INFRASTRUCTURE COMMITTEE MEETING
6:00 P.M.
Monday November 24, 2014

HAMPDEN TOWN OFFICE

A G E N D A

1. MINUTES – 10/27/2014 Meeting
2. OLD BUSINESS
   A. Parks Policy Committee Update – continuation from Services Committee Meeting
   B. Old Fire Station Lease with RSU #22
   C. Wood Harvesting
      1. Dorothea Dix/LL Bean – Prentice & Carlisle Report
      2. Business Park

3. NEW BUSINESS
   A. Water District
      1. Proposed Charter Changes
      2. Filling Trustee Vacancy
   B. Brush Removal Requests
   C. Route 1A – next phase of rebuild – Mountainview to Murphy Lane - 2017
   D. Site Plan – Municipal Building Complex
4. PUBLIC COMMENTS
5. COMMITTEE MEMBER COMMENTS

INFRASTRUCTURE COMMITTEE MEETING MINUTES
Monday October 27, 2014

Attending:

Councilor David Ryder
Councilor Ivan McPike
Councilor Jean Lawlis
Councilor Tom Brann
Councilor William Shakespeare

Kiwanis Club Representatives
Public Works Director Chip Swan
Residents

The meeting was opened at 6 p.m. by Chairman Ryder.

1. MINUTES – 8/25/2014 Meeting – Motion by Councilor Shakespeare, seconded by Councilor McPike to approve the minutes. Minutes approved as presented.
2. OLD BUSINESS
   A. Update - Cemetery Maintenance Costs – 2014 – Public Works Director – The Public Works Director presented a proposal to put the cemetery operations out to bid for a three year period. The bid would be put out in November and be awarded in time for spring cemetery maintenance to occur. This proposal is the result of a review of expenditures for cemetery operations this year with the possibility of some reduction in cost. This would negate the need to hire additional personnel in the summer for mowing and maintenance. Existing personnel would continue to mow recreation fields and to do maintenance on town buildings and town parks. Motion by Councilor Brann, seconded by Councilor McPike to support the Public Works Director's plan to put cemetery maintenance out to bid. Unanimous vote in favor.
   B. Project Inspection Costs/Process – Councilor Shakespeare – Councilor Shakespeare had asked for information related to the practice of paying a third party inspector to inspect private development and town projects. The Town Manager had provided a breakdown of the projects done over the past five years and the inspection costs associated with same. She explained that the Town required third party inspection of projects to insure that work done by contractors for both the Town and Developers was done according to plan specifications. The Town's zoning ordinance requires third party inspection of developer projects, and the Town treats itself in the same manner by having inspectors on town construction projects. The Public Works Director explained that the cost of hiring an engineering firm to do such inspections would be nearly double per hour what the Town currently pays a retired civil engineer or the Town's former Public Works Director. Resident Stan MacMillan, a long-time contractor, noted that the town was getting a good deal on inspections by using the personnel that it does rather than hiring an engineer. No action was taken on this item by the Committee.

C. Wood Harvesting – Business Park/Dorothea Dix/LL Bean – Councilor Ryder discussed the report done by Prentice and Carlisle for the Town in 2008 related to wood harvesting at Dorothea Dix Park for park management, the LL Bean parcel and the town-owned parcel on Kennebec Road to see if there was Committee interest in considering implementation of parts of that plan. Also discussed was the wood harvesting for the Business Park and whether or not the Town should arrange for that to be done in order to realized any profit from the sale of the wood or if it should be left to Sargent when the infrastructure is constructed for the road/utilities. Councilor Brann told the Committee that both Sargent and Thornton had agreed to give the Town the money from sale of wood associated with clearing on the property. It was the consensus of the Committee that the Town should get those agreements in writing from Sargent and Thornton. The Kennebec Road parcel was not seen in the report as having wood of any commercial value and the Committee concentrated primarily on discussions of the LL Bean parcel and Dorothea Dix. Resident Peggy Brown who owns land adjacent to the Kennebec Road parcel asked questions related to what the Town's intent was in regard to that property. At the present time it is used as a snow dump and there are no other plans for it at this time. Some Committee members expressed concern that the harvesting plan was out of date because it was done in 2008. The Manager will contact Prentice and Carlisle and see what, if any, updates the plan would need in order to be used as part of an RFP. The first priority was seen as Dorothea Dix Park, where the wood harvest could serve to clean up the park, improve safety, and develop trails with the cost offset by the value of the wood that the contractor would be able to sell. The LLBean parcel was also considered a priority and the Manager will check with the DEP to see if wood harvesting can be done on a parcel if it has been designated as wetland mitigation for a development project. The Committee will review the information requested at the next Infrastructure Committee meeting with the hope of being able to proceed with at least the Dorothea Dix improvements over the coming winter.

3. NEW BUSINESS
   A. Streetlight Request
      1. Chickadee Crossing – The Town Manager reported that streetlights were included and approved as part of the Chickadee Crossing subdivision by the Planning Board. The lights should have been installed as part of the construction; however, since they were not, the Town will contact Emera to have them put up. There is no upfront cost for the installation, only the per month electrical charge. If there were any additional expense for the installation it would be paid by the developer of Chickadee Crossing.
      2. Route 202, LL Bean Property Entrance – The Public Works Director explained that MDOT is requiring a streetlight at the intersection of the new access onto Route 202 as part of the entrance that will serve the Calvary Apostolic Church on land owned by Peter Thornton. Motion by Councilor McPike,

seconded by Councilor Lawlis to recommend to the Council the installation of a streetlight at the new Route 202 entrance. Unanimous vote in favor. Resident Dennis Whitcomb asked if abutting landowners would be allowed to utilize the new access road. Councilor Brann responded that Ammo Park owner Peter Thornton had indicated that the two abutters to the access road would be able to utilize it and that owners should contact Mr. Thornton in that regard.

B. Public Safety Fees – Public Safety Director – The Manager explained that Police and Fire staff persons had reviewed the Fees Ordinance and identified a number of areas that were outdated. These included items such as pool fills and culvert flushing that the town does not do, as well as the fees for standby ambulance or police officers at an event were not correct with current wage rates. Motion by Councilor Shakespeare, seconded by Councilor McPike to recommend to the Council to update the Fees Ordinance as presented. Unanimous vote in favor.
C. Review Snowmobile Club lease – direction for renewal – Town Manager – Motion by Councilor Lawlis, seconded by Councilor McPike to recommend to the Council a ten year renewal on the Snowmobile Club lease on the same terms and conditions as currently exist. Unanimous vote in favor. It was noted by several Committee members that the Snowmobile Club performed a lot of community service through snowmobile trail maintenance and use of the Club for fundraisers. In addition, the Club has done an excellent job of maintaining the buildings.
D. Review Kiwanis Club Lease – direction for renewal – Town Manager. Several Kiwanis members attended the meeting and made a presentation on the history of the club, the types and amount of community services performed by the club, the other non-profit organizations that also benefit from the club and the amount of money that the Kiwanis have invested in building maintenance and renovations at the site. Motion by Councilor Ryder, seconded by Councilor Lawlis to recommend to the Council a ten year renewal on the Kiwanis Lease under the same terms and conditions from the prior lease. Unanimous vote in favor. Councilor Lawlis asked that representative(s) from the Club attend the November 17, 2014 Council meeting to give a brief presentation on the Club and its activities so that the public may become more aware of them and perhaps to assist the club with finding new members.
E. Review Old Fire Station Lease RSU#22 – direction for renewal – Town Manager – It was the consensus of the Committee to have an inspection done by the Town Code Officer and Fire Inspector prior to discussions of a lease extension for RSU22. Committee members discussed options for the building ranging from continued leasing to RSU#22 to demolition. This item will be on the next Infrastructure Committee agenda.
F. Truck Monitors – Councilor McPike – The Public Works Director reported that he had been in contact with T-Mobile, the company used by the City of Bangor, for costs associated with installing GPS monitors in Public Works vehicles so that the Town can better manage its resources. The cost is approximately $25 per vehicle

per month. The Manager indicated that she was looking for a consensus of support from the Committee for installation of these monitors since the cost was under the bid price. A straw vote for installation was unanimous.

G. Monitoring of Construction & Demo at Transfer Station – Councilor Shakespeare

4. PUBLIC COMMENTS – Curt Slininger, a Kiwanis member, thanked the Committee for recommending support of a lease renewal. Alex King thanked Public Works for the work done on Ichabod Lane extension.
5. COMMITTEE MEMBER COMMENTS – Councilor Brann asked that the location of a streetlight at the intersection of Papermill Road and Coldbrook Road be requested from Emera again. This request was made previously but no light has been installed. Councilor Ryder discussed the need for expansion of parking at the Lura Hoit Pool to accommodate soccer games on the fields there. There are many times when Western Avenue is lined with cars and he is concerned that a child may get hit. The Public Works Director reported that the new fuel tank is now in operation at the Town Garage.

The meeting was adjourned at 8:35 p.m.

Respectfully submitted,

Susan Lessard
Town Manager

2B

Susan Lessard <manager@hampdenmaine.gov>

Old Fire Station

4 messages

Susan Lessard <manager@hampdenmaine.gov> Wed, Oct 29, 2014 at 8:56 AM
To: Emil Genest <egenest@sad22.us>

Hi Emil -
At their meeting on Monday night the Infrastructure Committee of the Council discussed the renewal of the lease on the old fire station. They asked me to have our code/fire inspection people do an inspection of the building in order to better understand what the physical condition of the building is and what kind of life span/future it might have depending on what is needed for repairs, other than the parking lot, which is badly deteriorated.
Do you have any objection if Miles Block (CEO) and Jason Lundstrom (Fire Inspector) do an inspection of the building? Is there someone that you would want to accompany them?
Thanks
Sue

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Sue Lessard
Town Manager

Town of Hampden
106 Western Avenue
Hampden, ME 04444
(207)-862-3034
manager@hampdenmaine.gov

Genest Emil <egenest@rsu22.us> Thu, Oct 30, 2014 at 11:04 AM
To: Susan Lessard <manager@hampdenmaine.gov>
Cc: Greenier David <dgreenier@rsu22.us>, Lyons Richard <rlyons@rsu22.us>, Kelly Bickmore <kbickmore@apshealthcare.com>, Niles Parker <nparker@mainediscoverymuseum.org>, Martha Harris <mjh@plhlaw.com>

Sue,

Reference your noted email about the RSU#22 "old fire station" lease with the Town of Hampden .....

RSU#22 has no problem with the inspection.The best individual to accompany Mike and Jason is David Greenier (cell# 852-2140).....He is aware of all the building improvements that have occurred over the past (14) fourteen years such as:

1. Replaced Roof with a new EPDM membrane...(has not leaked since RSU#22 replaced the roof)

2. Repaired interior damage(ie. ceilings) caused by water leaks and frozen pipes

3. Scraped and painted front of building

4. Installed a disconnect for emergency power

5. Installed new insulation in building windows(bay area)

6. Painted bay area

7. Repaired/replaced overhead garage doors by replacing motors,panels and rollers

8. Major furnace repair (all piping and replaced the burner)

9. Remodeled floor drains to prevent water from going into town sewer

10. Installed security lighting on outside of building

11. Installed freeze warning system on the exterior of the building to alert staff of low temperatures that could cause building to freeze

12. Installed safety breaker in area of the building where water and electricity could be a problem (ground fault interrupters)

Yearly operational costs include: electricity $965; fuel $4,400; water/sewer $480.....

In summary..... RSU#22 wishes to continue to use this facility in the future...We do have a need for it.....Let me know if you have any further questions or wish to further discuss its use with the school district.....

[Quoted text hidden]

--
Emil P. Genest
Assistant Superintendent
RSU#22
24 Main Road North
Hampden, ME 04444
(207) 862-3255
Fax (207) 862-2789

Susan Lessard <manager@hampdenmaine.gov> Thu, Oct 30, 2014 at 12:52 PM
To: Genest Emil <egenest@rsu22.us>

Thank you Emil for the information. I will have Miles and Jason contact David for a visit.
Sue
[Quoted text hidden]

Susan Lessard <manager@hampdenmaine.gov> Thu, Oct 30, 2014 at 12:54 PM
To: Myles Block <mblock@hampdenmaine.gov>, Jason Lundstrom <jlundstrom@hampdenmaine.gov>

Hi -
Could you two please contact Mr. Grenier and do an inspection of the old Fire Station that we lease to RSU #22? I spoke with you Miles about what we are looking for about the building.
Thank you-
Sue
[Quoted text hidden]

HAMPDEN PUBLIC SAFETY

Police – Fire – EMS – Code Enforcement

106 Western Avenue

Hampden, Maine 04444

Phone 207-862-4500

Fax: 207-862-4588

November 4, 2014

Ms. Susan Lessard
Manager, Town of Hampden

Susan,

On November 4, 2014, per the Town Council, Infrastructure Committee's request, we conducted a walk around inspection of the "Old Fire Station" that is currently leased to RSU #22 for a storage facility. We were accompanied by David Greenier from the RSU.

The building appears structurally sounds by visual inspection. There is evidence of water damage to multiple ceiling areas but Mr. Greenier states that the damage was done before the new roof was placed and no other leaks have been found since the installation of the new roof. These damaged areas are cosmetic in nature. Mr. Greenier states that numerous improvements to the building have been done since the RSU started using the building. There were no other problems found.

The occupancy of this structure is storage in nature and to the best of our knowledge and inspection there are no life safety issues with the current set up.

Please let us know if you have any questions or require any more information.

Very Respectfully,

Myles M. Block
Code Enforcement Officer

Lt. Jason Lundstrom
Fire/Building Inspector

LEASE AGREEMENT

LEASE AGREEMENT dated this 1ST day of APRIL, 2003, between Town of Hampden, a Maine municipality with a place of business in Hampden, Maine ("Landlord"), and S.A.D. No. 22, a school administrative district with a place of business in Hampden, Maine, ("Tenant").

1. LEASE OF PROPERTY; TERM OF LEASE.

(a) Landlord, for and in consideration of the rents to be paid and of the covenants and agreements hereinafter contained to be kept and performed by Tenant, hereby leases to Tenant, and Tenant hereby hires from Landlord, the land, together with buildings and improvements thereon, situated at 10 Main Road South, Hampden, Maine, as more particularly depicted on Exhibit A annexed hereto and made a part hereof ("premises").

(b) The term of this Lease shall be for a period of five (5) years, commencing on April 1, 2003 and ending on March 31, 2008, both dates inclusive, unless sooner terminated, as herein provided.

2. RENT.

(a) During the term of this lease, Tenant covenants and agrees to pay to Landlord, in advance, without demand, setoff, or reduction of any kind, annual rent in the amount of One Dollar ($1.00).

3. PAYMENT OF ASSESSMENTS, UTILITY CHARGES, ETC.

(a) Tenant shall timely pay all charges for electricity, water, sewer, and all other public and private utility service or services furnished to or for the benefit of the premises during the term.

(b) Tenant shall also pay all costs, fees, and expenses associated with the use and maintenance of the premises.

(c) Tenant shall, at its sole cost and expense, sufficiently heat the premises to protect against freeze ups and damage to the building.

4. USE, MAINTENANCE, ALTERATIONS, REPAIRS, ETC.

(a) Tenant has leased the premises after a full and complete examination thereof, as well as its present uses and non-uses. Tenant accepts the premises without any representation or warranty, express or implied, in fact or by law, by Landlord and without recourse to Landlord as to the nature, condition, or suitability thereof, or the use or uses to which the premises or any part thereof may be put.

(b) Throughout the term, Landlord shall not be required to furnish any services or facilities, nor to make any repairs or alterations, in or to the premises. Tenant hereby assumes the full and sole responsibility for the condition, operation, repair, replacement, maintenance, and management of the entire premises.

(c) Tenant shall, at its sole cost and expense, at all times throughout the term, take good care of the premises and make all repairs necessary thereto in order to maintain and/or restore all buildings and improvements on the premises at least to the extent of their value at the time of maintenance and/or restoration, and as far as practicable to their original quality and character, as existed immediately prior to the occurrence necessitating the repairs, whether interior or exterior, structural or nonstructural, ordinary or extraordinary, and foreseen or unforeseen. Further, Tenant shall maintain and keep the premises and parking lot in good order, repair and condition. The foregoing obligation of Tenant is absolute, regardless of whether the repair could be characterized as routine maintenance or a capital repair.

If any capital repair exceeds the estimated cost of $5,000.00 and (1) the repair is not covered by the insurance required under this Lease, (2) the repair is not due to inadequate maintenance by

Tenant, or (3) the repair is not due to the intentional or negligent acts of Tenant, its agents or employees, then the parties agree to enter into discussions to determine whether the capital repair is economically feasible and, if so, how the parties shall share the costs of the same.

(d) Only upon obtaining the prior written consent of Landlord, Tenant may, at its sole cost and expense, make additions, alterations, and changes in and to the premises, provided that Tenant is not then in default in the performance of any of Tenant's covenants, obligations, duties, or agreements in this Lease. All erections, alterations, additions, and improvements, whether temporary or permanent in character, which may be made upon the premises by any person, except only the placement thereon of furniture, moveable trade fixtures, and moveable machinery or equipment of Tenant, shall become the property of Landlord and shall remain upon and be surrendered with the premises as part thereof at the termination of this Lease without any compensation whatsoever to Tenant or to anyone else.

(e) If a mechanic's lien is filed against the premises as a result of erections, alterations, additions, or improvements made by or on the behalf of Tenant, then Landlord may, at its sole option, upon sixty (60) days prior written demand to Tenant that Tenant either discharge such lien of record or otherwise secure same to Landlord's satisfaction, discharge said lien without inquiring into the validity thereof. Tenant shall forthwith reimburse Landlord for the total expenses, including without limitation, attorney's fees, incurred by Landlord in discharging any one or more such liens.

5. INDEMNIFICATION OF LANDLORD; MUTUAL WAIVER OF SUBROGATION.

(a) After commencement of this lease, Landlord shall not be responsible or liable for any damage or injury to any property or to any one or more persons at any time on or about the premises arising from any cause whatsoever after the commencement of this lease. Tenant shall not hold Landlord in any way responsible or liable therefor, and hereby releases and remises Landlord

therefrom. Tenant shall defend, indemnify and hold Landlord harmless from and against (i) any and all claims, liabilities, penalties, damages, expenses and judgments arising from injury to persons or property of any nature in or upon the premises and (ii) any and all of the foregoing arising from Tenant's occupation of, and its conduct of business upon, the premises. Tenant's obligation hereunder shall be limited to the applicable amounts set forth in Paragraph 6(b).

(b) Tenant and Landlord each hereby waive all rights of recovery against the other, their agents, employees, and representatives as to any and all claims, liabilities, actions, proceedings, or otherwise which are covered by insurance, to the extent of such insurance coverage. Neither Tenant nor Landlord, nor their respective agents, employees, or representatives, shall be liable to the other for loss or damage to the extent covered by any insurance policy. The liability of Tenant to indemnify Landlord as set forth in sub-paragraph 5(a) hereof shall not extend to any matter to the extent Landlord actually receives insurance proceeds therefor; provided, however, that if any such liability shall exceed the amount of proceeds actually collected by Landlord, Tenant shall be liable for such excess.

(c) All insurance polices required under this Lease shall contain waivers by the carriers issuing same of all subrogation rights as against Landlord and Tenant, if same are procurable.

6. INSURANCE.

(a) During the term, Tenant shall, at its sole cost and expense, and for the benefit of the Landlord, carry and maintain fire and extended coverage insurance covering the premises against loss or damage by fire and against loss or damage by other risks now or hereafter embraced by "extended coverage", so-called, in an amount equal to current replacement costs of all improvements and buildings on the premises, and shall name Landlord and Tenant as loss payees as their interests may appear.

(b) During the term, Tenant shall, at its sole cost and expense, and for the benefit of Landlord, carry and maintain comprehensive public liability insurance, including property damage, insuring Landlord and Tenant against liability for injury or damage to persons or property occurring in or about the premises or arising out of the ownership, maintenance, or use or occupancy thereof. The liability under such insurance shall not be less than: (i) $1,000,000.00 for any one person injured or killed, (ii) $1,000,000.00 for any one accident, and (iii) $100,000.00 for personal property damage per accident.

(c) All policies of insurance (except liability insurance) carried or maintained hereunder shall provide by endorsement that any loss shall be payable to Landlord and Tenant as their respective interest may appear. All such insurance shall be in a form, and maintained with carriers, satisfactory to Landlord.

(d) All policies of insurance carried or maintained hereunder shall contain an agreement by the insurer that each such policy shall not be cancelled without at least 10 days prior written notice to Landlord and Tenant.

(e) Tenant shall annually deliver to Landlord evidence of the above mentioned insurance coverage satisfactory to Landlord. Upon Tenant's failure to comply in full with this paragraph 6, Landlord shall have the immediate right to: (i) obtain the aforesaid insurance coverage, (ii) pay the premium therefor, and (iii) collect the amounts paid for the premium from Tenant.

7. DAMAGE OR DESTRUCTION.

(a) If, at any time during the term, the buildings or improvements on the premises shall be wholly or partially damaged or destroyed by fire or other casualty (including any casualty for which insurance coverage was not provided) of any nature whatsoever, regardless of whether said

damage or destruction resulted from an act of God, the fault of Tenant, or from any other cause whatsoever, except those caused by Landlord, its agents or employees, and Landlord determines that it is in its best interests to have the same repaired or reconstructed, then all insurance money collected by Tenant and/or Landlord from any policy of insurance on account of such damage or destruction, less the cost, if any, incurred in connection with the adjustment of the loss and the collection thereof (herein sometimes referred to as the "insurance proceeds") shall be applied to the cost of repair or reconstruction of the premises, which shall be undertaken by Landlord. If Landlord determines that repair or reconstruction is not in its best interests, Landlord shall so notify Tenant and this Lease shall terminate and all insurance proceeds shall be paid to Landlord.

8. CONDEMNATION; TAKING BY EMINENT DOMAIN.

(a) If the entire premises shall be taken under the exercise of the power of eminent domain (or any similar governmental power in the nature thereof) by any competent governmental authority, this Lease shall terminate as of the date of such taking. In that event, all prepaid rent, if any, shall be repaid to Tenant.

(b) If less than the entire premises shall be taken under the exercise of the power of eminent domain or any similar power, Tenant shall make such repairs and restorations as may be necessary and possible to fully restore all remaining portions of the premises at least to the extent of their value, and as near as practicable to their original quality and character, as in existence immediately prior to the taking. During the time such repairs or restorations are being made, Tenant shall only be required to pay that proportion of the aggregate rent, costs, and expenses reserved hereunder as the area of the portion of the premises remaining tenantable bears to the area of the premises prior to said taking. Upon completion of said repair or restoration, the rent reserved hereunder shall be reduced for the remainder of the term and thereafter Tenant shall be required to

pay that proportion of the rent as the area of the restored premises bears to the area of the premises prior to said taking, exclusive of non-material areas. Tenant shall use the entire award from such partial taking for payment of the cost and repairs and restoration, and shall supply at its own expense all costs of repair and restoration in excess of such award. All such proceeds received by Tenant shall be held in trust for the purpose of paying the cost of such repairs or restoration.

(c) In the event of any taking, whether total or partial, Tenant shall have no claim in or to any award of damages for such taking, except to the extent that the proceeds of any partial taking must be used by Tenant for restoration of the premises. Tenant hereby expressly assigns any and all of its right, title and interest in and to such awards to Landlord.

9. ASSIGNMENT; SUBLETTING.

(a) Tenant shall not assign, mortgage, pledge, hypothecate, encumber, or in any manner transfer this Lease, any portion thereof, or any interest therein, nor sublease all or any portion of the premises, without the prior written consent of Landlord.

(b) In the event of any voluntary or involuntary bankruptcy, arrangement, plan of reorganization, assignment for the benefit of creditors, or other insolvency or related proceeding filed, instituted, or conducted by, against, or otherwise on behalf of or regarding Tenant, the leasehold created hereby shall not be assigned in whole or in part nor the premises sublet, in whole or in part, nor shall either this leasehold or the premises be otherwise conveyed or transferred in whole or in part, to any party.

10. DEFAULT PROVISIONS.

The occurrence of any of the following events shall constitute a default under this Lease:

(a) Tenant fails to make full and timely payment of any rent or any other sum payable by Tenant to Landlord, and such failure continues for a period of 15 days after written notice by Landlord to Tenant as per paragraph 18 herein.

(b) Tenant shall fail to perform or observe any covenant, term or condition of this Lease to be performed or observed by Tenant, and such failure continues for a period of 30 days after written notice by Landlord to Tenant as per paragraph 18 herein (other than regarding defaults covered by sub-paragraph (a) hereof).

(c) Tenant shall cause or permit the premises to become vacant or abandoned for any period of time whatsoever.

11. LANDLORD'S REMEDIES.

Upon the occurrence of an event of default specified in paragraph 10 hereof, Landlord may, at its option, exercise any one or more of the following remedies:

(a) Landlord may give Tenant a notice of its intention to terminate this Lease, specifying a date not less than 30 days thereafter, upon which date this Lease, the term and estate hereby granted, and all rights of Tenant hereunder shall expire and terminate. Notwithstanding the foregoing: (i) Tenant shall remain liable for damages as hereinafter set forth, and (ii) Landlord may institute dispossession proceedings for non-payment of rent, distraint, or other proceedings to enforce the payment of rent. Upon such termination or expiration of this Lease, Tenant shall peaceably quit and surrender the premises to Landlord, and Landlord may without further notice enter upon, re-enter, possess, and repossess himself thereof, by force, summary proceedings, ejectment, or otherwise and may have, hold, and enjoy the premises.

(b) Landlord may, at Landlord's sole option (without imposing any duty upon Landlord to do so), and Tenant hereby authorizes and empowers Landlord to: (i) re-enter the premises on

Tenant's account, for Landlord's own account or otherwise, (ii) relet the same for any term, (iii) remodel the same if necessary or desirable for such reletting purposes, and (iv) receive and apply the rent so received to pay all fees and expenses incurred by Landlord as a result of such default, including without limitation any legal fees and expenses arising therefrom, the costs of re-entry, repair, remodeling and reletting, and the payment of the rent, and other charges due hereunder. No entry, re-entry, or reletting by Landlord, whether by summary proceedings, termination, or otherwise, shall discharge Tenant from any of its liability to Landlord as set forth in this Lease.

(c) Regardless of whether Landlord relets the premises, or enters or re-enters the same, whether by summary proceedings, termination, or otherwise, Tenant will pay Landlord, and be liable to Landlord for the full amount of all rent and other charges then due or thereafter to become due to Landlord either on the days originally fixed herein for payment thereof or, upon demand, in a single sum, as Landlord in his sole discretion may determine.

(d) Tenant shall be liable for all costs, charges and expenses, including without limitation attorney's fees and disbursements, incurred by Landlord by reason of the occurrence of any default or the exercise of the Landlord's remedies with respect thereto.

(e) Tenant, for itself and on behalf of any and all persons claiming through or under it, including without limitation creditors of any kind, hereby waives and surrenders all rights and privileges that they or any of them may have under or by reason of any present or future law to redeem the premises, or to have a continuance of this Lease for the remainder of the term, after being dispossessed or ejected therefrom by process of law or after the termination of this Lease as herein provided.

12. LANDLORD'S RIGHT TO PERFORM; CUMULATIVE REMEDIES; WAIVERS; ATTORNEY'S FEES.

(a) If the Tenant shall fail to make any payment required to be made under this Lease, or shall default in the performance of any covenant, agreement, term, provision, or condition herein contained, Landlord may 30 days after written notice as per paragraph 18 herein, without being under any obligation to do so and without thereby waiving such default, make such payment and/or remedy such other default for the account and at the sole expense of Tenant. Tenant shall pay to Landlord, on demand, the amount of all sums so paid and all expenses so incurred by Landlord, together with interest on such sums and expenses from the date of payment by Landlord until payment in full at the rate of 15% per annum.

(b) Landlord may restrain any breach of any covenant, agreement, term, provision, or condition herein contained. However, the mention herein of any particular remedy shall not preclude the Landlord from any other remedy he may have, either at law or in equity. The failure of Landlord to insist upon the strict performance of any one of the terms of this Lease, or to exercise any right, remedy or election herein contained or permitted by law, shall not constitute or be construed as a waiver or relinquishment for the future of such terms, rights, remedies, or elections, but the same shall continue and remain in full force and effect. Any rights and remedies of Landlord, whether created hereunder or existing at law, in equity, or otherwise upon breach by Tenant of any covenant contained in this Lease, shall be distinct, separate, and cumulative rights or remedies, and no one of them, whether exercised by Landlord or not shall be deemed to be in exclusion of any other. No term of this Lease shall be deemed to have been waived by Landlord unless such waiver is in writing, signed by Landlord or his agent fully authorized in writing. Receipt

or acceptance of rent by Landlord shall not be deemed a waiver of any default under this Lease, nor of any right Landlord that may be entitled to exercise under this Lease.

(c) In the event of any default by Tenant under this Lease, Landlord shall be entitled, in addition to any other rights and remedies hereunder, to be reimbursed by Tenant of attorney's fees incurred by Landlord in the exercise of its rights and remedies.

13. QUIET ENJOYMENT.

Landlord covenants that if and for so long as Tenant keeps and performs each and every covenant herein required to be kept and performed by it, Tenant shall peacefully and quietly enjoy the premises without hindrance or molestation by Landlord, subject to the covenants, agreements, terms, provisions and conditions of this Lease.

14. EXPIRATION OF LEASE.

Upon the expiration of the term, or the sooner termination hereof:

(a) Tenant shall peaceably and quietly leave, surrender, and yield up unto Landlord the entire premises free of occupants. Any removable property of Tenant which shall remain in or upon the Premises after the expiration of the term or sooner termination thereof and the removal of Tenant from the premises may, at the option of the Landlord, be deemed to have been abandoned, and may be either retained by Landlord as his property or disposed of in such manner as Landlord may in his sole discretion deem appropriate; and (b) If Tenant shall remain in the premises such holding over shall not constitute a renewal or extension of this Lease. Landlord may, at his sole discretion, elect to: (i) treat Tenant as one who has not removed at the end of its term, or thereupon be entitled to all remedies against Tenant provided for by law or under this Lease regarding such situation; or (ii) construe such holding over as a tenancy at will, subject to all the terms and conditions of this Lease except the duration thereof.

15. MEMORANDUM OF LEASE.

At the request of either Landlord or Tenant, a Memorandum of Lease in proper form for recording shall be executed and recorded in the Penobscot County Registry of Deeds. The Lease itself shall not be recorded.

16. SUCCESSORS AND ASSIGNS.

Except as otherwise provided in this Lease, this Agreement shall inure to the benefit of, and shall be binding upon, the parties hereto and their respective successors and assigns.

17. ENTIRE AGREEMENT.

This Lease contains the entire agreement between the parties, supersedes all prior negotiations and understandings among them, and shall not be altered or amended except by written agreement signed by Landlord and Tenant.

18. NOTICES.

All notices, demands, and other communications hereunder shall be in writing, by certified mail, return receipt requested, and shall be sent to the following addresses:

To Landlord by mailing to:

Susan Lessard, Town Manager
Town of Hampden
106 Western Avenue
Hampden, ME 04444

To Tenant by mailing to:

Richard Lyons, Superintendent
S.A.D. No. 22
24 Main Road North
Hampden, ME 04444

19. GOVERNING LAW.

This Lease shall be governed by and construed in accordance with the laws of the State of Maine.

20. COUNTERPARTS.

This Lease may be executed in several counterparts, each of which shall be deemed to be an original copy, and all of which taken together shall constitute one agreement binding on all parties hereto, notwithstanding that the parties shall not have signed the same counterpart.

IN WITNESS WHEREOF, the parties have hereunto set their hands the day and year first above written.

TOWN OF HAMPDEN

Witness

By
Susan Lessard
Its Town Manager

S.A.D. NO. 22

Witness

By
Richard Lyons
Its Superintendent

2C

FINAL REPORT

Forest Management Plan
Four Parcels
Hampden, ME

Prepared For

Town of Hampden

August 10, 2007

August 10, 2007

Susan M. Lessard
Town Manager
Town of Hampden
106 Western Avenue
Hampden, ME 04444

Re: **Timber Inventory and Management Plan**

Dear Ms. Lessard:

We completed the inventory and management plan for four timberland parcels in Hampden. Our findings and recommendations are included in the enclosed report.

Please review the information and let me know if you have any questions.

It has been a pleasure working for the Town of Hampden and if we can be of service to you in the future please do not hesitate to contact us.

Sincerely,

Prentiss & Carlisle
Management Co., Inc.

