consideration for fragile environments where recreation activities would pose a threat.

Available Recreation Resource Planning Reference

Much research is available dealing with recreation resource planning, user preference for a variety of recreation activities, and setting preferences. Universities, especially those providing recreation and tourism curricula are good sources of research data. Also suggested for reference is the USDA, *Forest Service Recreation Opportunity Spectrum Users Guide* on which much of the FLESA Recreation Resource Assessment is based.

Map and Data Requirements

1. Road map of town with road standards indicated
2. USGS Quad maps or Digital Raster Graphic maps covering town
3. Regional maps
4. Trail maps
5. Parcel size (Acreage)
6. Data on conservation easements or current use status by land unit
7. Soils, Water Resource maps

Steps Required to Complete the Recreation Assessment (Exhibit 3)

1. Establish the final criteria and point values for the Recreation Resource Assessment and apply the following steps to each forested land unit or parcel.

2. Determine parcel accessibility and related point value.

    a. Overlay land unit map with road map to determine proximity of forested parcels to roads.
    b. Assign appropriate points based on road standards.

3. Determine presence of trail(s) and related point value.

    a. Overlay land unit map with USGS map or other map showing trails.
    b. Determine type of trail present and assign appropriate points.

4. Determine current use status and assign appropriate point value.

5. Identify recreational attractors present and assign appropriate point value.

    a. Select all factors that apply and assign total point value.
    b. Water bodies can be identified from USGS Maps or Digital Raster Graphic maps.
    c. Existing trails can be identified from USGS maps and trail maps.
    d. Viewshed information can be obtained from the Scenic Resource Assessment (Chapter 8).
    e. Hunting and fishing data can be identified from local knowledge.
    f. Historical data can be obtained from USGS maps, surveys, and local knowledge.

6. Evaluate contiguous areas to determine significance in providing recreation opportunity and assign appropriate point value.

    a. Select all factors that apply and assign total point value.
    b. Public lands, presence of large water bodies, and recreation areas can be identified from USGS maps.

7. Total all point value allocations to determine parcel score.

Exhibit 3

Recreation Resource Criteria Scoring Sheet

(Example Based on Bath, NH FLESA Pilot Study)

Parcel No. _____

Criteria	Assessment Factor	Maximum Factor Points	Point Assignment
1) Accessibility	(Select Highest Standard)		
	a) Direct Access To Paved Road	60	
	b) Direct Access To Year Around Gravel Road	50	
	c) Direct Access To Class 6	40	
	d) Legal Right-of-Way	20	
	e) No Legal Access	0	
2) Trail Type Present	(Select One)		
	a) Public Use Trail	40	
	b) Private/Non-Designated Trail	20	
	c) No Trails Available	0	
3) Public Investment	(Select One)		
	a) Current Use: Recreational Adjustment	20	
	b) Current Use: Documented Stewardship	15	
	c) Current Use: Standard	10	
4) Recreational Attractors	(Select All That Apply)		
	a) Lake/Pond or Class 1 Stream	50	
	b) Class 2 or 3 Stream	30	
	c) Trails/Any Type	20	
	d) View/Highly Scenic	15	
	e) View/Moderately Scenic	6	
	f) View/Minimal	5	
	g) Hunting/Fishing	10	
	h) Historical Site	10	
	i) Recreation Facility	10	
	Maximum Points This Factor	**156**	
5) Contiguous Areas	(Select All That Apply)		
	a) Adjacent To Public Land	8	
	b) Adjacent To Water Body	8	
	c) Adjacent To Trail Corridor	8	
	Maximum Points This Factor	**24**	

Maximum Total Points 300

Total Parcel Score For Recreation Resource Assessment _____

Chapter 8 – Scenic Resource Assessment

Protection of scenic resources is important to a state that relies heavily on tourism and on the rural quality of life. Perhaps more important is that scenic resources contribute extensively to the character and identity of New Hampshire communities. As New Hampshire continues to grow, most residents desire to preserve the scenic attributes of the landscape and to carefully blend development and land management activities with the surrounding natural appearing landscape. Evidence of this concern can be seen in the efforts to manage land use issues related to open space, urban sprawl, and preservation of the state's cultural heritage.

Forests play a significant role in and are an important component of New Hampshire's scenery. Comprising over eighty-four percent of the land area in New Hampshire, forests provide the scenic backdrop to open farm fields, lakes, and villages. Trees mark the courses of streams, line country roads, and herald the change of seasons. Studies have shown that high quality scenery, especially that related to natural appearing forests, enhances people's lives and benefits society. However, despite their importance, scenic resources usually are not effectively evaluated in natural resource and community planning projects.

Research has shown that it is possible to identify landscape characteristics that contribute to visual quality and scenic resources. Research has also shown a surprising consistency in the types of landscape people prefer. As a general statement, natural appearing landscapes are the ones most valued. The important fact is that all landscapes can be described and quantified for assessment purposes. Along with this, the same landscapes can be rated according to their importance to the community. One of the best ways to describe the visual appeal of forested landscapes within a community and to help preserve those characteristics that have high visual value is to conduct a Scenic Resource Assessment. Besides the goal of identifying and gaining a general appreciation of the aesthetic values that exist in forested settings, the possible objectives of conducting such an inventory are:

1) To coordinate timber and other management activities on parcels with high scenic value so that visual quality is not lost.

2) To evaluate parcels or sites with potential scenic value that can be maintained and/or enhanced through management activity.

