

UWSP - TREEHAVEN
LAND MANAGEMENT PLAN



 ***Treehaven***
"where learning comes naturally"



Acknowledgements

Many individuals from within and outside of the UW-Stevens Point College of Natural Resources have produced this Treehaven Land Management Plan (*revision*) through an integrated planning process. The groundwork for development of this plan was actually started in early 2005 with recognition that the previous Treehaven Land Management Plan completed in 1994 was becoming out-dated. Comments, suggestions, and expertise from a variety of stakeholders were solicited early in the planning process, an updated forest inventory and property map was completed, and detailed lists of land-use objectives were documented. With this foundation for planning in place, an intensive process of plan creation, review, and revision was followed until its formal acceptance by the multi-disciplinary Land Management Planning Committee, and other stakeholders. Through everyone's hard work and expertise, we have created a sound planning tool that will guide management of the UWSP-Treehaven property for the next 15 years and beyond.

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Wisconsin Department of Natural Resources Reference Materials:

Peshigo River State Forest Master Plan
Silviculture Handbook
Natural Heritage Inventory data base

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Foreword

As a woodland owner, we have an ethical stewardship responsibility to manage our forests in a sustainable manner for future generations.

We also have a social obligation to harvest our timber resources, in a manner which will provide local jobs and the wood products that are necessary to sustain our economy and standard of living.

Purpose of the Plan:

The Treehaven Land Management Plan provides a vision and framework for the use, development, and management of the forest well into the future with an emphasis on the next 15 years. It describes general land management goals, and specific management prescriptions for each forest type to meet current and future needs. Recommendations are included to improve education, demonstration, and research opportunities, along with enhancing recreation, forest production, aesthetics, and habitat conservation.

Visionary: This plan describes an idealized view of the long-term future for Treehaven’s land base, and the steps needed in the short term to achieve these goals. The diversity of forest composition and structure are enhanced over time, providing for a broader range of ecological, social, and financial values as the plan moves through implementation.

Focused: This plan prescribes a variety of active and passive management activities across the property, and over time, to achieve its goals. It relies on integrated and adaptive management of the forest resources, and emphasizes the compatibility of forest uses with educational requirements.

Flexible: This plan calls for adaptive management. A method of monitoring the response of forest management activities, evaluated against the goals of management, followed by a revision of the prescriptions or goals if necessary, will form the basis for a feedback loop to continually improve the plan and subsequent management practices. This plan calls for continuous monitoring and improvement, with a formal revision every 15 years.

Sustainable: A sustainable forest requires flexible plan implementation, timely decision processes, and adaptive management. This plan will assure sustainable forest products from the property, continued educational and recreational opportunities, a perpetual source of revenues, as well as a sustainable ecosystem and healthy watersheds.

Foreword

Treehaven:

Treehaven is one of the major administrative units of the University of Wisconsin – Stevens Point, College of Natural Resources (UWSP-CNR). Donated to the UWSP-CNR in 1979 by Dorothy K. Vallier, the Treehaven property has become the centerpiece of natural resource activities and student instruction for the College.

The fundamental purpose of the Treehaven Facility and associated Land base is to provide natural resources EDUCATION, resource management DEMONSTRATION, and environmental RESEARCH opportunities for the UWSP College of Natural Resources, and to the public. Within UWSP, the primary function of Treehaven is to fulfill the needs of the CNR Summer Camp Program. Treehaven is also designated as a stand-alone Environmental Learning Center with the goal of providing many additional services; support to UWSP teaching, natural resource based outreach programs, a field site for environmental research, an outdoor oriented passive recreation area, and to serve as a demonstration site for resource management practices.

Background:

Treehaven is located in the north central portion of Wisconsin in the Town of King, Lincoln County. The property is approximately 10 miles east of Tomahawk, and 15 miles southwest of Rhinelander. U.S. Highway 51 and State Highway 17 provide the major north/south access to County Highway A, which leads to Pickerel Creek Road. The Treehaven properties and facilities are located at the end of Pickerel Creek Road.

Abstract information for the Treehaven land base indicates that different parts of the property were first transferred to individuals or the State of Wisconsin from the United States of America starting in 1881. Following a series of ownership changes, the parcels constituting what is now Treehaven eventually ended in the ownership of Dorothy K. Vallier and her late husband, Gordon Kummer. Dorothy and Gordon Kummer, and later Dorothy and her second husband Jacque Vallier purchased additional lands throughout the 1950's, for the purpose of practicing forestry, game management, and other land restoration related activities. The "Treehaven" which Dorothy Vallier deeded to the University in 1979 was over 850 acres in size. Currently, with additional land purchases and donations, Treehaven has increased to about 1,200 acres by 2009.

The Treehaven land base underwent the same kind of use/abuse as did much of northern Wisconsin during the settlement period. Timber which could be harvested was heavily cutover beginning in the mid 1800's. Farming was attempted on much of the cutover land, and destructive wildfires throughout this time period burned over many areas, sometimes on multiple occasions, up until about 1930. Uncontrolled "open-range" cattle grazing and mowing of the open fields and wetland marshes persisted on the Treehaven property until the mid 1950's.

In 1956 a detailed management plan for the Treehaven property was developed by the Trees for Tomorrow Chief Forester, William A. Sylvester. This was an aggressive management plan which called for creating and improving access roads, tree planting, timber harvesting, timber stand improvement thinning, and insect & disease control measures. Bill's plan was enthusiastically followed by the Kummer's, and by 1979 all of the recommendations in Bill's original plan had been successfully completed.

Foreword

Since UWSP-CNR took over management of the Treehaven property in 1979 several forest, vegetation, wildlife, watershed, and soil inventories have been completed by both the CNR faculty and students. In addition, every summer Treehaven hosts 170 to 200 CNR students who are assigned resource inventory projects on the Treehaven land base as a part of their experiential summer camp studies. Several Treehaven land management plans have also been authored since 1979, but due to overwhelming faculty teaching loads, and the physical distance from Treehaven to the main campus in Stevens Point, these plans have not been vigorously implemented. None the less, approximately 500 acres of forest improvement practices (timber harvesting, thinning, and planting) have been completed on the property since 1979, in addition to numerous road maintenance, boundary line survey, trail construction, and wildlife management projects.

Physical Description:

Treehaven is located on the glacial landscape of north central Wisconsin just north of the Harrison Hills. Glacial topography in this area is an interesting mix of glacial moraine and outwash features. Elevations vary from 1,465 to 1,605 feet above sea level, and the terrain is low rolling hills on the western end of the property to very hilly and steep on the eastern side of the property. Soils are dominantly droughty sands and gravels in the uplands, and shallow to deep boggy mucks in the lowlands.

Big Pine Creek flows into the property from the northeast and exits the property on the southwest eventually entering the Lake Alice Wisconsin River impoundment. Pickerel Creek flows into the property from the north and merges with Big Pine Creek shortly after it enters the property. Big Pine and Pickerel Creeks are classified as Wisconsin trout streams, although both offer rather warm water and muddy bottom habitats for most of their length. Several abandoned beaver flowages are located along each of these streams, which are currently large sedge meadows. Several small lakes and vernal ponds are also scattered throughout the property.

In general, the Treehaven forests are typical north central Wisconsin second growth which naturally regenerated after fires and grazing were excluded from the property. There are, however, isolated large diameter legacy trees that may pre-date even the earliest logging era. Lowland areas consist of black spruce/tamarack and non-forested acid bog environments, along with a mix of sedge, shrub, hardwood, and cedar wetlands. Upland sites are primarily composed of aspen, white birch, and red maple, with a lesser area of mixed red pine, white pine, white spruce, and balsam fir. Red pines planted under the 1956 management plan are prominent along the roads throughout the property. A minor component of northern hardwoods and hemlock hardwoods are also present in smaller areas, especially on the western edge of the property.

All endogenous wildlife of the area inhabits or at least temporarily utilizes the Treehaven property as part of their home range. Reintroduced species such as fisher, timber wolves, and turkey are now common on the property, as are black bear. Problem wildlife species continue to be white tailed deer, occasionally porcupine, and, at least near the facilities, raccoon have recently become a nuisance.

Foreword

Development and Use:

Treehaven is largely undeveloped. Pickerel Creek Road enters the property from the northwest corner and runs for approximately 0.75 miles to dead end at the educational complex. While there are no other paved roads, there is a network of approximately 10 miles of un-surfaced access roads throughout the property. These access roads are gated and remain off limits to public vehicular/ATV traffic.

The Treehaven educational complex is built at the edge of a natural ridge on the northeast side of the property overlooking the confluence of Pickerel and Big Pine Creeks to the south. The facilities consist of two 100 bed dormitories, an upscale cabin, the Vallier classroom center, dining facility and staff office building, the faculty cottage, three maintenance/storage buildings, and the Property Managers residence. Total footprint for the facilities, associated parking, and recreational area is approximately 9.5 acres.

Currently, land-use adjacent to the Treehaven property is primarily undeveloped woodlands, with some limited rural development and agricultural parcels beyond that. Notably, a portion of the Lincoln County Forest adjoins the northeast corner of Treehaven adding an additional 2,250 acres of protected working woodlands. In addition, this portion of Lincoln, Langlade, and Oneida Counties is very rural where minimally altered natural forest landscapes are the norm. There are literally thousands of acres of working forestland within a few miles of Treehaven that are protected by the Wisconsin Department of Natural Resources, the County Forest System, and industrial/private tax law lands.

Land Ownership:

This plan implicitly includes the 160 acres owned by Dorothy K. Vallier in section 26 (see Appendix – C, for complete land listing). This property has been previously willed to the UWSP-Foundation by Dorothy Vallier. By instruction from the Kummer/Vallier Estate, this property and the management and use thereof is to be an integral component of this plan as administered by the UWSP-Foundation and Treehaven.

