Catalyst for Regional Progress

PVPC

A Community Vision for Agriculture and Open Space at Lampson Brook Farm, Belchertown, Massachusetts

Pioneer Valley Planning Commission

www.pvpc.org

September 2014

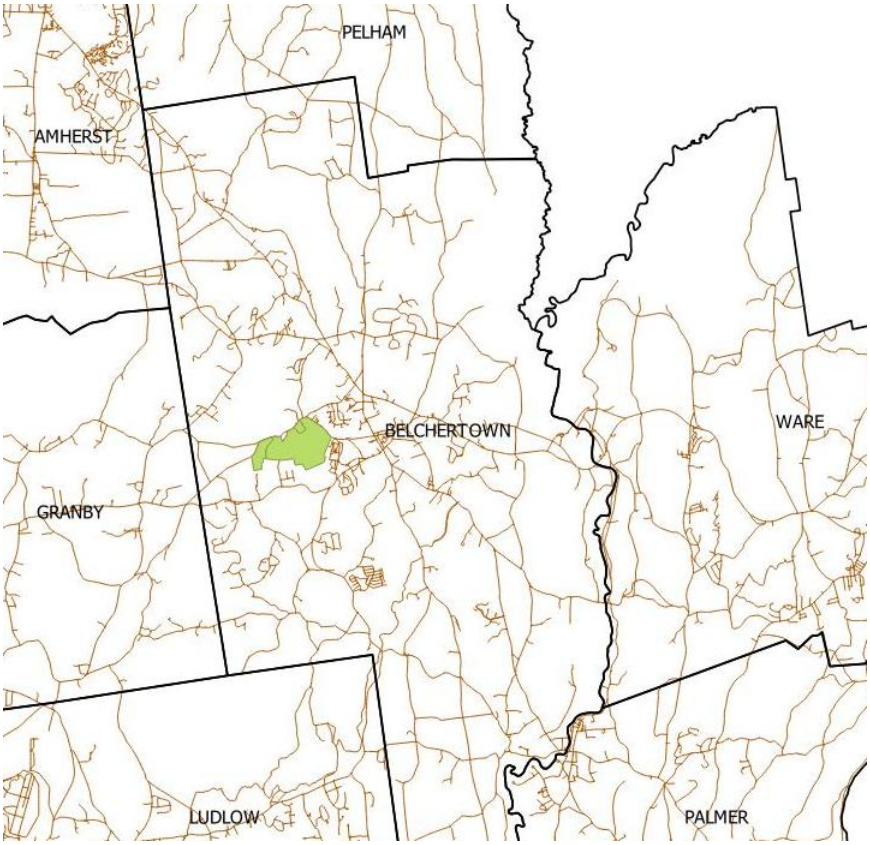
A summary of community goals, ideas and possibilities for the 427-acre Lampson Brook Farm property near Belchertown Center and the former Belchertown State School campus.

Table of Contents

1. Overview

Lampson Brook Farm is a 427-acre property that includes agricultural, forest, and open space lands near the town center of Belchertown, Massachusetts. The property has a long history of use by residents and institutions for forestry, agriculture, conservation and recreation. The majority of the land on the property has been owned by the Commonwealth since 1916. Since 2003, the state has leased the property to the New England Small Farm Institute (NESFI), which is headquartered there.

FIGURE 1-1: Lampson Brook Farm Property Location and Visual Characteristics



For many years the property's agricultural fields were used to raise crops and livestock to feed the residents and staff of the Belchertown State School, the campus of which occupied adjacent property to the east. The farm ceased operation in the early 1970s and the school closed in 1992.

Under the terms of Chapter 664 of the Acts of 1986, NESFI has a long term lease for the Lampson Brook Farm property with the Commonwealth of Massachusetts Division of Capital Asset Management (DCAMM), for the purpose of "promoting the development of a small farm demonstration and training center." NESFI is responsible for maintaining the open fields in agricultural use through sub-lease agreements with small-scale and part-time farm enterprises and offering information and programs relevant to small-scale agriculture. The forested areas of the Lampson Brook Farm property are popular with Belchertown residents for hiking, bird watching, cross-country skiing and other recreation. The Belchertown High School cross country track team uses the sites woodland trails for training and competitive events.

Now, as proposals are being considered for redevelopment of the former state school campus, attention is turning to how the Lampson Brook Farm property can add value to the new development while continuing to serve the agricultural mission of NESFI and the recreation, open space and conservation needs and goals of Belchertown residents. Critical to this discussion is the fact that there are currently no legal land protection mechanisms for the Lampson Brook Farm property; at present, the state has the authority to sell the property, which is held by DCAMM's Office of Real Estate Management, as "surplus property" without community consultation.

NESFI is now engaged in multiple planning efforts for the long term future of this site. These include an inventory of natural resources on the site that has been produced by ConservationWorks; re-mapping by NRCS of the site's eleven agricultural sub-lease parcels to include bordering conservation and "biodiversity management" land; a master planning effort for a six-acre portion of the "NESFI 30" core site where most structures and facilities are located produced by students of the Conway School of Landscape Design; preliminary discussions with the Glynwood organization to initiate a "Keep Farming" program; and the ongoing work of the Friends of Lampson Brook community group. NESFI has approached the Belchertown Conservation Commission, Agricultural Commission, Historical Commission and Town Planner for insight into how the property can best serve the community's needs and interests, and is working with state agencies of the Commonwealth to revise the terms of its lease to enable sustainable management of the site.