3) To identify critical forest based scenic resources that could receive threats to their visual integrity as a result of development and may need restrictions or protection.

4) To identify significant scenic resources that have potential for educational and/or recreational use.

Through a Scenic Resource Assessment, the community and landowners have an opportunity to integrate aesthetic concerns with other land management objectives. Paying careful attention to the scenic qualities of a given site can mitigate a great deal of the objection to land alteration activities. Comprehensive inventories that include Scenic Resource Assessments will often have immediate significant impacts on the opinions of planning board members, planning directors, landowners, and community residents.

Scenic Resource Assessment

The Scenic Resource Assessment component of FLESA outlines a logical and consistent method for assessing forest landscapes for their value as an integral part of a scene and their role in enhancing a view. However, preserving scenic quality is different from the other resource assessment components in its implementation requirements. While the other resource assessments are related to on-site attributes, the Scenic Resource Assessment is largely based on viewing the parcel from an off-site location and judging how the parcel is perceived as part of the total landscape. It is important in this assessment to identify the viewpoints from which the forested parcel is viewed.

Scenic assessment requires field observation to score the evaluation criteria. Even though some initial information and data can be obtained from maps and community participation, the assessment is more field intensive than the other FLESA inventories. Evaluation of many of the site attributes requires visual or on-site interpretation, especially if consistency is desired in applying the inventory procedures across the parcels being assessed. Although utilization of the selected assessment criteria will help keep the resource assessment objective, there is always an element of subjectivity in scenic inventories and interpretation. Preferably, a single individual or team should be used to conduct the entire Scenic Resource Assessment to maintain consistency. It would also be of benefit if they were familiar with landscape assessments in general and are able to validate each scenic attribute with equal attention and professional judgment.

The Scenic Resource Assessment is completed for two important categories. The first is related to the **Scenic Importance** of the parcel being viewed. This category deals with the concern that the community has for the particular view that the parcel is associated with. It includes such factors as how well the view represents community character, how many times it is viewed, type and duration of the view, and distance from the viewer. In order to accomplish this step, it will be important to identify the key viewpoints throughout the project area. Initially this can be accomplished through community participation where those who participate in the FLESA process can list views in the community that are important to them. Community surveys may be a way to accomplish these tasks, along with gathering other information relating to attitudes toward the scenic resource and its importance.

Once the initial viewpoint data is obtained, it is essential that the viewpoints be verified in the field and that specific data related to the criteria be collected. Physical attributes can be identified as well as factors such as type and duration of the view. Fieldwork may also be needed to identify additional views. A good practice is to document viewpoints and related views with photographs for later use in interpreting field data and making interpretations related to the criteria.

The second category of criteria for Scenic Resource Assessment is used to determine the **Scenic Quality and Integrity** of the viewed parcel. This category looks at attributes such as topography, mix of vegetation, special features, overall composition, variety, and whether there are distracting elements in the view. In general, the more distinctive any one of the landscape components (landform, vegetation, and water) is by itself, or when they occur in combination, the more scenic the landscape. Overall, natural appearing landscapes rich in variety are the most valued.

Primary Site Assessment Criteria and Scoring for the Scenic Resource

The following suggested criteria to assess the forest based scenic resource are divided into the two sections of Scenic Importance and Scenic Attractiveness and Integrity. For the most part, the criteria provided in Exhibit 4 will be fully utilized to complete the Scenic Resource Assessment. What will vary are the specific attributes used to score the individual criteria. A helpful step is to write a simple character description of the land base involved, usually the entire town, describing the range of variety in elements such as landform, presence of water, mix of vegetation, and presence and type of special features. These factors will have a wide range across the state and it is important to describe the assessment of each community in the local or regional context of what these factors offer. The landform in the mountainous areas of the state will have different elevation and slope factors applied as compared to the areas that range from flat to gently rolling in other parts of New Hampshire. Some communities will have an abundance of water features, while for others special features may relate more to rock ledges or historic and cultural factors. Points allocated to each section should total the 300 points assigned to the Scenic Resource Assessment component of FLESA.

Scenic Importance (Suggested Criteria):

> **Concern Associated With Viewed Parcel**– This criterion represents a general consensus by the FLESA participants as to the significance of the view. This can be obtained from surveys and from such factors as times viewed, or whether the view of the forested parcel is highly representative of community character or relates to a common occurrence. Concern can be identified as low, moderate, or high.

The relationship of the viewpoint to a special location will often influence its importance. Most viewpoints are associated with a trail, road, water feature, or recreation area. Community objectives for forested scenic resources may carry more weight for one of these associations verses another. One community rich in lakes may have a concern for forested views from lakes, while another may associate its views more highly from trails.

Duration of view is also important and can relate to whether the view is associated with an overlook, as an opening along a trail, or whether it is only observed for a short distance along a high-speed highway.

Type of View – This criterion provides an indication of the quality of the view and an indication of its significance. Whether the view is panoramic in nature, focal, or a filtered view is an indicator of its ability to be readily viewed.

Viewing Distance – The position of the viewer in relation to the forested parcel is important. Distance zones of foreground (0 –1/2) mile from viewer to viewed feature, middle ground (1/2 – 4 miles), and background (over 4 miles) are the zones usually recognized. Research on human perception shows foreground has the most value because it is closest to the viewpoint and provides the greatest ability to perceive detail. However, many forested scenes include striking views in the middle ground and background, which are also highly valued. Public participation is the best way to determine what is locally important.