In addition, the 249.43 acres owned by Dorothy K. Vallier in sections 25 and 36 are also attached to this management plan by request of the Kummer/Vallier Estate. This property has previously been willed to Dorothy's son William "Biff" Kummer. Mr. Kummer's stated intent is to also will this property to the UWSP-Foundation in the future. On-going management of this property will be overseen by Biff Kummer with collaboration and support of the Treehaven Forest Ecologist as needed.

This entire property as originally owned by Dorothy Vallier was enrolled in the Tree Farm program on May 13th, 1957 under the "Treehaven" name. Property donations to the UWSP-Foundation began in 1979 with additional donations continuing into the future. In essence, the entire property will be reconsolidated at some point in the future under ownership of the UWSP-Foundation. Management of all the properties which comprise Treehaven have, and will continue to remain consistent with the objectives and guidance set forth in this plan.

Guiding Principles for Treehaven Land Management

*The Treehaven Land Management Plan (TLMP) must be considered to be **part**⁽¹⁾ of a **long-term, on-going, and adaptive process**⁽²⁾ - the purpose of which is to focus and guide our interactions with the Treehaven property in a manner which ensures **science based stewardship**⁽³⁾, promotes the **mission of Treehaven**⁽⁴⁾, and serves to support the **specific land use guidelines**⁽⁵⁾ identified for the property.*

⁽¹⁾ This Land Management Plan is part of an overall Treehaven Master Plan which covers all of the facilities, programs, and operations at the Treehaven Environmental Learning Center. In addition to this plan, and in order to successfully implement the plan, we also establish and record policies and procedures designed to address management and natural resource related issues not specifically identified in the plan. These operational policies and procedures are documented through time, as they are needed, to ensure consistent implementation of the plan during day-to-day operations. These items can include everything from a standardized procedure for conducting inventories, to a policy on how stumpage revenues are distributed – all of which are operational in nature, may be very detailed, and are subject to frequent modification. This level of operational detail is intentionally excluded from the TLMP; however, they are assembled in a separate “Land Management Policy and Procedure Manual” that is reviewed and refined over time.

⁽²⁾ Planning for management of natural resources requires that we attempt to predict the unpredictable: future events over extremely long time frames; complex and dynamic ecosystem interactions; changing climatic conditions; and an ever volatile market situation, operational environment, and regulatory atmosphere. In addition, our state of environmental knowledge and technical abilities will improve over time, which will give us a progressively stronger basis for our land management decisions. Because of these factors, this plan should not be considered a “hard policy” document. It must remain flexible in its implementation, and adaptive to change. This plan will be subjected to an on-going process of review and adaptation, with a formal revision occurring at a minimum of each fifteen years after its adoption.

⁽³⁾ The UWSP College of Natural Resources is a recognized leader in the education of natural resource management professionals who have a broad base of training and field experience in various resource specialization fields (ie. Forestry, Soils, Water, Wildlife, and Human Dimensions). As an extension of the CNR, management of the Treehaven property must compliment and demonstrate this science based, integrated, multi-resource management philosophy. In addition, this plan is designed to be a defensible, real-world, working document that embodies the land ethic and conservation philosophy of the property donors (Jacque and Dorothy Vallier). This plan has been prepared in such a format that it will be acceptable as a qualifying Tree Farm Program management plan. It is also intended to be consistent with the Sustainable Forestry Initiative (SFI) and Forest Stewardship Council (FSC) certification requirements, and with the Wisconsin DNR Managed Forest Law (MFL) program. Although these programs may or may not be pursued in the future, this plan has been created with multiple opportunities in mind.

Guiding Principles for Treehaven Land Management

⁽⁴⁾ **Treehaven Mission:**

Treehaven is the Wisconsin center for integrating natural resources education, management, research, and recreation. Treehaven is a unit of the University of Wisconsin-Stevens Point, College of Natural Resources.

This plan will play a significant role in supporting and advancing the mission of Treehaven and the UWSP College of Natural Resources. As such, all management activities on the Treehaven property must be evaluated in respect to this mission. The following Treehaven mission based goals will be incorporated throughout future implementation of management activities:

- Promote experiential education opportunities to CNR students and Faculty to include: for credit CNR courses, instructional opportunities and workshops, graduate research, student internships, student work study programs, and others.
- Encourage and actively support environmentally based research on the Treehaven property.
- Conduct long-term monitoring of environmental resources on the Treehaven property. This monitoring will be designed to support identification and interpretation of long-term changes as a result of completed management practices, and natural changes in non-managed “control” areas.
- Develop efficient data management systems (acquisition, storage, retrieval, and analysis), along with a means to provide accessibility to this data by the CNR Faculty and others.
- Demonstrate resource management practices under a variety of objectives.
- Schedule resource management activities to produce an even flow of income/expenses and workload, and to provide demonstration of active management practices on an annual basis.
- Generate revenue through active forest management practices, but not as a priority over the mission of education, demonstration, and research.

Guiding Principles for Treehaven Land Management

⁽⁵⁾ Specific Land Use Guidelines:

Specific Treehaven Land Use guidelines fall into three general categories: **(1)** the first category of guidelines are prescribed in the Deed of gift between Dorothy K. Vallier (Grantor), and the University of Wisconsin Stevens Point Foundation, Inc. (Grantee) - this document was signed into effect on the 25th day of June, 1979, and specifies Dorothy's wishes for how the Treehaven property is to be used; **(2)** the second category of guidelines pertains to the entire Treehaven property; **(3)** while the third category pertains only to specifically designated land management areas of the property. Many of the second and third categories serve to support and/or define in more detail, Dorothy's original desires for use of the property. Due to the varied and sometimes competing goals for the Treehaven property, the third "site specific" category is necessary to accommodate mutually exclusive management goals.

All of the guidelines from categories one and two will be promoted on each acre of the Treehaven property, but their importance or priority ranking may be emphasized differently in specific areas to achieve a desired management result. The category three guidelines will serve to further define individual site management prescriptions and desired results. In many cases the category three guidelines are not desirable or suitable for application on an individual site at the same time. For example, a "timber management goal" and a "passive management goal" can not be employed on the same site – both may be desirable to promote on appropriate sites, but they are incompatible for application on the same site at the same time. Category three guidelines can therefore only be achieved at the property level or multi-site scale.

Treehaven land use activities will be guided by, and will include all of the following principles - with the management goal of supporting and promoting each at the correct time and place across the ownership.

Category 1 - Conditions and Restrictions of the Deed of Gift:

- The Treehaven property shall be used exclusively for forest and wildlife education, demonstration, and research purposes.
- Sound forest management practices shall be carried out on the Treehaven property.
- The Treehaven property shall be posted against general public access.
- Gates shall be maintained across road entrances to the property.
- Motorized vehicles shall not be operated on the property, except for maintenance and management purposes.
- No mineral, gas, or oil rights on the Treehaven property shall ever be exploited.

Guiding Principles for Treehaven Land Management

Category 2 - General Land Use Principles:

Land Use Values

- Develop and conduct management activities to support the Treehaven mission of education, demonstration, and research.
- Minimize negative aesthetic impacts on the forested landscape and, where practical, improve the natural scenic qualities of the forest.
- Attempt to maximize revenue generation and/or minimize expenditures, within the constraints prescribed by the site, the activity, and the Treehaven mission.
- Expect, and then seek to accommodate, unforeseen management opportunities and/or constraints as they arise (adaptive management).
- Strive for compatibility among the different user groups and educational programs when designing and implementing resource management activities.

Land Management Goals

- Monitor wildlife populations, and implement management techniques that will assure native populations remain within their long-term habitat carrying capacity.
- Identify and protect threatened and endangered species, and preserve areas of ecologic, geologic, historic, and cultural significance.
- Provide for a variety of renewable forest products, wildlife habitats, and a diversity of terrestrial and aquatic communities consistent with the ecological capabilities of the property.
- Limit and control the spread and establishment of invasive species.
- Establish complimentary programs and educational opportunities with CNR Faculty and other partners.
- Plan and construct non-motorized trail systems on the property to enhance access and recreation.
- Create and install signage to identify - Treehaven property boundaries; trail, road, and place names; and, to provide “self guided” educational tours of management demonstration areas.
- Acquire additional land, and/or make appropriate land trades for reasons of increasing educational opportunities, resource protection, critical development needs, access, boundary continuity, or protection from non-compatible uses.

Guiding Principles for Treehaven Land Management

Category 3 - Designated Land Management Areas:

The entire Treehaven land base has been designated into one of three distinct land management areas. In addition to the three land management areas, there are also several management overlay zones which help to identify areas of special concern. Each management area describes a unique landscape or management focus that considers soils, topography, community type, and other factors based on the ecological capabilities of the area. Each management area also has specific short and long-term objectives that serve to promote the future desired condition for the area. Forested landscapes change slowly even with intelligent management intervention. For that reason, actions taken (or not taken) over the next 15 years may require 50-100 years to significantly affect the forest, or achieve the desired condition.

Conventional Rotation Management (CRM) Area: The general management goal for a CRM Area is the sustainable and profitable production of forest products. However, the CRM Area may also meet a wide range of ecologic, education, recreation, and research objectives. In all cases, management practices are modified to be compatible with and support these multiple objectives.

Long Rotation Management (LRM) Area: The primary management goal for an LRM Area is the representation and perpetuation of mature native plant communities. Management activities are designed to achieve land management objectives by closely mimicking natural processes whenever possible. Only those areas of highest value for protection or community restoration have been selected as LRM areas.

Forest Control Areas (FCA): The principal goal for an FCA is to follow a strict regime of passive management along with a program of frequent monitoring. Except for a few unique large stands, these are relatively small areas of significant ecological, research, demonstration, or ecosystem monitoring value.

Management Overlay Zones: An overlay zone is an area of special interest, “layered” over part of one or more of the preceding three designated management areas. These zones are used to denote additional management concerns for the underlying management area/s. For example; all of the areas that are within the visual corridor of a scenic overlook, would be included in a scenic overlay zone.