Daniel J. McConville

Project Forester/Analyst
License FI3409

General Property Information and Plan Summary

Landowner: Town of Hampden, 106 Western Ave., Hampden, Maine

Plan Preparer(s): Daniel J. McConville (FI 13409)

Date of Report: August 10, 2007;

Date of Last Inspection: May 23, 2007;

Planning Period: June 1, 2007 – May 31, 2017

Town and County: Hampden, Penobscot County

Tax Map and Lot: NA

Parcel Location: Included in parcel-level sections

Scope: Evaluation of four parcels as to how each can be used to meet the Town's overall objectives and develop a set of specific recommendations for each. Work includes:

- Parcel inspections of infrastructure, timber and non-timber resources;
- Timber inventory to calculate merchantable volume by product and species (82 variable radius plots).
- Development of stand and stock tables;
- Growth and yield modeling of each stand type;
- Non-timber resource research;
- Preparation of management;
- Various maps (timber type, inventory plot locations, MNAP, location, etc.)
- No deed research or title review was done to verify ownership or acreage
- We did not perform a complete assessment of the presence of wetlands, vernal pools, endangered or threatened species, or habitats. We requested this information from the Maine Natural Areas Program but do not warranty its completeness

Town-Level Objectives:
(Parcel-level objectives described in report)

1. Preserve open space
2. Provide a variety of active and passive public recreation opportunities
3. Maintain habitats and ecosystems
4. Protect water quality
5. Demonstrate good forest stewardship

Recommendations:

1. Dorothea Dix: improve value for passive recreation by thinning forest and clearing dead and dying trees that pose risk hazard; improve walking trails and water drainage
2. L.L. Bean: Develop as demonstration forest **or** recreation park or combination; harvest stands to improve health and generate income to offset costs for demonstration forest or recreation park
3. Main Rd. South: Consider area east of pipeline for new school or school expansion; residual area ideal for mix of education and recreation; harvest area west of pipeline to improve health; install bridge across Reeds Brook, repair brook banks, install proper drainage
4. Kennebec Rd.: Consider trading for higher conservation-value land

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1 Introduction

This land-use assessment and forest management plan was prepared at the request of the Town of Hampden for four parcels that total ± 325 acres in Hampden, Penobscot County, Maine (Table 1.1). This plan was prepared on August 10, 2007 by Dan McConville (license #FI 13409) of Prentiss & Carlisle Management Company (107 Court St., Bangor, ME; 207-942-8295) for the planning period of 2007-2017.

Table 1.1. Location description of four parcels.

Parcel Name	Location	Map & Lot	GIS Gross Acres	GIS Forested Acres
Dorothea Dix Park	Route 1A 3/10 mi. north of Hopkins Rd. on east side	45-014	23	20
LL Bean	Route 202 half mile northeast of Cold Brook Rd. on north side	10-0-056-2	219	197
Kennebec Road	Kennebec Rd. and railroad (snow dump) between Back Winterport Rd. and railroad on north side	06-026	20	19
Main Rd. South	End of Liberty Ave. off of Constitution Ave.	06-A-064 06-0-042-A 06-0-042-B	63	55
Total			**325**	**291**

2 Purpose

The purpose of this assignment is to (1) present an objective assessment and analysis of the subject parcels to assist the Town with understanding how these parcels can be used to meet their land-use goals within the context of comprehensive planning, and (2) provide recommendations for achieving these goals, also in the context of the Comprehensive Plan. The overall objective of this assignment is to assess whether these parcels can be used to achieve the Town's goals for open-space, recreation and timberland, and to make recommendations for attaining these goals. The parcels have been assessed to determine how well they can serve as areas for:

1. Preserving open space
2. Providing public recreation opportunities
3. Maintaining the habitats and ecosystems that large parcels provide
4. Protecting water quality
5. Demonstrating good forest management

Each tract is described individually in this report and assessed for how well it can serve these broad objectives with a set of recommendations for achieving both the specific and broader goals.

3 Scope

The primary data supporting these findings and recommendations are the inventory and analysis, photo-interpretation, the comments and observations from experienced foresters, and from communications with Town officials. In addition, some of the sources of data, particularly the non-timber resource information come from the State of Maine. For example, the review for endangered or threatened species or habitats comes from the Maine Natural Areas Program. We make no warranty as to the accuracy or completeness of the assessment completed by the Maine Natural Areas Program.

All of this information has been analyzed to describe the timber quantity and quality, infrastructure (access to and within the property), the water resource, soils, and the forest as habitat for wildlife, and make recommendations for protecting or enhancing these values.

The sources of data and products and services compiled and provided by Prentiss & Carlisle Management Co. are listed below:

- Comparative assessment of each of the four parcels with respect to how each can contribute to the Town's overall goals
- Forest management plans for each parcel
- Property map showing roads, forest types, elevation, and water (forest type map, 1 cruise map; 20 chains/inch, approx. 36" x 34")
- Timber inventory and stand and stock tables
- Summary of timber volume by product and species
- Silvicultural recommendations
- Sustainable harvest level recommendations
- Growth estimates derived from growth and yield modeling software
- General field inspection of the property including the timber quality, past harvesting, non-timber resources, and condition of the boundary lines
- Soil type map from data collected by the Maine Natural Resources Conservation Service (NRCS)
- Map of the Habitats of Management Concern (acquired from Maine Natural Areas Program) detailing areas of ecological importance

4 Summary

Each of the four parcels was evaluated to determine how well each can be used to meet the Town's broad multiple-use objectives, which were:

1. Preserve open space
2. Provide a variety of active and passive public recreation opportunities
3. Maintain habitats and ecosystems
4. Protect water quality
5. Demonstrate good forest management

Several attributes were evaluated and are described in this report to assess the relative value of each parcel in the context of the Town's broad objectives. These attributes were: location (proximity to residential areas and noise pollution), size, and quality, quantity and diversity of natural resources (timber, water, habitat, soils and topography).

Based on this assessment, we ranked each parcel as to how well it can contribute to the Town's objectives (Table 4.1). It is important to remember, however, that an individual parcel need not necessarily have a high value for every objective. For example, Dorothea Dix Park has high value for preserving open space and as a place for passive public recreation. However, because of it's relatively small size and the rules and regulations of the Park (as described in the Dorothea Dix Park ordinance), it is not a practical location for snowmobiling and ATV use. Thus, one should not evaluate each parcel based on the sum of the rankings for each attribute. Instead, parcels should be evaluated based on their collective contribution to the Town's objectives. That said, clearly some parcels are more valuable than others. We recommend that the Town consider selling or trading lower value parcels for parcels that have the attributes more in line with the objectives. For example, the Kennebec Road parcel, which is adjacent to the town snow dump, should be carefully analyzed in terms of its values. It has relatively little value in timber, habitat, recreation, and as a place to protect water quality. It's only virtue in the context of the Town's objectives is that it is open space—that is, it is not developed. Despite its relatively low value for meeting the Town's objectives it may be valuable for development. It has about 1,500 feet of frontage on Kennebec Road and is 20 acres in size. The town might consider trading or selling this parcel to acquire a parcel that perhaps has less economic value per acre but has considerably more value in terms of the Town's objectives.

We believe the highest and best uses for these parcels in the context of the Town's goals are:

1. Dorothea Dix – Traditional park with natural areas used as arboretum
2. LL Bean – Woodlot with support of current recreation (snowmobile, walking, etc.)
3. Main Rd. South – Use at least part of tract for outdoor classroom for schools
4. Kennebec Rd. – Sell or trade for more valuable land (in terms of recreation or timber)

Table 4.1. Rank of four parcels of their relative contribution to Town objectives

Category	Attribute	Dorothea Dix	L.L. Bean	Main Road South	Kennebec Rd
Preserve open space	Overall rank	4	1	3	2
	Comments	Narrow parcel, not in danger of losing park status	Large area to preserve	No rd frontage, good candidate for school expansion	High visibility from major road
Recreation	*Passive Recreation*	1	2	3	4
	Walk	1	3	2	4
	Jog	3	1	2	4
	View nature	1	2	3	4
	X-Country ski	4	1	2	3
	Proximity to housing	1	4	2	3
	Presence of big trees	1	2	3	4
	Aesthetic value	1	2	3	4
	Quietness	2	4	1	3
	Comments	Underutilized but high potential value for passive rec.	High traffic noise not conducive to passive rec.	Quieter setting than other tracts; good location relative to residential areas	Small, high noise, brushy
	Active Recreation	4	1	2	3
	Hunt (bow)	4	1	2	3
	Snowmobile	4	1	2	3
	ATV	4	1	2	3
	Mountain Bike	4	1	2	3
	Comments	Small size and park ordinance limit active rec. potential	Noisy parcel ideal for motorized vehicles	Existing snowsled/ATV trails; lot of public use	Small size and lack of existing trails
Habitat/ Ecosystems	Overall	3	1	2	4
	Diversity of forest structure	3	1	2	4
	Diversity of soils/topography	3	1	2	4
	Wildness of adjacent land	4	1	2	3
	Abundance of wetlands	4	1	2	3
	Likelihood of vernal pools	3	1	2	4
	Comments	Value for wildlife that don't require large areas (i.e. songbirds)	Large size makes it possible to manage for wildlife that require more space	Second largest; also valuable for wildlife that require more space, such as deer	Small, no forest diversity
Water Quality	Overall	1	3	2	4
	Abundance of water features	1	3	2	4
	Importance to watershed integrity	1	3	2	4
	Comments	Brook, pond, Penob. R.	Few seasonal brooks	Reed Brook flows to Penobscot and needs protection	Little importance to watershed
Demonstration of forest stewardship	Overall	3	2	1	4
	Diversity of tree species composition	2	1	3	4
	Diversity of age structure	3	1	2	4
	Location	2	3	1	4
	Potential for timber income	3	1	2	4
	Comments	Needs harvest but unlikely to harvest again; more value as arboretum & park than woodlot	Best place for woodlot; large enough to generate timber income	Excellent location for demonstration forest; existing beaver demo area nearby	Too small for woodlot; poor soils, little age/species diversity

5 Dorothea Dix Park

5.1 Plan Summary

Dorothea Dix Park is located on the east side of Route 1A approximately 3/10th mile north of Hopkins Road. The parcel was granted to the Town from the State several years ago to be managed as a park. The parcel will continue to be actively managed as a park and no other use was considered. However, we have made recommendations as to how to better manage the park to meet the Town's broad objectives. The park is about 23 acres and stretches from Route 1A to the Penobscot River. It is rectangular in shape and about ½ mile long (from Route 1A to the river) by 360' wide.

The park is relatively open near the entrance but is densely forested beyond the first 200 feet. Beginning in the entrance area, an old gravel road serves as a walking trail and extends to a field approximately 2,000 feet from the parking area. Beyond the entrance area, the park is underutilized for recreation at the present time. Upgrading the trails, fixing some drainage issues, and removing the over-mature and dead trees would greatly increase the utility of the park while leaving it in a more natural state. An alternative option is to thin the dead and dying trees and create 2-3 semi-cleared areas approximately 1-3 acres in size to serve as picnic areas.

Given these options, the Town should consider whether to manage the park in a more natural state or to create a more park-like setting. If managed in a more natural state, we recommend harvesting the dead and dying trees that present a hazard to visitors and to improve the health of the forest by creating more growing space for better quality trees. We recommend hiring a contractor to clean out the dead, dying, and poor quality trees. Live and dead wood could be sold to offset the cost of the work.

An alternative option to managing the park in a more natural state is to both thin the forest as described above and create 2-3 partially cleared areas approximately 1-3 acres in size through the park. These partial clearings should retain the best quality oak and sugar maple trees but remove the remaining trees. By opening up the parcel in this way, it will be more inviting and thereby increase its utility as a park. Having areas separated by forested buffers but connected by trails will allow more visitors to enjoy the park while seeming less crowded.

There are some valuable non-timber attributes within the park that should be maintained or enhanced. An old gravel road serves as a walking trail and extends from the parking area eastward through most of the property. The trail needs to be improved by installing proper drainage and adding gravel. We recommend creating additional trail where possible to make one or two loops, rather than a single back and forth trail.

A brook meanders through the northern boundary about midway through the park and opens to an attractive pond. The pond was created by a failed wooden box culvert that had previously allowed water

to pass beneath the road but is no longer functional. The pond and trail/road could be maintained by carefully placing a culvert so that the bottom of the pipe is at the desired elevation of the pond. There are at least two springs that feed a wetland on the south side of the road across from the pond. Care should be taken when harvesting to avoid interrupting water flow above the springs.

At the easternmost point on the property there is a spectacular overlook on the bluff along the Penobscot River that could serve as a scenic overlook. The area is dominated by large pines, some of which are dying and present a hazard. This area is difficult to access as there is no trail to the bluff, and the downed trees make it difficult to get to the edge of the bluff. The area to and along the bluff should be carefully harvested to remove hazard trees and the trail could be extended to an area along the bluff. Zoning regulations require that a permit is obtained for timber harvesting within 250 feet of the river.

The forest was established approximately 125 years ago, likely the result of farm field abandonment. Little harvesting has been done since that time. There are approximately 40 cords per acre of merchantable volume, 85 percent of which is composed of white pine, oak, and maple (red and sugar). Although the volume is high, the quality and health of the trees is fair to poor. The oak is the healthiest component in this forest and should be maintained by carefully thinning around the best individuals. The sugar maple, white ash, and hemlock are generally healthy and should be retained. Much of the pine has considerable rot but should continue to live for many more decades. Most of the spruce, fir, cedar, and red maple is dead, dying or in poor health. In addition to the 40 cords per acre of live merchantable trees, there is about 2-4 cords per acre of standing or recently fallen dead trees. While the dead trees are valuable for biodiversity some present a hazard to visitors.

There are three stands in the parcel (from west to east):

1. H4B (4 acres)—mature stand composed primarily of hardwood species; sugar maple (37%), red maple (35%), red oak (15%), black cherry (8%), other hardwoods (2%) and balsam fir (3%); trees are generally 50-75' tall, 5-26" dbh; canopy closure is 60-79 percent and average DBH (QMD) = 10.6".
2. HS4B (11 acres)—mature stand composed primarily of mixedwood species; red oak (33%), white pine 26%), red maple (17%), spruce (6%), balsam fir (5%) cedar (5%), and white ash (3%); trees are generally 50-75' tall, 5-26" dbh; canopy closure is 60-79 percent and average DBH (QMD) = 10.5".
3. P4B (4 acres)—mature stand composed primarily of white pine (90%) with minor components of hemlock (5%), spruce (3%) and cedar (2%); trees are generally 70-110' tall, 15-35" dbh; canopy closure is 60-79 percent and average DBH (QMD) = 18.5".

We recommend harvesting about 35 percent of the live merchantable volume, exclusive of creating cleared areas. This would leave a residual volume of about 26 cords per acre. If the Town wishes to create 2-3 semi-cleared areas, we recommend locating these in the hardwood and mixedwood stands, leaving the best quality oaks at a 30-40 foot spacing. Dead trees that pose a hazard should be removed.

This will leave a sufficient number of standing dead trees that do not pose a hazard and that will serve as important wildlife habitat.

In the hardwood and mixedwood stands, we recommend harvesting 35-45 percent of the standing live merchantable volume using a crop-tree approach. The silviculture objectives are designed to move these stands to oak/sugar maple stands, which are long-lived, with a relatively high resistance to disease and insect problems, and are generally wind-firm. In this approach, the best quality leave trees should be selected and identified with flagging and trees competing with the crop trees should be marked to cut. We recommend selecting the best quality oak and sugar maple as the primary crop trees. In areas with low sugar maple and oak stocking, we recommend selecting the best quality red maple as the crop trees. Crop trees should be spaced so that crowns have sufficient room to expand. The total harvest in these stands should be approximately 188 cords.

In the mature pine stand, we recommend a light crown thinning designed to remove pines with inferior crowns. The thinning should not exceed 30-35 percent removal. Exceeding that level will increase the risk of future blowdown. Trees that should be marked for removal include individuals with poor crown form, insufficient live crown ratio, and generally poor quality trees that appear likely to die in the next 10 years due to competition. The total removal in the pine stand should be about 80 cords.

The soils are generally well-drained and productive but are prone to erosion. Given the soils, the slope of the property and the brook and springs, erosion control measures should be installed. Rain water currently runs down the trail from the parking area and shows obvious signs of erosion. Water bars and culverts should be installed to redirect water away from the trail.

Finally, extensive areas of the forest floor are covered with honeysuckle, an invasive-exotic species that is very difficult to control. Honeysuckle impedes the regeneration and growth of more desirable species, such as oak seedlings in two ways: it produces allelopathic chemicals that enter the soil and inhibit the growth of other plants, and it produces a dense canopy that prevents other tree and plant germinants from growing. We recommend controlling honeysuckle through a combination of mechanical and chemical methods. An advantage to chemically treating honeysuckle is that it is one of the first species to leaf-out in the spring and the last to drop its leaves fall. As such, a foliar application of Glyphosate, the active ingredient in Roundup Ultra during the fall after other hardwoods have dropped their leaves will minimize the damage to other species. Bags can be placed over non-target species to further minimize damage. A second treatment should be planned the following year to kill seedlings that grow from seed held in the soil.

5.2 Management Objectives and Recommendations

The objectives for the Dorothea Dix Park are:

1. Enhance passive recreation opportunities
2. Maintain and enhance the health and productivity of the forest
3. Protect and maintain biodiversity
4. Protect water quality within the watershed

5.2.1. Enhance passive recreation opportunities

The primary goal for the Park is to enhance "passive" recreation activities. Most active recreational activities, such as the use of motorized vehicles and bicycles, and camping and hunting are prohibited by park ordinance. Management recommendations, therefore, are geared towards enhancing permissible activities such as picnicking and walking. At the present time, the park is underutilized primarily due to its appearance from the entrance. From the entrance area, the park seems to include only the cleared area in front (approximately 1-2 acres) and the forested area may seem unsafe to many young families. To increase recreational use of the property we recommend:

- Harvesting dead and dying trees to open up the forest canopy to provide more space for the best trees and to create a more inviting setting
- Widening and resurfacing the main trail so that it is easier for walking and can support an ambulance
- Creating additional trails including a trail loop connected to the existing trail and a trail extension to the bluff overlooking the river—a single dead-end trail is less appealing than a loop trail
- Removing much of the dead and dying debris from the forest floor
- Creating 2 or 3 semi-cleared openings in the forest to serve as picnic areas

5.2.2. Maintain and enhance the health and productivity of the forest

There are serious forest health issues that threaten the sustainability of the forest (detailed in section 5.3.2). We recommend removing dead and dying trees and reallocating growing space to the healthiest trees. We recommend cutting about 270 cords, or 34 percent of the living merchantable volume to increase the health and productivity of the forest. This excludes volume harvested in the semi-cleared openings recommended for enhancing recreation opportunities. The forest management goals call for maintaining the forest in a late-successional state, dominated by large, mature oaks and white pine. These goals are different from what would be recommended for an oak-pine type in a timberland parcel where we would recommend some level of regeneration cuts to promote oak germination and growth.

5.2.3. Protect and maintain biodiversity

Biodiversity is the variety of life in all its forms, levels and combinations, and includes ecosystem diversity, species diversity, and genetic diversity. Given the relatively small size of the parcel and its requirements for public use, both the extent and scale at which it can be used to protect biodiversity is limited. Nevertheless, there are actions that can be done to improve habitat for plants and animal, such as:

- Identifying, mapping and monitoring interesting plants and animals in the park by organizing volunteer efforts. These can be rare or endangered or popular species.
- Reducing or eliminating (if possible) honeysuckle to create growing space for a greater variety of endemic plants
- Leaving some of the non-hazardous standing dead trees to serve as cavity trees for birds and other wildlife
- Protecting the pond and wetland from invasive plants and foot traffic
- Improving water drainage by installing culverts and water bars to stop erosion problems

5.2.4. Protect water quality within the watershed

Water bodies in the surrounding area are a tremendous asset for the Town and surrounding area, both for biodiversity and recreation. The property lies in the Penobscot River Watershed, which drains approximately 8,570 square miles of area and covers several towns. The property has approximately 500 feet of frontage on the Penobscot River, the main stem of the drainage system. The river is tidal from Bucksport to Veazie and brackish to Hampden.

The Penobscot River is home to both freshwater and sea-run fish species. Freshwater species include smallmouth bass, white perch and pickerel, and sea-run fish include Atlantic salmon, alewives, American shad, American eel, sea lamprey, and striped bass. The most important fish on this list is the federally-listed endangered Atlantic salmon. The historic salmon run in the Penobscot River was 50,000 or more fish. Today, the run is estimated at 1,000-4,000 adults, which is largest Atlantic salmon run remaining in the United States. The critical issues related to salmon habitat in the Penobscot River in Hampden are passageway to and from spawning areas.

Actions within the watershed can affect the water quality downstream. The brook that runs through the parcel eventually drains into the Penobscot River south of the parcel boundary. As such, it is important that water quality is protected in the brook because it in turn affects aquatic habitat in the river. Harvesting near the brook, if not done carefully can lead to sedimentation. Sedimentation can decrease water quality and negatively impact salmon and other native fish habitat. As recommended in previous sections, we suggest that logging contractors strictly adhere to BMPs and state regulations pertaining to harvesting near brooks, minimize crossings of brooks when legally permissible, and leave sufficient shade within a buffer around the brook.

Water resources are regulated by a variety of Federal, State and local laws, such as the Clean Water Act (Federal), Natural Resources Protection Act (State), Land Use Regulation Commission (LURC, State – unorganized towns), Dept. of Environmental Protection (DEP, State – organized and unorganized towns), Protection and Improvement of Waters Act (State) and local ordinances. There is no "one-size fits all" recommendation to manage riparian areas. Tree stocking and shade retention, buffer and filter strips, are currently regulated under both LURC and DEP rules and regulations. At a minimum, you must adhere to all Federal, State and local laws in applying protection to riparian areas. BMPs have been established to provide a number of protection measures to meet water quality standards and protect wildlife habitat that often are more restrictive than laws. We recommend you use a particular BMP or combination of BMPs as appropriate given site-specific conditions. The recommendations made within this plan are designed to minimize stream crossings by logging equipment.

5.3 Property Description

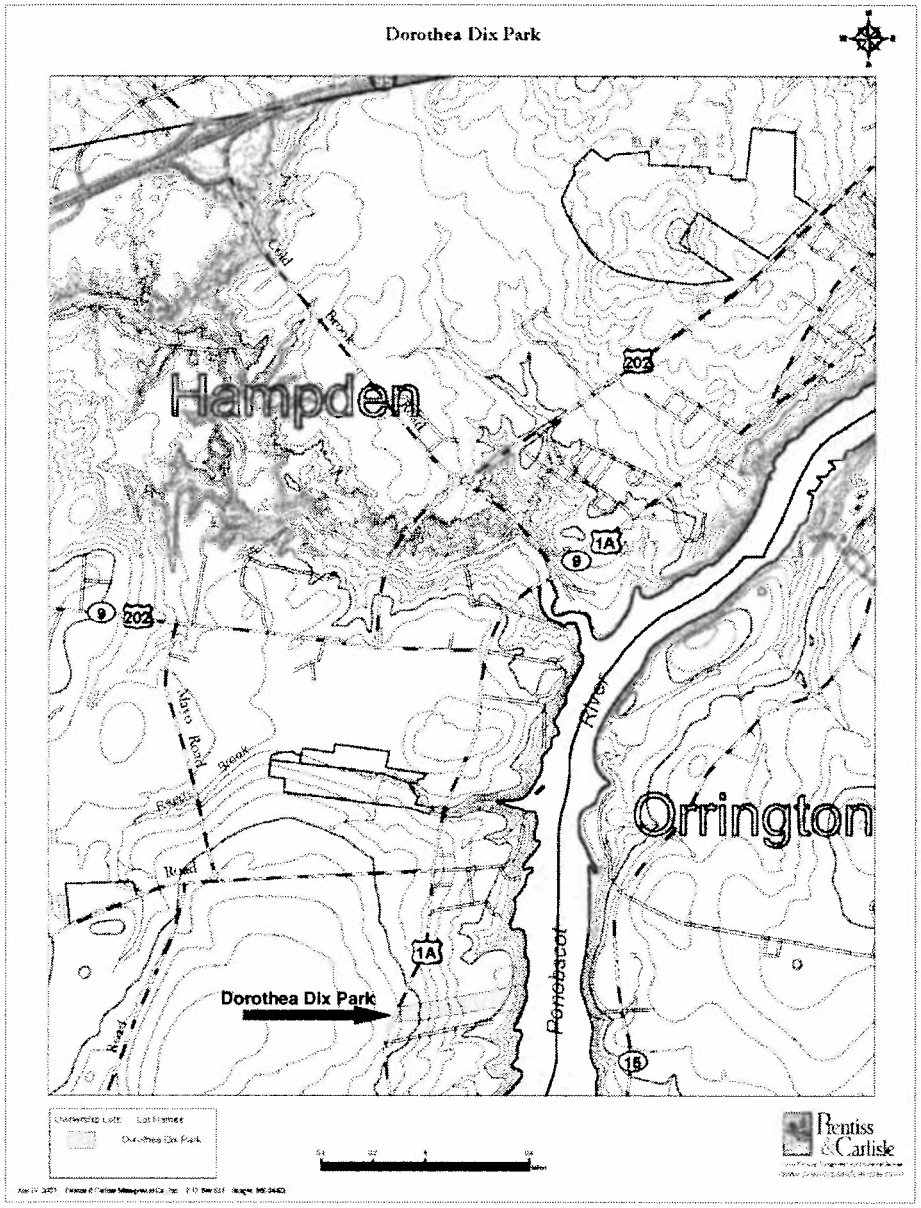
5.3.1. Acreage and Location

Dorothea Dix Park is located on Route 1A approximately 3/10th of a mile north of Hopkins Road (Figure 5.1). The property is roughly rectangular in shape and extends from Route 1A east to the banks of the Penobscot River. We estimated the gross GIS acreage to be 23 acres based on information provided by the Town. The forested acres, conventionally defined as the acreage available for harvesting trees (i.e. accessible, productive, and harvesting is not prohibited) was estimated to be 20 acres. Acreage estimates are not the result of a survey but represent the best available information. The acreage calculations by type are shown in Table 5.1.

Table 5.1. Acreage by forest and non-forest categories

Category	Broad Type	Acreage Class	Acres
Forested Acres	Softwood	P4B	5
			5
	Mixedwood	HS4B	11
			11
	Hardwood	H4B	4
			4
		Total Forested Acres	**20**
Non-Forest		Water	<1
		Wetland	2
		Roads/Parking	1
		Total Non-Forest	**3**
		Grand Total	**23**

Figure 5.1. Location map



5.3.2. Forest Age/Disturbance History

The forest was likely pasture (or farm fields) abandoned about 125 years ago and has maintained an even-aged structure. Most of the pine trees have large limbs, which are typical of old-field succession. The primary disturbances appear to be natural mortality related to age and competition, especially among shorter-lived species. Many of the shorter-lived species, such as cherry and white birch likely have died over the past fifty years. Standing dead and nearly dead birch and cherry can be found throughout the hardwood and mixedwood stands. In addition, many of the large spruce, which are considered a long-lived species, are standing dead or dying. There are signs of recent cutting throughout the parcel. Apparently, the Boy Scouts have removed some dead and dying trees. It is possible that similar cutting has taken place over the past 75-100 years.

5.3.3. Soils/Topography

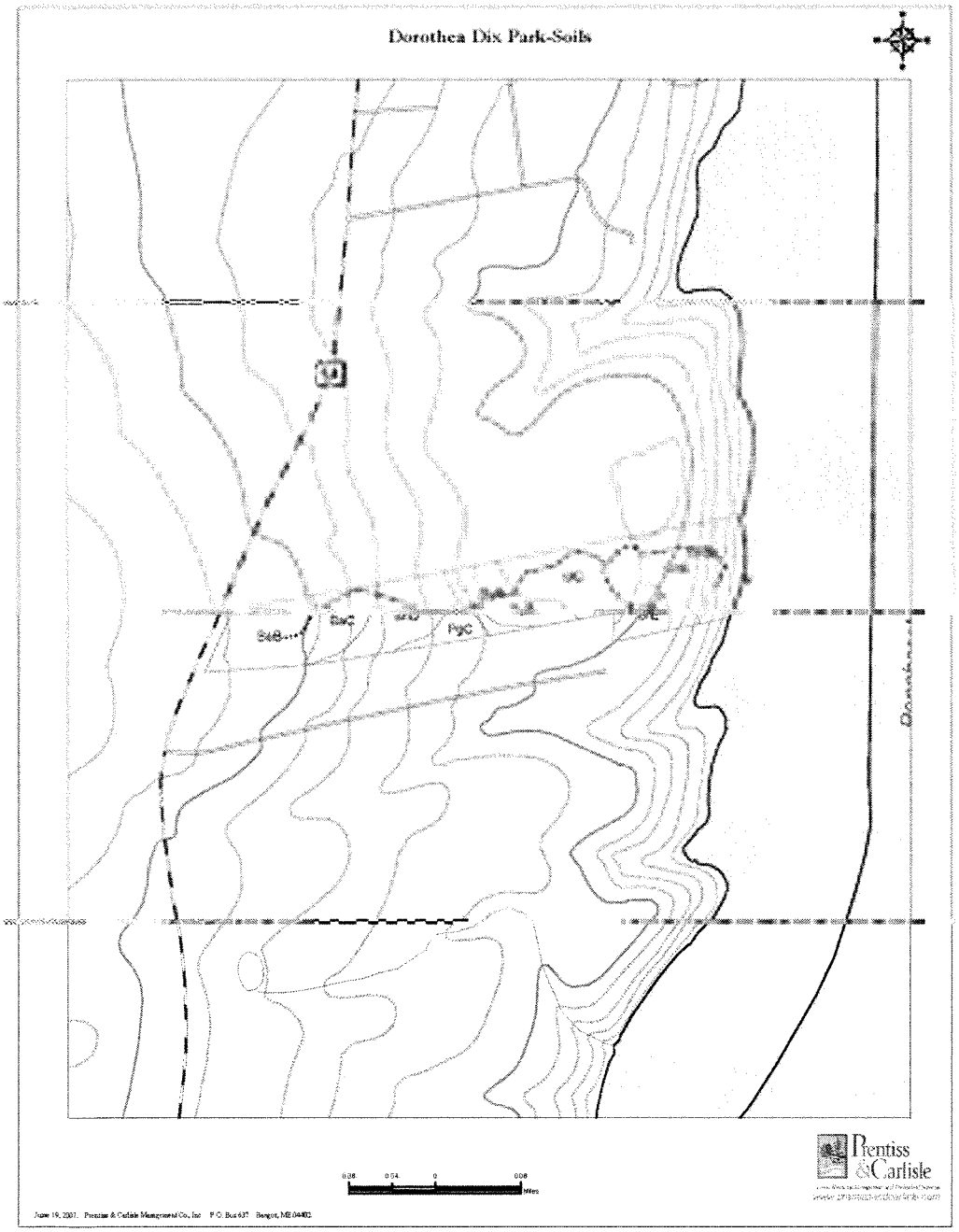
The topography is characterized by a gradual downward slope from Route 1A to a bluff approximately 30 feet above the Penobscot River. Along this elevation gradient the species mixture changes from pure hardwood, to mixed wood, to softwood from the high to low point. A brook runs through the property from the north nearly bisecting the property. An old gravel road has created a wetland on either side where the road crosses the brook in an area of poorly and somewhat poorly drained soils. A few woodland seeps feed the stream from different locations and an aquifer adjacent to an old gravel pit provides additional water to the brook.

The soils are generally rich and well-drained throughout. Seven soil series dominate the property (shown in Table 5.2). While drainage is good in most cases, these soils are all highly erodible with the exception of Dixmont. Drainage around trails, the parking area, and roads should be carefully designed to prevent erosion.

Table 5.2. Acreage by soil series and forest type

Broad Type	Drainage Class	Wetland	H4B	HS4B	P4B	Other	Grand Total
Rockland Thorndike material	Excessively drained				1.6		**1.6**
Buxton silt loam	Somewhat poorly drained	0.1		0.7			**0.8**
Dixmont very stony silt loam	Somewhat poorly drained	0.7		1.1			**1.8**
Bangor silt loam	Well drained		3.8	4.0		0.7	**8.5**
Colton gravelly sandy loam	Well drained		0.3	0.8	2.4		**3.5**
Plaisted gravelly loam	Well drained			1.0			**1.0**
Stetson-Suffield Complex	Well drained	0.1		3.6	0.6	1.3	**5.6**
Grand Total		**0.9**	**4.1**	**11.2**	**4.6**	**2.0**	**22.8**

Figure 5.2. Soils map



5.3.4. Water Resources

The property has approximately 500 feet of frontage on the Penobscot River. The river is tidal from Bucksport to Veazie and brackish to Hampden. A brook enters the property along the north boundary and widens into a small pond where it meets the old road and current path. It continues through an old box culvert (that needs replacement) and exits through the south boundary heading towards the Penobscot River. There are at least two springs that feed a wetland on the south side of the road across from the small pond.