Visual Protection – Optional criterion centers on the importance of a forested parcel to provide a buffer to screen out distracting elements in the landscape. The parcel could have special significance if it screens out such things as junkyards, gravel pits, power line and substations, and interstate highways.

Scenic Quality and Integrity (Suggested Criteria):

Topographic Features – Terrain features of topography and slope can add much diversity or variety and interest to viewed landscapes. Flat terrain does not offer the visual relief of a ridgeline or steep slope. Higher elevation forest is commonly recognized as more scenic. Forested slopes providing backdrops to views contribute substantially to the rural appearance of a community.

Special Features – The addition of observable special features in the view associated with forested scenes, such as lakes, wetlands, rock ledges, open fields, or historic and cultural features, adds an additional element to the composition of the forested view.

Vegetation Cover – The mix of forest cover can also contribute significantly to variety and interest of a view. Generally a mix of vegetation between conifers and deciduous species will offer the greatest interest in visual color and textural contrast, especially on a seasonal basis.

Integrity of View/Distracting Elements – Scenic integrity or wholeness of the viewed landscape is another component that needs to be taken into account in determining scenic quality. Landscapes with a high degree of scenic integrity have minimal evidence of distracting elements that take away from the aesthetic value of the view. Distracting elements might include alterations of the landscape resulting from power lines, clear cuts poorly designed or out of scale with the landscape, gravel pits, and unattractive structures.

Map and Data Requirements

The primary maps needed to complete the Scenic Resource Assessment are either USGS Quad maps or Digital Raster Graphic maps covering the town. These maps are useful for recording location of views, interpreting terrain data, identifying special features, and outlining the amount of area viewed from a viewpoint.

Steps Required to Complete the Scenic Resource Assessment (Exhibit 4)

1. Establish the final criteria and point values for the Scenic Resource Assessment and apply the following steps to determine a forested parcels importance for this resource area.

2. Identify locations providing scenic views.

    a. Identify locations from community member input, general knowledge, and/or by field observation.
    b. Locate viewing positions on USGS Quad map.

3. Visit view locations and collect data and information related to important factors.

    a. Type of View (Panoramic, focal, filtered)
    b. Topographic Features (Mountainous/steep, rolling, flat)
    c. Special Features (Water, rock ledge/outcrop, cultural, etc.)
    d. Vegetation (Deciduous, conifer, mixed)
    e. Integrity of View (Distracting elements present)

4. Optional - Take photograph of view for future reference and potential use in completing community survey and rating of important views.

5. On USGS Quad or topographic map outline limits or boundary of view.

6. In office, overlay land units map with view location/viewed area map and determine which forested parcels are in the identified views.

7. Determine concern level of view and assign appropriate point value from Scenic Resource Criteria Scoring Sheet (Exhibit 4) to those parcels that are observed within the view.

    a. Consider completing a community survey and rating of photographs taken of views to determine which views are the most and least important.
    b. Note whether parcel being evaluated is viewed from more than one view location.
    c. Is view highly representative of community character?
    d. Is duration of view for a short or long period of time?

8. Assign appropriate point value for type of view.

9. Determine if forested parcels are in the foreground, middle ground or background distance zone and assign appropriate point value.

    a. On map used in step 5, use map scale to measure distance from view location to viewed parcel.

10. Assign appropriate point value for Scenic Quality/Integrity factors identified in the field and listed on criteria scoring sheet.

11. Total all point value allocations to determine parcel score.

Exhibit 4

Scenic Resource Criteria Scoring Sheet

(Suggested Criteria For Assessment)

Parcel No. _____

Criteria	Assessment Factor	Maximum Factor Points	Point Assignment
A. Scenic Importance			
1) Concern Level	(Select One) a) High b) Moderate c) Low	 80 50 20	
2) Type of View	(Select One) a) Panoramic b) Focal c) Filtered	 40 24 8	
3) Viewing Distance	(Select One) a) Foreground b) Middle ground c) Background	 30 18 6	
B. Scenic Quality/Integrity			
1) Topographic Features	(Select One) a) Highly Diverse (Mountainous, Steep Slopes) b) Rolling/Foothills c) Flat/Lowland	 64 40 16	
2) Special Features (Water, Rock Ledge, Cultural Feature, Open Field, Unique Vegetation)	(Select One) a) 2 Or More Present b) 1 Or More Present c) None Present	 36 18 0	
3) Vegetation Cover	(Select One) a) Mixed b) Deciduous c) Conifer	 25 15 15	
4) Integrity Of View/Distracting Elements	(Select One) a) No Distractions Present b) Minimum Distractions Present c) Moderate Level Of Distractions d) High Level Of Distractions	 25 15 5 0	

Maximum Total Points 300

Total Parcel Score For Scenic Resource Assessment _____

Chapter 9 – Putting It All Together

Analysis of FLESA Results

Once the FLESA process is completed and the data mapped and tabulated, the results can be used to make sound forest resource and community planning decisions. An overall picture of those parcels most significant to the various resource assessment categories will be provided showing their distribution and relationship to each other. There will be a good indication of where the best parcels are for timber management, wildlife habitat, recreation, and which parcels are most significant in scenic values. Results may show that these parcels are scattered or are in large contiguous blocks with perhaps concern over fragmentation that would affect several of the resource areas.