Chapter 3 will describe each of these management areas and overlay zones in more detail, where they are located on the Treehaven property, and outline specific management objectives for each forest type within their respective management area.

General Forest Overview

Forested portions of the Treehaven land base are part of a complex ecosystem with a mix of biotic communities that provide habitat for a diversity of plants and animals. As a result of this region’s glacial moraine and outwash topography, Treehaven has an uncommonly high diversity of soil and water resources within a relatively small area. This diversity of substrate is reflected in the high diversity of forest cover types. Treehaven currently contains 218 mapped forest types, with an average forest type of approximately 5 acres in size. The largest single cover type on the Treehaven property is an old agricultural field at 31 acres in size.

General land-use breakdown for the Treehaven property

General Land-Use	Stands	Acres	% of Total
Conifer Uplands	55	250	21%
Conifer Lowlands	46	211	18%
Hardwood Uplands	80	493	42%
Hardwood Lowlands	2	3	0%
Total Forested	183	957	82%
Non-Forested Uplands	11	63	5%
Non-Forested Lowlands	20	134	11%
Open Water	1	4	0%
Maintained Facilities	3	12	1%
Total Non-Forested	35	213	18%
Grand Total	218	1,170	100%

Most of the uplands have dry sand and gravel soils that can support red and white pine, aspen, white birch, red maple, and red oak. Smaller areas of loamier soils support more mesic forest communities containing a hemlock hardwood mix. Lowland areas of the property are dominated by conifers, primarily black spruce and tamarack on the impeded wetlands, and white cedar, white spruce, and balsam fir on the drained wetlands. Most of the forest is biologically mature to over-mature (60 – 80 years of age), and many areas are showing significant signs of decline (especially aspen and white birch). Scattered non-forested wetlands, ponds, and vernal ponds on the property help to protect water quality and provide habitat for a variety of fish, bird, insect, and plant species.

General Forest Overview

Forest Cover:

Current forest cover types on the Treehaven property are a result of past disturbance, primarily early logging and the catastrophic wildfires of the early 1900’s. Pioneer forest species such as aspen and white birch regenerated naturally after the fires on any site suitable for seed germination. The result of this is testified by the large proportion of Treehaven that is occupied by the aspen/white birch forest type (37% of the total area), and with only minor exceptions, almost every tree on Treehaven dates back to the same disturbance event. Each forest type on Treehaven is therefore 60 to 80 years in age, which is in the over-mature category for all of the pioneer species. Through the process of forest succession, these pioneer forest stands have been gradually transitioning to a later seral stage, marked by the natural conversion to longer lived and shade tolerant species.

Management of the Treehaven forest will be designed to either advance this process of natural forest succession, maintain the current seral forest stage, or in some cases promote an earlier stage of succession. The determining factor for management will be identified by the Management Area objectives designated for each forest type (ie. **Conventional Rotation Management**, **Long Rotation Management**, or **Forest Control Area**).

The following table shows the current and long-term future community makeup of the Treehaven forest as a result of implementing this management plan (corresponding maps are located in Appendix A). For forest inventory purposes, forest stands are classified by their dominant cover type. This means that forest stands listed as aspen have 50% or more of their stocking in aspen trees. In reality, most forest stands contain a mixture of tree species. For example, an “Aspen/Birch” area contains aspen and or white birch, but may also contain red maple, red or white pine, oak, etc. Therefore, two forest stands with the same dominant cover type may not have the same overall forest composition.

Forest Cover Type	Current Forest Composition			Future Forest Composition		
	Stands	Acres	% of Total	Stands	Acres	% of Total
Aspen/Birch	73	431	37%	30	196	17%
Spruce/Tamarack	29	147	12%	26	143	12%
Cedar	12	46	4%	21	110	9%
Hardwood/Hemlock	12	81	7%	22	154	13%
Mixed Pine	13	46	4%	71	329	28%
Red Pine Plantation	24	126	11%	5	50	4%
Spruce/Fir	21	82	7%	12	31	3%
Lowland Hardwood				3	8	1%
Mixed Oak				9	44	4%
Non-Forest	34	211	18%	19	105	9%
Grand Total	218	1,170	100	218	1,170	100

General Land Management Provisions

Forest Monitoring:

Treehaven uses a Geographical Information System (GIS) based forest inventory system to gather, record, analyze, and report information on the condition of the forest. This is an on-going inventory process which is called a forest reconnaissance, or simply a “recon” for short. The database created from the recon captures the physical description of each mapped area or “stand” (cover type, stocking, condition, soils, ecological attributes, wildlife use, goals, restrictions, etc.). Reports can then be generated to show forest stands that are scheduled for a management review, or areas that are only in need of an updated recon. All stands (forested & non-forested, managed & non-managed) on the Treehaven property are formally reviewed at a minimum of each five years. In addition to the on-going forest reconnaissance, Treehaven also employs a Continuous Forest Inventory (CFI) system to monitor growth and mortality, to evaluate tree health and value improvement, to set harvesting goals, and to track long-term ecological changes of the forest. Both the recon and the CFI help to track forest changes, identify management opportunities, locate potential problems, and refine management practices to more fully achieve the desired goals identified for the Treehaven land base.

Reconnaissance: Each of the Treehaven stands is tracked in the database with various description fields and attributes, the most important of which is the Year-Of-Treatment (YOT). Typically, more than one stand will have the same YOT, and all stands listed for a given YOT are scheduled for a decision regarding potential management at the same time. Because of the small stand size on the Treehaven property, this “grouping” of stands for management purposes is necessary to meet minimum market and operability requirements. Determination of each individual YOT, and the formation of YOT stand groupings, is carefully planned to support the overall Treehaven “sustainable harvesting” goal. It should be noted however, that this planning process is driven by individual stand biology before being grouped to meet market requirements.

The YOT date triggers an on-site management review of the respective stands that are scheduled for treatment. The in-field review includes an intensive timber inventory, verification of all stand description fields, an evaluation of the management objective, and a refinement of the treatment prescription if necessary. If the stand is not ready for a management treatment, the database is updated and a new YOT is entered that will group appropriately with other nearby stands. If the stand is ready for a management treatment, this information is used to prepare a detailed harvesting plan which will ensure a sustainable harvest. Once the practice has been completed, a new recon is initiated and the database is similarly updated.

Continuous Forest Inventory: The Treehaven CFI system is a set of permanent plot locations that are revisited and re-measured on a five year cycle. Exact measurements are taken of numerous tree growth and health characteristics, tree regeneration, understory vegetation, dead and down trees, damaging agents, etc. Although this information is very useful for quantifying forest attributes at the time of measurement, the true value is a comparison of attributes from measurement period to measurement period (change analysis). CFI information will primarily be used to set/modify our annual allowable cut, and to monitor ecological changes to the forest. Annual allowable cut is based on the net average annual growth (average annual growth – average annual mortality), and is used to ensure that timber harvesting is equal to or less than net growth.

General Land Management Provisions

Resource Protection:

Biotic Damage: For the purpose of this management plan, “biotic damage” refers to any negative impact on native flora or fauna, that is in excess of naturally occurring processes, and which is directly caused by an insect, disease, animal, or human activity. Significant biotic damage events will be evaluated with consideration to the property management goals and the potential threat to neighboring land owners. Any potential response to significant biotic damage events will be evaluated using an interdisciplinary team approach. Responses may include any methods that are recommended through this approach to include timber salvage, pesticide treatments, animal control measures, program modification, etc. However in all situations, the control option initiated first will always strive to be as low impact, environmentally friendly, and financially responsible as to accomplish the desired results with the least non-targeted impacts.

Abiotic Damage: Abiotic damage includes negative impacts to native flora or fauna as a result of intense weather phenomena, wildfire, climate change, pollution, etc. Other than suppressing wildfires, this category of damage essentially requires appropriate action after the event to prevent/reduce subsequent biotic damage. In most situations this will require timely salvage of the damaged trees to reduce insect and disease outbreaks, and their potential spread to healthy trees.

Invasive Species: When detected, invasive and non-native plant species will be inventoried, and evaluated as to their long-term impact on the resources. If significant negative impacts are predicted, the invasive plants may be controlled using appropriate and effective methods, including but not limited to the use of herbicides, cutting, or hand removal. Control measures may be restricted in certain sensitive management areas.

Water Quality: All management and other activities on the property will follow, as a minimum standard, the guidelines set forth in Wisconsin’s Forestry Best Management Practices for Water Quality (BMPs) (DNR publication PUB-FR-093-95, or any later revision).

Threatened & Endangered Species: The WDNR Natural Heritage Inventory (NHI) has been checked for Threatened, Endangered, and Special Concern Species which may be located on the Treehaven property. A 2009 search of the NHI resulted in 7 plant species, 4 animal species, and 6 natural communities that may be present on the Treehaven property (complete list included in Appendix B). An updated search of the NHI data base will be conducted prior to all forest management activities, ground breaking projects, and recreational and trail development projects.

All management and other activities on the Treehaven property will consider the needs of T&E species, and the potential impacts to the species and their habitat. Management actions are checked against an up-to-date database of listed species to assure that no actions result in the direct taking of any known endangered or threatened resource. In addition, T&E species are searched for and inventoried as a part of our on-going forest monitoring program, and pre-treatment evaluations.

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Fire Control: Wildfires of natural or human induced origin will be suppressed using local fire departments and/or the WDNR Fire Crews. However, prescribed fire may be used as a management tool where feasible and safe. Prescribed fire may be the only method to regenerate many forest cover types such as mixed pine, oak, and white birch. Fire may also be used to create and maintain forest openings and wildlife habitat, to reduce fuels and decrease wildfire hazard, or to control undesirable vegetation.