5.3.5. Boundary Lines

By state law it is the responsibility of the landowner to ensure the boundary lines are properly maintained when harvesting more than 10 acres near a boundary. Lines should be identified and clearly marked with paint and updated when appropriate. Special consideration should be made when harvesting 10 or more acres within 200' of an adjacent owner. A forester should re-paint these lines if they are not clearly visible prior to any harvesting. In cases where lines are no longer visible, a surveyor may be required to re-establish the lines. Property line trees can not be harvested without first obtaining permission from abutting landowner.

The boundary lines appear to be adequate at this time but they should be periodically inspected and updated if necessary. It is much less expensive to renew lines than it is to re-establish lines using a survey. A rock wall along the northern boundary serves as an adequate line. Relatively new flagging can be found along much of the lines.

5.3.6. Forest Cover Types

We used aerial photo-interpretation (true-color contact prints taken by James W. Sewall in April 2006) to determine the productive forest acres and the acres by each forest and non-forest type within the ownership boundary (Figure 5.3). Photo-interpretation was ground-truthed and changed if necessary.

The typing scheme consists of a broad species grouping (H, HS, M, SH, S, C, P, PO), a size class (R, 1-4), and a canopy closure class (A-D). H, M, and S indicate hardwood, mixedwood, and softwood, respectively. C, P and PO designate a stand dominated by cedar (C), pine (P) or poplar [(PO); aspen or balm-of-Gilead]. A single H or S indicates this type comprises 75 percent or more of the volume. For HS or SH types, the first letter indicates the more dominant type. M is used if it cannot be discerned which group is more dominant. An "S" at the end of the type name indicates that the site is wet (i.e. CS3A and SH3CS). The size classes indicate the following:

R = regeneration, or trees 5' tall or less
1 = saplings 1-3" DBH, or about 5-20' tall
2 = larger saplings/small polesize trees about 3-5" DBH and 20-40' tall
3 = polesize trees, 20-55' tall and 5-9" DBH
4 = sawlog size trees, 55'+ tall and 10"+ DBH

The canopy closure classes are:

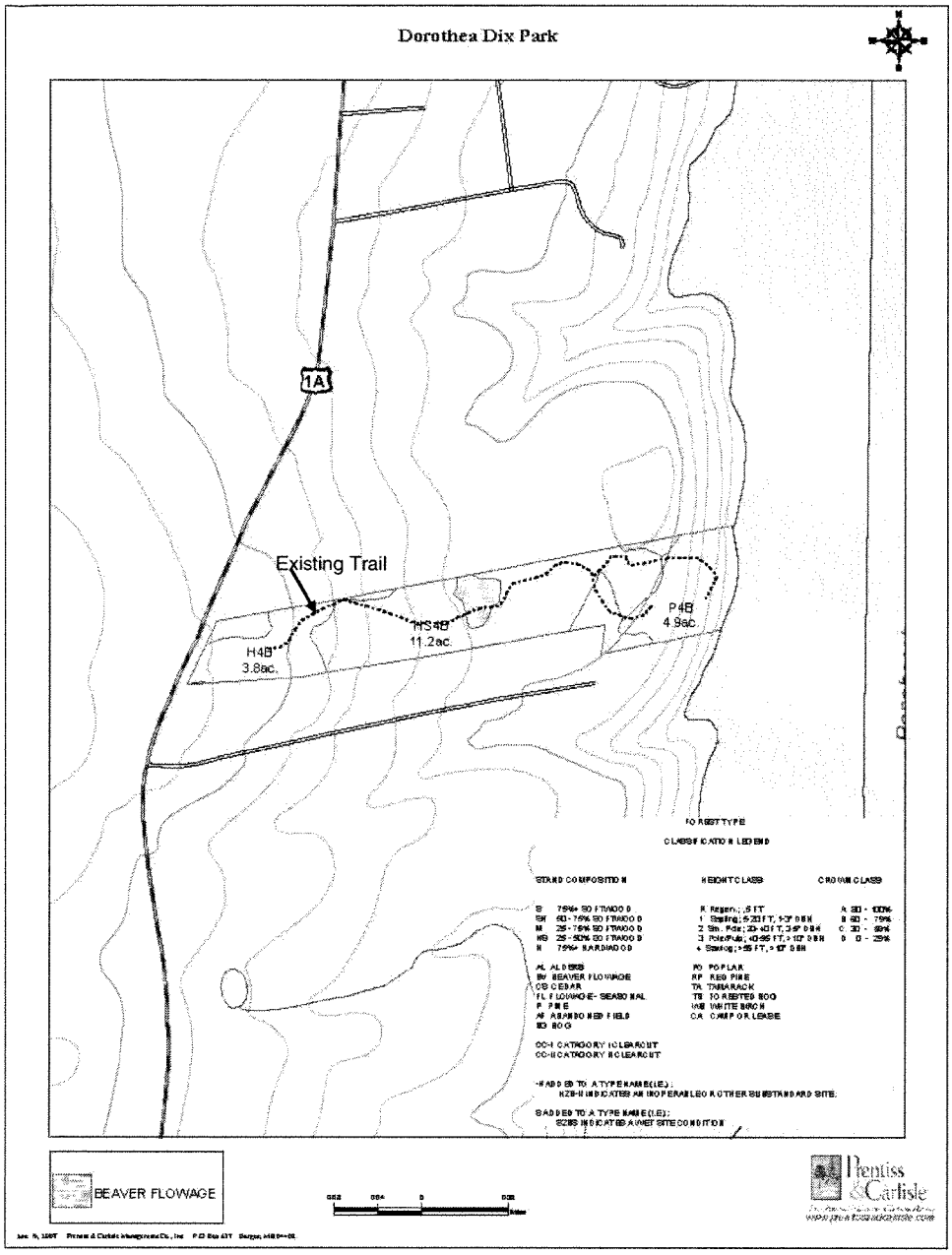
A = 80 percent or greater
B = 60-79 percent
C = 30-59 percent
D = 0-29 percent

In all we had 3 distinct forest types, which are described in greater detail in the "Detailed Stand Information" section (Table 5.3).

Table 5.3. Stratification in inventory process showing the forest types that were combined to determine volumes by strata

Strata	Forest Types	Acres	Plots
H4B	H4B	4	2
HS4B	HS4B	11	8
P4B	P4B	5	3
Total		**20**	**13**

Figure 5.3. Type map for property showing forest types delineated from aerial photos and site inspection



5.3.7. Timber Volume and Quality

As part of this plan, we completed a timber inventory of the property in May 2007. We installed 13 plots along a grid. The inventory data were stratified according to the forest types developed from the photo-interpretation and ground checking. Across all forested acres, we estimate there are 791 cords of merchantable wood, which equates to 39.6 cords per forested acre ± 7.6 percent (Table 5.4).

Volume by product is shown in Table 5.5. Approximately 46 percent of the volume is pulp and 11 percent is growing stock (including boltwood), and 42 percent in sawlog volume (including pallet). Pulp volume is wood that cannot be merchandized as sawlogs now or in the future. This includes smaller trees with poor form and large sawlog-size trees that because of stem defects such as rot, seams or excessive branchiness can only be merchandized as pulpwood. These trees occupy valuable space in the forest that could otherwise be used to grow more valuable trees. The "growing stock" portion of volume is comprised of trees that meet sawlog quality specifications but are undersized. Sawlog volume meets the current specifications for logs in regional markets (See product specifications in Appendix).

Table 5.4. Summary statistics for the Dorothea Dix inventory

Forest Type	Acres	Plots (#)	Mean	Standard Deviation	Standard Error	Std Error as a Pct. Of the Mean	Unless a 1 in (N) chance has occurred in sampling, the true mean is with the interval below. N = 10		N = 20	
H4B	4	2	31.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HS4B	11	8	35.78	10.82	3.83	10.69	28.53	43.03	26.73	44.83
P4B	5	3	54.53	14.97	8.64	15.85	29.30	79.76	17.34	91.71
Total	20	13	39.56	0.00	3.02	7.62	34.18	44.93	32.99	46.13

Table 5.5. Volume by product and species

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
W Pine	0	41	0	0	6	259	348
Spruce	0	6	0	0	8	8	30
Fir	0	2	0	0	17	3	25
Hemlock	0	4	0	0	3	0	13
Cedar	0	2	0	0	3	19	26
Sugar Maple	3	8	5	8	8	14	64
Red Maple	0	13	9	0	20	44	112
White Ash	0	5	0	0	0	1	12
Oak	19	31	5	0	12	17	149
Cherry	3	1	0	0	0	2	10
Other Hwd	0	0	0	0	3	0	3
Tot Swd	0	55	0	0	37	289	442
Tot Hwd	25	58	19	8	43	78	350
Tot All	25	113	19	8	80	367	792

5.3.8. Species Composition

Approximately 56 percent of the volume is in softwood species (white pine, balsam fir, red spruce, and cedar), and the remaining 44 percent is in hardwood trees (oak, sugar and red maple). In comparison, the statewide average volume (2002) was 16.0 cords per forested acre, of which, approximately 44 percent is in hardwood species. Thus, this forest has substantially more volume than the state average but is typical in terms of softwood to hardwood ratio.

Table 5.6. Merchantable volume (cord) by diameter class and species

DBH	W Pine	Spruce	Fir	Hem-lock	Cedar	Sugar Maple	Red Maple	White Ash	Oak	Cherry	Other Hwd	Tot Swd	Tot Hwd	Tot All
5	2	0	3	0	0	5	4	0	0	0	3	5	11	16
6	4	0	6	0	0	0	9	0	0	0	0	11	9	20
7	0	10	10	0	6	0	0	0	0	0	0	26	0	26
8	0	5	5	0	4	0	0	0	7	0	0	15	7	22
9	0	0	0	0	4	0	0	0	0	0	0	4	0	4
10	5	5	0	13	0	6	11	0	5	0	0	23	23	46
11	11	0	0	0	5	7	5	0	0	0	0	16	12	28
12	18	0	0	0	0	0	17	0	7	0	0	18	23	41
13	0	0	0	0	0	0	13	0	13	0	0	0	26	26
14	34	8	0	0	0	11	6	0	7	0	0	42	23	65
15	10	0	0	0	6	0	0	0	6	0	0	16	6	22
16	0	0	0	0	0	0	24	0	0	0	0	0	24	24
17	6	0	0	0	0	0	6	0	12	0	0	6	18	25
18	9	0	0	0	0	0	7	0	6	10	0	9	23	32
19	23	0	0	0	0	9	0	0	7	0	0	23	15	39
20	40	0	0	0	0	9	0	6	7	0	0	40	22	62
21	0	0	0	0	0	0	0	6	0	0	0	0	6	6
22	15	0	0	0	0	0	5	0	22	0	0	15	27	42
23	15	0	0	0	0	0	0	0	6	0	0	15	6	21
24	31	0	0	0	0	0	0	0	12	0	0	31	12	43
25	9	2	0	0	0	8	0	0	0	0	0	10	8	19
26	22	0	0	0	0	9	0	0	21	0	0	22	30	52
27	22	0	0	0	0	0	0	0	0	0	0	22	0	22
28	0	0	0	0	0	0	0	0	6	0	0	0	6	6
29	8	0	0	0	0	0	0	0	6	0	0	8	6	14
30	8	0	0	0	0	0	0	0	0	0	0	8	0	8
32	30	0	0	0	0	0	0	0	0	0	0	30	0	30
33	7	0	0	0	0	0	0	0	0	0	0	7	0	7
34	6	0	0	0	0	0	0	0	0	0	0	6	0	6
35	13	0	0	0	0	0	0	0	0	0	0	13	0	13
36	0	0	0	0	0	0	5	0	0	0	0	0	5	5
Tot 5-9"	6	15	24	0	14	5	13	0	7	0	3	61	27	88
Tot 10"+	342	15	0	13	11	59	99	12	143	10	0	380	321	704
Tot All	348	30	24	13	25	64	112	12	150	10	3	441	348	792

5.4 Recommended Projects

5.4.1. Timber Harvesting

Forests are inherently dynamic, continuously changing over time. The park regenerated from an abandoned old-field about 125 years ago and has gone through several stages of succession. Currently, longer-lived and more shade tolerant species—primarily sugar maple, oak, and pine—are becoming the dominant tree species in the forest, replacing shorter-lived and shade tolerant species such as white birch, black cherry, and balsam fir that dominated the forest for the first 75 years. The change in species composition will continue to occur naturally in the absence of active forest management. However, the result may not be consistent with the goals for the park.

For the park, the goal is to create a more stable forest structure that is less prone to disturbances from insects, disease, and wind. Given these criteria, the ideal forest structure for the park should be a single canopy of well-spaced, large, healthy trees composed of long-lived and relatively disease and insect resistant species. The question is whether to let nature take its course, and essentially do nothing, or to actively manage forest structure to achieve the desired outcome.

Currently, the forest is in an overstocked condition, meaning there are too many trees competing for too few resources (i.e. light, above and below-ground space, nutrients, and water). Either by virtue of location, genetic characteristics or chance, some individual trees are able to capture more of the limited resources than neighboring trees. This process has lead to rapid decline in health of trees unable to compete, and to a lesser extent has taken a toll on trees that are "winning" the competition for resources. For example, trees competing for light will change their growth habits and put more energy into height growth at the expense of stem diameter growth and root growth. Exacerbating this problem, the foliage in the lower part of the tree crown is unable to survive because of low light conditions in the lower canopy. The net effect of this is a decrease in live crown ratio (proportion of crown length to stem length), an increase in the height to diameter ratio, and an increase in the shoot to root ratio for individual trees. The combination of these three factors leads to a gradual decline in the health of trees, for both the winners and losers of the competition for limited resources and makes them susceptible to mortality from insect and disease and wind.

Given the current forest condition and goals for the park, we believe active timber management is the correct approach. Through active timber management we can better control mortality, and in turn control the resulting species composition, structure and health of the forest. In addition, harvesting trees now that have been weakened by competition will lessen the negative impacts of competition on the better quality trees. If we wait a decade or more for these weakened trees to die naturally, the surviving trees will be in a weaker state than if we remove the poor quality trees through harvesting. The natural process will lead

to greater mortality in the overstory and open up growing space to regenerate a new cohort of trees in the understory. Over time, the forest will become multi-aged with trees in two or more age classes. While this is an appropriate structure in many cases, it is not appropriate for the park, because it will be too dense to walk or see through, limiting aesthetic and recreational value.

The challenge for timber harvesting is to remove enough trees to improve the health of residual trees but not open up the forest too much so that it leads to regeneration in the understory. To achieve this end, we recommend harvesting about 250-350 cords, about 32-44 percent of the standing live merchantable tree volume. This is a relatively low harvest removal for a forest that averages about 40 cords per acre. The reason for the light harvest recommendation is that the goal is improve the health of the mature trees and inhibit regeneration, thereby creating a more stable forest. Also, it is better to err on the side of light harvest rather than heavy. Additional harvesting can be done in the future if needed.

Silviculture Recommendations

We recommend crop-tree thinning for the hardwood (H4B) and mixedwood (HS4B) stands. A forester should flag the best quality trees to leave in the stand and compute the standing volume of these trees. The forester should select the best quality oak, sugar maple, and white ash trees as crop trees. In areas where these species do not exist, the forester should select the best quality red maple as a crop tree. If there are neither ash, oak, nor maples, then the forester should select a different species. Crop tree selection should be based on species and tree health (as indicated by tree crown conditions) and wildlife considerations. It is important to note that crop trees should not necessarily be analyzed in terms of economic value as it is not the goal of the Town to maximize the economic value of the timber component of the park. As such, the forester may select a tree with less than ideal stem form as a crop tree over a more valuable stem if he or she believes the less valuable tree is healthier and will hold up to wind forces better. Moreover, we recommend flagging some cull trees as crop trees to serve wildlife. These are trees that are very large in diameter and have large live limbs and expansive crowns.

Crop trees should be well-spaced and without any sizable gaps. The spacing of crop trees should be relative to their size; for example, small crop trees should be more closely spaced than large crop trees. Generally, the spacing should be between 18 and 30 feet between crop trees. There will be situations when large oak trees or possibly high quality sugar maple trees will not be chosen as crop trees but instead will be harvested. These trees should be harvested if they are too close to better quality trees or if the forester believes they should be cut to improve the residual spacing of crop trees. All crop trees should be flagged and measured to estimate the residual post-treatment volume. After the forester is confident that the residual volume will fall within the desired target, all non-crop trees should be painted for removal.

For the pine stand, we recommend a very light thinning designed to remove only the pine that are likely to die over the next 10 years. These are the pine with very poor crowns in the intermediate and overtopped crown classes. We recommend limiting the harvest to less than 33 percent. Additionally, much of this stand is within 250' of the Penobscot River and therefore subject to shoreland protection zoning. A permit must be obtained prior to any harvesting within 250' of the river. Also, it is important that the Town or forester first check to find out if there are any known bald eagle sites in the area and carefully inspect the area for unreported sites along the Penobscot River. If a nest is found, there should be no harvesting near the nest.

Wildlife Recommendations

Often aesthetic and recreation goals run counter to wildlife goals. For example, while large standing dead trees are valuable for wildlife they may pose a hazard to visitors, and a well-manicured and clean forest may be more attractive to many visitors but a forest sanitized and devoid of any down or standing dead trees is of little benefit to wildlife. The challenge here is to accommodate both interests as best as possible. To meet that end, we recommend removing all standing dead trees that pose a risk to people but leaving those that are less of a risk. We also recommend picking up recently dead trees that are relatively sound but small in diameter. There is little wildlife value in downed trees that are less than 10" in diameter. We recommend leaving a buffer around the pond and leaving most if not all of the dead trees standing around the pond. In our visits to this area in the spring we noted an abundance of songbirds using the area around the wetland, and particularly the standing dead trees around it. These are very important for songbirds, and we believe the park can serve as songbird habitat despite its small size.

Harvest Equipment and Timing

We recommend a hand-crew and small cable skidder is used for harvesting. We considered a cut-to-length system (processor) but concluded it would not be appropriate for the site and large trees that will be removed. Harvesting should be done during a dry period in the summer or in the winter, and scheduled for 2008 or 2009.

Estimated Volume Removal

We recommend a harvest removal in the range of 250-350 cords. This range will provide the forester some options in terms of creating semi-cleared areas as authorized by the Town, an allowance for adjusting the prescriptions based on the condition of the forest at the time of harvest, and some room for differences in actual versus predicted volume. The estimated volume removed by species and product reflects the inventory estimates predicted from the sampling and silviculture prescriptions (Table 5.7).

Table 5.7. Estimate volume removal by species and broad product class

Species	Log (MBF)	Hygrade (cords)	Pulp (cords)	Total (cords)
Balsam Fir	0.0	19.8	5.0	24.8
Black Cherry	7.8	0.0	2.0	19.1
Cedar	2.1	0.0	21.6	26.3
Hemlock	4.2	3.5	0.0	12.6
Other Hwd	0.0	0.0	2.5	2.5
Red Oak	1.9	1.1	5.2	10.5
Red Maple	6.4	4.7	22.0	40.7
Spruce	5.8	8.1	8.0	28.8
Sugar Maple	0.3	0.9	4.3	5.9
W Ash	0.0	0.0	0.4	0.4
W Pine	11.4	0.0	68.8	94.0
Total	**39.8**	**38.2**	**139.9**	**265.7**

5.4.2. Trail Maintenance and Construction

The Town wishes to increase the utility of the existing trail by widening and extending the existing trail. We recommend that the trail is extended as close as possible to the Penobscot River; that the design of the new trail include one or two loops if possible rather than the existing single back and forth trail. We recommend that the town works with the forester to lay out the trail. The trail could be used for yarding harvested wood from the forest to the road, so it is important that the layout be planned in conjunction with the harvesting.

The existing wooden box culvert that runs beneath the trail is no longer working and needs to be replaced. It is allowing water to run over and pool on the trail causing erosion. Near the top of the trail, runoff from the parking area moves down the trail and is causing erosion. Water bars and runoff ditches should be installed to reduce erosion.

5.4.3. Reduce or Eliminate Honeysuckle

Honeysuckle, an invasive exotic shrub species has proliferated beneath the canopies in the hardwood and mixedwood stands. It is reducing the diversity of understory vegetation by out-competing other tree and herbaceous species and is therefore negatively impacting biodiversity. Honeysuckle impedes the regeneration and growth of more desirable species, such as oak seedlings in two ways: it produces allelopathic chemicals that enter the soil and inhibit the growth of other plants, and it produces a dense canopy that prevents other tree and plant germinants from growing. In addition, it reduces the use of the forest making walking difficult off the trail.

We recommend controlling honeysuckle through a combination of mechanical and chemical methods. An advantage to chemically treating honeysuckle is that it is one of the first species to leaf-out in the spring and the last to drop its leaves fall. As such, a foliar application of Glyphosate, the active ingredient in Roundup Ultra during the fall after other hardwoods have dropped their leaves will minimize the damage to other species. Bags can be placed over non-target species to further minimize damage. A second treatment should be planned the following year to kill seedlings that grow from seed held in the soil. We recommend treating the honeysuckle after the timber harvesting.

5.5 Detailed Stand Information

Three stand types were identified and described: H4B, HS4B, and P4B.

5.5.1. Stand Type: H4B

The H4B type is composed of sawlog-size hardwood trees dominated by maples (sugar and red) and red oak. The basal area of the merchantable trees is 112.5 square feet per acre and the density is 183 trees per acre. The quadratic mean diameter (diameter of the tree with the average basal area) is 10.6". We recommend removing dead and dying trees throughout this stand to create more growing space for the healthiest, long-lived species—primarily red oak and sugar maple.

Table 5.8. Stand Attributes for H4B type.

Attribute	Description
Stand area	4 acres
Composition/ structure	Composed primarily of hardwood species; sugar maple (37%), red maple (35%), red oak (15%), black cherry (8%), other hardwoods (2%) and balsam fir (3%); trees are generally 50-75' tall, 5-26" dbh; canopy closure is 60-79 percent . QMD = 10.6".
Age/history	Approximately 125 years old; likely regenerated from field abandonment
Stand health	Okay—some recent mortality due to suppression and overmaturity—shorter-lived species should be thinned to reduce over-crowding
Stand volume	31.1 cords/acre
Stand stocking	Overstocked
Stand quality	Good; approximately 79 percent of volume in growing stock or sawlogs; most rough and rotten volume is due to issues mentioned in "stand health" section
Growth rate	Fair; 10-year PAI is 0.28 cds/ac/yr
Project Recommendations	Thin 35-45% of volume to favor oak and healthy sugar maple
Long range silvicultural objectives	Move towards oak/sugar maple dominance and eliminate short-lived species

Table 5.9. Product Table for H4B stand showing volume by species and product.

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
Balsam Fir	0	0	0	0	1.05	0	1.05
Total Swd	0	0	0	0	1.05	0	1.05
Sugar Maple	0.78	1.92	1.17	0.32	0	2.97	11.5
Red Maple	0	0.6	1.98	0	2.86	2.6	11.08
Red Oak	1.3	0.64	0	0	0	0.45	4.55
Black Cherry	0.68	0.25	0	0	0	0.51	2.41
Other Hwd	0	0	0	0	0.63	0	0.63
Total Hwd	2.76	3.4	3.15	0.32	3.49	6.54	30.18
Total All	2.76	3.4	3.15	0.32	4.54	6.54	31.23

5.5.2. Stand Type: HS4B

The HS4B type is a mixedwood type with 58 percent hardwood and 42 percent softwood species. It is composed of sawlog-size hardwood trees dominated by maples (sugar and red) and red oak. The basal area of the merchantable trees is 131.3 square feet per acre and the density is 219 trees per acre. The quadratic mean diameter (diameter of the tree with the average basal area) is 10.5". We recommend moving this stand to a hardwood dominated stand with oak and sugar maple as the major components. We recommend harvesting all of the softwood and only the poorest quality red maple.

Table 5.10. Stand Attributes for HS4B type.

Attribute	Description
Stand area	11 acres
Composition/ structure	Composed primarily of mixedwood species; red oak (33%), white pine 26%), red maple (17%), spruce (6%), balsam fir (5%) cedar (5%), and white ash (3%); trees are generally 50-75' tall, 5-26" dbh; canopy closure is 60-79 percent . QMD = 10.5".
Age/history	Approximately 125 years old; likely regenerated from field abandonment
Stand health	Poorer than H4B—high mortality in large spruce and fir due to overmaturity—shorter-lived species should be thinned to reduce over-crowding
Stand volume	35.8 cords/acre
Stand stocking	Overstocked in places, although some new gaps being created by dying softwood
Stand quality	Fair; approximately 58 percent of volume in growing stock or sawlogs; most rough and rotten volume is due to issues mentioned in "stand health" section
Growth rate	Average; 10-year PAI is 0.41 cds/ac/yr
Project Recommendations	Harvest the softwood and some of the red maple to favor oak and healthy sugar maple
Long range silvicultural objectives	Move towards oak/sugar maple dominance and eliminate softwood

Table 5.11. Product Table for HS4B stand showing volume by species and product.

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
W Pine	0	0.34	0	0	0.56	8.07	9.34
Spruce	0	0.33	0	0	0.74	0.46	2.01
Balsam Fir	0	0.16	0	0	1.15	0.3	1.87
Cedar	0	0	0	0	0.28	1.5	1.78
Tot Swd	0	0.84	0	0	2.72	10.32	15
Sugar Maple	0	0	0	0.65	0.75	0.23	1.63
Red Maple	0	0.94	0.13	0	0.76	3.06	6.12
W Ash	0	0.46	0.02	0	0	0.12	1.11
R Oak	1.28	2.54	0.49	0	1.1	1.42	11.93
Tot Hwd	1.28	3.94	0.64	0.65	2.61	4.83	20.78
Total:	1.28	4.77	0.64	0.65	5.33	15.15	35.78

5.5.3. Stand Type: P4B

The P4B type is dominated by large, mature white pine. The basal area of the merchantable trees is 170 square feet per acre and the density is 91 trees per acre. The quadratic mean diameter (diameter of the tree with the average basal area) is 18.5". We recommend a very light thinning designed to remove only the pine that are likely to die over the next 10 years. These are the pine with very poor crowns in the intermediate and overtopped crown classes. We recommend limiting the harvest to less than 33 percent. Additionally, much of this stand is within 250' of the Penobscot River and therefore subject to shoreland protection zoning. A permit must be obtained prior to any harvesting within 250' of the river.

Table 5.12. Stand Attributes for P4B type.

Attribute	Description
Stand area	11 acres
Composition/ structure	Composed primarily of white pine (90%) with minor components of hemlock (5%), spruce (3%) and cedar (2%); trees are generally 70-110' tall, 15-35" dbh; canopy closure is 60-79 percent . QMD = 18.5".
Age/history	Approximately 125 years old; likely regenerated from field abandonment
Stand health	Fair—many of the large pine are hollow for the first 16' of stemwood; mortality present in intermediate and overtopped pine due to overcrowding; smaller pine should be thinned to reduce future mortality
Stand volume	54.5 cords/acre
Stand stocking	Good
Stand quality	Poor; 64% of volume is pulp, primarily due to rot; additional volume (not merchantable) was tallied as cull due to excessive rot
Growth rate	Average; 10-year PAI is 0.41 cds/ac/yr
Project Recommendations	Thin pine with poor crowns to capture merchantable volume before it dies and to prevent hazard trees
Long range silvicultural objectives	Allow trees with best crowns to grow; inhibit regeneration by selectively removing poor quality trees without creating large gaps

Table 5.13. Product Table for P4B stand showing volume by species and product.

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
W Pine	0	7.36	0	0	0	34.06	49.1
Spruce	0	0.43	0	0	0	0.58	1.57
Hemlock	0	0.83	0	0	0.7	0	2.57
Cedar	0	0.42	0	0	0	0.41	1.29
Total Swd	0	9.03	0	0	0.7	35.05	54.53
Total:	0	9.03	0	0	0.7	35.05	54.53

6 LL Bean Tract

6.1 Plan Summary

The LL Bean tract is located on the north side of Route 202 approximately 1.3 miles northeast of the Coldbrook Road/Route 202 intersection. The tract contains about ¼ mile of frontage on Route 202, and is about 218 acres in size with 194 acres classified as forested. The parcel was owned by the US Government and served as a military installation until 1981. During that time, the primary management objective at that time was to support military training. Clearcutting was used to keep trees and brush from obscuring radar visibility from the training facility. In 1981, the parcel was granted to Ernest Sprowl and Salvatore Messina, who then transferred it to L.L. Bean, Inc. in 1989. In 2004, L.L. Bean granted the property to the Town of Hampden. It is unclear whether the tract was harvested from 1981 through 2004.

Based on our assessment, we believe this tract can be used to meet all of the Town's goals, which are; preserving open space, providing public recreation opportunities, maintaining habitats and ecosystems, protecting water quality and demonstrating good forest management. The objectives for this tract are:

1. Develop active recreation opportunities including recreation trails
2. Improve the aesthetic quality of the property
3. Improve wildlife habitat and biodiversity
4. Realize a positive financial return through careful timber harvests

At 218 acres, the L.L. Bean tract is the largest contiguous timberland tract owned by the Town and the best of the four parcels for timber management. It is also well-located for recreational use (ATV, snowmobile, hiking trails, ski trails) given its frontage on Route 202. There is an extensive trail system throughout the property that should be improved and enlarged to accommodate the planned recreational activities. The parcel would not serve as a peaceful "wilderness" setting because traffic noise is very high from both I-95 and Route 202.

The forest contains three broad age/structural classes. There are 79 acres that apparently regenerated following clearcuts about 30 years ago and comprise the youngest age class. These stands are beginning to produce merchantable size trees (5"+ dbh), will grow rapidly over the next 10-20 years and can be commercially thinned in the next 10-20 years. There are about 70 acres of mature stands that should be harvested within the next 10 years. These stands regenerated 45-70+ years ago resulting from commercial clearcuts. Most of these stands contain residual trees that were not merchantable during the commercial clearcut. We recommend treating these stands within the next 10 years to improve species composition and quality. Last, there are about 45 acres that contain two distinct age classes, with an overstory that is 70+ years old over a younger age class that is about 30 years old. These stands can be harvested within the next decade.

The most challenging aspect of managing this forest is in improving stands that have been degraded due to extensive clearcutting and aggressive harvesting. Mixedwood stands that were clearcut have grown back to pure aspen and aspen/red maple stands, while spruce dominated stands have re-grown to fir, red maple and aspen stands. The change in species composition is typical following aggressive harvesting; mature stands comprised primarily of long-lived shade tolerant or intermediate species are clearcut and regenerate as intolerant stands (i.e. aspen, white birch), or intermediate or tolerant stands comprised of short-lived species (i.e. balsam fir and red maple), or a mix of these types. If left alone, the intolerant stands would eventually be replaced by intermediate and shade tolerant species that are longer-lived (i.e. spruce, red oak, white pine, sugar maple).

The key to forest management on this parcel is to use carefully planned harvesting to accelerate the process of succession and thereby move stands of intolerant and or short-lived species to stands of intermediate/tolerant long-lived species more rapidly than what would occur naturally. Harvest prescriptions should be geared towards altering the current species composition by targeting aspen, white birch, and balsam fir for removal and favoring desirable species (Table 6.1). In addition, poor quality red maple, pine, hemlock, and cedar should be removed.

The change in species composition and quality can take 2-3 entries on a 15-year basis (i.e. 30-45 years) before a marked change in composition and quality is realized. The long-term silvilculture strategy is to maintain each stand in an uneven-age state by conducting periodic partial harvests on a 10-20 year interval with the goal of growing large diameter sawlogs.

In total, we recommend harvesting about 860 cords of roundwood, primarily from the SH3A, SH3B, P4D/M2A, S4D/S2B, and P4B stands in the next 5 years. Combined, these types represent 115 acres for an average removal of 7 cords/acre. The P4B and SH3A stands are uniformly well-stocked, at an economically optimal stage for commercial harvesting and will support a higher average removal rate. The HS3B, P4D/M2A, and S4D/S2B stands, however, are marginal in terms of economic operability and highly variable in stocking. Harvesting should not be prescribed uniformly throughout these marginal stands but should vary depending on small-scale stocking, species composition and stand structure. Some areas should be treated with overstory removal, improvement thinning, and group selection while other areas should be left unharvested. Areas treated in these marginal types will have one or more of the following criteria: (1) a higher volume than the average for the type, (2) more trees at risk of dying in the near future, and (3) the presence of good quality spruce, oak, maple or pine (regeneration or pole-size) that could respond to thinning neighboring poor quality trees. These criteria should be assessed on the ground in the harvest planning phase.