There are different options that have been used to display the results of the FLESA process and to provide a format that makes it easier to begin analysis of the resulting data and information. One of the simplest and most understandable formats is a matrix (Figure 9.1) that displays the rated parcels along the left margin with columns for the individual resource area scores listed across the top. The last column provides the total overall score for the parcel.

Parcel	**Forestland Evaluation Score**	**Timber Resource Assessment Score**	**Wildlife Resource Assessment Score**	**Recreation Resource Assessment Score**	**Scenic Resource Assessment Score**	**Total Parcel Score**
1						
2						
3						
↓ Continue						

Figure 9.1

This format allows the reviewer to quickly identify the parcels with the highest overall score and identify what the most important resource areas are within the parcel. Review and analysis of the matrix might show that there are several parcels that scored high in two or more resource assessment area. These are parcels that will need to be addressed due to potential for competing use. This may lead to strategies where coordination and management direction in one category, such as timber, may be used to benefit the wildlife, recreation, or scenic resource. In some cases, the analysis of the data may indicate a direct conflict where decisions need to be made to minimize certain uses related to one resource in order to protect the quality of another.

Another option, especially in using GIS technology, is to create a shaded or color coded map (Figure 9.2). In this type of map, those units having the highest score can be displayed using darker colors or shades of gray, while the lowest scoring units are displayed in light tones. This type of map is very useful in graphically illustrating the location of the units along with a relative indication of their value. This type of map can be developed for overall parcel scores or for each resource assessment area as illustrated in Figure 9.2, Timber Management Assessment Scores for New Boston.

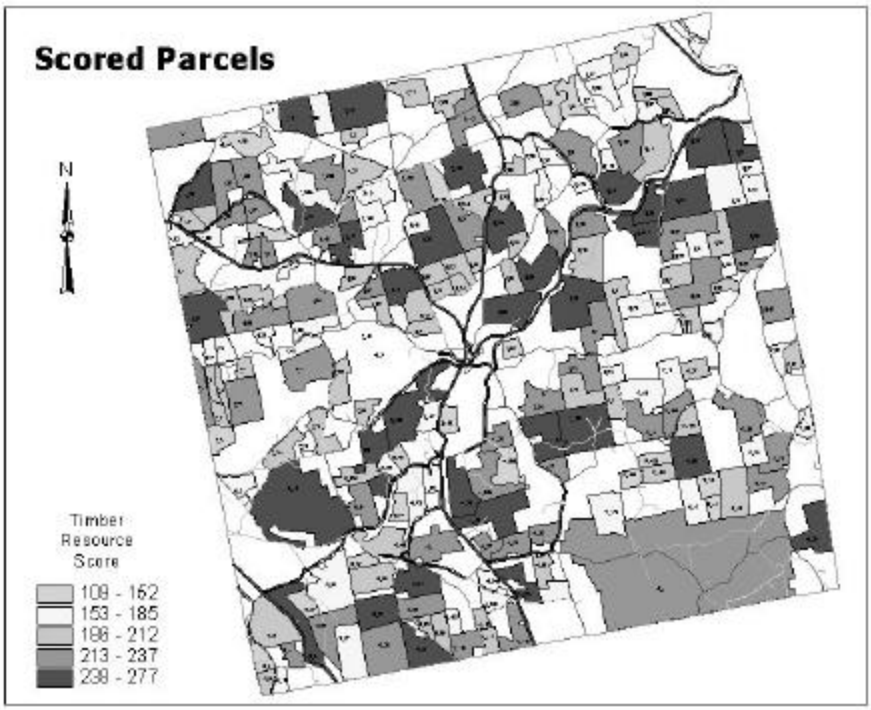

Figure 9.2 - Parcels included in the New Boston FLESA study. Shades indicate ranges of the combined Forestland Evaluation and Timber Resource Assessment scores

Review and analysis of the FLESA results can be as broad or as detailed as needed to address the goals and needs identified earlier in the process. The important point to remember is that the FLESA process will have generated valuable information. It will only be useful if the FLESA task team is willing to put thoughtful and creative time into analysis and interpretation of the data and incorporating the results into community planning.

The user of FLESA is again encouraged to read *Natural Resources Inventories: A Guide for New Hampshire Communities and Conservation Groups*, specifically Chapter 5 for additional thought on putting the inventory data to work. This guide along with *Open Space for New Hampshire: A Toolbook of Techniques for the New Millennium* outline ways to incorporate the results of natural resource inventories into useful management tools.

Appendix A

Statewide Forest Planning

1996 NH Forest Resources Plan Vision Statement

New Hampshire's landscape will be dominated by diverse forest cover in a complex mosaic of forests and farms, rivers, lakes and mountains, interspersed with thriving urban and rural communities, enhanced by undeveloped open spaces.

The landscape will reflect a balance that is vital to the character of New Hampshire – sustainable, strong economies of forest industry, tourism and outdoor recreation, dependent upon healthy, properly functioning ecosystems.

New Hampshire citizens, now and in the future, will live, work and play in this diverse forested landscape, and will increasingly understand themselves as sustaining the landscape, and being sustained by it.

RSA 220, the Forest Resource Planning Act, passed in 1981, requires that a comprehensive statewide plan be prepared every ten years. This law formalized a 50-year tradition of forest planning that has periodically evaluated the condition and needs of forest resources in New Hampshire. The most recent planning effort culminated in the publishing of the *New Hampshire Forest Resources Plan* in April of 1996. The vision statement in this forest resources plan describes a desired future condition for the New Hampshire landscape.