Herbicide/Pesticide Use: Approved herbicides and pesticides may be used for various purposes on the forest when other control methods did not, or will not, achieve the desired results. All product labeling, dosage rates, and appropriate BMPs will be strictly adhered to during application. Warning placards will be installed and clearly visible around treatment areas if there is any risk to human health.

Aquatic Resources: Big Pine and Pickerel Creeks and their associated wetlands comprise a significant portion of the Treehaven property at 120 acres or 10% of the overall land base. According to locals, both of these streams were a much better fishing resource in the past than they are presently. Stream monitoring is currently underway to establish baseline data, with the goal of improving the fishery through in-stream management techniques in the future. Forest management activities near these streams will follow BMP's, and be designed to maintain water quality and increase forest cover where appropriate. Buffer zones, filter strips, and equipment restriction zones as identified in Wisconsin's BMP's for Water Quality will be identified on the ground to ensure harvesting operations or other projects comply with the BMP set-back suggestions.

Historical/Cultural Resources: The Treehaven property and surrounding area has a rich history of human occupation since the last glacial period. At present there has not been any documented archeological sites pre-dating the settlement era on the Treehaven property, but with adequate water and food resources this area was likely heavily used by Early Americans. There are old foundations on the property which are suspected to be remains of a pre 1900's logging camp, and two other areas which appear to have been used for some purpose in the early 1900s. These known sites will be protected from disturbance during forest management practices, and they will remain unmarked to protect from looting. Potential new sites are searched for during normal forest monitoring activities, and harvest areas are intensively reviewed prior to scheduled management activities. Any newly discovered sites will be afforded the same protections as the known sites.

Tree Planting: Many formerly forested open areas on the Treehaven property will be naturally regenerated, or manually/mechanically planted to re-establish native forest cover. Natural regeneration is always the preferred method of re-establishing forest cover, but many areas will require site preparation, planting, and secondary release treatments. Site preparation methods will be designed to ensure favorable establishment and growth of planted seedlings, while at the same time minimizing negative impacts to the environment. In all tree planting activities, native site adapted species will be procured from seed sources that have originated as near the Treehaven property as possible. Appropriate deer browsing protective measures will be required for most planting sites.

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Road/Trail Management:

Currently Treehaven has very good road access to all parts of the property north and west of Big Pine Creek. There are approximately 10 miles of road accessible by a two wheel drive vehicle. All access roads are vegetated dirt or gravel, mowed annually, and cleared of down trees as needed throughout the year. In addition to property management, this road system doubles as a groomed ski trail during the winter months, and walking trails during the summer months. Within the property, there are three road classifications:

- 1) **Haul Roads** – these are primary access roads with wide sweeping corners and low grade change. Haul roads are designed and maintained during harvesting operations to support movement of large logging trucks, and for educational access to the property via school bus. A minimum surface area of haul roads has been identified for access into each major area of the property.
- 2) **Woods Roads** – these are secondary access roads designed to support movement of two wheel and four wheel drive passenger vehicles. Woods roads may have steep slopes and sharp corners that will preclude use by larger vehicles, and may require four-wheel-drive.
- 3) **Trails** – These are walking/snowshoe trails that in most cases will not support vehicular traffic other than small All Terrain Vehicles.

All road access points to the Treehaven property will remain gated to prevent vehicular and ATV use on the property. However foot traffic (walking, snowshoeing, and cross country skiing) by the public is welcome. Currently Treehaven does not charge for public use of the trail system or groomed ski trails. Discussions have been initiated regarding a trail use fee to help cover the maintenance and grooming expenses.

Minor erosion has occurred in the past on some of the steepest slopes, but given the porous sand/gravel nature of Treehaven soils, this is only a concern on the steepest slopes. Heavier soils on the west side of the property are a concern during wet periods, and these roads typically require graveling and grading after use for logging. All roads on the Treehaven property must remain in a state of repair that will allow access for educational purposes at all times. This requires constant maintenance even during active harvesting operations. The few minor erosion problem areas are maintained every fall along with the wet areas.

Currently there are no vehicular access points crossing either Pickerel or Big Pine Creeks and none are required in the future. However, access to the Treehaven property east of Big Pine Creek is a problem. Two low impact bridges are planned for construction in the future. Both bridges already have approved clear-span stream crossing permits from the WDNR. One of the bridges will be for foot traffic only, while the other bridge providing access the southernmost 40 will be an ATV crossing. With construction of these bridges, new trails will be constructed in these currently inaccessible portions of the property. Additional walking/snowshoe trails are in the process of construction to provide low impact access to scenic and unique areas of the property.

Signs on the road system to aid in navigation are currently lacking, in a poor state of repair, or located too near the road for trucking or bus travel. New trail signs, trail maps, and sign posts are in the process of being installed in appropriate locations at all intersections, with all old signs being removed at the same time. On-going

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maintenance of the new signs and trail maps will become a part of annual land management activities. In addition to the trail signs, interpretive signs for forest management activities and unique forest habitats will also be installed as time and budgets allow.

The Treehaven educational facilities and lodging options are all handicap accessible, but there are currently no outdoor handicap accessible sites on the property. Selected trail systems will be designed to meet the Americans with Disabilities Act (ADA) requirements, and they will be constructed as time and budgets allow. These new trails will also include permanent interpretive and plant identification signs. Because of the steep topography on Treehaven, many of the trail heads for ADA trail systems may require vehicular access.

Wildlife Management:

The Treehaven property supports a wide diversity of wildlife species indigenous to north central Wisconsin including threatened and endangered species, game and non-game species, and migratory species. Management of the Treehaven property focuses on maintaining and enhancing habitat for all of these wildlife species in the appropriate locations, with the appropriate intensity, and over the appropriate time scale. This will require the management of diverse cover types representing all stages of succession from very young through very old habitats. Diverse and healthy wildlife populations will be maintained by managing the composition, structure, and age of forest habitats. These habitat improvement principles have been integrated into the management activities prescribed for each area of the Treehaven property. Wildlife habitat values are further assured through an intensive site evaluation of each area prior to harvesting. These evaluations include a search for T&E and invasive species, unique micro-habitats, active den or nesting sites, high use travel corridors, etc. Through the identification and location of unique wildlife use or site features, harvesting operations may be re-designed to incorporate site modification, maintenance, or protective measures tailored to improve or maintain habitat qualities.

Harvesting Provisions: Long lived trees such as red oak, white pine, red pine, and white spruce will be maintained in harvesting units including clearcuts as “legacy” trees to provide for species and stand compositional diversity. However, where high tree density dictates, some may need to be removed during the harvest to ensure that the objective of the harvest is not compromised. Small pockets of mature trees and/or healthy saplings will also be reserved in harvesting units where appropriate to further increase diversity in the future stand. Large diameter old trees, full crowned trees, trees with dens or cavities, as well as dead trees (snags) will be maintained on appropriate sites in all management areas. These trees will typically only be removed where they are unsafe, create aesthetic concerns, or increase insect/disease problems.

Wetland Habitats: Non-forested wetlands, including northern sedge meadows, shrub-carr, boreal rich fen, and open bogs will be protected from vehicular, equipment, and excessive foot traffic. These wetlands provide habitat for a wide variety of wetland wildlife including species of special concern. In some instances northern white cedar re-establishment is prescribed for the sedge and shrub-carr habitats that show indications of

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previous forest cover. Forested wetlands, including black spruce, tamarack, and cedar may be managed to increase growth, remove mature aspen/fir, and to promote species diversity. These forest types will be regenerated at the appropriate time using accepted regeneration techniques. However, most of the forested wetlands on Treehaven are relative “teenagers” (60 to 80 years old) and will not need regeneration harvests for at least another 20 to 40 years.

Aquatic Habitats: Undeveloped lake, pond, and stream shoreline is important habitat, and creates natural movement corridors for a variety of wildlife. Ephemeral ponds and permanent small ponds also provide important breeding sites for amphibians and waterfowl. These shoreline habitats will be managed to protect water quality, maintain wildlife and fish habitat, and to enhance scenic qualities. In addition to the sensitive shoreline wetland areas, upland sites immediately adjacent to streams and ponds are classified as Riparian Management Zones (RMZ). These sites will be protected through vegetative management adapted to minimize impacts, and by following Best Management Practices for Water Quality when conducting all forest management activities.

Threatened and Endangered Species: Individuals of all threatened, endangered, and special concern wildlife species will be protected during all activities on the property. Critical habitat for these species will be actively investigated, documented, and will be maintained or protected through management. Examples of critical habitat includes unique sites used for breeding and foraging, bald eagle and osprey nest sites, wood turtle nest sites, wolf den and rendezvous sites, red-shouldered hawk and northern goshawk nest territories, etc.

Wildlife Population Management: Treehaven currently prohibits hunting or trapping of any kind on the land base. However this policy must be reviewed in light of on-going wildlife damage. In the past, excessive porcupine damage has been a serious problem in localized areas, but does not seem to be a problem at this time. Over browsing by white tailed deer is, and has been, causing serious damage to the forest, to the habitat, and to the long term sustainability of favored browse species. Exact numbers of deer on the Treehaven property are not known, but this fact is irrelevant – serious over browsing is plainly evident. Finding/negotiating an acceptable method of reducing and then maintaining the Treehaven deer herd at a more sustainable level will be a priority. As part of the forest monitoring, deer browse surveys will be conducted annually to quantify current damage, and monitor changes through time.

Wildlife Education: All activities associated with forest management, or non-management, directly influence wildlife habitat – some species will benefit while others will be impacted negatively. The key to successful management of the Treehaven property is to ensure that the timing, intensity, and scale of management activities, are directed in such manner as to benefit all species by rotating their preferred habitat across the land base over time. Wildlife research, monitoring of populations, habitat suitability studies, and habitat modification are strongly encouraged and financially supported through timber sale revenues. Collaboration with the UWSP College of Natural Resources to incorporate students in the inventory, planning, implementation, and monitoring of integrated resource management activities for the property is a Treehaven program priority.