Table 6.1. Species desirability and silvical characteristics for softwood and hardwood (next page) species

Broad Type	*Desirabilty	Species	Habitat	Shade Tolerance	Practical Lifespan (yrs)	Insects/Disease	Size	Comments
Softwood	high	Red spruce	Fair sites--competes best on poorer drained/shallow soils	Tolerant	250-350	Few chronic issues; susceptible to spruce budworm especially when associated with fir	15-24" DBH; 60-75' tall	Economically valuable, long lifespan and shade tolerance provide many options for forest management and make red spruce a highly desirable tree
	high	White pine	Fair to good sites--occupies deeper better drained soils than spruce, fir, and cedar	Intermediate	200-400	Regeneration prone to pine weevil if grown in open conditions but can be reduced if regenerated under a partial canopy; relatively few other issues	20-40" DBH; 60-120' tall	Economically valuable, long lifespan, good wildlife tree as a perch for raptors, cavity tree for birds and mammals and coarse woody debris for denning; highly desirable tree given the objectives for this forest
	neutral	Hemlock	Fair to good sites--ssociated with spruce and pine; typically occupies sites with better drainage than spruce and fir	Very tolerant	300-400	Large trees prone to red-heart rot, which limits the economic value of stems but increases wildlife value for denning	18-33" DBH; 50-75' tall	Relatively low economic value for softwood species, long lifespan and shade tolerance provide many options for forest management; grows large and is valuable as a cavity tree (standing and down) for wildlife
	neutral	Cedar	Poor to fair sites--ssociated with spruce and pine; typically occupies sites with a little better	Tolerant	150-350	Prone to heart rot	10-20" DBH; 40-60' tall	Low economic value because of rot and poor form; good cavity tree for birds
	low	Balsam fir	Fair to good sites; generally outcompetes spruce on slightly better drained (somewhat poorly drained), deeper and richer sites	Tolerant	70-150	Chronically prone to spruce-fir fungi butt rot complex that causes rot at the base of the stem that spreads upwards and leads to winthrow; rot occurs rapidly and generally in trees > 8" DBH; major host for spruce-budworm	10-20" DBH; 60-80' tall	Grows rapidly, regenerates prolifically, high value for studwood, but difficult to grow for more than 60 years. As such, it is not a good choice as a primary species in an uneven-age forest with the objective of growing large, old sawlog-size trees; some fir component will be present regardless of silviculture. Fir is a good source of cover for snowshoe hare and deer but is a poor source of browse and a last resort for deermoose

*High indicates that management should increase the abundance, neutral indicates no change; low indicates a desire to decrease the abundance

Broad Type	*Desirability	Species	Habitat	Shade Tolerance	Practical Lifespan (yrs)	Insects/Disease	Size	Comments
Hardwood	high	Red oak	Good sites--associated with pine and deeper better drained soils	Intermediate	200-250	Few problems	20-30" DBH; 60-80' tall	Although less economically valuable on a per board foot basis than sugar maple, oak tends to grow large and straight and produces a high sawlog to pulpwood ratio and is very valuable; acorns are an excellent food source for wildlife
	high	Sugar maple	Good to excellent sites--associated with yellow birch and white ash	Very tolerant	150-250	Sugar maple borer generally not an issue in Eastern Maine; Eutypella canker less of a problem than with red maple	20-30" DBH; 60-80' tall	High economic value for sawlog quality trees; less prone to diseases and stem form problems than red maple; can be regnerated in single-tree gaps because of shade tolerance; long-lived and grows large; regeneration is a good source of browse for wildlife.
	high	Yellow birch	Good sites--associated with sugar maple and white ash	Tolerant	150-250	Few problems	20-30" DBH; 60-80' tall	Economically valuable, relatively resistant to damaging agents, shade tolerant, long-lived and large-growing make yellow birch a valuable species in hardwood and mixedwood stands
	neutral	Red maple	Fair to good sites--red maple thrives in a wide range of sites and is associated with fir, pine, spruce, white birch and aspen	Tolerant	80-130	Prone to Eutypella canker, which causes poor stem form and rot reducing the number of sawlog quality trees	8-16" DBH; 40-65' tall	Relatively short-lived and shade tolerant; poor stem form and susceptibility to rot and physical wounds reduce the desirability of red maple on lower quality sites
	low	White birch	Competes well on a wide range of soil and site conditions and is associated with nearly every species on this list	Intolerant	80-130	Post-logging decadance, which is mortality due to heavy harvesting around white birch is common in Maine. It is not a recommended tree to leave after a harvest.	10-20" DBH; 50-60' tall	Low economic value because of rot and poor form; relatively small size, and shade intolerance make white birch a low priority species for this forest
	low	Aspen (quaking or bigtooth)	Fair to good sites--occupies deeper better drained soils than spruce, fir, and cedar	Intolerant	60-100	Prone to Hypoxylon canker, which effects stem quality; prone to rot in trees > 10" DBH	12-20" DBH; 60-80' tall (bigtooth generally larger than quaking)	Short-lived species capable of prolific regeneration from seed and root suckering following heavy harvesting; requires nearly full sunlight to regenerate; fast growing and relatively high value for hardwood species
	low	Beech	Good sites--associated with sugar maple and white ash	Very tolerant	~60 for diseased trees	Virtually all beech in eastern Maine are infected with beech bark Nectria complex	4-8" DBH; 30-50' tall	Uninfected beech should not be harvested because they produce mast for wildlife and may produce regeneration that are not susceptible to the disease

*High indicates that management should increase the abundance, neutral indicates no change; low indicates a desire to decrease the abundance

6.2 Management Objectives and Recommendations

The objectives for the L.L. Bean tract are:

1. Improve the quality of the timber resource
2. Develop active recreation opportunities including recreation trails
3. Improve the aesthetic quality of the property
4. Improve wildlife habitat and biodiversity
5. Realize a positive financial return through careful timber harvests

6.2.1. Improve the quality of the timber resource

Improving the quality of the timber resource through active timber management is vital to meeting all of the objectives. A healthy forest is aesthetically pleasing, which is important for recreation; it is beneficial to wildlife because it offers a diversity of forage and shelter; and it produces valuable forest products, which will provide income to the Town to offset costs for developing and maintaining the recreation trail system.

The most effective way to improve the health and productivity of the forest is through prudent harvesting that targets low quality and over-mature trees. Doing so will create the ideal conditions for regenerating high quality trees and valuable tree species, and reduce the forests' susceptibility to damage and mortality.

The forest contains a mixture of young, early successional stands and mature, mid to late-successional stands. The timber management program for this tract is designed to accelerate the development of early-successional stands to more stable late-successional stands. This process will occur in the absence of management but will take several more decades to achieve without active timber management. The management actions described in this plan are designed to move forest structure from short-lived shade intolerant species to longer lived tolerant species that can regenerate and grow from partial harvesting. More tolerant, longer-lived species will provide for a more stable forest that will produce more economically and ecologically valuable species.

6.2.2. Develop active recreation opportunities including recreation trails

The L.L. Bean tract is the best timberland property owned by the town for achieving its active recreation goals. The tract is large, already contains some trails, and is well-located for recreational use. Usage of trails is valuable for educational purposes (examining woodlot management and wildlife viewing) and exercise. The types of activities the Town should consider are: snowmobiling, cross-country skiing, running, mountain biking, horseback riding, and ATV riding. Some of these activities may be mutually exclusive so the Town should carefully consider which activities they would like to occur. For example,

ATV use and running and mountain biking is a dangerous mix of activities and snowmobile tracts do not make for good cross-country ski trails.

The town should determine the mix of uses it would like and then design a trail system to meet that use. To do this, we recommend that the Town develop a recreation trail plan that clearly states the goals of the trail system, including the types of recreation that will be permitted, and includes a plan for trail construction and maintenance. Trail design should emphasize loops that lead users back to the starting point without re-tracking ground already covered, thoughtful use-designations, such as snowmobile-only or ski-only in the winter, to keep incompatible uses from occurring on the same trail, and a trail system large enough to accommodate the desired number of users.

6.2.3. Improve the aesthetic quality of the property

The appearance of the forest is an important visual sign of overall health and quality of the forest and forest management. All management activities including timber harvesting and trail development should carefully consider the aesthetic impact of the activity. Harvesting will be designed to minimize the visual impact to visitors. Damage to residual trees, such as scarring and crown breakage should be minimized by using the proper equipment and vigilant oversight. Rutting is unacceptable and if ruts do occur they should be re-graded. Yards should be located to minimize rutting and should be seeded at the end of the harvest. Harvesting should be done in the winter on frozen ground to minimize rutting and soil disturbance.

6.2.4. Improve wildlife habitat and biodiversity

Maintaining biodiversity in the forest is both important in its own right and critical for the long-term production of forest products. Beyond the protection of rare plants and animals, biodiversity provides an important stabilizing mechanism within ecosystems and supports a number of essential functions such as pollination, seed dispersal, the breakdown of nutrients and organic matter, pest control, and other vital processes all of which are critical to the health of the forest.

Through careful planning and management, harvesting timber can be compatible with maintaining biodiversity across this timberland. We believe that the most efficient way to maintain biodiversity across a landscape is to use a combination of a habitat approach, in which broad age-classes are maintained throughout the forest, and stand-level prescriptions that protect or maintain important structure such as snags and den trees for wildlife.

The habitat approach is based on the idea that different species have adapted to a host of conditions including early, mid, and late-successional forests of different sizes and shapes. Even-aged stands created through clearcutting, overstory removal and shelterwood provide early successional habitat. Early

successional habitat is essential for species like snowshoe hare and the predators that rely on snowshoe hare in their diet such as the Canada lynx. Uneven-aged stands created through partial cutting create structure typical of late-successional stands and support species that require this structure. For example, the American pine marten, an animal often referred to as an "umbrella species" for biodiversity that require late-successional habitat, thrives in large areas of trees greater than 30' tall, with a basal area of 80 ft^2 or more. They are called an umbrella species because the habitat they require is also important for many other similar species. It would not be possible or practical to monitor the population dynamics of every species. Instead, we can try to provide habitat for similar species that have the most restrictive habitat requirements. We call these "umbrella species." By having at least a portion of your forest in these three different stages you are maintaining an ample supply of habitat for wildlife and plant species that require a broad array of conditions.

Viewing the property from a regional perspective, the surrounding area is a mix of urban, forest, and agricultural use. Nearby private forests are similar in structure to the L.L. Bean tract in its present condition in that they have been aggressively harvested and are in the early to mid-successional stages of development. In the context of these surrounding forests and in light of the other objectives, we recommend to the greatest extent possible managing for mid to late-successional habitat in this forest. That said, there are a number of ecologically important wildlife that cannot be managed for give the location and relatively small size of the tract.

In addition to this habitat approach we have included the results of a survey conducted by the ***Maine Natural Areas Program*** (MNAP) of important habitat on or near your property. According to their records, there is no documentation of *Rare, Threatened and/or Endangered Plants*; *Rare and/or Exemplary Natural Communities*; or *Rare, Threatened and/or Endangered Animals*. The MNAP map indicates there is an area that contains *significant habitat*, shown as a deer wintering area (see attached map "Habitats of Management Concern"). The deer wintering area is on the southern portion of the property and is part of a larger area on the neighboring parcel. Recommendations for managing for deer wintering area include: harvest little or no cedar or hemlock, harvest during the winter to provide browse, use thinning to maintain the overstory cover, attempt to maintain canopy closure at 70 percent or greater that is at least 35' tall and composed primarily of softwood species. Light thinning can be done and is recommended in deer wintering areas to remove dead and dying trees to improve the health and vigor of the residual stand, which in turn improves the ability of the shelter to reduce snow depths on the ground. In addition, functional travel corridors for deer to adjacent wintering and foraging areas are an important landscape-level consideration.

In addition to maintaining broad age-classes across the forest and protecting rare and endangered species/habitats, it is essential to create or protect important features at a smaller, stand-level scale. The detailed stand-level prescriptions call for:

- retaining vertical structure (having trees of different heights within a stand),
- retaining the natural native species composition,
- maintaining or creating downed woody material, snags and cavity trees,
- ensuring a viable supply of mast (particularly through maintaining oaks that produce a good acorn crop), and
- limiting the disturbance to the forest soils and the forest floor, to reduce potential negative effects on site productivity.

6.2.5. Realize a positive financial return through careful timber harvests

Although monetary gain is not the Town's motivation for managing this parcel it can provide income to help recover the costs of developing and maintaining the recreational plan. Given this objective, we recommend harvesting that targets dead and dying merchantable trees to capture their economic value before it is too late. Also, given the objective of improving the quality of the timber resource through careful harvesting, it would be foolish to not derive income from harvesting.

The financial gain from timber sales is affected by the costs for harvesting and delivering wood to market, the degree to which the wood is properly utilized and marketed, the prices paid at market, and the prevention of theft. Using the proper equipment for the job is critical for reducing harvest costs, optimally utilizing the trees to their highest value, and for meeting the management objectives. It appears that the majority of harvesting in the past has been done with either hand-crews (chainsaw and skidder) or a mechanical system (feller-buncher and grapple skidder). While hand-crews work well in some situations they are not suited for all situations in this forest. A cut-to-length system (processor and forwarder) will result in a greater amount of wood utilized and sold because it is better suited to cutting smaller trees and merchandizing trees to a smaller diameter that would not be economical using a hand-crew or feller-buncher. A processor could be used to work through most of the acreage cutting the dying fir and white birch that would otherwise be left in the forest.

Timber theft is clearly a problem in Maine. To reduce the incidence of theft we recommend hiring a forester to oversee harvesting and ensure that all wood harvested is accounted for.

6.3 Property Description

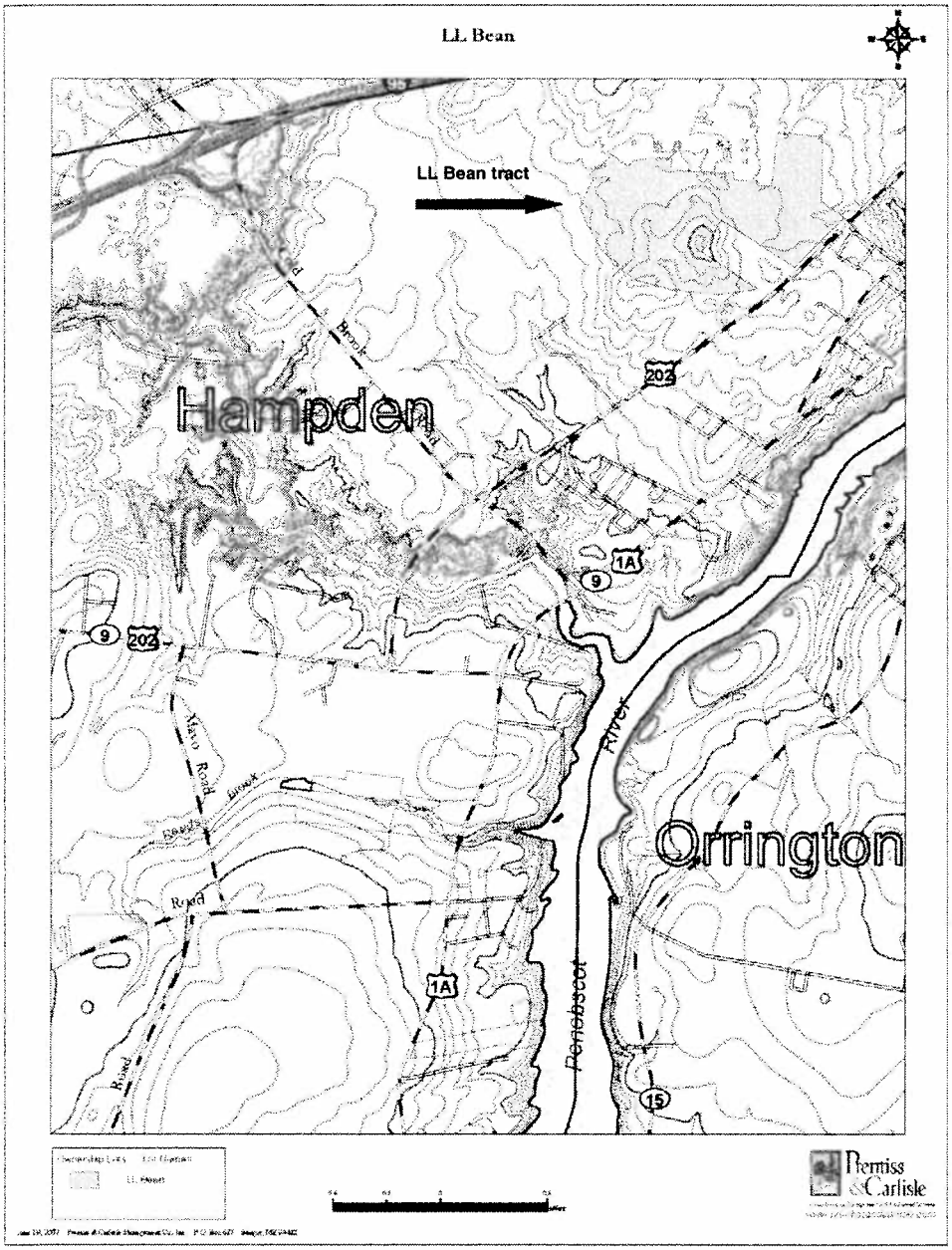
6.3.1. Acreage and Location

The L.L. Bean tract is located on the north side of Route 202 approximately 1.3 miles northeast of the Coldbrook Road/Route 202 intersection. The tract contains about ¼ mile of frontage on Route 202. (Figure 6.1). The property is situated between Route 202, I-95 and Coldbrook Road. We estimated the gross GIS acreage to be 218 acres based on information provided by the Town. The forested acres, conventionally defined as the acreage available for harvesting trees (i.e. accessible, productive, and harvesting is not prohibited) was estimated to be 194 acres. Acreage estimates are not the result of a survey but represent the best available information. The acreage calculations by type are shown in Table 6.2.

Table 6.2. Acreage by forest and non-forest categories

Category	Broad Type	Acreage Class	Acres
Forested Acres	Softwood	P4B	8
		S4D/S2B	23
			31
	Mixedwood	HS3B	12
		P4D/M2A	22
		SH2B	14
		SH3A	40
		SH3B	10
			98
	Hardwood	H2B	53
		PO2A	12
			65
		Total Forested Acres	**194**
Non-Forest		Water	<1
		Field	21
		Pipeline ROW	2
		Total Non-Forest	**24**
		Grand Total	**218**

Figure 6.1. Location map



6.3.2. Forest Age/Disturbance History

The forest is composed of three broad age/structural types:

(1) young, even-age stands that regenerated from clearcutting about 30 years ago (79 acres);

(2) mature even-age stands regenerated from heavy harvesting 45-70 or more years ago (70 acres); and

(3) two-age stands that were partially harvested about 30 years ago and contain a 30-year old age-class and a 70+ year old age-class (45 acres).

Much of the heavy harvesting that was done in the mid to late 1970s was clearcutting carried out by the owner at that time, the US government. Clearcutting was used to increase visibility around the training area, possibly for the radar site. At the time the property was owned by the US government (1970s) the forest was likely about 70 years old and likely regenerated from old pasture land likely pasture abandoned around 1900. It cannot be determined if there was active timber harvesting prior to the 1970s. However, it is clear that harvesting during the 1970s had a marked impact on stand structure causing the regeneration of the 79 acres of even-age ~30 year old stands and the partial regeneration of the 70 acres of two-age stands.

6.3.3. Soils/Topography

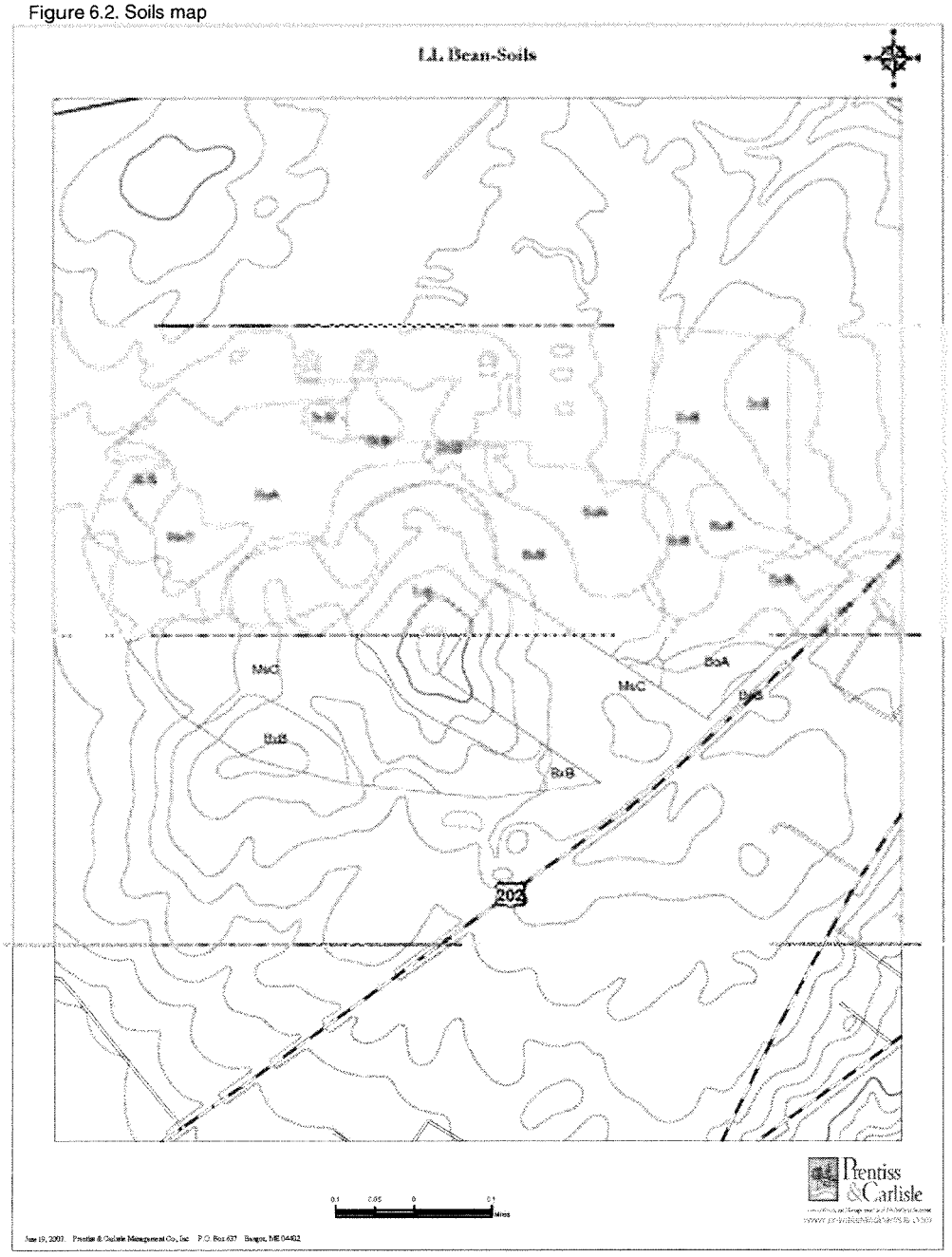
The topography is generally flat throughout the forest with minor topographical relief (2-10 feet). The flat and lowest elevations are generally shallow, organic soils over glacial till that are generally poorly drained. Just a few feet of elevational increase improves the soil depth and drainage to a point where hemlock and pine occur more frequently than fir and spruce. The hardwood dominated stands, which are more an artifact of disturbance history than soils, are found predominantly on the higher elevations. Over time, these will likely go from aspen/white birch stands to pine, fir, and hemlock. As such, it is not accurate to refer to these sites as "aspen", "birch" or "hardwood" sites.

During our site inspections in April and May, the forest floor was generally wet and many of the trails under a few inches of water. This was consistent with the predominantly poorly drained soils (Table 6.3).

Table 6.3 Acreage by soil series

Broad Type	Drainage Class	Total
Biddeford silt loam, 0-3 percent slopes (BaB)	Very poorly drained	56
Buxton silt loam, 0-2 percent slopes (BuA)	Somewhat poorly drained	5
Buxton, Scantic, and Biddeford stony silt loams, 0-8 percent slopes (BxB)	Very poorly drained	46
Monarda and Burnham extremely stony silt loams, 0-15 percent slopes (MsC)	Very poorly drained	45
Monarda and Burnham very stony silt loams, 0-8 percent slopes (MrB)	Poorly drained	4
Scantic silt loam, 0-8 percent slopes (ScB)	Poorly drained	17
Suffield silt loam, 2-8 percent slopes (SuB)	Moderately well drained	11
Thorndike very stony silt loam, 2-8 percent slopes (TvB)	Well drained	35
Grand Total		**218**

Figure 6.2. Soils map



6.3.4. Water Resources

The property has very little water on it. We did not find any sizable brooks or streams although there are a number of small intermittent, unmapped brooks. There is small pond that is partially within the lot and appears to have been an abandoned gravel pit. There is one notable wetland about 1 acre in size in the northwest portion of the property on the H2B stand. These riparian areas are very important for biodiversity.

6.3.5. Boundary Lines

By state law it is the responsibility of the landowner to ensure the boundary lines are properly maintained when harvesting more than 10 acres near a boundary. Lines should be identified and clearly marked with paint and updated when appropriate. Special consideration should be made when harvesting 10 or more acres within 200' of an adjacent owner. A forester should re-paint these lines if they are not clearly visible prior to any harvesting. In cases where lines are no longer visible, a surveyor may be required to re-establish the lines. Property line trees can not be harvested without first obtaining permission from abutting landowner.

The boundary lines appear to be adequate at this time but they should be periodically inspected and updated if necessary. It is much less expensive to renew lines than it is to re-establish lines using a survey. Relatively new flagging can be found along much of the lines.

6.3.6. Forest Cover Types

We used aerial photo-interpretation (true-color contact prints taken by James W. Sewall in April 2006) to determine the productive forest acres and the acres by each forest and non-forest type within the ownership boundary (Figure 6.3). Photo-interpretation was ground-truthed and changed if necessary.

The typing scheme consists of a broad species grouping (H, HS, M, SH, S, C, P, PO), a size class (R, 1-4), and a canopy closure class (A-D). H, M, and S indicate hardwood, mixedwood, and softwood, respectively. C, P and PO designate a stand dominated by cedar (C), pine (P) or poplar [(PO); aspen or balm-of-Gilead]. A single H or S indicates this type comprises 75 percent or more of the volume. For HS or SH types, the first letter indicates the more dominant type. M is used if it cannot be discerned which group is more dominant. An "S" at the end of the type name indicates that the site is wet (i.e. CS3A and SH3CS). The size classes indicate the following:

R = regeneration, or trees 5' tall or less
1 = saplings 1-3" DBH, or about 5-20' tall
2 = larger saplings/small polesize trees about 3-5" DBH and 20-40' tall
3 = polesize trees, 20-55' tall and 5-9" DBH

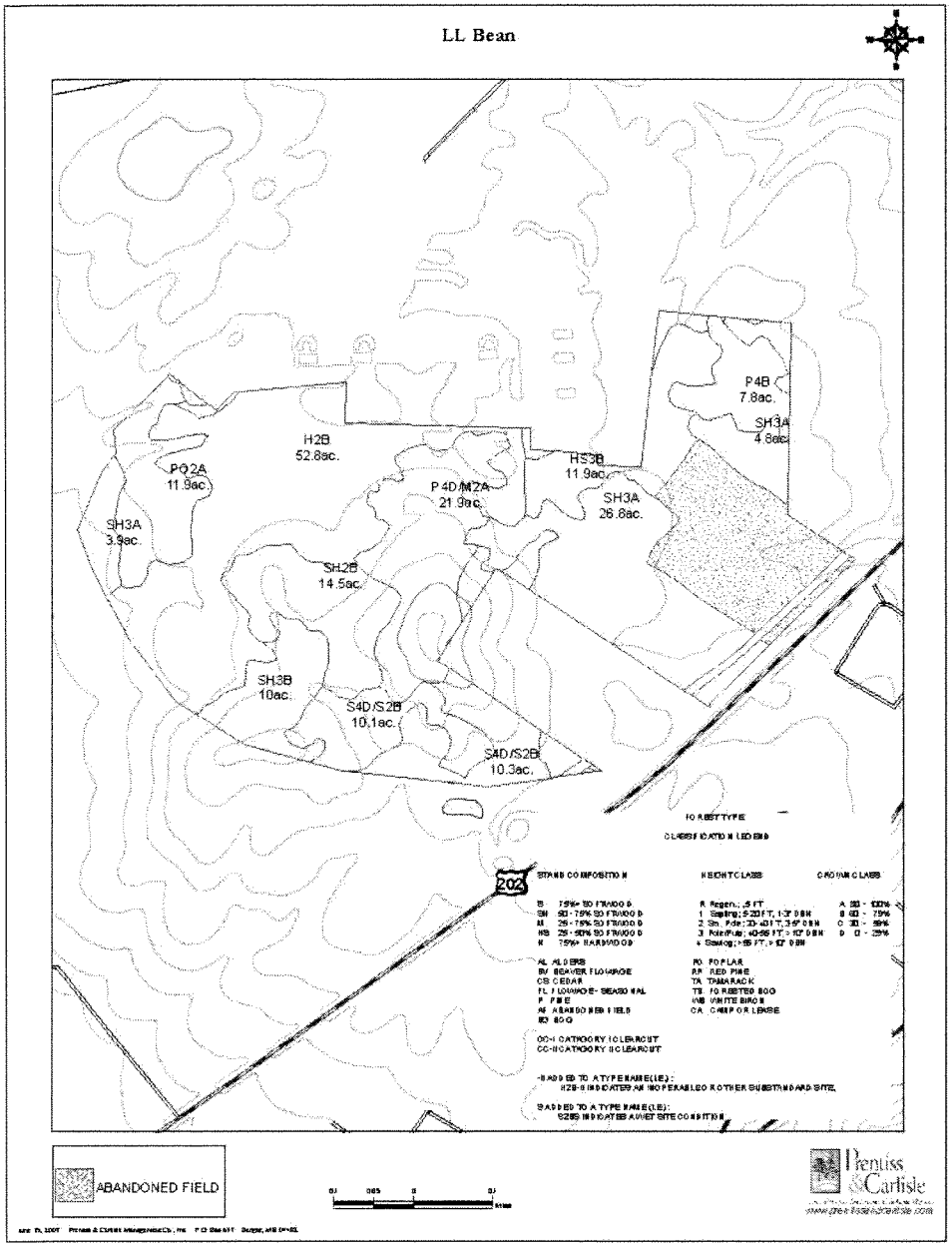
4 = sawlog size trees, 55'+ tall and 10"+ DBH

The canopy closure classes are:

A = 80 percent or greater
B = 60-79 percent
C = 30-59 percent
D = 0-29 percent

In all we had 9 distinct forest types, which are described in greater detail in the "Detailed Stand Information" section.

Figure 6.3. Type map for property showing forest types delineated from aerial photos and site inspection



6.3.7. Timber Volume and Quality

As part of this plan, we completed a timber inventory of the property in May 2007. We installed 39 plots along a grid. The inventory data were stratified according to the forest types developed from the photo-interpretation and ground checking. Across all forested acres, we estimate there are 2,402 cords of merchantable wood, which equates to 12.4 cords per forested acre ± 10.9 percent (Table 6.4).

Volume by product is shown in Table 6.5. Approximately 38 percent of the volume is pulp and 38 percent is growing stock, and 24 percent in sawlog volume (including pallet). Pulp volume is wood that cannot be merchandized as sawlogs now or in the future. This includes smaller trees with poor form and large sawlog-size trees that because of stem defects such as rot, seams or excessive branchiness can only be merchandized as pulpwood. These trees occupy valuable space in the forest that could otherwise be used to grow more valuable trees. The "growing stock" portion of volume is comprised of trees that meet sawlog quality specifications but are undersized. Sawlog volume meets the current specifications for logs in regional markets (See product specifications in Appendix).