Of the thirteen challenges to achieving the vision identified in the *New Hampshire Forest Resources Plan*, the Forestland Evaluation and Site Assessment (FLESA) Process described in this handbook addresses nine. This process is specifically identified and its use encouraged in the *New Hampshire Forest Resources Plan* under an action item to "Encourage careful siting of development to maintain ecologically significant land and large contiguous blocks of managed lands." The challenges to obtaining this vision that FLESA directly or indirectly addresses are:

- People understand and appreciate the value of New Hampshire forests.
- Forest communities sustain biologically diverse populations of native plants, animals, and other organisms that depend on the processes of the forest environment for survival and continuation of evolutionary processes.
- Scientific information about natural communities, ecological systems and physical site conditions is the foundation for land management and protection decisions.
- Natural resources are used by New Hampshire industries to provide a diverse economic base that optimizes value-added products and provides stability for communities and residents.
- Forest based businesses, which have contributed to the stability of New Hampshire's economy for 300 years, are recognized and encouraged by public and private organizations, and public at large.
- Privately owned forestlands contribute significantly to New Hampshire's forest based economy, tourism and outdoor recreation, biological diversity, and character of landscapes.
- Landowners responsibly exercise property rights and the public respects owners' rights.
- The New Hampshire tradition of cooperation and community spirit continues with well-informed citizens who actively participate in local, regional, and state decisions about forest resources.
- Local land use plans reflect and incorporate the state forest resource plan.

Appendix B

Development Potential Assessment

Development Potential Assessment discusses a different application of FLESA. It rates a parcel's value for potential development use rather than its natural resource values addressed in previous chapters. The application discussed here is based on a community issue and concern identified in the Bath NH Pilot Study. It illustrates the ability of FLESA to be tailored to address specific land use planning issues related to forested parcels. In this Pilot Project, it was determined that to address potential conflicts with natural resource uses, it would be beneficial to look at which parcels have the most potential for conversion to development uses.

Much work has been done to evaluate the suitability of land for a range of development, such as on-site septic disposal, construction of foundations, and building of roads. When soil criteria are used as the focus of land suitability discussions, it is logical that good soil characteristics will be beneficial for constructing buildings as well as growing trees. When a community conducts a FLESA, it should be aware that the identification of lands as being prime timber growing lands could set up conflicts with lands that are prime for development as they utilize similar attributes in determining their value. This is not necessarily so for lands of high value for wildlife habitat, recreational uses, or having scenic values. However, there is always the potential for conflicts between these resource areas and lands having development potential as well.

By comparing parcels ranked high for timber, wildlife, recreation, and scenery with their value for development potential, possible land use conflicts will become apparent. When conflicts are identified, they can be objectively addressed through the planning process.

Primary Site Assessment Criteria for Development Potential

A parcel of land's suitability for development can be based on a number of factors. The Bath Pilot Study developed criteria for both Positive Development Factors and for Negative Development Factors. Criteria and scoring values were developed between the two factors to give an overall score with a maximum of 300 points. A more thorough discussion of this assessment along with examples of the specific criteria and scoring values used can be found in the Town of Bath FLESA Report (Available from NH RC&D Area Councils).

Positive Development Factors

Soil Suitability for Development – As with the Timberland Resource Assessment, a Soil Potential Index (SPI) Reference Table for development suitability is available from NRCS. These scores are based on the ability of a specific soil type to accommodate proper and safe development activities, principally on-site wastewater assimilation, building foundations, and road construction. As with the timber criteria, in scoring individual parcels, it is often necessary to blend several soil types to create a composite

SPI. This composite takes into account the number of acres of each soil type present in a parcel and uses a weighted average

Accessibility – The same evaluation of a parcel's accessibility for timber value is used for its development suitability as well. Access to a particular parcel is an important factor relating to development potential, primarily its use for housing.

Water Features – Water tends to be a positive attribute, often attracting development. The presence of a stream, pond or lake is an important positive factor.

Aesthetic Value – The view from a parcel is a major factor in its desirability and value for development. The variety and quality of the surrounding environment is also an important aspect in developing this criteria factor.

Current Zoning – Zoning in a community reflects the collective view of where development should be sited, as well as its type and density. Zones intended for open, conservation, agricultural or similar low-density use should be scored lower than other districts.

Availability of Utilities – The cost of bringing electricity, water and sewer to a remote site can be high. The presence of utilities on a site or its relative proximity is an important consideration to development potential.

Negative Development Factors

Floodplain - Location of a parcel in a floodplain is a disadvantage from a development standpoint. The need to raise a structure above the 100-year flood elevation to conform to local zoning restrictions and the inadvisability of floodplain encroachment are disincentives to developing in flood prone areas. Generally, parcels in floodplain locations should not be developed and should be designated as such.

Neighboring Land Use/Other Factors – The suitability of a parcel for development is influenced by adjacent land uses or by other physical characteristics of land not on the property being evaluated. A major electrical power transmission line, an above ground gas pipeline, obnoxious manufacturing activity, gravel pits, or other use will have a bearing on the development potential of the parcel.

Environmental Limitations – This category is used to assess limitations that are not reflected in soil suitability indexes. Limiting factors could relate to important wildlife habitat, wetlands, steep slopes, or similar factors.