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Fisheries Management:

Treehaven does not have any lakes or ponds that support fish populations. Dragonfly Pond is a very shallow (60% less than 2 feet deep) warm water pond with deep mucky substrate and no distinct inflow or outflow. Only the central mud minnow and possibly the top minnow inhabit these waters due to the lack of dissolved oxygen. Pickerel Creek is a coldwater tributary to Big Pine Creek that supports a small population of coldwater species. Big Pine Creek is a “fair” quality (IBI ranking) coldwater stream and hosts a wide variety of warm water species as well as brook trout. These streams have summer water temperatures that do not typically get above 70 degrees and have moderate flows. The fisheries present in these waters consist of brook and or brown trout, along with some warm water species which migrate upstream from the Wisconsin River.

An assessment of Pickerel Creek is currently underway by the student chapter of the American Water Resources Association. The purpose of this assessment is to gather baseline water and fisheries data, which will then be used to recommend stream improvement projects. The goal of management will be to maintain or enhance a self-sustaining trout fishery by increasing the food supply, creating cover, and providing spawning substrates. This project will extend to Big Pine Creek in the future. Active trapping of beaver and removal of beaver dams has been conducted by APHIS on both of the creek drainages since 1999 to improve cold water habitat.

Recreation Management:

The Treehaven forest and trail system is open to the public for non-motorized use on a year around basis. The most popular recreational activities include use of the groomed cross country ski and snowshoe trails during winter months, and walking trails during the summer months. An impressive 19 hole disc golf course was recently installed in the pine plantation surrounding the facilities area which will add recreational opportunities for program attendees, students, and the general public. An archery range, two horseshoe pits, sand volley ball, and a basketball court are also located in the facilities area. In addition, off-site recreation opportunities include canoe, kayak, and mountain bike rentals.

Currently camping and mountain biking are prohibited on the land base, but these are activities that seem to fit well with the overall property objectives and should be reviewed in the future. Other recreational opportunities that may arise will be considered in the context of Treehaven’s multiple objectives and land-use values.

Scenic Management:

Aesthetic management on the entire Treehaven property will be an on-going objective for all activities, but there are several high priority scenic areas that are identified in the scenic Overlay Zone. Each of these areas has unique scenic characteristics that will be addressed during specific management activities. In general, forest management activities will be designed and timed to promote quick visual “healing” of the activity. To avoid long-term paint marks after harvesting projects are completed, temporary buffer zones, cutting boundaries, and other set-back zones required for the activity will be marked with colored ribbon, and then promptly removed after the activity has been successfully completed.

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Education, Public Programs and Conferencing:

Treehaven’s mission is to provide opportunities in natural resource and environmental education for UWSP undergraduates in the College of Natural Resources, as well as for Wisconsin citizens. The multipurpose, year around design of the facilities, over 1,000 acre land base, and geographical setting provide opportunity for the CNR Summer Session, public workshops, professional conferences, university credit courses, business meetings, educational seminars, training in-services, K-12 environmental programs, Elderhostel, naturalist programs, special public events and much more.

Educational Programs are divided into five thematic areas:

- 1) **UWSP College of Natural Resources Summer Session**, (200 students/year). This is an intensive 6 week hands-on field training session required of all CNR students – Treehaven hosts two sessions per summer. Training includes classes in forestry, water, wildlife, and soils. CNR Summer Session represents the primary reason for development of the Treehaven field station.
- 2) **UWSP college credit courses**, (600 students/year). Classes are offered primarily in Health Promotion and Wellness, Health Exercise Science, Athletics, and the College of Natural Resources with both Continuing Education and Departmental listings available.
- 3) **Youth and School Programs**, (750 students/year). Programs are run both for self-contained groups as well as custom designed and instructed. Many programs are tailored for inner city youth, with a focus on hands-on environmentally based learning in curriculum lasting up to four days.
- 4) **Public Programs in Leisure and Lifestyle**, (1,000 participants/year). Offerings are focused on outdoor recreation, crafts, and back country skills for all ages.
- 5) **Conventions and Professional Conferences**, (3,650 professionals/year). Priority is granted to groups featuring natural resource agendas and multi-night residential stays.

These nearly 6,000 annual participants account for approximately 15,000 “user-days” at Treehaven!

A number of land management considerations are vital to promoting educational programs:

The entire spectrum of on-going land management activities, forestry practices, and management rationale must be conveyed to educational staff. This will be necessary to ensure that these activities are fully integrated into educational curriculum showcasing Treehaven as a working model of multiple-use, sustainable forestry. In the future, informational signage and self guided tours will aid in forestry education.

Educators must also be informed of pending management activities which may affect revenue generating programs. Significant examples might include logging operations adjacent to the ski trail or operations which might adversely affect trail use or participant safety. To reduce site use conflicts, operations affecting the ski trail should be conducted in the April to December time period as much as possible.

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To facilitate off-trail hiking, snowshoeing, and other programs, it is essential to have some Forest Control Areas (non-managed natural areas) available and accessible for partial day exploration and ecosystem interpretation.

The Forest Management Areas and site prescriptions designated in this management plan have been reviewed and fully endorsed by Program Staff as appropriate to program function and needs.

Management and Administration:

Summary management prescriptions in support of the goals for each scheduled activity will be prepared and included in an annual Treehaven land management “plan of work”. In addition to measurable objectives, this detailed work plan will also include an estimate of implementation costs, associated revenues, equipment and supply needs, labor requirements, timing of practices, etc. This annual plan of work will be prepared and submitted each fall to identify the following year’s proposed activities.

A detailed harvest or treatment plan with associated maps will be prepared for each management activity on the Treehaven property. These site specific plans will document how the prescribed activity fits in to the preceding objectives and management considerations, and will set forth the specific requirements for successful completion of the activity. Activity plans will also include an after action summary to document completion, any modifications to the plan, and contain notes for improving the activity in future operations.

In all management activities on the Treehaven property, Federal, State, County, Municipal, and other laws and regulations relevant to the activity will be strictly adhered to. In addition, all applicable Wisconsin Best Management Practices (BMP’s) will be followed when conducting management activities on the property. Any variances to the BMP’s which may be required to achieve site objectives, correspond to prevailing market conditions, alleviate operability constraints, increase protection to the resources, or to support research and education will be reviewed by an interdisciplinary committee of resource management professionals. Should the proposed variance be accepted for implementation by the review committee, all such variances shall be thoroughly documented in the activity plan.

Management Area Definitions

Site specific management prescriptions and scheduled treatment activities for each cover type on Treehaven will be developed based on the designated Management Area in which the cover type is located. Essentially the Management Areas can be considered as landscape scale management zones, in that they encompass many individual cover types (stands) that will all be treated using the same philosophy of management. See Appendix A for the associated Management Areas Designations Map.

Conventional Rotation Management (CRM) Area: The general management goal of a CRM Area is the long term sustainable harvest of timber products using conventional forest rotation ages and intermediate treatment cycles. From an ecological perspective, management in CRM areas may be designed to promote development of a later stage of succession, to maintain the current seral stage, or promote an earlier seral stage. Various methods of maintaining forest growth, health, and vigor will be employed where and when they are appropriate and as the site conditions and cover types dictate. CRM areas will also be managed to meet a wide range of ecological, wildlife habitat, scenic, and recreational opportunities. The management objectives for each site specific prescription will vary depending on tree condition, site capability, cover type, and the needs of education or demonstration. Unique sites with high ecological significance, scenic value, or locations with special habitat requirements will often be small inclusions within CRM areas. In these situations, management practices will be modified so that they are compatible with and promote the goal for the specific site condition. If these sites are greater than one acre in size, they may also be classified as a special use Management Overlay Zone. Although CRM areas will focus on sustainable management of timber products, activities in these areas will also incorporate ecological forestry principles, wildlife habitat improvements, and aesthetic maintenance techniques. Specific management objectives for the CRM area include:

- Demonstrate a variety of silvicultural techniques and regeneration strategies.
- Retain unique and ecologically important woodland features such as legacy trees, snags, coarse woody debris, den, nest, and cavity trees, drumming logs, etc.
- Increase the species composition, age classes, size classes, structural diversity, and spatial heterogeneity of the forest, at the property level.
- Salvage harvest over-mature/declining aspen and white birch, and ensure adequate re-establishment of favorable site adapted tree species.
- Re-establish forest cover by planting appropriate tree species in areas of poor natural regeneration.
- Provide timber production based demonstration areas for research and educational purposes.

CRM areas were selected based on their relative high degree of past disturbance, their overall lower level of sensitive/unique habitats, their proximity to the road infrastructure, and they are located on gentler topography. Selected areas were then grouped across the landscape to promote easy identification on the ground, and ease of logging operability. The CRM designation encompasses 109 individual stands which amount to a total of 629 acres. CRM areas represent approximately 54% of the overall Treehaven land base (62% of potentially productive acres).

Management Area Definitions

Long Rotation Management (LRM) Area: These stands are managed with the primary goal of representing and perpetuating native plant communities and other aspects of native biological diversity. From an ecological perspective, management in the LRM Area will be designed to promote development of a later stage of succession, or to maintain the current mid-successional stage. Management practices are designed to achieve land management objectives through activities and recovery periods that closely mimic natural disturbance processes. Management activities in the LRM Area achieve their goals through; 1) retention and promotion of biological legacies, 2) intermediate treatments that enhance within stand heterogeneity, and 3) appropriate recovery periods between intermediate treatments and regeneration harvests (Franklin et al, 2007). In general, the goal for LRM areas will be to promote large diameter trees and late succession forest conditions. Native, site adapted species will be emphasized, and the re-introduction or mimicking of natural disturbance events (such as fire and wind) will be utilized wherever practical. Specific management objectives for the LRM area include:

- Restore and maintain indigenous climax forest cover types and large diameter, old trees.
- Promote long-lived forest cover types and species groups, including oaks, pines, hemlock, sugar maple, yellow birch, cedar, and black spruce on sites where appropriate.
- Create unique and ecologically important woodland features such as legacy trees, snags, coarse woody debris, den, nest, and cavity trees, tip-up mounds, etc.
- Plan for and produce sustainable forest products as a result of Long Rotation Management practices.
- Provide areas that replicate old forest conditions for demonstration, research and educational purposes.