Table 6.4. Summary statistics for the L.L. Bean inventory

Forest Type	Acres	Plots (#)	Mean	Standard Deviation	Standard Error	Std Error as a Pct. Of the Mean	Unless a 1 in (N) chance has occurred in sampling, the true mean is with the interval below. N = 10		N = 20	
H2B	53	10	2.96	2.89	0.91	30.82	1.29	4.63	0.9	5.02
HS3B	12	3	16.29	16.43	9.48	58.21	0	43.98	0	57.1
P4B	8	2	41.3	0	0	0	0	0	0	0
P4D/M2A	22	5	12.85	11.82	5.29	41.14	1.58	24.12	0	27.53
PO2A	12	3	0.71	1.23	0.71	100	0	2.78	0	3.77
S4D/S2B	23	3	10.35	6.88	3.97	38.38	0	21.95	0	27.44
SH2B	14	2	8.18	0	0	0	0	0	0	0
SH3A	40	8	24.32	11.65	4.12	16.93	16.52	32.12	14.58	34.06
SH3B	10	3	10.3	11.16	6.44	62.58	0	29.11	0	38.02
Total	194	39	12.38	0	1.35	10.9	10.09	14.67	9.63	15.14

Table 6.5. Volume by product and species

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
W Pine	0	164	0	0	15	329	681
Spruce	0	50	0	0	29	1	147
Fir	0	12	0	0	123	32	187
Hemlock	0	7	0	0	20	28	65
Cedar	0	0	0	0	46	78	124
White birch	0	0	0	0	128	141	269
Red Maple	0	0	0	0	153	161	314
Aspen	0	11	0	0	398	101	523
Oak	3	10	6	0	0	29	72
Other Hwd	0	0	0	0	0	20	20
Total	3	253	6	0	913	921	2,402

6.3.8. Species Composition

Approximately 50 percent of the volume is in softwood species (white pine, balsam fir, red spruce, hemlock, and cedar), and the remaining 50 percent is in hardwood trees (white birch, red maple, aspen, oak, and other hardwood; Table 6.6). In comparison, the statewide average volume (2002) was 16.0 cords per forested acre, of which, approximately 44 percent is in hardwood species. Thus, this forest has substantially less volume than the state average but slightly more hardwood than average.

Table 6.6. Merchantable volume (cord) by diameter class and species

DBH	W Pine	Spruce	Fir	Hemlock	Cedar	W Birch	R Maple	Aspen	Oak	Other Hwd	Tot Swd	Tot Hwd	Tot All
5	0	0	53	0	0	0	72	100	0	20	53	191	244
6	0	16	31	0	29	62	63	57	0	0	76	183	258
7	0	0	49	0	25	54	31	138	0	0	74	223	297
8	0	20	39	0	0	38	0	51	0	0	58	89	147
9	15	0	15	15	13	115	20	36	0	0	58	171	228
10	0	28	0	18	0	0	69	62	0	0	46	131	178
11	39	28	0	0	40	0	59	17	0	0	107	76	182
12	20	0	0	0	18	0	0	0	36	0	38	36	74
13	41	20	0	0	0	0	0	18	0	0	61	18	79
14	44	0	0	0	0	0	0	24	0	0	44	24	68
15	58	15	0	14	0	0	0	21	0	0	87	21	109
16	39	0	0	18	0	0	0	0	0	0	57	0	57
17	42	21	0	0	0	0	0	0	0	0	63	0	63
18	14	0	0	0	0	0	0	0	0	0	14	0	14
19	35	0	0	0	0	0	0	0	18	0	35	18	53
20	67	0	0	0	0	0	0	0	0	0	67	0	67
21	72	0	0	0	0	0	0	0	0	0	72	0	72
22	129	0	0	0	0	0	0	0	17	0	129	17	147
24	24	0	0	0	0	0	0	0	0	0	24	0	24
28	14	0	0	0	0	0	0	0	0	0	14	0	14
29	9	0	0	0	0	0	0	0	0	0	9	0	9
30	7	0	0	0	0	0	0	0	0	0	7	0	7
33	12	0	0	0	0	0	0	0	0	0	12	0	12
Tot 5-9"	15	35	187	15	66	269	186	381	0	20	318	856	1,174
Tot 10+	666	112	0	50	58	0	128	142	72	0	886	342	1,228
Tot All	681	147	187	65	124	269	314	523	72	20	1,204	1,198	2,402

6.4 Recommended Projects

6.4.1. Timber Harvesting

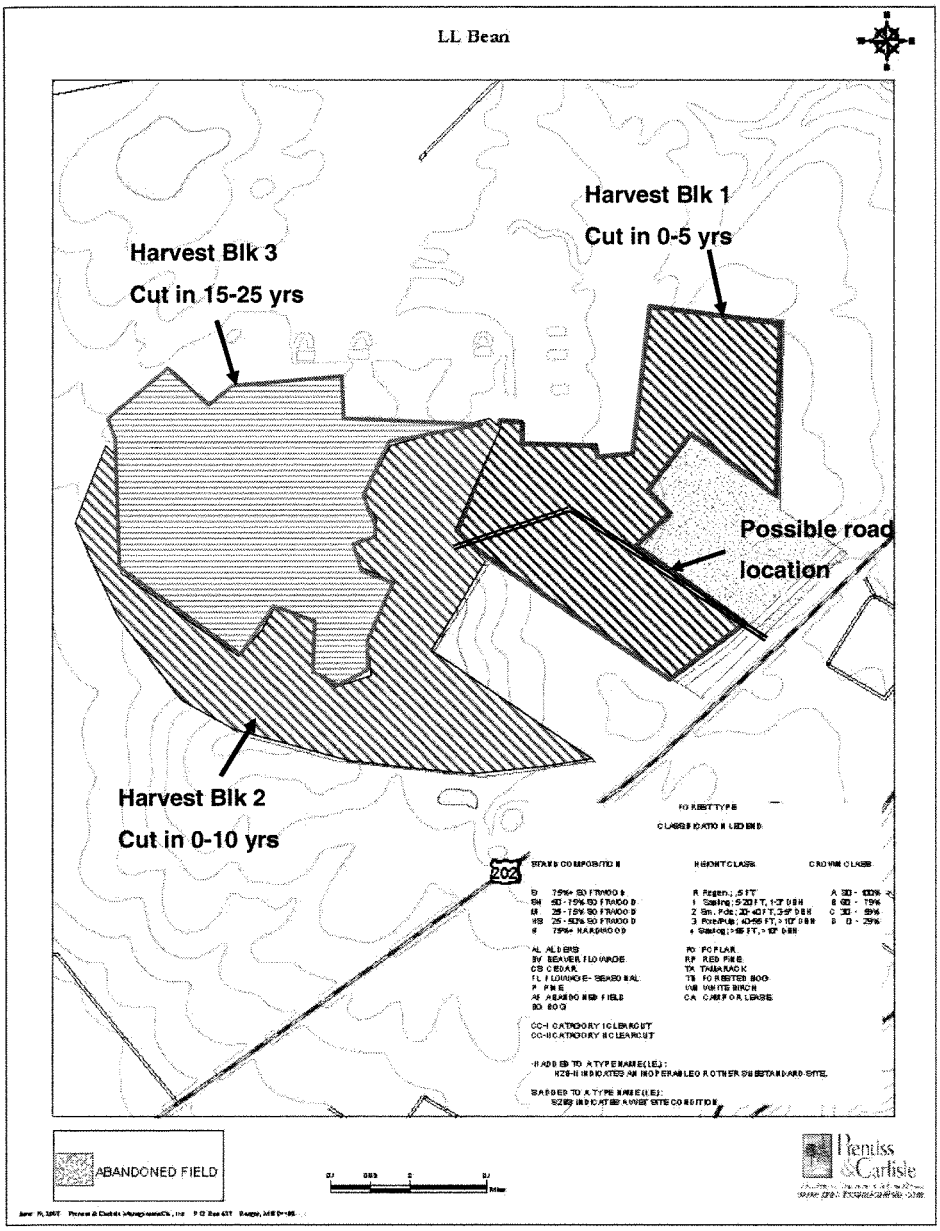
The overall goal for harvesting is to manipulate stand structure and species composition to create a forest structure that will meet the multi-use objectives for this tract. Across the forest, the goals are to create three-age stands dominated by long-lived intermediate shade-tolerant species such as spruce, pine, hemlock, oak, sugar maple, and yellow birch. Such stands will be valuable from an economic, aesthetic and biodiversity perspective.

We recommend partial harvests across 110 of the 194 forested acres that will result in a total harvest of about 839 cords. The harvesting is divided into two harvest blocks (1 & 2; Figure 6.4). Block one is a higher priority than two and should be treated within the next five years. It may be more practical to harvest Block 2 at the same time as Block 1, although from a silvicultural perspective this is not necessary.

Table 6.7. Projected harvest volumes by harvest block and stand type

Harvest Block	Stand	Acres	Volume (cords/acre)	Volume Cords	Average Removal (cords/acre)	Total Removal (cords)	Percent Removal
1	P4B	8	41.3	330	15	120	36%
	SH3A (east)	32	24.3	768	9	284	37%
	HS3B	12	16.3	194	5	60	31%
	Total	52	25.1	1,292	9	464	36%
2	P4D/M2A	22	12.9	283	6	122	43%
	SH3A (west)	4	24.3	95	9	35	37%
	SH3B	10	10.3	103	9	88	85%
	S4D/S2B	23	10.4	238	6	131	55%
	Total	59	8.2	480	6	375	78%
Grand Total		110	16.1	1,773	8	839	47%

Figure 6.4. Harvest blocks in L.L. Bean tract



Silviculture Recommendations

Silviculture prescriptions are designed to convert the species composition from short-lived and or shade intolerant trees to longer lived shade tolerant or intermediate tolerant species. In addition, these prescriptions are intended to create three-age stands throughout the forest to meet the Town's various objectives. It will take two to three entries and 30-40 years to convert the forest to the desired species composition and structure.

Table 6.8. Silviculture prescriptions for stands recommended for harvesting over the next 10 years

Stand	Acres	Volume (cords/ac.)	Percent Removal	Prescription	Details	Goal
P4B	8	41.3	36%	Crown Thin	Harvest suppressed and intermediate pine first and codominants second to achieve a 15-20 foot spacing	Maintain even-age pine stand but substantially increase average tree diameter
SH3A	36	24.3	38%	Improvement Thin	Harvest poor quality trees to create a two age stand with pine, spruce, and good quality red maple and oak in the overstory, and sufficient growing space for the regeneration of shade tolerant trees	Begin the process of altering single-cohort stand to a three-age stand by removing poor quality trees and undesirable species, thereby creating growing space for regeneration
HS3B	12	16.3	31%	Improvement Thin	Same as above	Same as above
P4D/M2A	22	12.85	43%	Improvement Thin	Target for removal fir, red maple, aspen and poor quality hemlock to favor spruce and pine	Convert two age class to three age class by thinning the M2A cohort
SH3B	10	10.3	85%	Improvement Thin	Harvest fir, white birch, and poor quality red maple	Improve quality and species composition; inititate regeneration
S4D/S2B	23	10.4	55%	Improvement Thin	Harvest 5-10" poor quality fir, cedar, red maple and white birch; retain large pine	Improve quality and species composition; inititate regeneration

Harvest Equipment and Timing

We recommend using a cut-to-length harvest system on the property as it is the best suited to meet the silvicultural objectives. Harvesting should be done in the winter on frozen ground given the wet soil conditions.

6.4.2. Recreation Plan

The Town should form a committee to create a Recreation Plan for this parcel. The first goal should be to determine the mix of uses that will be allowed on the property from the various alternatives (i.e. snowmobile, ATV, hiking, skiing, etc.). Based on the concluded best use(s), the committee should visit nearby recreation areas and determine the trail specifications for the desired use. A trail system should be designed that meets the use requirements. And finally, a construction and maintenance plan should be developed.

6.5 Detailed Stand Information

Nine stand types were identified and described: H2B, HS3B, P4B, P4D/M2A, PO2A, S4D/S2B, SH2B, SH3A, SH3B.

6.5.1. Stand Type: H2B

The H2B type (53 acres) is composed primarily of 3-5" hardwood trees that are 20-40' tall. It is dominated by aspen with a lesser component of red maple. Red maple trees are generally smaller and regenerated from stump sprouting, while aspen likely regenerated from root suckering following a clearcut that occurred about 30 years ago. There are some residual large white pine trees in the overstory but they are scattered and contribute little to the volume and value and have little affect on the rapidly growing young hardwood trees below. The 10- and 20-year PAI are both 0.95 cords per acre per year. The stand will become financially operable in the next 10-15 years depending on markets and growth rates. The current merchantable volume is 3 cords per acre and is composed of the larger (5-7") aspen. The basal area of the merchantable trees is 16.5 square feet per acre and the density is 99 trees per acre. The total density of all trees is about 2,300 stems per acre. We recommend allowing the stand to grow for another 10-15 years before any harvesting is done.

Table 6.9. Stand Attributes for H2B type.

Attribute	Description
Stand area	53 acres
Composition/ structure	Composed primarily of aspen (82%), red maple (18%) by density; trees are generally 20-40' tall, 3-5" dbh; canopy closure is 60-79 percent ; QMD = 3.0"
Age/history	Approximately 30 years old; regenerated from clearcut
Stand health	Very good
Stand volume	3.0 cords/acre
Stand stocking	Very good
Stand quality	Very good
Growth rate	Excelent; 10-year PAI is 0.95 cds/ac/yr
Project Recommendations	None within 10 years
Long range silvicultural objectives	Thin in 10-15 years

Table 6.10 Product table for H2B stand showing volume by species and product.

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
W Pine	0	0.18	0	0	0	0.07	0.44
Tot Swd	0	0.18	0	0	0	0.07	0.44
R Maple	0	0	0	0	0	0.26	0.26
Aspen	0	0	0	0	1.25	1.01	2.26
Tot Hwd	0	0	0	0	1.25	1.27	2.52
Total All	0	0.18	0	0	1.25	1.34	2.96

6.5.2. Stand Type: HS3B

The HS3B type (12 acres) is 82 percent hardwood and 18 percent softwood by merchantable volume. It is composed of pole-size aspen and white birch trees beneath large, sawlog-size white pine trees. The basal area of the merchantable trees is 60.0 square feet per acre and the density is 139 trees per acre. The quadratic mean diameter (diameter of the tree with the average basal area) is 8.9". We recommend a partial harvest to remove about 1/3rd of the volume within the next 10 years. The long-term objective is moving this stand from an aspen dominated stand to a mixedwood stand with components of white pine, spruce, red and sugar maple, and oak. The long-term silviculture goals should foster the growth of longer-lived more shade tolerant species by harvesting aspen and white birch through light partial harvests. The goal is to expedite what would occur naturally (i.e. speed up succession) through careful partial harvests.

Table 6.11. Stand Attributes for HS3B type.

Attribute	Description
Stand area	12 acres
Composition/ structure	Composed primarily of aspen (72%), white pine 18%), and white birch (10%); white pine component is older and larger with trees ranging from 20-35" and generally 60-85' tall; canopy closure is 60-79 percent, and the QMD is 8.9".
Age/history	Hardwood trees are approximately 45 years old and the pine are 80-100 years old. Hardwood regenerated following a partial overstory removal about 45 years ago
Stand health	Generally good; pine have rot within the first 16' of stemwood; aspen is generally healthy
Stand volume	16.3 cords/acre
Stand stocking	Very good
Stand quality	Excellent; approximately 86 percent of volume in growing stock or sawlogs
Growth rate	Fair; 10-year PAI is 0.38 cds/ac/yr
Project Recommendations	Improvement thinning designed to remove about 30 % of volume
Long range silvicultural objectives	Move towards longer-lived mixedwood species, such as maple, oak, pine and spruce

Table 6.12. Product table for HS3B stand showing volume by species and product.

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
W Pine	0	0.68	0	0	0	1.55	3.01
Tot Swd	0	0.68	0	0	0	1.55	3.01
W Birch	0	0	0	0	1.58	0	1.58
Aspen	0	0.4	0	0	10.18	0.67	11.7
Tot Hwd	0	0.4	0	0	11.77	0.67	13.28
Tot All	0	1.08	0	0	11.77	2.22	16.29
W Pine	0	0.68	0	0	0	1.55	3.01
Tot Swd	0	0.68	0	0	0	1.55	3.01
W Birch	0	0	0	0	1.58	0	1.58
Aspen	0	0.4	0	0	10.18	0.67	11.7
Tot Hwd	0	0.4	0	0	11.77	0.67	13.28
Tot All	0	1.08	0	0	11.77	2.22	16.29

6.5.3. Stand Type: P4B

The P4B type (8 acres) is dominated by large, mature white pine (75%) with a secondary component of fir (3%), hemlock (4%), red maple (3%), and oak (15%). The basal area of the merchantable trees is 143 square feet per acre and the density is 215 trees per acre. The quadratic mean diameter (diameter of the tree with the average basal area) is 11.0", and the merchantable volume is 41 cords per acre.

We recommend harvesting thinning half of the volume within 5 years using crown thinning designed to harvest pine trees with small or poor crowns and reallocate growing space to the healthiest individuals. All of the fir and poor quality oak, hemlock, and red maple should be harvested.

Table 6.13. Stand Attributes for P4B type.

Attribute	Description
Stand area	8 acres
Composition/ structure	Composed primarily of white pine 75%) with minor components of red oak (15%), hemlock (4%), fir (3%) and red maple (3%); trees are generally 50-70' tall, 5-22" dbh; canopy closure is 60-79 percent . QMD = 11.0".
Age/history	Approximately 70 years old; undetermined history
Stand health	Very good; pine are in excellent health, no remarkable health issues
Stand volume	41.3 cords/acre
Stand stocking	Fair—pine are overstocked and in need of thinning
Stand quality	Excellent; 74% of volume is classified as growing stock or sawlog
Growth rate	Good, although growth is slowing due to overstocking; 10-year PAI is 0.51 cds/ac/yr
Project Recommendations	Harvest the stand by removing about 40% of volume using crown thinning; remove smaller pine and pine with poor crowns and remove fir, and poor quality red maple, oak, and hemlock
Long range silvicultural objectives	Foster the growth of the best quality pine and oak for 30 or more years and then regenerate the stand

Table 6.14 Product table for P4B stand showing volume by species and product.

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
W pine	0	9.09	0	0	1.9	9.81	30.79
Fir	0	0	0	0	1.2	0	1.2
Hemlock	0	0	0	0	1.84	0	1.84
Tot Swd	0	9.09	0	0	4.94	9.81	33.83
R Maple	0	0	0	0	1.17	0	1.17
Oak	0.39	1.29	0.73	0	0	0.99	6.3
Tot Hwd	0.39	1.29	0.73	0	1.17	0.99	7.47
Tot All	0.39	10.38	0.73	0	6.11	10.8	41.3

6.5.4. Stand Type: P4D/M2A

The P4D/M2A type (22 acres) is a two-aged stand with mature spruce and pine sawlog-size trees above a sapling/pole-size mixedwood age-class. Species composition by merchantable volume is: white pine

(11%), red spruce (7%), balsam fir (12%), hemlock (5%), red maple (14%), and aspen (51%). The older age-class consists of white pine, red spruce and hemlock that are 15-30" in dbh and approximately 80-100 years old. This older, larger cohort comprises only 30 percent of the merchantable volume. The younger cohort consists primarily of 5-10" aspen, fir, and red maple that are about 30-45' tall and about 40 years old. In addition, there is an abundance of 1-4" fir, red maple, and aspen that are sub-merchantable. The total and merchantable basal area are 191 and 57 square feet per acre, respectively. and the density is 215 trees per acre. The quadratic mean diameter (diameter of the tree with the average basal area) for all trees (including 1-4" dbh) is 3.0" and the merchantable volume is 12.9 cords per acre.

We recommend an improvement thinning to remove poor quality trees within the next 10 years to establish a third age class and improve the quality of the midstory (M2A component). The long-term silviculture goals are to thin the mid-story in about 25-30 years. Understory thinning should target aspen and fir and favor longer-lived species.

Table 6.15 Stand Attributes for P4D/M2A type.

Attribute	Description
Stand area	22 acres
Composition/ structure	Older cohort is 15-30" white pine (11%), spruce (7%) and hemlock (5%); younger cohort is 5-10" aspen (52%), red maple (14%), and fir (12%).
Age/history	At least two partial harvests over the past 50 years to remove spruce and pine.
Stand health	Very good; no remarkable health issues
Stand volume	12.9 cords/acre
Stand stocking	Good
Stand quality	Excellent; 91% of volume is classified as growing stock or sawlog
Growth rate	Good due to abundance of young aspen; 10-year PAI is 0.53 cds/ac/yr and is expected to continue to increase for 30 years.
Project Recommendations	Improvement thinning designed to remove poor quality trees and accelerate succession to 3-age stand
Long range silvicultural objectives	Retain most large pine and foster growth of mid-story; thin midstory in 25-30 years

Table 6.16 Product table for P4B/M2A stand showing volume by species and product.

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
W Pine	0	0.45	0	0	0	0.55	1.35
Spruce	0	0.43	0	0	0.02	0	0.95
Fir	0	0	0	0	1.52	0	1.52
Hemlock	0	0	0	0	0	0.66	0.66
Tot Swd	0	0.88	0	0	1.54	1.21	4.48
R Maple	0	0	0	0	1.81	0	1.81
Aspen	0	0	0	0	6.56	0	6.56
Tot Hwd	0	0	0	0	8.37	0	8.37
Tot All	0	0.88	0	0	9.91	1.21	12.85

6.5.5. Stand Type: PO2A

The PO2A type (12 acres) is a young, vigorous aspen stand that regenerated following a clearcut about 30 years ago. The stand is comprised of 1-5" aspen with very little merchantable volume at this time (<1 cord/acre). The total basal area is 113 square feet per acre and the quadratic mean diameter is 2.3". The predicted growth rates are very high over the next 20 years with PAI estimates of 0.93 and 1.00. These high growth rates are a result of in-growth—small, presently unmerchantable trees growing into merchantable size classes.

There are two possibilities for treating this stand: (1) conduct a semi-commercial thinning within five years or (2) wait 10-20 years to do a commercial thinning. The first option would be designed to reduce stem density and create more growing space for the best quality aspen to increase growth rates. Such a thinning could produce small diameter pulpwood (3-5" dbh trees) and biomass that could be sold to local markets. However, the costs for the operation would be close to the mill sale revenue. This option should be discussed and evaluated on the ground to assess whether it would produce a net loss or gain given the mill and contractor prices at that time. Under current market conditions, the margin is too tight to break even. We do not recommend this option if the net result is a cost to the Town.

Table 6.17 Stand Attributes for PO2A type.

Attribute	Description
Stand area	12 acres
Composition/ structure	Monoculture of aspen 1-5" dbh and approximately 30 feet tall
Age/history	Stand regenerated following a clearcut that occurred about 30 years ago.
Stand health	Very good; no remarkable health issues
Stand volume	<1 cord/acre
Stand stocking	Fair-good—some areas are overstocked and would respond to a semi-commercial thinning
Stand quality	Excellent
Growth rate	Excellent due to abundance of young aspen reaching merchantable size in the next 10 years; 10-year PAI is 0.93 and is expected to continue to increase to 1.00 cds/ac/yr in the next 10-year period.
Project Recommendations	Semi-commercial thinning to reduce overstocking (only if revenue >= costs) or do nothing depending on economics
Long range silvicultural objectives	Foster the rapid growth of aspen and harvest in 20-30 years

Table 6.18 Product table for P02A stand showing volume by species and product.

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
Aspen	0	0	0	0	0	0.71	0.71
Tot Hwd	0	0	0	0	0	0.71	0.71
Tot All	0	0	0	0	0	0.71	0.71

6.5.6. Stand Type: S4D/S2B

The S4D/S2B type (23 acres) is a two-aged stand with mature spruce and pine sawlog-size trees above a sapling/pole-size softwood age-class. Species composition by merchantable volume is: white pine (24%), red spruce (24%), balsam fir (25%), cedar (7%), white birch (11%), and other hardwood (8%). The older age-class consists of white pine and red spruce 11-22" in dbh and approximately 70-90 years old. This older, larger cohort comprises 48 percent of the merchantable volume. The younger cohort consists primarily of 5-8" fir, cedar and white birch that are about 30-45' tall and about 40 years old. In addition, there is an abundance of 1-4" fir, spruce, cedar and white birch, that are sub-merchantable. The total and merchantable basal area are 122 and 50 square feet per acre, respectively. The density is 2,298 (total) and 163 (merchantable) trees per acre. The quadratic mean diameter (diameter of the tree with the average basal area) for all trees (including 1-4" dbh) is 3.1" and the volume is 10.4 cords per acre.

We recommend an improvement thinning designed to remove poor quality trees and accelerate the development of three age classes. The PAI is predicted to be relatively low over the next 10 years (0.28) but increase in the second decade (2017-27 to 0.56 cords/acre/year. The long-term silviculture goals are to remove the overstory and thin the understory in about 10-15 years. Understory thinning should target fir and white birch and favor spruce and pine.

Table 6.19 Stand Attributes for S4D/S2B type.

Attribute	Description
Stand area	23 acres
Composition/ structure	Two-age stand with a 70-90 year old overstory of pine and spruce (11-22") over a younger cohort (~40 years old) of fir, spruce, cedar and white birch (5-8")
Age/history	Younger age-class regenerated following a partial harvest about 40 years ago.
Stand health	Fair; larger pine have rot in the first 16' and fir should be closely monitored for butt rot
Stand volume	10.35 cords/acre
Stand stocking	good—younger cohort is well-stocked
Stand quality	Fair; pulpwood is 43 percent of total volume; large pine and some small fir have rot; some pine have excessive limbs
Growth rate	Fair; 10-year PAI is 0.29 but next 10-year PAI (2017-27) is 0.56. Second decade growth is higher due to spruce and fir reaching merchantable size.
Project Recommendations	Improvement thinning designed to remove poor quality trees and accelerate succession to 3-age stand
Long range silv. objectives	Retain most large pine and foster growth of mid-story; thin midstory in 25-30 years

Table 6.20 Product table for S4D/S2B stand showing volume by species and product.

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
W Pine	0	0.43	0	0	0	1.67	2.52
Spruce	0	0.91	0	0	0.26	0	2.44
Fir	0	0.3	0	0	1.06	0.74	2.62
Cedar	0	0	0	0	0.74	0	0.74
Tot Swd	0	1.63	0	0	2.06	2.41	8.31
W Birch	0	0	0	0	0	1.18	1.18
Oth Hwd	0	0	0	0	0	0.86	0.86
Tot Hwd	0	0	0	0	0	2.04	2.04
Tot All	0	1.63	0	0	2.06	4.45	10.35

6.5.7. Stand Type: SH2B

The SH2B type (14 acres) is a of 1-4" mixedwood stand composed of white pine (11%), red spruce (14%), balsam fir (43%), aspen (10%), red maple (10%), and white birch (11%) trees that are 10-30' tall. The stand likely regenerated following a clearcut about 30 years ago. There are some residual trees that were left after this harvest: 7-10" white birch and18-25" white pine that combine for about 8.2 cords per acre.

The 10- and 20-year PAI are 0.66 and cords per acre per year. The higher growth rate in the second decade (2017-2027) is driven by the age structure—the abundance of 2-4" stems. The stand will become financially operable in the next 10-15 years depending on markets and growth rates. The basal area of the total and merchantable stand is 93.6 and 30 square feet per acre, respectively. The density is 2,093 and 26 trees per acre for total and merchantable stems, respectively. We recommend allowing the stand to grow for another 10-15 years before any harvesting is done, at which time the overstory should be removed and the younger cohort thinned to remove fir, aspen, white birch, and poorly formed red maple. The long-term objective is to move this stand to a softwood type dominated by red spruce and white pine.

Table 6.21 Stand Attributes for SH2B type.

Attribute	Description
Stand area	14 acres
Composition/ structure	Mixedwood stand of 1-4" sapling/polesize trees that are 10-30' tall. Fir comprise 43% of the trees (density basis) and the remainder are an even amount of spruce, pine, aspen, white birch, and red maple. Merchantable volume of 8.2 cords/acre is comprised of residual white birch and pine that were left following the commercial clearcut 30 years ago.
Age/history	Stand regenerated following a commercial clearcut about 30 years ago.
Stand health	Good; sub-merchantable trees are healthy and growing rapidly
Stand volume	8.18 cords/acre
Stand stocking	good—younger cohort is well-stocked
Stand quality	Good;
Growth rate	Fair; 10-year PAI is 0.28 but next 10-year PAI (2017-27) is 0.66. Second decade growth is higher due to spruce and fir reaching merchantable size.
Project Recommendations	None in this 10-year period
Long range silvicultural objectives	Thin fir, aspen and white birch in 15-20 years to favor spruce and pine; move stand from mixedwood to spruce/fir/pine dominated

Table 6.22 Product Table for SH2B stand showing volume by species and product.

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
W Pine	0	1.83	0	0	0	2.59	6.16
Tot Swd	0	1.83	0	0	0	2.59	6.16
W Birch	0	0	0	0	0	2.02	2.02
Tot Hwd	0	0	0	0	0	2.02	2.02
Tot All	0	1.83	0	0	0	4.61	8.18

6.5.8. Stand Type: SH3A

The SH3A type (40 acres) is a relatively high volume mixedwood stand with 56 percent hardwood and 44 percent softwood by merchantable volume. It is composed of pole to log-size red maple (22%), white pine (21%), white birch (20%), aspen (11%), cedar (9%), red spruce (6%), balsam fir (5%), hemlock (4%), and red oak (2%). The basal area of the merchantable trees is 99.3 square feet per acre and the density is 266 trees per acre. The quadratic mean diameter (diameter of the tree with the average basal area) is 8.3".

Projected growth rates in the absence of any management are predicted to be steady for the next 20 years (~0.47 cords/acre/year) and then begin to decline in 30 years. The key for this stand is to maintain this growth rate, but on more valuable species and individuals and for a longer period of time. In the absence of harvesting, much of the growth will be to continue pulpwood production on poor quality trees. Such growth will begin to crash in 30-40 years. We recommend harvesting the fir, aspen, and white birch, and cutting the poor quality red maple and pine. The total removal should be about 8-10 cords per acre. The silviculture goal is to expedite what would occur naturally (i.e. speed up succession) through careful partial harvests that favor the longer-lived intermediate and shade tolerant species (spruce, pine, hemlock, and oak) over the shorter-lived species (fir, aspen, white birch). Most of the large pine should be left with the exception of pine with poor crowns or excessive branchiness to allocate more growing space to higher value individuals. Because red maple is prone to disease and poor form we recommend cutting red maple trees that are rough and rotten, but leaving good quality stems. The long-term objective is to slightly change the species composition so that it is dominated by white pine, spruce, hemlock, cedar, and oak in a 10-30-year period. We believe that this change would occur naturally but would take 50-70 years.

Table 6.23. Stand Attributes for SH3A type.

Attribute	Description
Stand area	40 acres
Composition/ structure	Mixedwood stand of 5-9" pole/sawlog size trees that are 40-50' tall. In addition, there are residual white pine that are older and larger (18-29") than the main stand. Species composition by volume is white pine (21%), spruce (6%), fir (5%), hemlock (4%), cedar (9%), white birch (20%), red maple (22%), aspen (11%), and oak (2%).
Age/history	Stand is approximately 60 years old although older pine are about 100 years old
Stand health	Many of the larger pine have rot in the first 16'; cedar, white birch and hemlock also have considerable rot; most of red maple shows signs of Eutypella canker, a common disease occurring in red maple caused by the fungus *Eutypella parasitica*.
Stand volume	24.3 cords/acre
Stand stocking	Good—younger cohort is well-stocked
Stand quality	Fair; 48% of volume is pulp with pine, cedar, red maple, and white birch having the highest proportions of pulp to growing stock/sawlog volume
Growth rate	Good; 10-year PAI is 0.47 and next 10-year PAI (2017-27) is 0.48. Growth declines to 0.43 in third period.
Project Recommendations	Partial harvest designed to change species composition to favor pine, spruce, hemlock and oak and remove poor quality stems
Long range silvicultural objectives	Partial harvesting on a 15-year interval to continually improve species composition and quality with the goal of allocating growing space to the growth of large, sawlog-size trees

Table 6.24. Product Table for SH3A stand showing volume by species and product.