Development Potential Scoring Results

The table below was taken from the Bath NH FLESA Study. Based on the actual criteria and scoring values developed for the study, the most outstanding result for the Development Potential Assessment in Bath was that over 16,792 acres, 77 percent of the town scored 150 points or less out of a possible 300. Only 569 acres, or 3 percent of the town scored in the highest category. These results may indicate, based on criteria and scoring values the Bath FLESA committee chose, that development in Bath is already at or near the capacity of the town's available natural resource base to accommodate intensive development. Most likely the continued growth of residential or planned residential sites will and should continue, but this study may show that the town planning process of the last 30 years has assisted in directing growth to the most tolerant portions of town.

Development Potential Scoring Results
Bath, NH FLESA Pilot Study

Range Of Scores	Number Of Parcels	Percent Of Total Parcels	Number Of Acres	Percent Of Total Acreage
0-30	70	25	7784	36
31-90	38	14	3971	18
91-150	74	27	5007	23
151-210	80	29	4376	20
211-300	15	5	569	3

One needs to look at the overlap of high scoring development parcels with parcels scoring high for other resource areas. These combinations are where potential conflicts for competing uses are likely to occur.

Appendix C

Types and Sources of Natural Resource Planning Data for New Hampshire

Type of Data	Format of Data	Where to Obtain Data	Why Data is Important
Master Plans	Printed reports	NH towns and cities	FLESA must be incorporated in or complement a town's master plan.
Base Maps – (Roads, trails, streams, lakes, political boundaries, topography)	Printed USGS topographic maps Digital Raster Graphic (DRG) Maps	Local bookstores, regional planning commissions, USGS/ESIC[2] NH GRANIT (UNH[2] Complex Systems Research Center)	Critical for orientation and data recording. Used for all FLESA assessments to identify surface waters, wetlands, slopes, unfragmented forests and urbanization.
Aerial Photography (Black & White) Additional photography, such as low level 35mm	Contact prints and photo enlargements. Digital Orthophotoquad (DOQ) Data (Rectified digital aerial photography in quarter-quad format)	FSA[3] (Prime source), regional planning commissions, USGS, also towns and private contractors NH GRANIT (DOQ's are currently available for Rockingham County and White Mountain area)	Used for vegetation typing for Forestland Evaluation. Also used for wildlife and recreation inventories, to locate boundaries, identify surface waters, (wetlands) slopes, unfragmented forests and urbanization.
Color Infrared Photography Satellite Imagery	Contact prints and transparencies Digital imagery for use in classification and image analysis software	FSA (Prime source), towns, private contractors, forest product companies. NH GRANIT	Used for vegetation typing, forest health evaluations and wetland identification in Timber and Wildlife Resource Assessments.
Important Forest Soil Groups Maps	Printed forest soils maps Digital forest soils data	NRCS,[4] regional planning commissions NH GRANIT	Required for basic FLESA Forestland Evaluation using the recommended method.
National Cooperative Soil Survey (Soils maps)	Printed soils maps Digital soils data	NRCS, regional planning commissions NH GRANIT	Used to identify hydric soils (wetlands), and slopes.
National Wetlands Inventory (NWI) Maps	Printed NWI quadrangle maps Digital NWI data	Office of State Planning NH GRANIT	Used to identify wetlands for Wildlife Resource Assessments.

[2] US Geological Survey / Earth Science Information Center
[2] University of New Hampshire
[3] Farm Service Agency
[4] Natural Resources Conservation Service

Appendix C

Types and Sources of Natural Resource Planning Data for New Hampshire

Type of Data	Format of Data	Where to Obtain Data	Why Data is Important
Town and City Tax Maps and Assessors' Property Lists	Printed tax maps and lists of property characteristics. Digital tax maps and parcel information in database format.	Local tax assessor's office Certain towns, regional planning commissions, private contractors	Used for parcel identification, selection and data layering for FLESA assessments.
Local Zoning Regulations	Printed zoning district maps and ordinances. Digital zoning district boundary maps	Local planning board, regional planning commissions NH GRANIT	Site assessment criteria may be based on these regulations.
NH Natural Heritage Inventory	Area of Concern Maps by NH Natural Heritage Inventory (NHNHI) Approximate locations of NHI occurrences	DRED[5] – NH Natural Heritage Inventory (NHNHI) NHNHI, NH GRANIT	Used for Wildlife Resource Assessments.
Deer Yard Maps	Printed maps	NH Fish and Game (NHF&G)	Used for Wildlife Resource Assessments.
Local Wetlands Maps	Printed maps	City and town conservation commissions, regional planning commissions	Used for Wildlife Resource Assessments.
Trail Maps (Hiking, snowmobile, biking)	Printed maps, verbal descriptions Digital trails data	OSP[6], DRED Division of Parks and Recreation NH GRANIT	Used for Recreation Resource Assessments.
Other natural resource inventory data	Printed or digital data	Regional planning commissions, DRED, UNH Cooperative Extension, NHF&G, NRCS, NH GRANIT	Data, when available, are used for the appropriate resource assessments.