Only those areas of highest value for restoration and maintenance, or education and demonstration, have been selected as LRM areas. In general, these areas display a relatively lower degree of past disturbance, contain an overall higher level of sensitive/unique habitats, are furthest from the road infrastructure, and are located in steeper or wetter terrain. The LRM designation encompasses 76 individual stands which amount to a total of 362 acres. LRM areas represent approximately 31% of the overall Treehaven land base (35% of potentially productive acres).

Forest Control Areas (FCA): The principal goal for an FCA is to follow a strict regime of passive management along with a program of frequent monitoring. Except for a few unique large stands, these are relatively small areas of significant ecological, research, demonstration, or ecosystem monitoring value. The FCA designation encompasses 11 individual stands which amount to a total of 30 acres. FCA areas represent approximately 3% of the overall Treehaven land base.

*Franklin, Jerry, F.; Mitchell, Robert J.; Palik, Brian J. 2007. **Natural Disturbance and Stand Development Principles for Ecological Forestry.** Gen. Tech. Rep. NRS-19. Newton Square, PA:U.S. Department of Agriculture, Forest Service, Northern Research Station. 44 p.*

Management Area Definitions

Management Overlay Zones: An overlay zone is a planning tool that allows for additional management prescriptions that can span multiple sites. They are used when there is a particular resource that requires additional prescriptions to meet the goals of the zone. The goals and management prescriptions for overlay zones are in addition to the goals and management prescriptions for the underlying management area. The most obvious overlay zone on the Treehaven property will be the RMZ along Pine and Pickerel Creeks; however there are other unique sites on the property that will also benefit from a more restrictive management strategy. In general, overlay zones will prescribe a more passive or restrictive approach to management.

- Management emphasis may be to preserve and protect rare species habitats, high quality natural communities, or important educational/research sites.
- Management emphasis may be to maintain or enhance scenic qualities.
- Management emphasis may be to identify a unique management objective such as a ruffed grouse “aspen” management area.
- Management emphasis may be to preserve an un-managed control area for demonstration.
- Provide areas of restrictive-use goals for demonstration, research, and educational purposes.

Some Management Overlay Zones have already been developed for the Treehaven property, primarily wetland protection zones, scenic areas, aspen management area, and the outdoor classroom area surrounding the main facilities. However this “layer” will become increasingly more complex as new research opportunities and educational programs are initiated at Treehaven.

Stand Inclusions: Small area features on the landscape that are less than one acre in size (typically 0.99 to 0.1 acres) such as unique forest cover types, wetland pockets, research sites, educational sites, etc. are mapped in a separate Stand Inclusion “layer”. These sites are identified and mapped as they are encountered, and referred to when planning site specific management activities.

Management Prescriptions

Two different management prescriptions for each of the primary forest cover types on Treehaven are outlined below, one for each of the two Management Areas (CRM & LRM). It must be remembered that a forest cover type is classified by only the dominant tree species - a variety of minor species, advance regeneration, and site capability may require slight modifications to the following prescriptions to achieve objectives for each individual site. This level of site specific detail will be included in the activity plan for each treatment area.

Aspen/Birch

These forest types are dominated by aspen and/or white birch and typically contain a minor component of maple, pine, oak, spruce, and balsam fir. This pioneer forest type on Treehaven is the result of severe wildfires in the past, and is currently over-mature (60 to 80 years old) and declining rapidly.

Management Prescriptions

CRM Area: Approximately 17% of the Treehaven land base (196 acres) will be managed to maintain early succession pioneer forests. To maintain these early pioneer forests on the landscape a sequence of small to mid size (5 to 20 acre) clearcut regeneration harvests will be conducted throughout time. Both the aspen and birch are sun loving species which require full to near full sunlight to regenerate and prosper. A diversity of aspen/birch age classes will be created across the property by regenerating some stands before economic rotation (35 to 45 years old), and other stands will be regenerated well beyond economic rotation (55 to 65+ years old). In addition, an approximate 60 acre Overlay Zone has been identified as a core ruffed grouse management area. Through time, management in this zone is designed to create 10, six acre stands representing each 10 year age class to age 60. This Overlay Zone also includes and is surrounded by other forest and non-forested habitat which are beneficial to ruffed grouse.

LRM Area: Approximately 46% of the current Aspen/Birch forest type will be converted to longer lived species, with most of this conversion occurring in the LRM Area. Conversion to a mixed pine cover type will be accomplished through light thinnings that maintain canopy closure sufficient to suppress natural sprouting of aspen (basal area 40 to 60 square feet per acre). In most areas the aspen component is already at an advanced age which will reduce coppice regeneration, and there is a well represented overstory component of pine, spruce, and red maple. Younger, healthier stands of the Aspen/Birch type will be retained until favorable conversion potential is achieved.

Mixed Pine

These can be very diverse forest types both compositionally and structurally. Tree species in the mixed pine type are typically dominated by white or red pine, but also contain white spruce, red maple, aspen, birch, oak, and balsam fir, with a dense shrub layer of hazel. Distribution of the minor trees can be scattered individuals, or small clumps to larger pockets, and their age is typically younger than the overstory pine. This older, mid successional, mixed pine forest type is under represented on the Treehaven property, and was likely the dominant forest type during the settlement era. Active management of the forest will allow the slow expansion of the mixed pine forest type to other areas of the Treehaven property.

CRM Area: Management of the mixed pine forest type will primarily promote large diameter pine, with most thinning occurring within the suppressed diameter classes and pioneer understory species. Healthy pine will be grown to economic maturity (90 to 180 years old), with some individuals being retained in the stand until natural mortality moves them to the snag tree category. Intermediate thinnings will be designed to maintain appropriate stocking levels that promote health and growth of large diameter healthy individuals.

In the absence of disturbance, white pine will likely outlive and out reproduce the red pine component. Therefore, prescribed fire, scarification, or planting in addition to shelterwood harvesting will be required to ensure that adequate areas of regeneration are available to perpetuate this type. Currently there are no mixed pine cover types on Treehaven that are in need of regeneration harvesting for at least another 40 to 50 years. However, smaller acreage regeneration trials, to include prescribed fire, will be conducted to ascertain the most reliable regeneration methods.

Management Prescriptions

LRM Area: Approximately 28% of the Treehaven land base will be managed to maintain or promote a mixed pine community type. Most of this type is currently in the LRM Area, and will continue to be promoted via the conversion of Aspen/Birch areas. Management in the LRM area will be very similar to the above, with the exception of holding the stands closer to biological maturity (160 to 200+ years old). Intermediate thinnings will incorporate a longer return cycle (15 to 25 years) between entries, and promote a patch work of slightly denser residual stocking levels, inter-mixed with open pockets. Creation of snags and coarse woody debris in current stands will be required due to the prominent lack of this structural diversity. Regeneration requirements within the LRM Area are the same as above.

Hardwood/Hemlock

For classification purposes this forest cover type includes what would typically be classified as Northern Hardwoods, Hemlock, and Hemlock Hardwoods. All three types are currently uncommon on Treehaven, and even when combined only represent 7% of the total land base. These forests are dominated by sugar maple and hemlock, but also contain a wide variety of minor species including basswood, yellow birch, red maple, aspen, white birch, balsam fir, white spruce, and white pine. Except for the western end of the property this type is found only in small stands or pockets with richer, mesic soil conditions. Even on the best sites, most of this forest type is still dominated by aspen/birch, and natural regeneration has been severely hampered from over browsing. The northern mesic forest type is listed as a rare community type in the Natural Heritage Inventory for this area of Lincoln County.

CRM Area: Most of the hardwood/hemlock forest type, and the best sites for conversion to it, are located in the CRM Area. The extent of this forest type will be nearly doubled through management to 13% of the total land base. This will be primarily an expansion and promotion of northern hardwoods that is slowly occurring naturally. Pure hemlock groves will be protected except for some small scale regeneration trials. To promote hardwoods (sugar maple, basswood, yellow birch, white ash, and hemlock) this forest type needs a series of improvement thinnings to liberate the desirable species from competition with the overtopping aspen/birch and red maple. Reducing aspen sprouting will be accomplished through frequent (every 6 to 12 years) light thinnings, designed to maintain residual stocking levels of greater than 60 square feet per acre. In dense stands, no more than 1/3 of the current stocking level will be removed during any thinning operation – multiple entry periods may be required to bring the stocking down to a desirable 80 to 100 square feet per acre of desirable species.

Once the stand is free of the aspen/birch component, regeneration thinnings will be initiated using a combination of single tree selection, and the group tree selection methods. Regeneration pockets (1/10 to 1 acre in size) will likely need to be fenced to exclude deer browsing until regeneration exceeds six feet in height. This method of thinning (every 10 to 15 years) will gradually move the structure of the forest to an uneven-aged condition. Rotation age or maximum diameter in this type will be determined by individual tree health, risk of loss, and predicted growth response until the next treatment cycle, but in general, an 18"+ dbh will be the management goal. Long-term management of this type will be to produce high quality sawlogs and veneer.

Management Prescriptions

LRM Area: Management of the hardwood/hemlock forest type in the LRM area will be identical to that described for the CRM Areas until the stands are free of the aspen/birch component. At that point, the single tree selection method will be used exclusively to promote healthy, large diameter, overstory trees. To maintain species diversity, irregular heavy thinnings will be conducted (residual stocking of 40 to 80 square feet per acre), using a 15 to 20 year re-entry cycle. Rotation age or maximum diameter in this type will be determined by individual tree health, risk of loss, and predicted growth response until the next treatment cycle, but in general, a 24"+ dbh will be the management goal. Long-term management of this type will be to produce a closed canopy, large diameter, old forest replicating late successional conditions.