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
W Pine	0	0.69	0	0	0	3.54	5.03
Spruce	0	0.32	0	0	0.57	0.03	1.38
Fir	0	0.12	0	0	0.93	0	1.25
Hemlock	0	0.18	0	0	0.14	0.33	0.9
Cedar	0	0	0	0	0.71	1.44	2.15
Tot Swd	0	1.32	0	0	2.36	5.33	10.71
W Birch	0	0	0	0	2.73	2.14	4.88
Red Maple	0	0	0	0	2.6	2.85	5.45
Aspen	0	0.15	0	0	1.61	0.78	2.75
Oak	0	0	0	0	0	0.53	0.53
Tot Hwd	0	0.15	0	0	6.94	6.31	13.61
Tot All	0	1.47	0	0	9.3	11.64	24.32

6.5.9. Stand Type: SH3B

The SH3B type (10 acres) is a mixedwood stand with 67 percent softwood and 33 percent hardwood by merchantable volume. It is composed of pole to log-size balsam fir (33%), red maple (33%), cedar (20%), and red spruce (15%). The basal area of the merchantable trees is 45 square feet per acre and the density is 170 trees per acre. The quadratic mean diameter (diameter of the tree with the average basal area) is 7.0".

Projected growth rates in the absence of any management are predicted to increase slightly over the next 30 years (0.27, 0.36, 0.40 cords/acre/year, respectively for the next three decades) and then begin to decline in 40 years. We recommend a partial harvest to improve species composition and quality. The long-term silviculture is similar to the SH3A stand, to change the species composition to favor spruce and pine.

Table 6.25. Stand Attributes for SH3B type.

Attribute	Description
Stand area	10 acres
Composition/ structure	Mixedwood stand of 5-15" pole/sawlog size trees that are 40-50' tall. Species composition by volume is fir (33%), red maple (33%), cedar (20%), and red spruce (15%).
Age/history	Stand is approximately 50 years old, although there are some older residual trees that are about 100 years old.
Stand health	Fair; nearly all cedar contains rot, most of red maple shows signs of Eutypella canker, a common disease occurring in red maple caused by the fungus *Eutypella parasitica.*
Stand volume	10.3 cords/acre
Stand stocking	fair—stocking is highly variable with some areas poorly stocked and others with adequate stocking
Stand quality	Poor; cedar and red maple are very poor quality; fir is fair
Growth rate	Fair; 10-year PAI is 0.27 and next 10-year PAI (2017-27) is 0.36.
Project Recommendations	Partial harvest designed to change species composition to favor pine, spruce, hemlock and oak and remove poor quality stems
Long range silvicultural objectives	Partial harvesting on a 15-year interval to continually improve species composition and quality with the goal of allocating growing space to the growth of large, sawlog-size trees

Table 6.26. Product table for SH3B stand showing volume by species and product.

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
Spruce	0	0.67	0	0	0	0	1.53
Fir	0	0	0	0	1.87	1.51	3.38
Cedar	0	0	0	0	0	2.03	2.03
Tot Swd	0	0.67	0	0	1.87	3.55	6.94
R Maple	0	0	0	0	0	3.35	3.35
Tot Hwd	0	0	0	0	0	3.35	3.35
Tot All	0	0.67	0	0	1.87	6.9	10.3

7 Main Road South

7.1 Plan Summary

The Main Road South tract is situated between Main Road South (Route 1A) and Mayo Road; to the east and west, respectively, and south of the Constitution Avenue subdivision. The parcel has no road frontage, but the most likely access points come from Liberty Road (off of Constitution Avenue) or from the middle school (off of Main Road South). The tract is about 63 acres in size with 55 acres classified as forested. Reeds Brook runs through the parcel from west to east where it eventually runs into the Penobscot River.

Based on our assessment, we believe this tract can be best used to meet the Town's goals for active recreation and forest demonstration. Perhaps the most valuable attribute of the parcel is its location behind the middle and elementary schools. There is a beaver viewing area behind the middle school that is used for education purposes. Additional "outdoor classrooms" could provide for more diverse education opportunities. Forest management, although secondary to recreation and demonstration, can be used to enhance recreation value and provide the setting for demonstrating the science of forest ecology and good forest management. Forest management as a primary use is not appropriate for this lot given the small size and lack of good existing forest structure.

The parcel receives a lot of use for recreation purposes. A snowmobile trail bisects the property following the gas line right-of-way; ATV use occurs on this trail as well; we found a few tree stands that have been recently used for bowhunting deer; and trails are actively used (primarily to get to and from the school) on the eastern half of the lot.

Based on our assessment, and in support of the Town's goals, the objectives for this tract are threefold:

1. Improve existing recreation recreation trails
2. Create an outdoor classroom to serve the school and public
3. Harvest timber with the primary objective of serving as a demonstration of good forest management

7.2 Management Objectives and Recommendations

7.2.1. Improve existing recreation trails

Implicit in any planning for this parcel is the protection of water quality in Reeds Brook. Currently, a snowmobile trail crosses through the brook. While the impact to water quality may be minimal when the brook is frozen solid, activity from snowmobiles and ATVs is creating ruts in the brook bed, erosion, and sedimentation. The first and highest priority for this tract is the construction of a bridge to cross the brook. There may be funds available to offset the cost of the snowmobile bridge.

The snowmobile trail follows a gas line right-of-way that is perpendicular to the brook. Just south of the brook the trail runs up a gradual slope. Runoff from rain water and snowmelt runs down the trail and into the brook causing erosion and sedimentation. Given the problems with water quality and erosion, the trail needs to be properly drained, including the installation of culverts and water bars.

Once the bridge and drainage problems are fixed, a thorough trail construction and maintenance plan should be developed to determine the permitted uses (i.e. ATV, snowmobile, etc.), the trail standards for the concluded uses (i.e. trail widths, number and length of trails), a trail system design, and a development of trail costs for construction and maintenance.

7.2.2. Create an outdoor classroom to serve the school and public

Given the close proximity of the parcel to the public schools the parcel is ideally located to establish an "outdoor classroom." An outdoor classroom can be used to enhance all parts of a school's curriculum; particularly science and math. Project Learning Tree offers grants for establishing outdoor classrooms as well as guidelines for how to make a project successful. There is a beaver viewing area adjacent to this parcel between the parcel and the school on Reeds Brook that is likely used by the school. We recommend designing and building similar areas throughout the forest.

A walking trail leads from the school to this area and extends westerly. Heading west on the trail, there is a forested wetland on either side that could serve as a learning area. Beyond the wetland there is a regenerating mixed wood stand that is about 10 years old with spruce and birch. This could serve as an excellent area to teach about forest succession and competition. Traveling further west and crossing the Brook, the parcel transitions to a mature conifer forest providing an excellent example of a mature Maine forest. Within this block (area west of the right-of-way) one could develop a demonstration area showcasing forest management activities and different forest harvesting and silviculture activities to promote sustainable forest management.

All of these destinations or "classrooms" can be created within a 15-minute walk from the elementary and middle schools. We recommend that the Town work with Project Learning Tree to develop and plan the outdoor classroom.

7.2.3. Harvest timber with the primary objective of serving as a demonstration of good forest management

From a timber management perspective, the area west of the pipeline is in need of some level of harvesting. This area is about 16 acres in size and contains about 350 cords. We recommend thinning out the poor quality trees to increase the health and aesthetic value of the forest. Any harvesting should be planned in accordance with the outdoor classroom planning and should be done primarily to serve this purpose.

7.3 Property Description

7.3.1. Acreage and Location

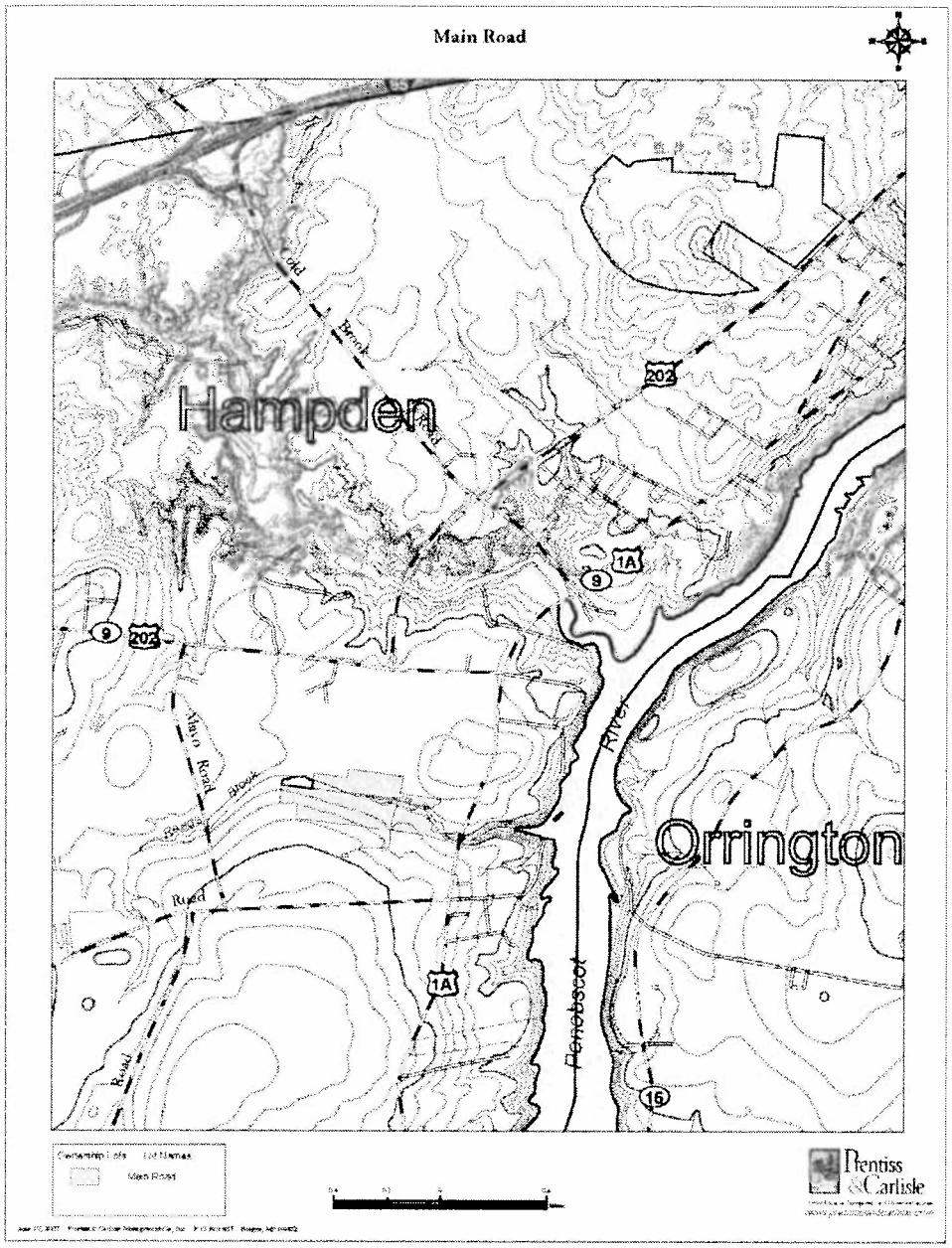
The Main Road South parcel is located between Main Road South (Route 1A) and Mayo Road to the east and west, respectively, and south of the Constitution Avenue subdivision. The parcel has no road frontage, but the most likely access points come from Liberty Road (off of Constitution Avenue) or from the middle school (off of Main Road South). The tract is about 63 acres in size with 55 acres classified as forested. Reeds Brook runs through the parcel from west to east where it eventually runs into the Penobscot River.

We estimated there are 63 gross GIS acres based on information provided by the Town. The forested acres, conventionally defined as the acreage available for harvesting trees (i.e. accessible, productive, and harvesting is not prohibited) was estimated to be 55 acres. Acreage estimates are not the result of a survey but represent the best available information. The acreage calculations by type are shown in Table 7.2.

Table 7.2. Acreage by forest and non-forest categories.

Category	Broad Type	Acreage Class	Acres
Forested Acres	Softwood	S3A	1.1
			1.1
	Mixedwood	S4D/SH3B	14.7
		SH2C	3.0
		SH3C	6.4
			24.1
	Hardwood	H1C	8.2
		H2A	7.7
		H3A	1.1
			17.0
		Total Forested Acres	**42.2**
Non-Forest		Wetlands	18.8
		Pipeline ROW	1.5
		Other	0.9
		Total Non-Forest	**21.2**
		Grand Total	**63.4**

Figure 7.1. Location map



7.3.2. Forest Age/Disturbance History

The forest is composed of two broad age/structural types:

(1) young, even-age stands that regenerated from clearcutting or heavy partial cuts about 25 years ago (25 acres); and

(2) mature even-age stands regenerated from heavy harvesting 50-70 or more years ago (17 acres);

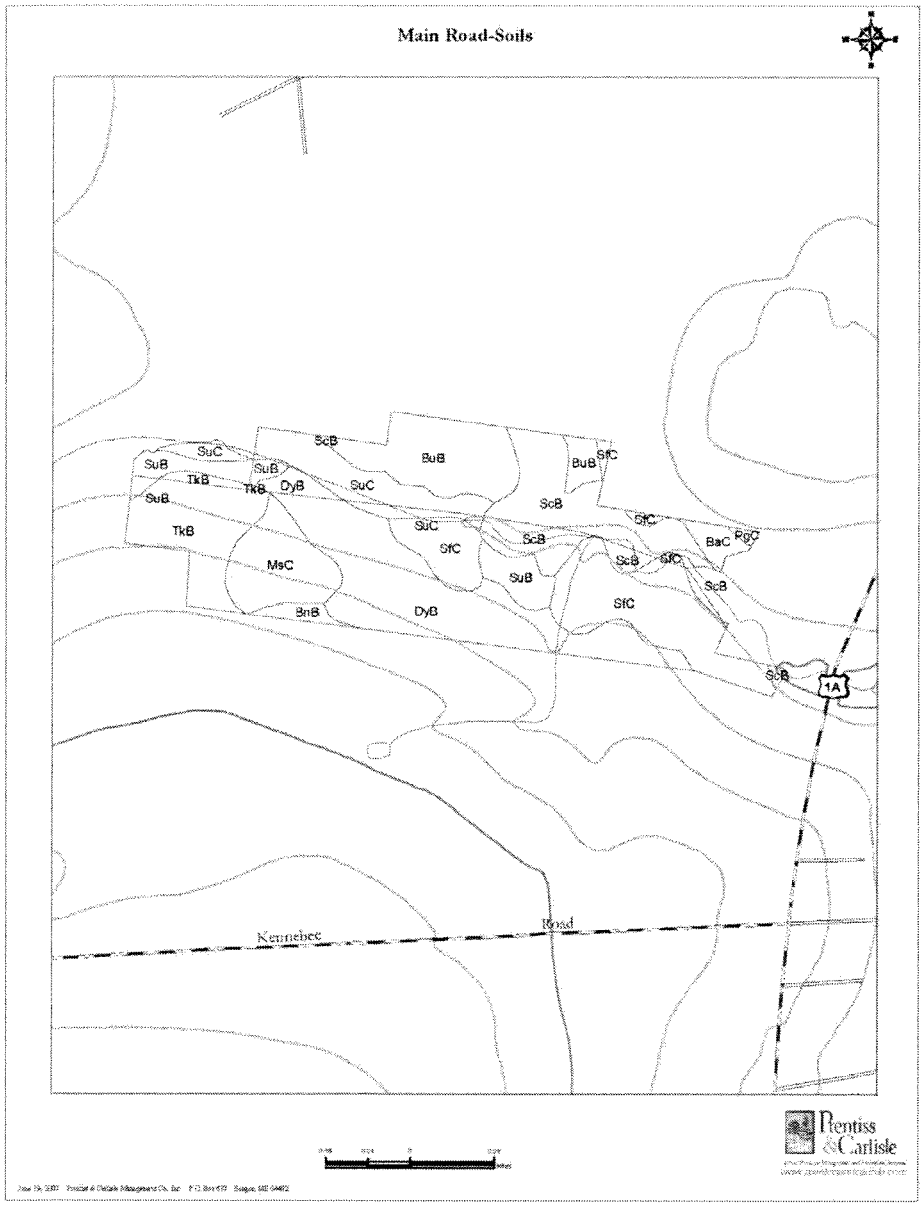
The entire parcel appears to have regenerated following pasture land abandonment about 60-80 years ago. About 25 years ago, most of the parcel east of the pipeline was aggressively harvested.

The area east of the pipeline (47 acres) is dominated by young stands that were aggressively harvested about 25 years ago to remove spruce, fir and sawlog quality red maple, leaving cedar, small spruce and fir, and poor quality red maple. The area west of the pipeline is dominated by mature softwood and mixed wood stands that regenerated on abandoned pasture land about 50-70 years ago. This area does not appear to have been harvested since its establishment.

7.3.3. Soils/Topography

The topography is generally flat north of Reeds Brook to the brook. South of the brook the elevation increases gradually with distance from the brook. In general, the soils around the brook are more poorly drained while the soils south of the brook and higher are better drained. However, there are pockets of more poorly drained soils in the higher elevation areas south of the brook (Figure 7.2). A significant portion of the property is classified as having silt loams, which are highly prone to erosion. Care should be taken when harvesting near the brook and perennial streams to avoid causing erosion and siltation of the brook.

Figure 7.2. Soils map (key on next page)



Key	Series	Drainage Class	Farmland Class	Acres
BuB	Buxton silt loam, 2 to 8 percent slopes	Somewhat poorly drained	Farmland of statewide importance	0.9
ScB	Scantic silt loam, 0 to 8 percent slopes	Poorly drained	Not prime farmland	2.9
ScB	Scantic silt loam, 0 to 8 percent slopes	Poorly drained	Not prime farmland	6.1
SfC	Stetson-Suffield complex, 0 to 15 percent slopes	Well drained	Farmland of statewide importance	0.4
ScB	Scantic silt loam, 0 to 8 percent slopes	Poorly drained	Not prime farmland	0.1
BuB	Buxton silt loam, 2 to 8 percent slopes	Somewhat poorly drained	Farmland of statewide importance	6.2
SuC	Suffield silt loam, 8 to 15 percent slopes	Moderately well drained	Not prime farmland	0.7
SuC	Suffield silt loam, 8 to 15 percent slopes	Moderately well drained	Not prime farmland	4.0
SuC	Suffield silt loam, 8 to 15 percent slopes	Moderately well drained	Not prime farmland	0.7
PgC	Plaisted gravelly loam, 8 to 15 percent slopes	Well drained	Farmland of statewide importance	0.2
SuB	Suffield silt loam, 2 to 8 percent slopes	Moderately well drained	All areas are prime farmland	0.2
SuB	Suffield silt loam, 2 to 8 percent slopes	Moderately well drained	All areas are prime farmland	0.4
SuB	Suffield silt loam, 2 to 8 percent slopes	Moderately well drained	All areas are prime farmland	1.3
DyB	Dixmont very stony silt loam, 2 to 8 percent slopes	Somewhat poorly drained	Not prime farmland	13.1
DyB	Dixmont very stony silt loam, 2 to 8 percent slopes	Somewhat poorly drained	Not prime farmland	0.8
TkB	Thorndike very rocky silt loam, 2 to 8 percent slopes	Somewhat excessively drained	Not prime farmland	6.1
TkB	Thorndike very rocky silt loam, 2 to 8 percent slopes	Somewhat excessively drained	Not prime farmland	0.0
TkB	Thorndike very rocky silt loam, 2 to 8 percent slopes	Somewhat excessively drained	Not prime farmland	0.4
BaC	Bangor silt loam, 8 to 15 percent slopes	Well drained	Farmland of statewide importance	1.0
MsC	Monarda and Burnham extremely stony silt loams	Very poorly drained	Not prime farmland	4.8
SfC	Stetson-Suffield complex, 0 to 15 percent slopes	Well drained	Farmland of statewide importance	2.6
SfC	Stetson-Suffield complex, 0 to 15 percent slopes	Well drained	Farmland of statewide importance	8.1
SfC	Stetson-Suffield complex, 0 to 15 percent slopes	Well drained	Farmland of statewide importance	0.1
SuB	Suffield silt loam, 2 to 8 percent slopes	Moderately well drained	All areas are prime farmland	1.7
BnB	Bangor very stony silt loam, 0 to 8 percent slopes	Well drained	Not prime farmland	0.7

7.3.4. Water Resources

The primary water feature on the property is Reeds Brook. Reeds Brook runs west to east where it drains into the Penobscot River. It is important that water quality is protected in the brook because it in turn affects aquatic habitat in the Penobscot River. Harvesting near the brook, if not done carefully can lead to sedimentation. Sedimentation can decrease water quality and negatively impact salmon and other native fish habitat. We suggest that logging contractors strictly adhere to BMPs and state regulations pertaining to harvesting near brooks, minimize crossings of brooks when legally permissible, and leave sufficient shade within a buffer around the brook. We have also noted where recreation activities have negatively impacted water quality in the brook and have made recommendations to fix these problems.

7.3.5. Boundary Lines

By state law it is the responsibility of the landowner to ensure the boundary lines are properly maintained when harvesting more than 10 acres near a boundary. Lines should be identified and clearly marked with paint and updated when appropriate. Special consideration should be made when harvesting 10 or more acres within 200' of an adjacent owner. A forester should re-paint these lines if they are not clearly visible prior to any harvesting. In cases where lines are no longer visible, a surveyor may be required to re-establish the lines. Property line trees can not be harvested without first obtaining permission from abutting landowner.

The boundary lines are not adequate at this time. Although we did find several pins, the lines should be marked with boundary paint. It may be necessary to re-survey the lines. However, we advise that you attempt to mark the lines prior to hiring a surveyor. If it is not possible to determine a precise location for the line than we advise that you contact a surveyor to re-establish the lines.

7.3.6. Forest Cover Types

We used aerial photo-interpretation (true-color contact prints taken by James W. Sewall in April 2006) to determine the productive forest acres and the acres by each forest and non-forest type within the ownership boundary (Figure 6.2). Photo-interpretation was ground-truthed and changed if necessary.

The typing scheme consists of a broad species grouping (H, HS, M, SH, S, C, P, PO), a size class (R, 1-4), and a canopy closure class (A-D). H, M, and S indicate hardwood, mixedwood, and softwood, respectively. C, P and PO designate a stand dominated by cedar (C), pine (P) or poplar [(PO); aspen or balm-of-Gilead]. A single H or S indicates this type comprises 75 percent or more of the volume. For HS or SH types, the first letter indicates the more dominant type. M is used if it cannot be discerned which group is more dominant. An "S" at the end of the type name indicates that the site is wet (i.e. CS3A and SH3CS). The size classes indicate the following:

R = regeneration, or trees 5' tall or less
1 = saplings 1-3" DBH, or about 5-20' tall
2 = larger saplings/small polesize trees about 3-5" DBH and 20-40' tall
3 = polesize trees, 20-55' tall and 5-9" DBH
4 = sawlog size trees, 55'+ tall and 10"+ DBH

The canopy closure classes are:

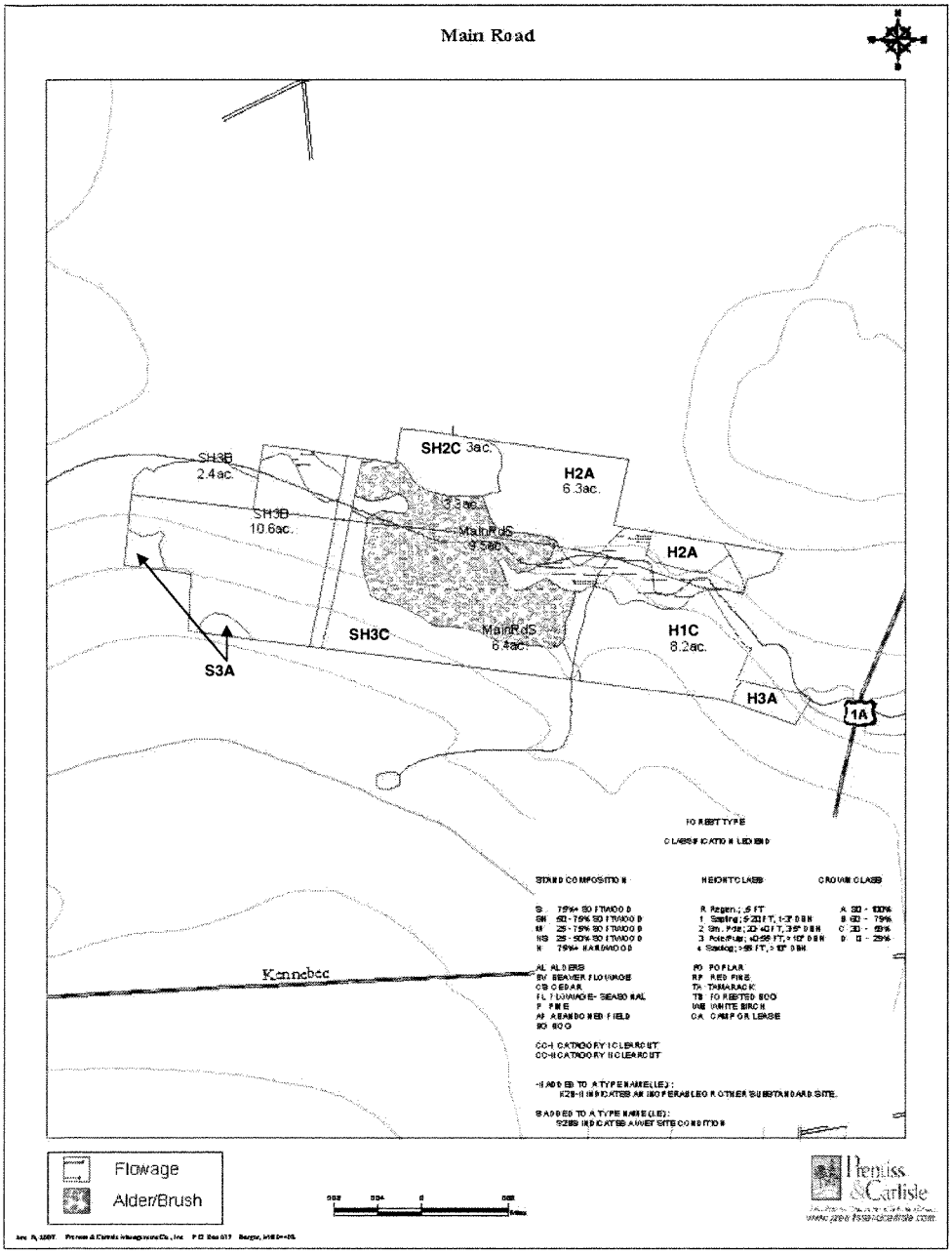
A = 80 percent or greater
B = 60-79 percent
C = 30-59 percent
D = 0-29 percent

Seven unique stands were delineated in the photo-interpretation and site inspection and are described below from field notes and through the inventory. Some were quantified by way of the timber cruise (if source of information is "Inventory") and others were described both quantitatively and qualitatively because there were few merchantable size trees ("Inventory/Qualitative description"). Some of the cruised types were combined because there were no significant differences among the combined types. The types that were classified on this property are shown below (Table 7.3).

Table 7.3 Forest types designated and sources of inventory information

Type	Acres	Source of Information	Inventory Run Type
S3A	1.1	Inventory	SH3B
S4D/SH3B	14.7	Inventory	SH3B
SH2C	3.0	Inventory	MainRdS
SH3C	6.4	Inventory	MainRdS
H1C	8.2	Inventory /Qualitative description	MainRdS
H2A	7.7	Inventory /Qualitative description	MainRdS
H3A	1.1	Inventory /Qualitative description	MainRdS
Total	42.2		

Figure 7.3. Type map for property showing forest types delineated from aerial photos and site inspection



7.3.7. Timber Volume and Quality

As part of this plan, we completed a timber inventory of the property in May 2007. We installed 19 plots along a grid. The inventory data were stratified according to the forest types developed from the photo-interpretation and ground checking. Across all forested acres, we estimate there are 377 cords of merchantable wood, which equates to 8.9 cords per forested acre ± 18.4 percent (Table 7.4).

Volume by product is shown in Table 7.5. Approximately 38 percent of the volume is pulp, 38 percent is growing stock, and 24 percent in sawlog volume (including pallet). Pulp volume is wood that cannot be merchandized as sawlogs now or in the future. This includes smaller trees with poor form and large sawlog-size trees that because of stem defects such as rot, seams or excessive branchiness can only be merchandized as pulpwood. These trees occupy valuable space in the forest that could otherwise be used to grow more valuable trees. The "growing stock" portion of volume is comprised of trees that meet sawlog quality specifications but are undersized. Sawlog volume meets the current specifications for logs in regional markets (See product specifications in Appendix).

Table 7.4. Summary statistics

Forest Type	Area (Acres)	Number Plots	Mean	Standard Deviation	Standard Error	Std Error as a Pct. of The Mean	Unless a 1 in (N) chance has occurred in sampling the true mean is within the interval below. N = 10		N = 20	
MainRdS	26	12	3.14	3.250	0.94	44.78	1.45	4.82	1.065	5.205
SH3B	16	7	18.47	9.790	3.7	20.03	11.28	25.66	9.42	27.52
Total	42	19	8.98	NA	1.26	18.44	6.78	11.18	6.32	11.64

Table 7.5. Volume by product and species

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
W Pine	0.0	7.9	0.0	0.0	0.0	35.8	51.7
Spruce	0.0	20.4	0.0	0.0	8.3	4.0	57.2
Fir	0.0	3.5	0.0	0.0	20.9	42.2	72.4
Cedar	0.0	8.1	0.0	0.0	5.1	65.1	88.3
Total Swd	0.0	39.9	0.0	0.0	34.3	147.0	269.5
Sf Maple	0.0	1.7	2.2	0.0	3.4	53.4	65.3
W Ash	0.0	0.0	0.0	0.0	7.9	2.0	10.0
Elm	0.0	0.0	0.0	0.0	0.0	6.8	6.8
Cherry	0.0	0.0	0.0	0.0	0.0	7.7	7.7
Other Hwd	0.0	0.0	0.0	0.0	0.0	17.9	17.9
Total Hwd	0.0	1.7	2.2	0.0	11.3	87.8	107.7
Total:	0.0	41.6	2.2	0.0	45.6	234.8	377.2

7.3.8. Species Composition

Approximately 71 percent of the volume is in softwood species (white pine, balsam fir, red spruce, and cedar), and the remaining 29 percent is in hardwood trees (white ash, red maple, elm, cherry, and other hardwood; Table 7.6). In comparison, the statewide average volume (2002) was 16.0 cords per forested acre, of which, approximately 44 percent is in hardwood species. Thus, this forest has substantially less volume than the state average and significantly more softwood than average.

Table 7.6. Merchantable volume (cord) by diameter class and species

DBH	W Pine	Spruce	Fir	Cedar	Sf Maple	W Ash	Elm	Cherry	Other Hwd	Tot Swd	Tot Hwd	Tot All
5	4	0	5	3	0	0	0	0	0	13	0	13
6	0	0	10	0	5	0	0	0	8	10	13	23
7	0	0	10	5	0	0	0	0	0	15	0	15
8	0	0	9	5	0	0	0	0	0	15	0	15
9	0	6	5	5	25	10	7	0	0	16	42	59
10	12	0	9	0	0	0	0	8	10	21	18	39
11	0	0	24	8	26	0	0	0	0	33	26	59
12	0	0	0	13	0	0	0	0	0	13	0	13
13	16	0	0	15	8	0	0	0	0	31	8	39
14	0	10	0	0	0	0	0	0	0	10	0	10
15	10	0	0	8	0	0	0	0	0	18	0	18
16	0	31	0	0	0	0	0	0	0	31	0	31
17	0	10	0	16	0	0	0	0	0	26	0	26
18	0	0	0	8	0	0	0	0	0	8	0	8
19	0	0	0	2	0	0	0	0	0	2	0	2
20	10	0	0	0	0	0	0	0	0	10	0	10
5-9"	4	6	40	18	31	10	7	0	8	68	55	123
10+	48	51	33	70	35	0	0	8	10	201	53	254
Merch	52	57	72	88	65	10	7	8	18	269	108	377
All	52	57	72	88	65	10	7	8	18	269	108	377

7.4 Recommended Projects

7.4.1. Timber Harvesting

The overall goal for harvesting is to manipulate stand structure and species composition to create a forest structure that will meet the multi-use objectives for this tract. Across the forest, the goals are to create three-age stands dominated by long-lived intermediate shade-tolerant species such as spruce, pine, hemlock, oak, sugar maple, and yellow birch. Such stands will be valuable from an economic, aesthetic and biodiversity perspective. These guidelines may be affected by plans for creating a demonstration forest depending on the final objectives for the parcel. However, the recommended prescription is designed to be consistent with a well-managed demonstration forest.