[5] NH Department of Resource and Economic Development
[6] Office of State Planning

Appendix D

Agencies and Organizations

UNH Cooperative Extension Offices

UNH Cooperative Extension
Nesmith Hall
131 Main Street
Durham, NH 03824-3597
Water Resources 862-1029
Forestry & Wildlife 862-1028

UNH Cooperative Extension
- Belknap County
36 County Drive
Laconia, NH 03246-2900
527-5475

UNH Cooperative Extension
- Carroll County
75 Main Street
Center Ossipee, NH 03814
539-3331

UNH Cooperative Extension
- Cheshire County
800 Park Avenue
Keene, NH 03431-1513
352-4550

UNH Cooperative Extension
- Coos County
629A Main Street
Lancaster, NH 03584-9612
788-4961

UNH Cooperative Extension
- Grafton County
3785 Dartmouth College Hwy.
Box 8
North Haverhill, NH 03774-4936
787-6944

UNH Cooperative Extension
- Hillsborough County
468 Route 13 South
Milford, NH 03055
673-2510

UNH Cooperative Extension
- Merrimack County
315 Daniel Webster Hwy.
Boscawen, NH 03303
225-5505

UNH Cooperative Extension
- Rockingham County
113 North Road
Brentwood, NH 03833
679-5616

UNH Cooperative Extension
- Strafford County
259 County Farm Rd., Unit 5
Dover, NH 03820-6015
749-4445

UNH Cooperative Extension
- Sullivan County
24 Main Street
Newport, NH 03773
863-9200

NH Regional Planning Commissions

Southwest Regional Planning Commission
20 Central Square, 2nd Floor
Keene, NH 03431-3771
357-0557

Nashua Regional Planning Commission
115 Main Street
PO Box 847
Nashua, NH 03061-0847
883-0366

Lakes Region Planning Commission
Humiston Building
103 Main Street. Suite 3
Meredith, NH 03253-5862
279-8171

Central NH Regional Planning Commission
28 Commercial Street
Concord, NH 03301
226-6020

Rockingham Planning Commission
156 Water Street
Exeter, NH 03833-2487
778-0885

Upper Valley Lake Sunapee Regional Planning Commission
77 Bank Street
Lebanon, NH 03766-1704
448-1680

Southern NH Planning Commission
438 Dubuque Street
Manchester, NH 03102-3546
669-4664

Strafford Regional Planning Commission
259 County Farm Rd., Unit 1
Dover, NH 03820-6019
742-2523

North Country Council
The Cottage at the Rocks
107 Glessner Road
Bethlehem, NH 03574-5800
444-6303

USDA Natural Resources Conservation Service (NRCS) and County Conservation District Offices

USDA Natural Resources Conservation Service
Federal Bldg., 2 Madbury Road
Durham, NH 03824-2043
868-7581

Belknap County Conservation
District & NRCS
719 North Main St, Rm 203
Laconia, NH 03246-2772
527-5880

Carroll County Conservation
District & NRCS
The Grindle Center
73 Main Street
PO Box 533
Conway, NH 03818-0533
447-2771

Cheshire County Conservation
District & NRCS
Rt. 12 South,
Walpole Industrial Park
R1 Box 315
Walpole, NH 03608-9744
756-2988

Coos County Conservation
District & NRCS
4 Mayberry Lane
Lancaster, NH 03854-3616
788-4651

Grafton County Conservation
District & NRCS
Swiftwater Road
RR2, Box 148-B
Woodsville, NH 03785-0229
747-2001

Hillsborough County
Conservation District & NRCS
Chappell Professional Center
#468, Route 13 South
Milford, NH 03055-3442
673-2409

Merrimack County
Conservation District & NRCS
The Concord Center
10 Ferry Street, Box 312
Concord, NH 03301-5081
223-6023

Rockingham County Conservation
District Office
118 North Road
Brentwood, NH 03833-6614
679-2790

Rockingham County NRCS
243 Calef Highway
Telly's Plaza
Epping, NH 03042
679-1587

Strafford County Conservation
District & NRCS
259 County Farm Rd., Unit 3
Dover, NH 03820-6015
749-3037

Sullivan County Conservation
District & NRCS
24 Main Street
Newport, NH 03773-1500
863-4287

USDA Farm Service Agency Offices

USDA Farm Service Agency
New Hampshire State Office
22 Bridge Street, 4th Floor
Concord, NH 03301
224-7941

Cheshire-Sullivan County FSA
Office
Walpole Industrial Park
R1 Box 315
Walpole, NH 03608
756-2970

Coos-Carroll County FSA
Office
4 Mayberry Lane
Lancaster, NH 03854-3616
788-4602

Grafton County FSA Office
Swiftwater Road
RR2, Box 148-C
Woodsville, NH 03785
747-3751

Hillsborough County FSA
Office
Chappell Professional Center
#468, Route 13 South
Milford, NH 03055
673-1222

Merrimack-Belknap County FSA
Office
10 Ferry Street
Box 22, Suite 212
Concord, NH 03301
223-6003

Rockingham-Strafford County
FSA Office
243 Calef Highway
Route 125
Epping, NH 03042-2326
679-4656

Other Organizations

US Fish and Wildlife Service
New England Field Office
70 Commercial Street, Ste 300
Concord, NH 03301
225-1411

NH Natural Heritage Inventory
172 Pembroke Road
PO Box 1856
Concord, NH 03302-1856
271-3623

NH Fish and Game Department
2 Hazen Drive
Concord, NH 03301
271-2462

NH Office of State Planning
2 ½ Beacon Street
Concord, NH 03301
271-2155

NH Association of
Conservation Commissions
54 Portsmouth Street
Concord, NH 03301
224-7867