Spruce/Tamarack

These forest types occupy wet depressions with impeded drainage. Stocking levels are very good in these types, but tree growth is slow, especially for the black spruce. Tamarack and black spruce are regenerating well in natural openings, with the tamarack surpassing black spruce in height growth. Approximately 12% of the land base is currently in this forest type, and this percentage will be maintained in the future.

CRM Area: All of these stands are relatively young, and most are not in need of management. However, small scale regeneration trials and pre-commercial improvement thinning will be conducted as education/demonstration areas. Commercial improvement thinning to enhance visual qualities (thinning from below) will also be conducted in some of the stands dominated by larger tamarack. These thinnings will be designed to remove over-mature pioneer species, high risk trees, and undesirable species to prepare the stand for regeneration harvesting in the future. Residual stocking levels after these preparatory thinnings will be maintained at 80 to 100 square feet per acre, and all activities will be restricted to frozen only conditions.

Both the black spruce and tamarack cover types will be regenerated at age 100 to 120+ years depending on site conditions, growth rates, and health of the stand. Currently there are no Spruce/Tamarack stands on the land base that are in need of regeneration harvesting for at least the next 20 to 40+ years.

LRM Area: Most of these areas will be reserved from intensive management during the life time of this management plan (next 15 years). However, small scale regeneration trials and pre-commercial improvement thinning may be conducted as education/demonstration areas.

Cedar

The northern white cedar cover type is rare on the Treehaven land base, and because of excessive deer browsing is not expected to increase without intensive management and protective measures. There is evidence that the cedar cover type was much more extensive in the past along Big Pine and Pickerel Creeks. River side wetlands that are currently dominated by tag alder and sedge were likely lowland conifers dominated by cedar prior to the settlement era logging, river drives, wildfires, and unrestricted grazing. Currently this cover type represents 4% of the Treehaven land base, with a goal of increasing this to 9% through management.

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CRM Area: Only small cedar pockets and individual trees are located in the CRM area. As such, all cedar trees will be protected during management operations.

LRM Area: Northern white cedar can be an extremely long lived species, reaching a maximum age up to 400 years old. Because of this, its high wildlife value, and the sensitive wetlands that these forest occupy, cedar stands will be excluded from intensive management during the life of this management plan. However, some small scale regeneration trials and pre-commercial improvement thinning will be conducted for education and demonstration. Management of this type will consist primarily of planting in areas along the creek side wetlands that show evidence of past cedar occupancy. In all plantings, deer fencing will be required to protect the seedlings until they are at least six feet in height (5 to 10 years after planting). Natural regeneration of native cedar stands will not be required on the Treehaven property for at least another 40+ years.

Red Pine Plantation

Currently there are 126 acres (11% of land base) of existing red pine that was planted in the late 1950's and early 1960's. This original planting was conducted as a restoration measure on old agricultural fields, former pasture lands, slopes to prevent erosion, and other areas lacking in natural regeneration. These plantations are now approximately 50 years old, and most areas have received at least one thinning in the past. Most of these plantations have developed a dense understory of red maple and/or balsam fir.

CRM Area: Because of the tenacious advance regeneration and steep topography, most of the current plantations will be managed to promote a natural conversion to a mixed pine, or a hardwood cover type. Management will consist of intermediate thinnings, approximately every 10 to 15 years, with residual stocking levels of 80 to 110 square feet per acre based on stocking guide recommendations. Rather than rotating these stands at the recommended 90 to 120 years, they will continue to be thinned allowing natural regeneration to gradually take over the stand.

New red pine plantation establishment will be conducted on several old agricultural fields (approximately 50 acres) on the southwest side of the property. These old agricultural fields were abandoned 10 to 15 years ago, and currently contain dense grass/forbs and encroaching aspen regeneration. Site preparation will be accomplished through mechanical trenching, with hand planting of seedlings in the bottom of the trench. Trenches will be spaced eight feet apart and follow the contours of slopes when encountered. Seedlings will be planted at a spacing of eight feet within the trenches which will produce an initial stocking of approximately 680 trees per acre. White spruce will be substituted for red pine in the lower areas during planting. Any subsequent planting mortality will be replaced using white pine or red oak protected from browsing.

LRM Area: Red pine plantations in the LRM Areas will be converted to a mixed pine cover type using the same methods as employed in the CRM area. However, thinnings will be conducted on a more irregular basis, with a mix of open areas, low stocked areas, to slightly overstocked areas. Following each thinning, a scattered planting of white pine and red oak in the open areas will help to accelerate conversion.

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Spruce/Fir

This forest type occupies 7% of the Treehaven land base, and will be decreased to 3% following management. Many of these stands are located on transitional areas between lowlands and uplands. Three small upland white spruce plantations are also included in this classification. The balsam fir component is typically dominant along with aspen/birch, and in most stands all are over-mature.

CRM Area: White spruce management is possible on most of these stands, and it will seed in naturally after management along with white pine. Long-term management will therefore promote the mixed pine cover type, with spruce and fir as a strong secondary component. Management activities will initially seek to salvage the over-mature aspen/birch, and balsam fir component. This will be accomplished through a designated species removal harvest, retaining all white spruce and younger balsam fir which is less than 20 feet in height. In extremely dense stands, and stands that are not protected from the wind, management may require selection marking of not greater than 50% of stocking to reduce windthrow.

Scarification of the site during harvesting operations is desired to promote a suitable seed bed for natural regeneration. Both white spruce and balsam fir are very shade tolerant and will respond quickly to release. Long-term management of the Spruce/Fir cover type will be accomplished through uneven-aged techniques. Single and group tree selection methods will be employed during future thinnings, with a re-entry cycle of every 20 to 30 years.

LRM Area: Initially, Spruce/Fir management in the LRM area will be similar to the CRM management. Once the over-mature pioneer species have been removed, long-term management will promote the mixed pine cover type, with spruce and fir as a strong secondary component. However, higher residual stocking levels, larger diameters, and more frequent entries will be employed to maintain lower impacts to the site. This will be accomplished very similar to the CRM area, with the exception of retaining balsam fir which is less than 30 feet in height, along with single tree selection as appropriate. Uneven-aged techniques will be used to maintain this cover type, with a re-entry cycle of every 10 to 20 years.

Mixed Oak

Approximately 4% of the Treehaven land base which is currently in the aspen/birch cover type will be managed to promote natural conversion to a mixed oak forest type. Red oak will be grown to biological maturity (age 90 to 150 years) and regenerated through the shelterwood system. Red, pin, and white oaks are important wildlife mast producing trees that are currently under represented on the Treehaven property. For the next 15 years or more, all oaks will be maintained and protected from damage on the Treehaven property, consistent with management objectives for the area.

CRM Area: Presently only one site on the Treehaven property has sufficient natural regeneration for conversion to mixed oak. This site is currently classified as aspen/birch, and is under contract for a thinning to promote the natural oak regeneration to grow through the browse line. A second thinning will be required to

Management Prescriptions

salvage the remaining aspen/birch and to further release the oak saplings within 3 to 6 years. Oak planting will also occur on appropriate sites as time and budgets permit.

LRM Area: Existing oak will be protected during management operations, and scattered oak plantings will be established in appropriate areas. In particular, the south facing slope near the powerline corridor will be aggressively managed for conversion to mixed oak through improvement thinning, weeding, oak plantings, and deer fencing. This stand currently has a scattered overstory of large diameter mixed pine, with a poor quality red maple mid-story, and some advance aspen regeneration from harvesting in the past. A light thinning of the pine and maple will be conducted, followed by a planting of red oak in natural openings. Deer fencing or tree tubes will be required to protect seedlings, along with follow-up release of the seedlings as the stand closes.