We recommend a removal of approximately 140 cords. The removal represents a 40-50 percent harvest on the forest types that have relatively high volume. We recommend using a cut-to-length system (processor). The harvest should take place in the winter on frozen ground. The harvest will take place primarily in the area west of the pipeline to remove poor quality and overmature trees. Removals should be a combination of commercial thinning and patch overstory removals. Patch overstory removal are prescribed for areas where thinning would result in extensive windthrow. The patch overstory removals should be no larger than 1-2 acres in size, and may be as small as ¼ acre. Harvests should target for removal the following species: fir, poor quality spruce or spruce that are not windfirm, red maple, white birch (minor component), and cedar; large white pine should be retained in all cases to provide vertical diversity for biodiversity, a seed source for regeneration, and for aesthetic purposes.

Harvesting is designed to create a three-aged stand with overstory pine, mid-story spruce and fir (3-7" dbh), and regeneration that will be created by harvesting. This relatively light harvest will result in abundant regeneration of shade tolerant species.

Because the soils consist of silt tills that are very prone to erosion, care should be taken when harvesting near brooks. BMPs should be strictly followed to avoid siltation of the brook and to limit compaction and rutting.

7.5 Detailed Stand Information

Seven stand types were identified in the typing. We combined the high volume types (S3A, S4D/SH3B, and H3A) and called them SH3B, since they were run together in the inventory and because S4D/SH3B represents 88 percent of the acreage. In addition, we combined SH2C and SH3C because they were very similar.

7.5.1. SH3B

The SH3B type is a combination of the S4D/SH3B (14.7 ac.), S3A (1.1 ac.) and H3A (1.1 ac.) for a combined total of 16.9 acres. This broad type represents the only merchantable component in the parcel. The merchantable volume is 18.5 cords per acre. The type appears to have regenerated following pasture land abandonment about 60-80 years ago. The health is beginning to decline as the cedar, fir and red maple are beginning to die. Spruce and white pine trees are healthy and should be released to increase their growth and proportion to total volume. The stand should be thinned using a processor in the winter on frozen ground to remove 40-50 percent of the standing volume by harvesting the poor quality trees. This harvest will release advance regeneration forming a second age class. A second harvest should be planned for 15-20 years from now to remove an additional 30-40 percent of the older age class and some of the younger age class to create a third age class. This silviculture system will promote the regeneration and growth of shade tolerant softwood species, primarily spruce and fir.

Table 7.5. Stand attributes for SH3B type

Attribute	Description
Stand area	16.9 acres
Composition/ structure	Composed primarily of cedar (30%), fir (25%), red maple (22%), spruce (13%), and white pine (10%) by volume; trees are generally 40-55' tall, 5-10" dbh; canopy closure is 60-79 percent ;
Age/history	Approximately 60-80 years old; regenerated from pasture land abandonment
Stand health	Good, although fir and red maple are beginning to die
Stand volume	18.5 cords/acre
Stand stocking	Very good
Stand quality	Fair to good; portions of fir, red maple, and cedar volume are poor in quality
Growth rate	Good; 10-year PAI is 0.50 cds/ac/yr
Project Recommendations	Thin poor quality trees with 40-50 percent removal
Long range silvicultural objectives	Create three age classes with an additional harvest in 15-20 years

Table 7.6. Product table for SH3B

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
W Pine	0	0.49	0	0	0	0.88	1.88
Spruce	0	0.98	0	0	0.08	0.25	2.47
Fir	0	0.22	0	0	1.3	2.64	4.53
Cedar	0	0.51	0	0	0.32	4.07	5.52
Total Swd	0	2.2	0	0	1.7	7.83	14.39
Sf Maple	0	0.1	0.14	0	0.21	3.34	4.08
Total Hwd	0	0.1	0.14	0	0.21	3.34	4.08
Total:	0	2.3	0.14	0	1.91	11.17	18.47

7.5.2. Stand Type: SH2C

The SH2C type is a combination of the SH2C and SH3C types and combines for 9 acres. The type is composed primarily of 3-5" softwood and hardwood trees that are 20-40' tall. It is essentially a hodge-podge of residual trees that were too small to harvest in the previous cut and poorly formed regeneration. The stocking is low—about 30-50 percent—primarily because of the aggressive past harvesting and poor soils. The soils are poorly to somewhat poorly drained on wet sites. There is no dominant species; the species composition is a mix of white pine, spruce, fir, cedar, red maple, grey and white birch, and other various hardwood species (ash, elm, other hardwood). We have estimated the merchantable volume to be less than 6 cords per acre. Red maple trees are generally smaller and regenerated from stump sprouting, while fir, spruce, cedar and pine are a combination of residual trees that were to small harvest in the previous cut and regeneration. The soils are fair to poor and typical of old pasture on wet poorly to somewhat poorly drained soils. Grazing activity compacted the following a clearcut that occurred about 30 years ago. There are some residual large white pine trees in the overstory but they are scattered and contribute little to the volume and value and have little affect on the rapidly growing young hardwood trees below. The 10- year PAI is 0.37 cords per acre per year. The stand will become financially operable in the next 10-15 years depending on markets and growth rates. The current merchantable volume is less than 6 cords per acre and is composed of the larger (5-7") pine, fir and aspen. We recommend allowing the stand to grow for another 15-25 years before any harvesting is done.

Table 7.7. Stand Attributes for SH2C type.

Attribute	Description
Stand area	9 acres
Composition/ structure	Composed primarily of white pine, spruce, fir, cedar, red maple, grey and white birch, and other various hardwood species (ash, elm, other hardwood) that are generally 20-40' tall, 3-5" dbh; canopy closure is 60-79 percent
Age/history	Approximately 30 years old; regenerated from clearcut
Stand health	Very good
Stand volume	Less than 6 cords/acre
Stand stocking	Fair
Stand quality	Very good
Growth rate	Fair; 10-year PAI is 0.37 cds/ac/yr
Project Recommendations	None within 10 years
Long range silvicultural objectives	Thin in 15-25 years

7.5.3. Stand Type: H2A

The H2A type is about 7.7 acres and is dominated by aspen and red maple. It appears to have regenerated approximately 30 years ago following a clearcut. Trees are 3-5" dbh and 25-35' tall. The merchantable volume is less than 6 cords per acre. Because of the low volume we do not recommend any harvesting until 10-15 years, at which time we recommend a thinning to remove poor quality trees to create more growing space for the best quality trees and species.

Table 7.9. Stand Attributes for H2A type.

Attribute	Description
Stand area	7.7 acres
Composition/ structure	Composed primarily of aspen and red maple
Age/history	Approximately 30 years old; regenerated from clearcut
Stand health	Very good
Stand volume	Less than 6 cords/acre
Stand stocking	Very good
Stand quality	Very good
Growth rate	Good; 10-year PAI is 0.52 cds/ac/yr
Project Recommendations	None within 10 years
Long range silvicultural objectives	Thin in 10-15 years

7.5.4. Stand Type: H1C

The H1C type is about 8.2 acres and is dominated by grey and white birch with pockets of alders. The stand had been clearcut in the last 15-20 years. The harvesting method was not appropriate for regenerating a high quality forest. Growth is slow due to poor soils and poor stocking and species composition. Trees are 1-3" dbh and 15-25' tall. The merchantable volume is less than 3 cords per acre. Because of the low volume we do not recommend any harvesting for 30 or more years.

Table 7.9. Stand Attributes for H1C type.

Attribute	Description
Stand area	8.2 acres
Composition/ structure	Composed primarily of grey birch, white birch and alder
Age/history	Approximately 15-20 years old; regenerated from clearcut
Stand health	Fair
Stand volume	Less than 3 cords/acre
Stand stocking	Poor
Stand quality	Poor
Growth rate	Poor; 10-year PAI is 0.10 cds/ac/yr
Project Recommendations	None within 10 years
Long range silvicultural objectives	Allow succession to occur and create regeneration of spruce and fir

8 Kennebec Road

8.1 Plan Summary

The Kennebec Road parcel is located on the north side of Kennebec Road adjacent to and east of the railroad tracks. It currently serves as the town's snow dump. It is approximately 20 acres in size with 19 acres classified as forested. Based on our assessment, the parcel has little or no value as timberland, both in the present and future. The current condition of the forest is poor and in terms of the quality of individual trees and the stocking of the stand. The soils are poorly drained in places; and where drainage is limiting there is an abundance of alder.

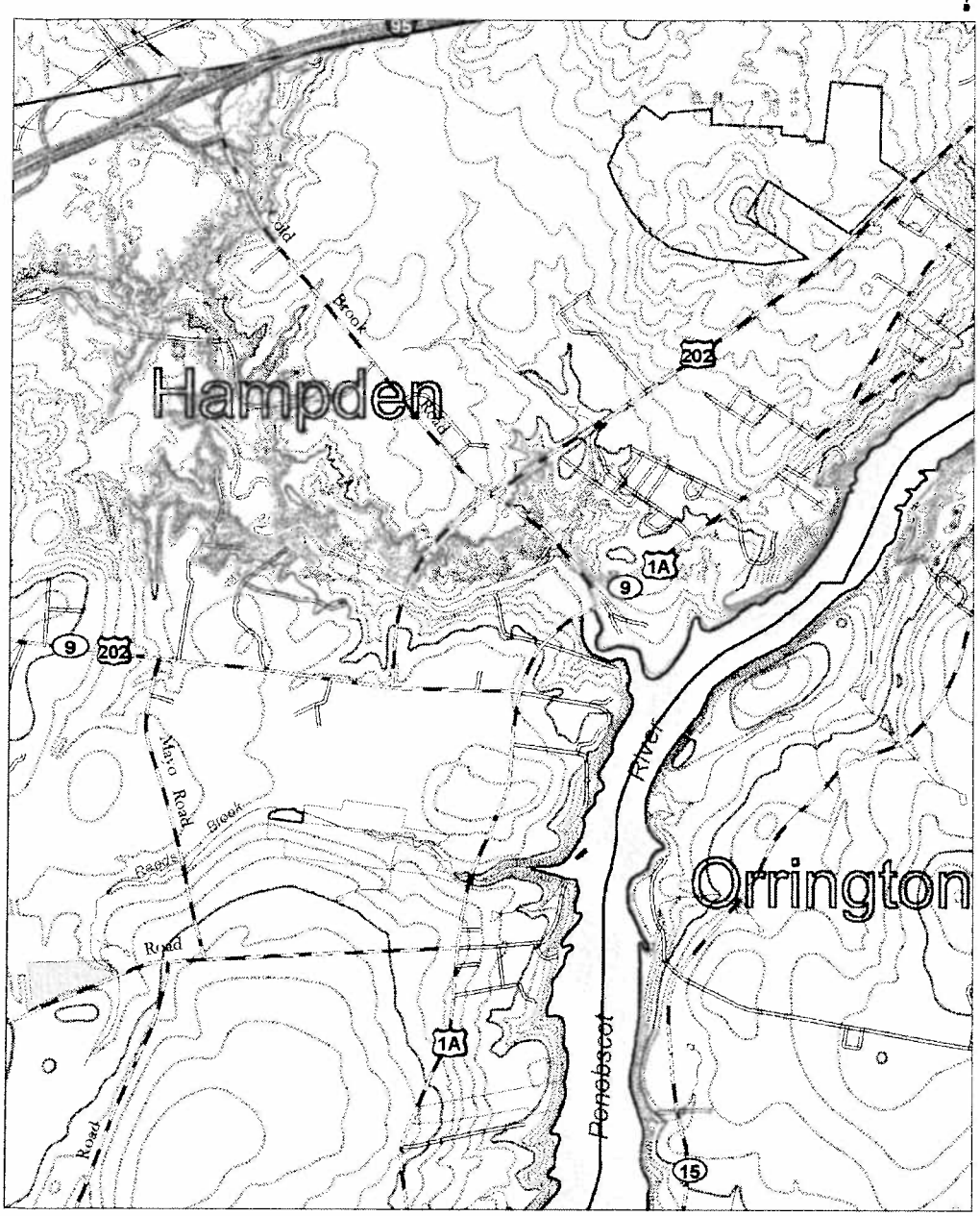
The parcel is dominated by white pine that regenerated after a clearcut about 30 years ago. Nearly all of the pine are weeviled and have several tops. These trees will not develop into sawlogs, and therefore, strictly from a forest management standpoint, they ought to be harvested. However, if the existing forest was harvested, the stand would likely have to be regenerated by planting to ensure adequate stocking and to control the post-harvest species composition. We would not recommend planting because of the poor site quality. This catch-22 makes this a good tract to consider for conversion to another use or leaving alone as open space.

We cruised the parcel in May 2007 and estimated the total volume to be 305 cords, or about 16 cords per acre (Table 8.1). About 69 percent of the volume is composed of large, poorly formed white pine. Nearly all of the pine trees have suffered chronic pine weevil damage over the past 20 years. Pine weevil larvae chew and burrow completely around the stem causing the current year's growth to wilt, droop, and eventually die. One or more side branches (laterals) bend upward to take over as the terminal leader. Over time, damaged trees become forked, developing two or more primary stems. Such trees cannot be sold as sawlogs and are typically sold for pine pulp or biomass, which have very little economic value.

Based on our assessment, we believe the Town should carefully weigh the contribution of this parcel to its overall goals. It has relatively little value in timber, habitat, recreation, and as a place to protect water quality. It's only virtue in the context of the Town's objectives is that it is open space—that is, it is not developed. Despite its relatively low value for meeting the Town's objectives it may be valuable for development. It has about 1,500 feet of frontage on Kennebec Road and is 20 acres in size. The town might consider trading or selling this parcel to acquire a parcel that perhaps has less economic value per acre but has considerably more value in terms of the Town's objectives.

Given it's low value in terms of habitat, timber and recreation; and relatively high value for future development, we recommend that the parcel is traded, sold or developed. We have therefore not summarized management objectives and stand characteristics in the context of a traditional forest management plan.

Kennebec Road



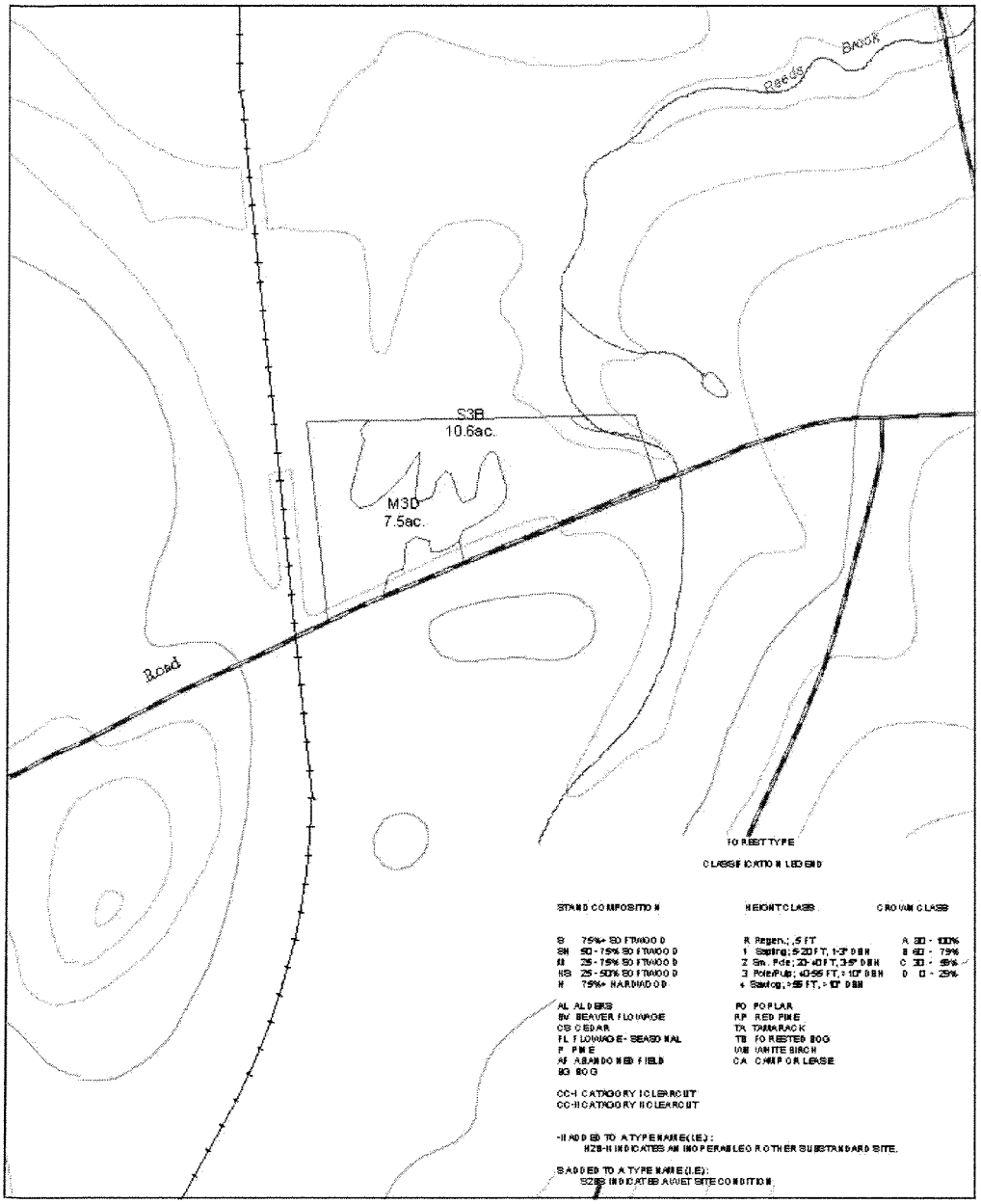
Ownership Lots Lot Names
Kennebec Road

0.4 0.2 0 0.4 Miles

Prentiss & Carlisle

June 19, 2007 Prentiss & Carlisle Management Co., Inc. P.O. Box 637 Bangor, ME 04402

Kennebec Road



FOREST TYPE

CLASSIFICATION LEGEND

STAND COMPOSITION	HEIGHT CLASS	CROWN CLASS
S 75%+ SOFTWOOD	R Regen.; ,5 FT	A 80 - 100%
SH 50 - 75% SOFTWOOD	1 Sapling; 5-20 FT, 1-3" DBH	B 60 - 79%
M 25 - 75% SOFTWOOD	2 Sm. Pole; 20-40 FT, 3-5" DBH	C 30 - 59%
HS 25 - 50% SOFTWOOD	3 Pole/Pulp; 40-55 FT, > 10" DBH	D 0 - 29%
H 75%+ HARDWOOD	4 Sawlog; >55 FT, > 10" DBH	

AL ALDERS
BV BEAVER FLOWAGE
CS CEDAR
FL FLOWAGE - SEASONAL
P PINE
AF ABANDONED FIELD
BG BOG

PO POPLAR
RP RED PINE
TA TAMARACK
TB FORESTED BOG
WB WHITE BIRCH
CA CAMP OR LEASE

CC-I CATAGORY I CLEARCUT
CC-II CATAGORY II CLEARCUT

-II ADDED TO A TYPE NAME(I.E.):
H2B-II INDICATES AN INOPERABLE OR OTHER SUBSTANDARD SITE.

S ADDED TO A TYPE NAME(I.E.):
S2BS INDICATES A WET SITE CONDITION

Prentiss & Carlisle
www.prentiss-carlisle.com

Prentiss & Carlisle Management Co., Inc. P.O. Box 617 Bangor, MD 04401

Table 8.1. Product Table for Kennebec Road parcel

Hampden Kennebec Road
Product Table
19 Forested Acres
Cruised May, 2007

	Veneer (mbf)	Sawlogs (mbf)	Pallet (mbf)	Boltwood (cords)	Growing Stock (cords)	Pulpwood (cords)	Total (cords)
W Pine	0	9	0	0	21	171	211
Spruce	0	12	0	0	8	3	37
Fir	0	2	0	0	0	0	6
Total Swd	0	23	0	0	29	174	255
Sf Maple	0	0	0	0	0	3	3
W Ash	0	0	0	0	0	2	2
Aspen	0	0	0	0	4	1	5
Elm	0	0	0	0	0	20	20
Cherry	0	0	0	0	3	2	5
Other Hwd	0	0	0	0	0	15	15
Total Hwd	0	0	0	0	7	43	50
Total:	0	23	0	0	36	217	305

9 Laws Pertaining to Forestry

There are five state laws you must keep in mind when conducting wood harvesting operations in Maine's organized municipalities:

1. The Protection and Improvement of Waters Law
    a. If soil or refuse as a result of logging washes into a waterway a violation has occurred, regardless of the distance from the logging operation to the water
2. The Erosion and Sedimentation Control Law,
    a. This law requires you to prevent unreasonable erosion of soil or sediment beyond the project site or into a lake, stream, or wetland, and that erosion control measures are put in place prior to commencement of the activity
    b. This law specifically applies to road construction or maintenance
3. The Natural Resources Protection Act (NRPA) and its associated rules
    a. Regulates activities on, over, and adjacent to water bodies and areas above 2700'
    b. See http://www.state.me.us/dep/blwq/stand.htm for more information
4. The Shoreland Zoning Act (SZA) and corresponding local ordinances
    a. This law was enacted to prevent damage to the natural beauty and habitat provided by lakes, ponds, rivers, tidal areas, non-forested freshwater wetlands, and streams
    b. The law targets development along the immediate shoreline of these resources and requires towns to enact a shoreland zoning ordinance at least as stringent as a model ordinance developed by the state.
5. The Forest Practices Act (FPA) and its associated rules
    a. Landowners must notify the Maine Forest Service before beginning any timber harvesting activities.
    b. Landowners who create clearcuts must adhere to standards for separation zones between clearcuts, and must prepare harvest plans for clearcuts larger than 20 acres.
    c. Landowners must ensure that a clearcut has adequate regeneration within 5 years after harvest.

For more detailed information please see, "A Field Guide to Laws Pertaining to Timber Harvesting in Organized Areas of Maine." (http://mainegov-images.informe.org/dep/blwq/docstand/timber.pdf).

10 APPENDIX

10.1 Product Specification

Table 10.1. Product specifications used in timber inventory

Code	Product	Species	Min. DBH	Min. Top Diam.	Min. Length	Description
P	Pulpwood	All Species	5"	4"	8 Feet	Not a potential log/graded product
L	Sawlog	All Hardwood	12"	8"	8 Feet	Minimum 2 clear sides
L	Sawlog	Spruce/Fir	8"	6"	16 Feet	Straight and sound. Must have at least 2 contiguous sections. Excessive branchiness is not a defect
L	Sawlog	Pine, Hemlock & other swd	10"	8"	8 Feet	Free of excessive knots, straight & sound
T	Tie/Pallet Log	All Hardwood	10"	8"	8 Feet	Straight and Sound
V	Veneer	All Hardwood	14"	12"	8 Feet	Must have all 4 sides clear
G	Growing Stock	All Species	5"	4"	8 Feet	Potential to produce a sawlog or better product in the future.
B	Boltwood	White & Yellow Birch, Hard Maple, White Ash	10"	8"	8 Feet	Minimum of 2 clear sides
C	Cull	All Species	5"	4"	8 Feet	Live trees with 50% rot or unusable

10.2 Silviculture Terminology

Prepared by the Silviculture Instructors Subgroup, Silviculture Working Group (D2), Society of American Foresters

Terminology Committee: David L. Adams (Univ. Idaho), John D. Hodges (Mississippi State Univ.), David L. Loftis (USDA FS), James N. Long (Utah State Univ.), Robert S. Seymour (Univ. Maine), John A. Helms, Chair (Univ. California). Reviewed by membership of Silviculture Working Group

This project was conceived by Prof. Clair Merritt (Purdue Univ.) who served as the committee's initial chair. Others contributing to earlier drafts included Al Alm (Univ. Minnesota), Ted Daniel (Utah State Univ.), and Ralph Griffen (Univ. Maine).

Advance Regeneration (Reproduction) syn. Advance Growth
Seedlings or saplings that development or are present in the understory

Afforestation
Establishment of a forest or stand in an area not recently forested.

Age class (Cohort)
A distinct aggregation of trees originating from a single natural event or regeneration activity, or a grouping of trees, e.g. 10-year age class, as used in inventory or management.

Artificial Regeneration (Reproduction)
An age class created by direct seeding or by planting seedlings or cuttings.

Basal Area
The area of the cross section of a tree stem, including the bark, generally at breast height (4.5 feet above the ground).

Breast Height
A standard height from ground level for recording diameter, girth, or basal area of a tree, generally 4.5 feet.

Burning, Prescribed
The application of fire, usually under existing stands and under specified conditions of weather and fuel moisture, in order to attain silvicultural or other management objectives.

Canopy
The foliar cover in a forest stand consisting of one or several layers.

Canopy Closure
See Crown Cover

Cleaning
A release treatment made in an age class not past the sapling stage in order to free the favored trees from less desirable individuals of the same age class which overtop them or are likely to do so (see Improvement Cutting, Liberating, Weeding).

Clearcutting
(see Regeneration Methods)

Codominant
(see Crown Class)

Cohort
see Age Class

Composition, Stand
The proportion of each tree species in a stand expressed as a percentage of either the total number, basal area, or volume of all tree species in the stand.

Coppice
(see Regeneration Method)

Crop Tree
Any tree that is selected to become a component of a future commercial harvest.

Crop Tree Release
A thinning designed to remove trees around selected crop trees. Typically, the best trees are flagged to retain and competing trees that interfere with crop trees are marked to cut

Crown
The part of a tree or woody plant bearing live branches and foliage.

Crown Class
A class of tree based on its crown position relative to the crowns of adjacent trees.

Emergent
Trees with crowns completely above the general level of the main canopy receiving full light from above and from all sides.

Dominant
Trees with crowns extending above the general level of the main canopy of even-aged stands or, in uneven-aged stands, above the crowns of the tree's immediate neighbors, and receiving full light from above and partly from the sides.

Codominant
Trees with crowns forming the general level of the main canopy in even-aged stands or, in uneven-aged stands, the main canopy of the tree's immediate neighbor's, receiving full light from above and comparatively little from the sides.

Intermediate
Trees with crowns extending into the lower portion of the main canopy of even-aged stands or, in uneven-aged stands, into the lower portion of the canopy formed by the tree's immediate neighbors, but shorter in height than the codominants. They receive little direct light from above and none from the sides.

Overtopped (Suppressed)
Trees of the varying levels of vigor that have the crowns completely overtopped by the crowns of one or more neighboring trees.

Crown Cover
The ground area covered by the crowns of trees or woody vegetation as delimited by the vertical projection of crown perimeters and commonly expressed as a percent of total ground area (syn. Canopy Cover).

Crown Density
The amount and compactness of foliage of the crowns of trees and/or shrubs.

Cutting Cycle
The planning interval between partial harvests in an uneven-aged stand (see Thinning Interval)

Dominant
(see Crown Class)

Emergent
(see Crown Class)

Even-Aged Stand
A stand of trees containing a single age class in which the range of tree ages is usually less than 20 percent of rotation.

Even-Aged System
A planned sequence of treatments designed to maintain and regenerate a stand with one age class. The range of tree ages is usually less than 20 percent of the rotation. (see Clearcutting, Seed Tree, Shelterwood, Coppice).

Forest Fertilization
The addition of nutrient elements to increase growth rate or overcome a nutrient deficiency in the soil.

Genotype
The genetic constitution of an organism in terms of its hereditary characteristics as distinguished from its physical appearance or phenotype.

Green Tree Retention
see Reserve Trees

Group Selection
(see Regeneration Methods)

Harvesting Method (Cutting Method)
A cutting method by which a stand is logged. Emphasis is on meeting logging requirements while concurrently attaining silvicultural objectives (see Regeneration Methods)

Improvement cutting
A cutting made in a stand pole-sized or larger primarily to improve composition and quality by removing less desirable trees of any species (see Cleaning, Liberating, and Weeding).

Ingrowth
Trees that during a specified period have grown past an arbitrary lower limit of (usually) diameter or height. Ingrowth is usually measured as basal area or volume per unit area.

Intermediate
(see Crown Class)

Intermediate Treatments (Tending)
A collective term for any treatment designed to enhance growth, quality, vigor, and composition of the stand after establishment or regeneration and prior to final harvest (see Tending, Stand Improvement).

Liberating (Liberation cut)
A release treatment made in a stand not past the sapling stage in order to free the favored trees from competition of older, overtopping trees.

Monoculture
A stand of a single species, generally even-aged.

Mycorrhiza
The symbiotic association between certain fungi and plant roots which enhances the uptake of water and nutrients.

Natural Regeneration
An age class created from natural seeding, sprouting, suckering, or layering.

Nurse Tree (Nurse Crop)
A tree, group or crop of trees, shrubs or other plants, either naturally occurring or introduced, used to nurture, improve survival or improve the form of a more desirable tree or crop when young by protecting it from frost, isolation, or wind.

Overstory Removal
The cutting of trees comprising an upper canopy layer in order to release trees to other vegetation in an understory (see Clearcutting).

Overtopped
(see Crown Class)

Phenotype
The observed expression of a trait in an individual resulting from a developmental interaction of the individual's genotype and its operational environmental.

Pole
A tree between the size of a sapling and a mature tree.

Precommercial Thinning (PCT)
A thinning that does not yield trees of commercial value, usually designed to reduce stocking in order to concentrate growth on the more desirable trees.

Reforestation
The natural or artificial restocking of an area with trees (syn. Regeneration).

Regeneration
Seedlings or saplings existing in a stand; or the act of establishing young trees naturally or artificially (syn. Reforestation).

Regeneration (Reproduction) Method

A cutting method by which a new age class is created. The major methods are Clearcutting, Seed Tree, Shelterwood, Selection, and Coppice (see Harvesting Method).

Coppice Methods

Methods of regenerating a stand in which the majority of regeneration is from stump sprouts or root suckers.

Coppice

A method of regenerating a stand in which all trees in the previous stand are cut and the majority of regeneration is from sprouts or root suckers.

Coppice with Reserves (Coppice with Standards)

A coppice method in which reserve trees are retained to attain goals other than regeneration. The method normally creates a two-aged stand.

Even-Aged Methods

Methods to regenerate a stand with a single age class.

Clearcutting

A method of regenerating an even-aged stand in which a new age class develops in a fully-exposed microclimate after removal, in a single cutting, of all trees in the previous stand. Regeneration is from natural seeding, direct seeding, planted seedlings, and/or advance reproduction. Cutting may be done in groups or patches (Group or Patch Clearcutting), or in strips (Strip Clearcutting). In the Clearcutting System, the management unit or stand in which regeneration, growth, and yield are regulated consists of the individual clearcut stand (see Group Selection). When the primary source of regeneration is advance reproduction, the preferred term is **Overstory Removal**.

Clearcutting with Reserves (see Two-Aged Methods)

Seed Tree

An even-aged regeneration method in which a new age class develops from seeds that germinate in fully-exposed micro-environments after removal of all the previous stand except a small number of trees left to provide seed. Seed trees are removed after regeneration is established.

Seed Tree with Reserves (see Two-Aged Methods)

Shelterwood

A method of regenerating an even-aged stand in which a new age class develops beneath the moderated micro-environment provided by the residual trees. The sequence of treatments can include three distinct types of cuttings: 1) an optional preparatory cut to enhance conditions for seed production; 2) an establishment cut to prepare the seed bed and to create a new age class; and 3) a removal cut to release established regeneration from competition with the overwood. Cutting may be done uniformly throughout the stand (Uniform Shelterwood), in groups or patches (Group Shelterwood), or in are in strips (Strip Shelterwood).

Shelterwood with Reserves (see Two-Aged Methods)

Two-Aged Methods

Methods designed to maintain and regenerate a stand with two age classes. In each case the resulting stand may be two-aged or tend towards an uneven-aged condition as a consequence of both an extended period of regeneration establishment and the retention of reserve trees that may represent one or more age classes.

Clearcutting with Reserves

A clearcutting method in which varying numbers of reserve trees are not harvested to attain goals other than regeneration.

Seed Tree with Reserves

A seed tree method in which some or all of the seed trees are retained after regeneration has become established to attain goals other than regeneration.

Shelterwood with Reserves

A variant of the Shelterwood Method in which some or all of the shelter trees are retained, well beyond the normal period of retention, to attain goals other than retention.

Uneven-Aged (Selection) Methods

Methods of regenerating a forest stand, and maintaining an uneven-aged structure, by removing some trees in all size classes either singly, in small groups, or in strips.

Group Selection
A method of regenerating uneven-aged stands in which trees are removed, and new age classes are established, in small groups. The maximum width of groups in approximately twice the height of the mature trees, with small openings providing micro-environments suitable for tolerant regeneration and the larger openings providing conditions suitable for more intolerant regeneration. In the Group Selection System, the management unit or stand in which regeneration, growth, and yield are regulated consists of a landscape containing an aggregation of groups (see Clearcutting).