NH Association of
Conservation
Districts
PO Box 2311
Concord, NH 03302-2311
763-5424

NH GRANIT
Complex Systems Research Center,
Morse Hall
UNH
Durham, NH 03824
862-1792

NH Division of Forests and Lands
172 Pembroke Road
PO Box 1856
Concord, NH 03302-1856
271-2214

NH Division of Parks and Recreation
172 Pembroke Road
PO Box 1856
Concord, NH 03302-1856
271-3556

NH Timberland Owners Association
54 Portsmouth Street
Concord, NH 03301
224-9699

NH Wildlife Federation
54 Portsmouth Street
Concord, NH 03301
224-5953

North Country Resource Conservation
and Development Area Council
719 N. Main Street, Room 220
Laconia, NH 03246
527-2093

Project Serve, UNH Cooperative
Extension
24 Main Street
Newport, NH 03773
863-9200

Society for the Protection of NH
Forests
54 Portsmouth Street
Concord, NH 03301
224-9945

Southern NH Resource
Conservation and Development
Area Council
10 Ferry Street
Box 4
Concord, NH 03301
223-0083

US Forest Service, White
Mountain National Forest
719 N. Main Street
Laconia, NH 03246
528-8721

US Geological Survey
361 Commerce Way
Pembroke, NH 03275
226-7800

Appendix E

Glossary of Terms

Aesthetics – The study, science, or philosophy dealing with beauty and with judgments concerning beauty. In scenery management, it describes landscapes that give visual and sensory pleasure.

Background – The distant part of a landscape; the landscape area located from four miles to infinity from the viewer.

Bat Habitat – Deep caves and old mine shafts providing specialized conditions required by bats to survive during their winter hibernation.

Biological Diversity – Also called Biodiversity. The variety and variability of all living organisms.

Contiguous Forestland – Forestland that is adjacent, or connected by a forested corridor at least 200 feet wide, to the parcel under assessment.

Cultural Element – Attributes in a human altered landscape; scenically positive cultural elements, most of which have historical backgrounds or nostalgic connotations. Examples include split-rail fences, stonewalls, barns, orchards, hedgerows, and historic structures.

Deer Wintering Area – Winter concentration areas of white-tailed deer that meet conditions characterized by heavy conifer cover with adequate food supplies nearby.

Distance Zones – Landscape areas denoted by specified distances from the observer. Used as a frame of reference in which to discuss landscape attributes or the scenic effects of human activities in a landscape.

Endangered Species – Any native species of plant or animal whose prospects for survival are in immediate danger with potential for extinction in all or most of its natural range.

Focal Point – A special feature or point within a view that provides accent and draws the eye.

Foreground – Detailed landscape generally found from the observer to ½ mile away.

Forest Type – Classification of forestland based upon the dominant tree species. Examples are beech-birch-maple or spruce-fir associations.

Fragmentation – A process in which the area occupied by a plant or animal community is reduced in area, subdivided into smaller units, or partitioned by barriers to movement.

Greenway – A linear open space established along either a natural corridor, such as a riverfront, stream valley, ridgeline, or overland along a railroad right-of-way converted to recreational use, scenic road, or other route.

Landscape – A mosaic of landforms, bedrock types, soils, water, vegetation, and the biological communities they support.

Landscape Character – Particular attributes, qualities, and traits of a landscape that give it an image and make it identifiable.

Management Activity – An activity imposed on a landscape for the purpose of managing natural resources.

Mast Production Areas – Beech and Oak stands that produce nut crops utilized by many species of wildlife including bear, blue jays, chipmunks, deer, grouse, squirrels, and turkey.

Middleground – The zone between the foreground and the background in a landscape. The area located from ½ to four miles from the observer.

Natural Appearing Landscape Character – Landscape character that has resulted from human activities, yet appears natural, such as historic conversion of native forest into farmlands, pastures, and hedgerows that have reverted back to forest through reforestation activities or natural regeneration.

Open Space – Land that is not built upon or substantially altered by human activity. It includes forest and open field, as well as undeveloped shorelands and water bodies.

Parcel – All contiguous land under a single ownership.

Rock Ledges / Outcrops – Exposed bedrock and/or talus slopes or boulders covering at least ¼ acre.

Scenic – Of or relating to landscape scenery; pertaining to natural or natural appearing scenery; constituting or affording pleasant views of natural landscape attributes or positive cultural elements.

Scenic Integrity – State of naturalness or, conversely, the state of disturbance created by human activities or alteration within the landscape.

Scenic Resource – Attributes, characteristics, and features of landscapes that provide varying responses from, and varying degrees of benefits to people.

Seen Area – The total landscape area observed. Seen area may be divided into distance zones of foreground, middleground, and background.

Sustainability – Balancing the broad human and ecological needs of today without compromising the ability of future generations to meet their own needs.

Threatened Species – Any native species of plant or animal that may become endangered if conditions surrounding them begin or continue to deteriorate.

Variety – An intermixture, diversity, or succession of different things, forms, or qualities in the landscape.

Viewpoint – Position in the landscape, usually associated with a road, trail, water body, or recreation facility, providing a view of the landscape.

Vernal Pools – A special kind of wetland habitat; small fish-less ponds that often dry up in late summer and are crucial breeding areas for a number of amphibians.

Wildlife Habitat – An area that contains all the resources (food, water, cover, and space) essential for the survival of a wildlife population.

Appendix F

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