Lowland Hardwood

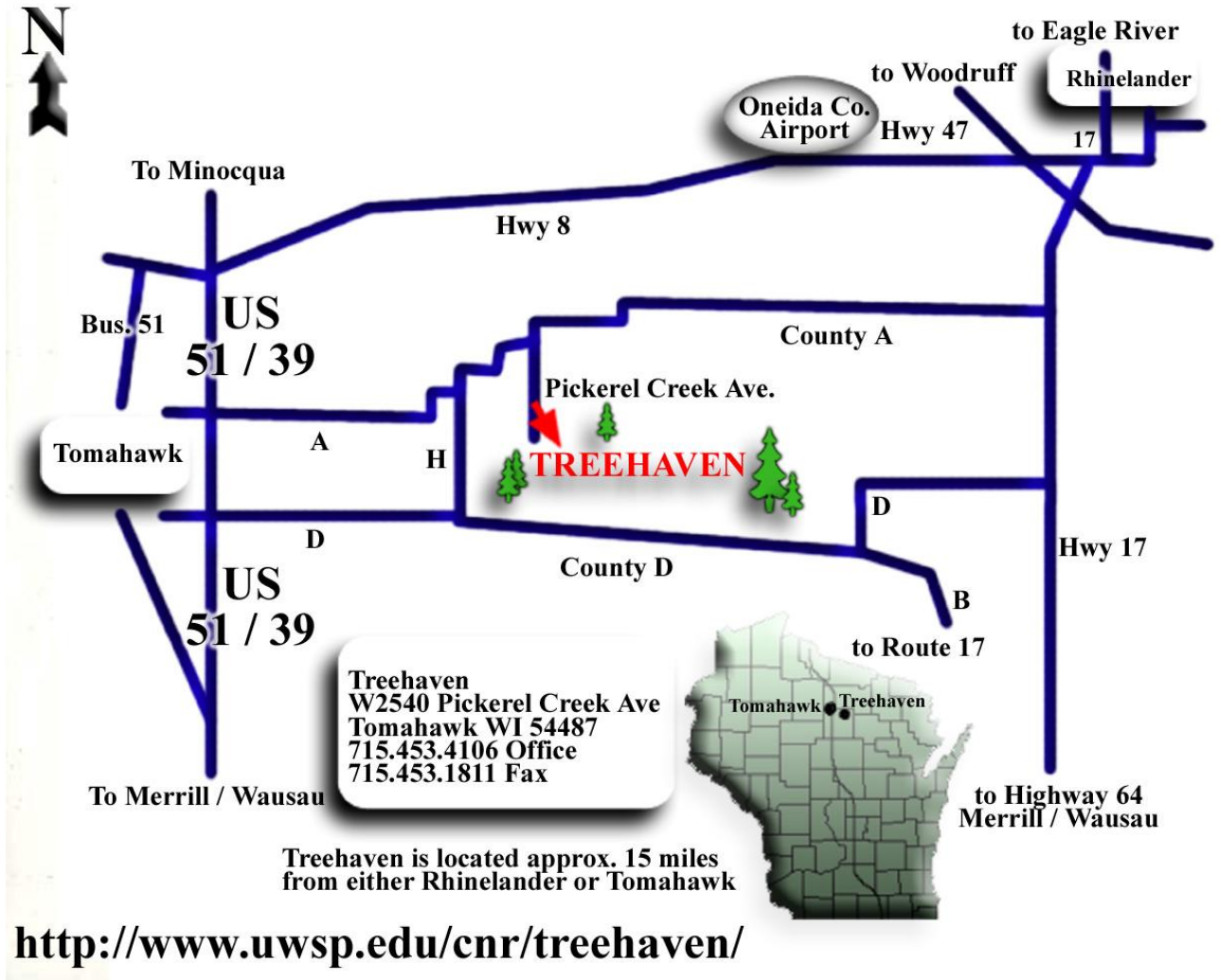
Lowland hardwoods are uncommonly rare on the Treehaven Property. Typically this cover type includes black ash and elm, along with balsam poplar, and wetland conifers. Only 3 stands are currently represented on Treehaven, all of which are actually dominated by off-site quaking aspen. These areas will be protected in a Forest Control Area, and promotion of this type in surrounding wetland areas will be encouraged through management.

Non-Forest

Maintained non-forest areas such as the Treehaven facility area and powerline corridor will be evaluated for inclusion of supplementary forest cover when and where appropriate. In addition, alternate non-forest uses consistent with the Treehaven mission for these areas will continue to be explored.

Other non-forest areas on the land base will be re-established to forest cover where appropriate. In particular, the non-forested wetland corridor along Pickerel and Big Pine Creeks (120 acres) will be re-forested using natural and artificial regeneration techniques. This may include the use of prescribed fire, scarification, and/or hand planting. Northern white cedar will be the preferred species to re-establish, but tamarack, spruce, elm, and black ash will also be attempted. High re-establishment costs including protective measures to reduce deer browsing, will necessitate that these re-forestation attempts remain small scale and dispersed over time.

A small portion of apparently natural forest openings will be maintained using prescribed fire, scarification, or herbicides for demonstration purposes. Most of the larger openings will be allowed to regenerate naturally, or be hand planted to an appropriate species. Through time, and across the property, small natural forest openings will be created as the result of on-going management practices and road work. As a result, forest openings will always be present on the property in various stages of development and recovery.



**Natural Heritage Inventory (NHI) Search Results for the Treehaven Property
Town of King T35N-R7E, Sections 24, 26, 25, and 36, Lincoln County, Wisconsin
October 29th, 2009**

Plants

<i>Arabis missouriensis var. deamii</i>	Deam's Rockcress	WDNR - SPECIAL CONCERN
<i>Callitriche hermaphroditica</i>	Autumnal Water-starwort	WDNR - SPECIAL CONCERN
<i>Myriophyllum farwellii</i>	Farwell's Water-milfoil	WDNR - SPECIAL CONCERN
<i>Potamogeton confervoides</i>	Algae-like Pondweed	WDNR - THREATENED
<i>Utricularia geminiscapa</i>	Hidden-fruited Bladderwort	WDNR - SPECIAL CONCERN
<i>Utricularia purpurea</i>	Purple Bladderwort	WDNR - SPECIAL CONCERN
<i>Utricularia resupinata</i>	Northeastern Bladderwort	WDNR - SPECIAL CONCERN

Mammals

<i>Canis lupus</i>	Gray Wolf	WDNR - SPECIAL CONCERN Federally Listed - Endangered
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Turtle

<i>Glyptemys insculpta</i>	Wood Turtle	WDNR – THREATENED
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Birds

<i>Haliaeetus leucocephalus</i>	Bald Eagle	WDNR - SPECIAL CONCERN
<i>Pandion haliaetus</i>	Osprey	WDNR - THREATENED

Communities

<i>Emergent marsh</i>	Emergent Marsh
<i>Floodplain forest</i>	Floodplain Forest
<i>Lake--shallow, soft, seepage</i>	Lake--Shallow, Soft, Seepage
<i>Northern mesic forest</i>	Northern Mesic Forest
<i>Open bog</i>	Open Bog
<i>Stream--slow, soft, warm</i>	Stream--Slow, Soft, Warm

UWSP - Treehaven Land Records

All parcels located in Lincoln County, Wisconsin

Owner	Township	Town	Range	Section	Desc - 1	Desc - 2	Tax Acres	Parcel ID
U W Stevens Point Foundation	King	35N	07E	24	NENE	Part of	19.63	012-3507-241-9991
U W Stevens Point Foundation	King	35N	07E	24	NESE	Part of	6.90	012-3507-344-9998
U W Stevens Point Foundation	King	35N	07E	24	NESE	Part of	33.10	012-3507-244-9999
U W Stevens Point Foundation	King	35N	07E	24	NESW		40.00	012-3507-243-9999
U W Stevens Point Foundation	King	35N	07E	24	NWSE		40.00	012-3507-244-9997
U W Stevens Point Foundation	King	35N	07E	24	SENE	Part of	7.00	012-3507-241-9992
U W Stevens Point Foundation	King	35N	07E	24	SESE		40.00	012-3507-244-9995
U W Stevens Point Foundation	King	35N	07E	24	SESW		40.00	012-3507-243-9996
U W Stevens Point Foundation	King	35N	07E	24	SWSE		40.00	012-3507-244-9996
U W Stevens Point Foundation	King	35N	07E	24	SWSW		40.00	012-3507-243-9997
U W Stevens Point Foundation	King	35N	07E	25	NENE		40.00	012-3507-251-9999
U W Stevens Point Foundation	King	35N	07E	25	NENW		40.00	012-3507-252-9999
U W Stevens Point Foundation	King	35N	07E	25	NESE		40.00	012-3507-254-9999
U W Stevens Point Foundation	King	35N	07E	25	NWNE		40.00	012-3507-251-9998
U W Stevens Point Foundation	King	35N	07E	25	NWNW		40.00	012-3507-252-9998
U W Stevens Point Foundation	King	35N	07E	25	NWSE		40.00	012-3507-254-9998
U W Stevens Point Foundation	King	35N	07E	25	SENE		40.00	012-3507-251-9996
U W Stevens Point Foundation	King	35N	07E	25	SESE		40.00	012-3507-254-9996
U W Stevens Point Foundation	King	35N	07E	25	SWNE		40.00	012-3507-251-9997
U W Stevens Point Foundation	King	35N	07E	25	SWSE		40.00	012-3507-254-9997
U W Stevens Point Foundation	King	35N	07E	26	NENE		40.00	012-3507-261-9999
U W Stevens Point Foundation	King	35N	07E	26	NENW		40.00	012-3507-262-9999
U W Stevens Point Foundation	King	35N	07E	26	NWNE		40.00	012-3507-261-9998
U W Stevens Point Foundation	King	35N	07E	26	NWNW		40.00	012-3507-262-9998
U W Stevens Point Foundation	King	35N	07E	26	SENE		40.00	012-3507-261-9996
U W Stevens Point Foundation	King	35N	07E	26	SWNE		40.00	012-3507-261-9997
U W Stevens Point Foundation	King	35N	07E	36	NWNE		40.00	012-3507-361-9998
U W Stevens Point Foundation	Harrison	35N	08E	19	SWSW		30.99	010-3508-193-9999
Dorothy K. Vallier	King	35N	07E	26	NESE		40.00	012-3507-264-9999
Dorothy K. Vallier	King	35N	07E	26	NWSE		40.00	012-3507-264-9998
Dorothy K. Vallier	King	35N	07E	26	SESE		40.00	012-3507-264-9996
Dorothy K. Vallier	King	35N	07E	26	SWSE		40.00	012-3507-264-9997
							1,177.62	
Dorothy K. Vallier (Biff's)	King	35N	07E	25	NESW		40.00	012-3507-253-9999
Dorothy K. Vallier (Biff's)	King	35N	07E	25	NWSW		40.00	012-3507-253-9998
Dorothy K. Vallier (Biff's)	King	35N	07E	25	SENE		40.00	012-3507-252-9996
Dorothy K. Vallier (Biff's)	King	35N	07E	25	SESW		40.00	012-3507-253-9995
Dorothy K. Vallier (Biff's)	King	35N	07E	25	SWNW		40.00	012-3507-252-9997
Dorothy K. Vallier (Biff's)	King	35N	07E	25	SWSW	Part of	38.60	012-3507-253-9997
Dorothy K. Vallier (Biff's)	King	35N	07E	25	SWSW	Part of	1.40	012-3507-253-9996
Dorothy K. Vallier (Biff's)	King	35N	07E	36	NWNW	Part of	0.81	012-3507-362-9990
Dorothy K. Vallier (Biff's)	King	35N	07E	36	NWNW	Part of	6.33	012-3507-362-9996
Dorothy K. Vallier (Biff's)	King	35N	07E	36	NWNW	Part of	2.29	012-3507-362-9994
							249.43	