Group Selection with Reserves
A variant of the Group Selection Method in which some trees within the group are not cut to attain goals other than regeneration within the group.

Single Tree Selection
A method of creating new age classes in uneven-aged stands in which individual trees of all size classes are removed more-or-less uniformly throughout the stand to achieve desired stand structural characteristics.

Regeneration (Reproduction) Period
The time between the initial regeneration cutting and the successful re-establishment of a new age class by natural means, planting, or direct seeding.

Regular Uneven-Aged (Balanced) Stand
A stand in which three or more distinct age classes occupy approximately equal areas and provide a balanced distribution of diameter classes.

Release (Release Operation)
A treatment designed to free young trees from undesirable, usually overtopping, competing vegetation. Treatments include cleaning, liberating, and weeding (see Stand Improvement).

Reserve Trees (Standards, Green Tree Retention)
Trees, pole-sized or larger, retained in either a dispersed or aggregated manner after the regeneration period under the Clearcutting, Seed Tree, Shelterwood, Group Selection, or Coppice Methods.

Root Pruning
The root pruning of seedlings in a nursery bed to limit the extension of roots in depth or laterally (see Undercutting).

Rotation
In even-aged systems, the period between regeneration establishment and final cutting.

Salvage Cutting
The removal of dead trees being damaged or dying due to injurious agents other than competition, to recover value that would otherwise be lost.

Sanitation Cutting
The removal of trees to improve stand health by stopping or reducing actual or anticipated spread of insects and disease (see Stand Improvement)

Sapling
A tree, usually young, that is larger than a seedling but smaller than a pole. Size varies by region.

Scarification
Mechanical removal of competing vegetation and/or interfering debris, or disturbance of the soil surface, designed to enhance reforestation.

Seed Tree
(see Regeneration Methods)

Shelterwood
(see Regeneration Methods)

Silviculture
The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.

Silvicultural System
A planned process whereby a stand is tended, harvested, and re-established. The system name is based on the number of age classes (see Even-Aged, Two-Aged, Uneven-Aged), and/or the regeneration method used (see Clearcutting, Seed Tree, Shelterwood, Selection, Coppice, Coppice with Reserves).

Single Tree Selection
(see Regeneration Methods)

Site Class
A classification of site quality, usually expressed in terms of ranges of dominant tree height at a given age or potential mean annual increment at culmination.

Site Index
A measure of actual or potential forest productivity expressed in terms of the average height of a certain number of dominants and codominants in the stand (balsam fir for this report) at an index age (age 50 in this report).

Site Preparation
A hand or mechanized manipulation of a site designed to enhance the success of regeneration. Treatments may include bedding, burning, chemical spraying, chopping, disking, drainage, raking and scarifying. All treatments are designed to modify the soil, litter, and vegetation and to create microclimate conditions conducive to the establishment and growth of desired species.

Site Quality (Productivity)
The productive capacity of a site, usually expressed as volume production of a given species.

Size Class
Tree size recognized by distinct ranges, usually of diameter or height.

Snag
A standing dead tree from which the leaves and most of the branches have fallen.

Stand
A contiguous group of trees sufficiently uniform in age class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit (see Mixed, Pure, Even-Aged, and Uneven-Aged).

Mixed Stand
A stand in which there is a mixture of species.

Pure Stand
A stand composed of essentially a single species

Stratified Mixture
A stand in which different species occupy different strata of the total crown canopy.

Stand Density
A quantitative, absolute measure of tree occupancy per unit of land area in such terms as numbers of trees, basal area, or volume.

Stand Improvement
A term comprising all intermediate cuttings made to improve the composition, structure, condition, health, and growth of even - or uneven- aged stands.

Stocking
An indication of growing-space occupancy relative to a pre-established standard. Common indices of stocking are based on percent occupancy, basal area, relative density, and crown competition factor.

Stratum (Canopy Layer)
A distinct layer of vegetation within a forest community.

Structure
The horizontal and vertical distribution of components of a forest stand including the height, diameter, crown layers and stems of trees, shrubs, herbaceous understory, snags, and down woody debris.

Succession
A series of dynamic changes by which organisms succeed one another through a series of plant community (seral) stages leading to potential natural community or climax.

Suppressed
(See Crown Class)

Tending
See Intermediate Treatments

Thinning
A cultural treatment made to reduce stand density of trees primarily to improve growth, enhance forest health, or to recover potential mortality.

Crown Thinning (Thinning from Above, High Thinning)
The removal of trees from the dominant and codominant crown classes in order to favor the best trees of those same crown classes.

Free Thinning
The removal of trees to control stand spacing and favor desired trees using a combination of thinning criteria without regard to crown position.

Low Thinning (Thinning from Below)
The removal of trees from the lower crown classes to favor those in the upper crown classes.

Mechanical Thinning (Geometric Thinning)
The thinning of trees in either even - or uneven-aged stands involving removal of trees in rows, strips, or by using fixed spacing intervals.

Selection Thinning (Dominant Thinning)
The removal of trees in the dominant crown class in order to favor the lower crown classes.

Thinning Interval
The period of time between successive thinning entries, usually used in connection with even-aged stands (see Cutting Cycle).

Tolerance, Shade
The relative capacity of a plant to become established and grow beneath overtopping vegetation.

Two-Aged System
A planned sequence of treatments designed to maintain and regenerate a stand with two age classes.

Undercutting
The root pruning of seedlings in a nursery bed to limit root depth extension (see Root Pruning).

Uneven-Aged Stand
A stand of trees of three or more distinct age classes, either intimately mixed or in small groups.

Uneven-Aged System
A planned sequence of treatments designed to maintain and regenerate a stand with three or more age classes (see Single Tree Selection, Group Selection)

Weeding
A release treatment in stands not past the sapling stage that eliminates or suppresses undesirable vegetation regardless of crown position

10.3 Regarding High Grading

Just Say No to High-Grading, Selective Cutting, and Diameter-Limit Cutting

Peter J. Smallidge - State Extension Forester, Cornell Cooperative Extension, Department of Natural Resources, Cornell University, Ithaca

And Michael C. Greason - Chief (retired) of the Bureau of Private Land Service, New York State Department of Environmental Conservation, Albany, NY

Cutting the best trees (those of highest value) and leaving the low value, often diseased or malformed trees, is too common. This type of forestry is called high-grading, where the highest grade (or value) trees are removed. By cutting only the largest and most valuable trees you remove those best suited to that site. The trees that are less well adapted remain as the next forest and the seed source for future forests. The financial gain of high-grading exist only briefly, yet ownership objectives can be sacrificed for decades. A similar analogy from livestock is the farmer or stable manager who shoots the blue ribbon bull or winning race horse and uses the losers for breeding stock. The quality of the herd, just as the quality of the forest and woodlot, declines rapidly!

In addition to high-grading, similar practices exist with different names. High-grading is often disguised under the name of "diameter-limit cutting". This is a practice that removes all trees above a certain minimum diameter. In some rare situations diameter-limit cutting is appropriate. For example, if old pasture trees are shading the growth of young hardwood saplings. Often however, diameter-limit cutting removes trees of commercial value (say above 12 or 14 inches in diameter) before these trees can attain a more valuable size and add seed and seedlings to the forest. Selective cutting is another technique where high-grading can occur. Selective cutting (generally not recommended) differs from the selection system of silviculture (a legitimate technique). Selective cutting, as commonly practiced, involves selecting the highest quality trees and cutting them. (Technical note: selective cutting by definition can include other activities such as improvement cuts) The selection system involves someone professionally trained in silviculture to select trees from all age and size classes, both high and low quality to produce an uneven-aged forest. Diameter-limit cutting and selective cutting are often rationalized by arguing to remove the bigger trees so the smaller trees can grow. However, the smaller trees may be undesirable species, poor form, or poor heath. By any name, high-grading degrades the value of the forest regardless of the "logic" used by foresters or loggers trying to make a quick buck.

Why does high-grading happen? A common cause for high-grading is greed to maximize immediate profits. Beginning in the early 1970's, demand for high-value timber increased and sawmills could pay more for certain species. Thus, markets for high-value trees grew stronger while markets for low value trees did not. Further, it costs about the same amount of money to cut and haul a $10 tree as it does to cut and haul a $300 tree of the same size. The result is that more immediate profit is gained by cutting

only the highest value trees, but left behind is a legacy of low quality trees and under-productive forests. This knowledge helps explain high-grading, but doesn't excuse it.

What are the consequences of high-grading, is it really that bad? One result is that the trees that are left behind won't grow as quickly as better quality trees and the time until the next harvest is lengthened. In addition, the next harvest will remove the low quality trees previously left so the value at the next harvest will be reduced. If you magnify the practice of high-grading across a region, assuming the demand for wood products remains steady, then more acres must be harvested to meet the demand. While timber harvesting is not bad, accelerated harvesting is not in the best interest of our natural resources and conflicts with a growing demand by the public for accountability of natural resource management. As the value of the land to produce timber crops decreases, the incentive to subdivide and develop increases.

So what can you do to avoid high-grading? One step is to work with competent and professional loggers and foresters. When you select a new refrigerator or car you likely consider several features, including price, reputation, service after the sale, and other long-term benefits. Similarly select your forester and logger. Ask for references, find out if the forester participates in continuing education programs and whether the logger has completed the "Trained Logger Certification" program, make a visit to forests or woodlots where they have worked, and know that the best price may not provide the best treatment for your land. The logger who out bids his competitors for a timber sale by a few percent may be more efficient or may not devote enough effort to ensure your property is left in good condition. Similarly the forester who promises you maximum short-term profit likely doesn't have in mind the best interests for you and your land. The consequences of selecting an incompetent forester or logger will exist longer than a bad choice on a refrigerator.

Another step to avoid high-grading is to have a written management plan. Your management plan will state your objectives and help keep you on track. The harvesting schedule in your management plan will help you decide when harvesting is appropriate. Just because a forester or logger offers to cut your timber doesn't mean it's the best time for your interests. The value of trees increases greatly as trees get bigger, and it's probably a safe assumption that good markets will continue to exist for high quality trees (although markets fluctuate).

Third, look for creative solutions to remove the low value trees at the same time the high value trees are harvested. A harvest that removes high-value and low-value trees provides financial benefits from the high- and low-value trees and improves the quality of the residual forest. One way is to have the forester mark and the logger skid the low value trees to the log landing. Then you can cut them yourself for firewood, or sell them to a firewood processor. This will require extra effort on the part of the logger and forester, which means you might not make as much money, but the benefits, including even greater profits, will exist a few years down the road.

Document Settings

Bookmark Name		
Client	*Client_name*	Town of Hampden, Maine
Client short name	*Client_short*	Hampden
Report Date	*Report_Date*	August 10, 2007
Valuation Date	*Valuation_Date*	######, 2007
Last Inspection	*Inspect_Date*	May 23, 2007
Title in Header	*Header_report_title*	Forest Management Plan for Four Parcels in Hampden
Acres	*Acres*	325

3-A-1

An Act to Amend the Charter of the Hampden Water District

Emergency preamble. Whereas, the inhabitants of the town of Hampden in the County of Penobscot have no public water supply and the built up portions of said town are in danger of destruction in case of fire, and the inhabitants of said town are unable to procure a satisfactory supply of pure water for domestic and sanitary purposes, and

Whereas, in the opinion of the legislature, these facts render the immediate passage of this act necessary for the preservation of the public peace, health, and safety and constitute an emergency within the meaning of section 16 of Article XXXI of the constitution, now, therefore,

Be it enacted by the People of the State of Maine, as follows:

Sec 1. Territorial Limits: corporate name; purposes. The inhabitants and territory within the Town of Hampden in the County of Penobscot shall be and are constituted a public municipal corporation under the name of "Hampden Water District" for the purpose of supplying the inhabitants of said district with pure water for domestic, sanitary, manufacturing and municipal purposes.

Sec 2. Source of supply. The said district, for the purposes of its incorporation, is hereby authorized to take, hold, divert, use and distribute water from the Souadabscook stream in said town of Hampden or from any well or wells, natural or artificial, or by purchase from any town, city, corporation or district.

Sec. 3. Right of eminent domain. The said district, for the purposes of its incorporation, is hereby authorized to take and hold, as for public uses, by purchase, gift, or by the exercise of the right of eminent domain, which right is hereby expressly delegated to said water district for said purposes, any lands or interest therein or water rights necessary for erecting and maintaining damns, for flowage, for power, for pumping its water supply through its mains, for reservoirs and standpipes, for wells, for preserving the purity of the watershed, for laying and maintaining aqueducts, mains and other structures for taking, distributing, discharging and disposing of water and for rights of way or roadways to its sources of supply, damns, power stations, reservoirs, standpipes, wells, mains, aqueducts, structures and lands.

Sec. 4. Authorized to lay pipes, etc., through public ways and across private lands. The said district is hereby authorized to lay in and through the streets, roads, ways and highways within said district and across private lands therein, and to maintain, repair and replaces all such pipes, aqueducts or mains in any street, roadway, or highway it shall cause the same to be done with as little obstruction as practicable to the public travel, and shall at its own expense without unnecessary delay cause the earth and pavement removed by it to be replaced in proper condition.

Sec. 5. Authorized to erect and maintain, reservoirs, etc. The said district is hereby authorized for the purposes of its incorporation, to erect and maintain all damns, pumping stations, with all necessary appliances required therefore, reservoirs, standpipes and structures necessary and convenient for its corporate purposes.

Sec. 6. Liability for damage; procedure in exercise of eminent domain; adjustment of damages. Said water district shall be liable for all damage that shall be sustained by any person or corporation in his or its property by the taking of any land or interest therein whatsoever, or water, or by flowage, or by excavating through any land for the purpose of laying pipes, aqueducts or mains, building dams or constructing reservoirs or standpipes.

In exercising any right of eminent domain conferred upon it by law, from time to time, in the taking of lands or interests therein, or water rights, the said district shall file in the office of the county commissioners of Penobscot County and record in the registry of deeds in said county, plans of the location of all such lands or interests therein or water rights, with an appropriate description and the names of the owners thereof, if known. When for any reason the district fails to acquire the property authorized to be taken, and which is described in such location, or the location recorded is defective or uncertain, it may, at any time, correct and perfect such location and file a new description thereof, and in such case the district shall be liable in damages only for property for which the owner had not previously been paid, to be assessed as of the time of the original taking, and the district shall not be liable for any acts which would have been justified if the original taking had been lawful. No entry shall be made on any private lands, except to make surveys, until the expiration of 10 days from such filing, whereupon possession may be had of all said lands or interest therein or water rights so taken, but title shall not vest until said district until payment therefore.

If any person or corporation sustaining damages by any taking as aforesaid and said water district shall not mutually agree upon the sum to be paid therefore either party, upon petition to the county commissioner of Penobscot County, may have such damages assessed by them; and the procedure and all subsequent proceedings and right of appeal thereon shall be had under the same restrictions, conditions and limitations as are or may be by law prescribed in the case of damages by the laying out of highways.

Sec. 7. Crossing of railroads. In case of any crossing of railroads, unless consent is given by the company owning or operating such railroad, as to place, manner and conditions of the crossing, within 30 days after such consent is requested by such district, the public utilities commission shall, upon petition setting forth a description of said premises and the reasons for said crossing, after notice given as said commission may prescribe, determine the place, manner and conditions of such crossing, and all work within the limits of such railroad location shall be done under the supervision of the railroad company and to the satisfaction of said company, but at the expense of said water district, unless otherwise ordered by said public utilities commission.

Sec. 8. Management of affairs of district; election of officers; ballot; trustees' meeting. All the affairs of said district shall be managed by a board of trustees composed of 5 members who shall be residents in the district. The trustees to be so elected shall be chosen by a plurality vote of the legal voters within said district voting at an election to be specially called for the acceptance of this act and the election of said trustees on the 2nd Monday of May, 1937. Such special election shall be called, advertised and conducted according to the law relating to municipal elections in said town, except as otherwise provided herein. Provided, however that the municipal officers in said Town of Hampden shall not be

required to prepare for posting, or the town clerk thereof to post, a new list of voters, but for the purpose of registration of voters said municipal officers shall be in session for 3 secular days next preceding such election, the first 2 days thereof to be devoted to registration of voters, and the last day to enable the municipal officers to verify corrections of said list, and to complete and close up their records of said session. All nominations of candidates so to be voted for shall be made by nomination papers signed in the aggregate for each candidate by not less than 25 qualified voters within said water district. Each voter signing the nomination paper shall make his signature in person and add to it his place of residence and each voter may subscribe to as many nominations as there are trustees to be elected and no more. Such nomination papers shall, before being filed, be submitted to the town clerk of the Town of Hampden, who shall forthwith certify thereon what number of the signatures are names of qualified voters in said district; 1 of the signers to each such separate paper shall swear to the truth thereof and the certificate of said town clerk at least 7 days, exclusive of Sundays, previous to the day of such election. With such nomination papers shall be filed the consent in writing of the person or persons nominated. All nomination papers being filed and being in apparent conformity with the foregoing provisions shall be deemed to be valid, and if not in apparent conformity, they may be seasonably amended under oath. In case any candidate who has been duly nominated under the provisions hereof shall die before the day of the election, or shall withdraw in writing, the vacancy may be supplied in the manner herein provided for such nominations. The name so supplied for the vacancy shall, if the ballots have not been printed, be placed on the ballots instead of the original nomination; or, if the ballots have been printed, new ballots containing the new nomination shall, if practicable, be furnished or slips containing the new nomination shall be printed under the direction of the town clerk, which may be pasted in proper place upon the ballots, and thereafter shall become part and parcel of said ballots as if originally printed thereon.

The ballot shall be substantial as follows: It shall contain the names of all candidates so nominated printed in 1 column under the heading, "For Trustees of Hampden Water District." Above such heading shall be printed "Vote for 5 (or such number as may be appropriate) trustees. Make a cross to the right of each name voted for." As many blank spaces shall be left after the names of the candidates as there are trustees to be elected, in which the voter may by writing insert the name or names of any person or persons for whom he desires to vote. In preparing his ballot the voter shall make a cross (X) against and to the right of such names on such ballot as he desires to vote for, not to exceed the number of trustees so to be elected. If the voter shall desire to vote for any person or persons whose name or names are not on the printed ballot, he may fill in such name or names in the blank spaces left therefore by writing the same therein. Where the voter so adds by writing in such new name or names, his vote for such new name or names shall be counted therefore although he may fail to mark a cross against the same. The result of such election shall be declared by said municipal officers, and due certificate thereof filed with the town clerk. ~~The term of office of the trustees shall begin on said 2nd Monday of May~~.

As soon as convenient after the initial members of the board are chosen the trustees shall hold a meeting at the town councilors' office in the Town of Hampden, to be called by one of the trustees upon reasonable notice as the trustee determine proper. They shall organize by the election of a president and clerk, adopt a corporate seal and, when necessary, may choose a treasurer and all other needful

officers and agents for the proper conduct and management of the affairs of the district. They may also ordain and establish by- laws as are necessary for their own convenience and the proper management of the affairs of the district. The trustees of said district holding office at the effective date of this act continue to hold office until their successors are elected and take office.

The terms of trustees of the district are for ~~5~~ 3 years. The trustees must be nominated and elected under the same procedure and at the same time as provided for the town councilors of the town. The term of office of the trustees begins on the 3rd Thursday of January.

Vacancy. In the event a vacancy arises in the membership of the board of trustees, ~~the unexpired term of the vacant office~~ the trustees may call a special election to fill a vacancy for an unexpired term in the same manner as special elections are called for expired terms pursuant to this act, or the trustees may appoint a person eligible to fill the vacancy. ~~must be filled by the Town Council of the Town of Hampden. When any trustee ceases to be a resident of the district, the trustee shall vacate the office of trustee and the vacancy must be filled pursuant to this section.~~

A vacancy is created upon the death, resignation, or should said trustee no longer reside within the territorial limits of the District. Any trustee that fails to attend two consecutive meetings or three meetings annually shall be deemed to create a vacancy. By a majority vote, the remaining trustees may, in their discretion, excuse an absence(s).

All trustees are eligible for reelection, but a person holding the office of town councilor or road commissioner in the Town of Hampden is not eligible for nomination or election as trustee.

The trustees may procure an office and incur expenses as may be necessary. Notwithstanding the Maine Revised Statutes, Title 35-A, Section 6410, subsection 7, the compensation of the trustees and the treasurer of the board of trustees is determined by the board of trustees. At the close of each fiscal year, the trustees shall make a detailed report of their doings, of the receipts and expenditures of the water district, of its financial and physical condition and of any other matters and things pertaining to the district that will show the inhabitants of the district how the trustees are fulfilling the duties and obligations of their trust, such report to be made and filed with the Town Council of the Town of Hampden.

Sec.9. Temporary loans negotiated; issue of bonds. For accomplishing the purposes of this act, said water district through its trustees is authorized to borrow money temporarily and to issue therefore the negotiable notes of the district, and for the purpose of refunding the indebtedness so created, for paying any necessary expenses and liabilities incurred under the provisions of this act, including the expenses incurred in the creation of a district, in securing sources of supply, taking water and land, paying damages, taking rights of way or other interest in real estate, by purchase or otherwise, laying pipes, aqueducts and mains, constructing, installing, maintaining, and operating reservoirs, standpipes, , pumping stations and whatever equipment may be necessary or incidental to the construction and installation of such system of water works, and making renewal of or extensions, additions and improvements to the same, the said water district, through its trustees, may, from time to time, issue bonds of the district, to an amount or amounts necessary in the judgment of the trustees therefore. Said

notes and bonds shall be legal obligations of said water district, which is hereby declared to be a quasi-municipal corporation within the meaning of section 116 of Chapter 56 of the Maine Revised Statutes, and all the provisions of said section shall be applicable thereto. The said notes and bonds shall be legal investments for savings banks.

Sec. 10. Contracts for supplying water. The water district is authorized to make contacts with the Town of Hampden and with corporations and inhabitants of the district, for the purpose of supplying water as contemplated by this act, and the Town of Hampden by its town councilors is authorized to enter into a contract with the district for a supply of water for public uses on such terms and for such time as the parties may agree, which contract when made is legal and binding on all parties to the contract and the Town of Hampden for said purposes may raise money in the same manner as for other municipal charges.

Sec. 11. Water rates. All individuals, firms, and corporations, whether private, public or municipal, shall pay to the treasurer of said district the rates established by said board of trustees for the water used by them; and the rates for water so supplied shall be uniform within the territory supplied by the district whenever the installation and maintenance of mains and the cost of service is substantially uniform, but nothing in this act shall preclude said district from establishing higher rates than the regular rates in sections where for any reason the cost of construction and maintenance or the cost of service exceeds the average, but such higher rates shall be uniform throughout the sections where they apply. Said rates shall be so established as to provide revenue for the following purposes.

1. To pay the current expenses for operating and maintaining the water system.
2. To provide for the payment of the interest on the indebtedness created or assumed by the district.
3. To provide each year a sum equal to not less than 1% nor more than 5% of the entire indebtedness created or assumed by the district, which sum shall be turned into a sinking fund and there kept to provide for the extinguishment of such indebtedness. The money set aside for the sinking fund shall be devoted to the retirement if the obligations of the district or invested in such securities as savings banks are allowed to hold.
4. If any surplus remains at the end of the year, it may be transferred to the sinking fund.

Sec. 12. Incidental rights and privileges. All incidental rights, powers and privileges necessary to the accomplishment of the main object herein set forth are granted to the public municipal corporation hereby created.

Sec. 13. Referendum; effective date; certificate to Secretary of State. Unless accepted and approved by a majority vote of the legal voters of the within said proposed increased territorial limits of said water district voting at an election called and held for the purpose by the selectmen of the Town of Hampden on or before December 31, 1969, section 1 of this Act shall forthwith become inoperative. The registrar of voters shall be in session the 3 secular days next preceding said special election for the purpose of revising the lists as provided in section 8. The town clerk shall reduce the subject matter of section 1 of

this Act to the following question: "Shall the Act, to include the entire territory of the Town of Hampden in the territorial limits of the Hampden Water District, passed by the 104th Legislature, be accepted?" The voters shall indicated by a cross or check mark placed against the words "Yes" or "No" their opinion of the same.

The result of the vote shall be declared by the selectman of the Town of Hampden and due certificate thereof filed by the town clerk with the Secretary of State.

Sec. 14 Qualified voters. In all elections under this act the town councilors of the Town of Hampden shall exclude from their lists and from all check lists the legal voters who are resident outside the territorial limits of the water district as defined in this act, and all warrants issued for elections must be varied accordingly to show that only the voters resident within the territorial limits of the water district are entitled to vote.

Sec. 15. Savings clause. Nothing herein contained is intended to repeal or shall be construed as repealing the whole or any part of any existing statute, and all the rights and duties herein mentioned shall be exercised and performed in accordance with all applicable provisions of chapter 62 of the Maine Revised Statutes and all acts amendatory thereof or additional thereto.

Sec 16. Emergency clause. In view of the emergency recited in the preamble hereof, this act shall take effect when approved, subject to the provision of section 13 hereof.

mrwa
MAINE RURAL WATER ASSOCIATION

254 ALEXANDER REED RD • RICHMOND, ME 04357
PHONE: 207-737-4092 • FAX: 207-737-7150
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WEBSITE: WWW.MAINERWA.ORG

November 15, 2014

Mr. Jamie Holyoke
Hampden Water District
PO Box 218
Hampden ME 04444-0218

Dear Jamie,

Thank you for the opportunity to prepare the amendments to the Hampden Water District's Charter; I have enjoyed working with you and your Board.

It is my understanding that a question has been posed as to the transition from municipal involvement in the creation of the District to the District's ability to amend its charter without municipal involvement.

Private and Special law 1937, Chapter 34 was the enabling legislation that created the authority for the creation of the Hampden Water District. Section 13 of this Chapter provides that the creation of the District is subject to the acceptance of the referendum. It further provides that the Selectmen of the Town of Hampden shall hold an election for the purpose of the legal voters to determine "Shall the act to incorporate the Hampden Water District be accepted?" This is the limit of municipal involvement.

It is worth noting that the Standard Water District Act, created in 1995, Title 35-A Chapter 64, provides a litany of mandatory procedures, one of which is a local referendum on the creation of a standard water district. As you can see in your charter, a comparable provision existed in P&S Law 1937, Chapter 34.

Additionally, the Standard Water District provides that a district's first board is often appointed by the municipal officials and subsequently elected thereafter. Your charter is unique in that the District's first board was actually elected subsequent to the acceptance of the referendum rather than being appointed by the municipal officials. (P&S Chapter 34).

The Legislature understood that it is necessary for the municipal officials to assist in the creation of a District, but at the point at which the eligible voters approved the referendum, the District was expected to stand on its own.

With the recent discussions regarding amendments to the District's charter, it is always wise to speak with the municipal officials to inform them of potential changes. After watching the Joint Standing Committee on Energy, Utilities, and Technology for over a decade, I have seen them ask for a letter of support from the municipality, and there have been times that they have not

given consideration to any such letter. With a brand new Joint Standing Committee, we won't know their preference until we arrive for the public hearing. I encourage the District to have an open dialogue with the Town. Should you need information, I would be pleased to help in any way that I can.

Sincerely,

Kirsten Hebert
Executive Director

3-A-2

TOWN OF HAMPDEN
PUBLIC NOTICE

HAMPDEN WATER DISTRICT TRUSTEE VACANCY

The Hampden Town Council is seeking applicants to fill a vacancy on the Hampden Water District Board of Trustees for a 5-year term from January 2015 to December 2019. Interested applicants should submit a letter of interest and application to the Hampden Town Council, 106 Western Avenue, Hampden, ME 04444 no later than _____. Information on the duties of the Trustee can be obtained by contacting the Hampden Water District at 862-3490.

Check One: ✓ Initial Application

___ Reappointment Application

TOWN OF HAMPDEN

APPLICATION FOR TOWN BOARDS AND COMMITTEES

NAME: White (LAST) Robert (FIRST) E (MI)

ADDRESS: 118 Main Rd (STREET) Hampden (TOWN) 04444 (ZIP)

MAILING ADDRESS (if different): P.O. Box 303

TELEPHONE: 207-862-3740 (HOME) 207-356-8697 (WORK)

EMAIL: _____

OCCUPATION: Retired

BOARD OR COMMITTEE PREFERENCE:

FIRST CHOICE: Hampded Water District

SECOND CHOICE (OPTIONAL): _____

How would your experience, education and/or occupation be a benefit to this board or committee? _____

_____

_____

Are there any issues you feel this board or committee should address, or should continue to address? _____

_____

3 YEAR

CONSERVATION COMMITTEE
BOARD OF ASSESSMENT REVIEW
PERSONNEL APPEALS BOARD
LURA HOIT MEMORIAL POOL
ECONOMIC DEVELOPMENT COMMITTEE
FRIENDS OF DOROTHEA DIX PARK
DYER LIBRARY
RECREATION COMMITTEE
BOARD OF APPEALS
HISTORIC PRESERVATION COMMITTEE
TREE BOARD

5 YEAR

PLANNING BOARD

OCT 14 2014

FOR TOWN USE ONLY Date Application Received: _____

COUNCIL COMMITTEE ACTION: _____ DATE: _____

COUNCIL ACTION: _____ DATE: _____

_____ NEW APPT _____ REAPPOINTMENT DATE APPOINTMENT EXPIRES: _____

Rev. 12/09

3-C

MaineDOT

Project Identification Form
MPO Project

Section 1 – Project Origination

Sponsoring metropolitan planning organization (MPO): BACTS

Section 2 – Project Description and Justification

Project Sequence Number (PSN):	Project Identification Number (PIN):
Municipality: Hampden	Route Number/Street Name: Route 1A

Description of Project Location: Beginning Mountain View Drive and continuing southerly approximately .30 miles to Murphy Lane.

Federal Functional Classification: Minor Arterial	Is the project on the NHS? No	Speed Limit (mph): 35
AADT (segment): 5618	Total Entering AADT: 5618	Potential locally administered project? ☐ Yes ☒ No

Please state the purpose and need, describing why the improvement is proposed: Pour base and drainage conditions.

Please describe the proposed scope of work: Project include full depth reconstruction of Route 1A including closed drainage system with curb and sidewalk. The existing concrete pavement beneath the existing roadway will be removed as part of this project.

Section 3 – Municipal Involvement

Please provide the following information about the sponsoring municipality:

Municipality Represented: Hampden		
Contact Name: Bob Osborne	Title: Town Planner	
Mailing Address: 106 Western Ave	Hampden	04444
Daytime Phone Number: 207-862-6527	E-mail Address: planner@hampdenmaine.gov	

Section 4 – MPO Project Contact

MPO contact for this project: Dianne Rice	Phone number: 974-3111
Form completed by: Dianne Rice	Date: 9/3/2015

Section 5 – Other Project Considerations

Has this project been reviewed in conjunction with other projects in the area, either under design or construction?	☒ Yes ☐ No ☐ N/A
If yes, please identify the person who conducted the review and specify the projects: Chip Swan, Public Works Director, Sewer and Water projects	
Has this project been reviewed for pedestrian/bicycle accommodations and ADA requirements, including sidewalks and sidewalk ramps?	☐ Yes ☒ No ☐ N/A
If yes, by whom?	
Comments:	
Has the project been reviewed for crash history or other safety concerns?	☐ Yes ☒ No ☐ N/A
If yes, by whom?	
Has this project been reviewed for potential environmental impacts?	☐ Yes ☒ No ☐ N/A
If yes, by whom?	
Has this project been reviewed for traffic data needs, including turning movement counts?	☐ Yes ☐ No ☒ N/A
If yes, please identify the person who did the review and provide this data to the MaineDOT MPO Coordinator.	
Are there existing maintenance problems – drainage, pavement flooding, scouring – that should be addressed as part of this project?	☒ Yes ☐ No ☐ N/A
If yes, please describe: Issues are related to existing concrete that does not extend the full width of the travel way.	
Are there related intersections that should be evaluated?	☐ Yes ☒ No ☐ N/A
If yes, please list:	
For intersection improvements that call for new signals where none currently exist, has a warrant analysis been completed?	☐ Yes ☐ No ☒ N/A
Will the project change the road's horizontal or vertical alignment?	☒ Yes ☐ No ☐ N/A
If yes, please describe: This is a continuing project along this corridor. It will slightly widen the roadway as it did in the former project areas.	
Are there any obvious right-of-way impacts or displacements?	☒ Yes ☐ No ☐ N/A
If yes, please identify the source of the review and briefly explain the impacts: See completed preliminary engineered plans at MDOT.	
Are there utility impacts within the proposed project limits?	☒ Yes ☐ No ☐ N/A
If yes, please describe the utility impacts: Water and Sewer	