PVPC has produced this report for the Belchertown Agricultural Commission to summarize the various ideas, visions and scenarios for continued and enhanced agricultural uses of the Lampson Brook Farm property and complementary open space and conservation-related programs that have been expressed by the Commission, NESFI and members of the community as part of the above-referenced planning processes. PVPC's work is funded in part by a grant from the U.S. Department of Housing and Urban Development as part of the Sustainable Knowledge Corridor program.

2. Description of Lampson Brook Farm Site

This section describes site characteristics and current uses at Lampson Brook Farm.

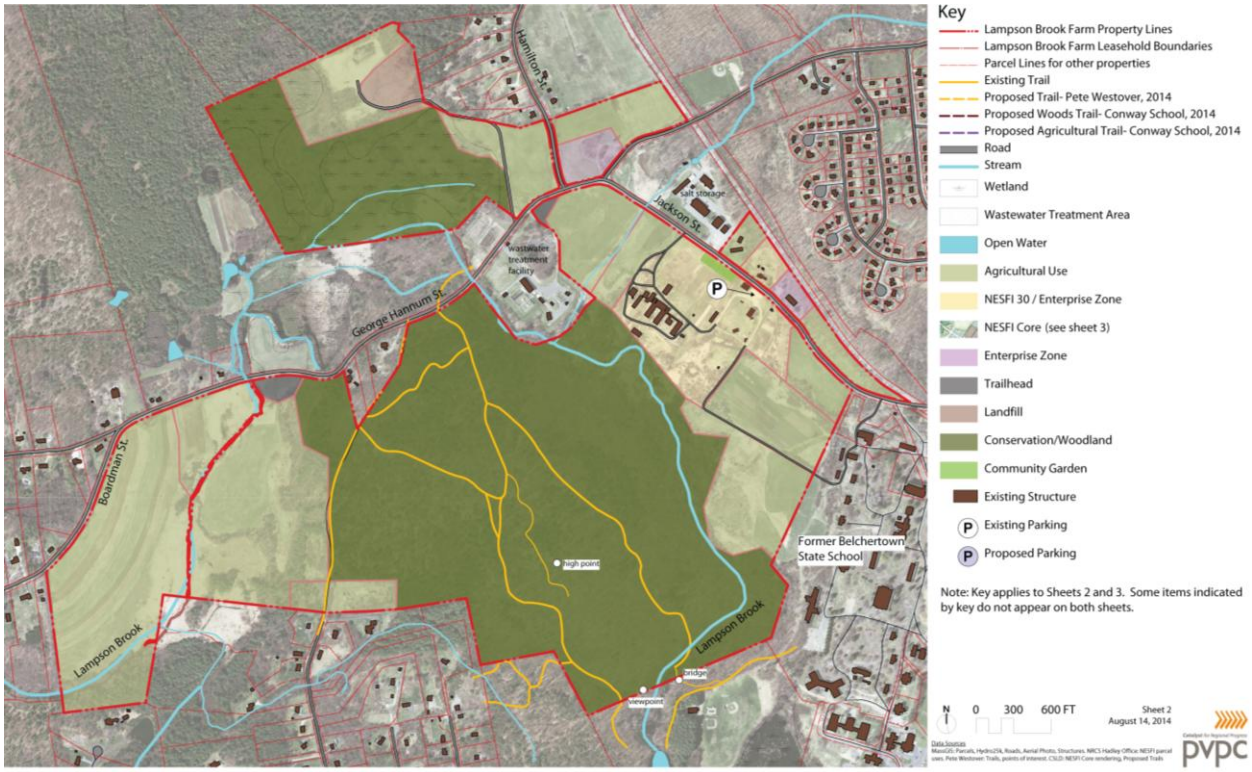
2.1 Site Characteristics

Site characteristics are summarized on the table and figure below.

DARK GREEN:	Woodland, Conservation, wetlands, other non-ag uses	222 ac
LIGHT GREEN:	NESFI subleased parcels	166 ac
TAN:	NESFI 30 (core, trail heads and EZ #1 dairy complex)	28 ac
PINK:	EZ #2 and #3 Economic Development Zones	6 ac
ORANGE:	Landfill	4 ac
TOTAL:		**427 ac**

(total does not add due to rounding)

FIGURE 2-1 Lampson Brook Farm Property Site Characteristics and Current Uses



Lampson Brook Farm is currently used in many ways. A total 426 acres are leased by NESFI, and 166 of those, including bordering conservation land, are sub-leased to small-scale and part-time farmers. Approximately 20 acres are utilized by NESFI for core mission activities such as Belchertown Community Garden and field events. Approximately 20 acres are also utilized by NESFI for core mission activities, such as the Belchertown Community Garden and field events.

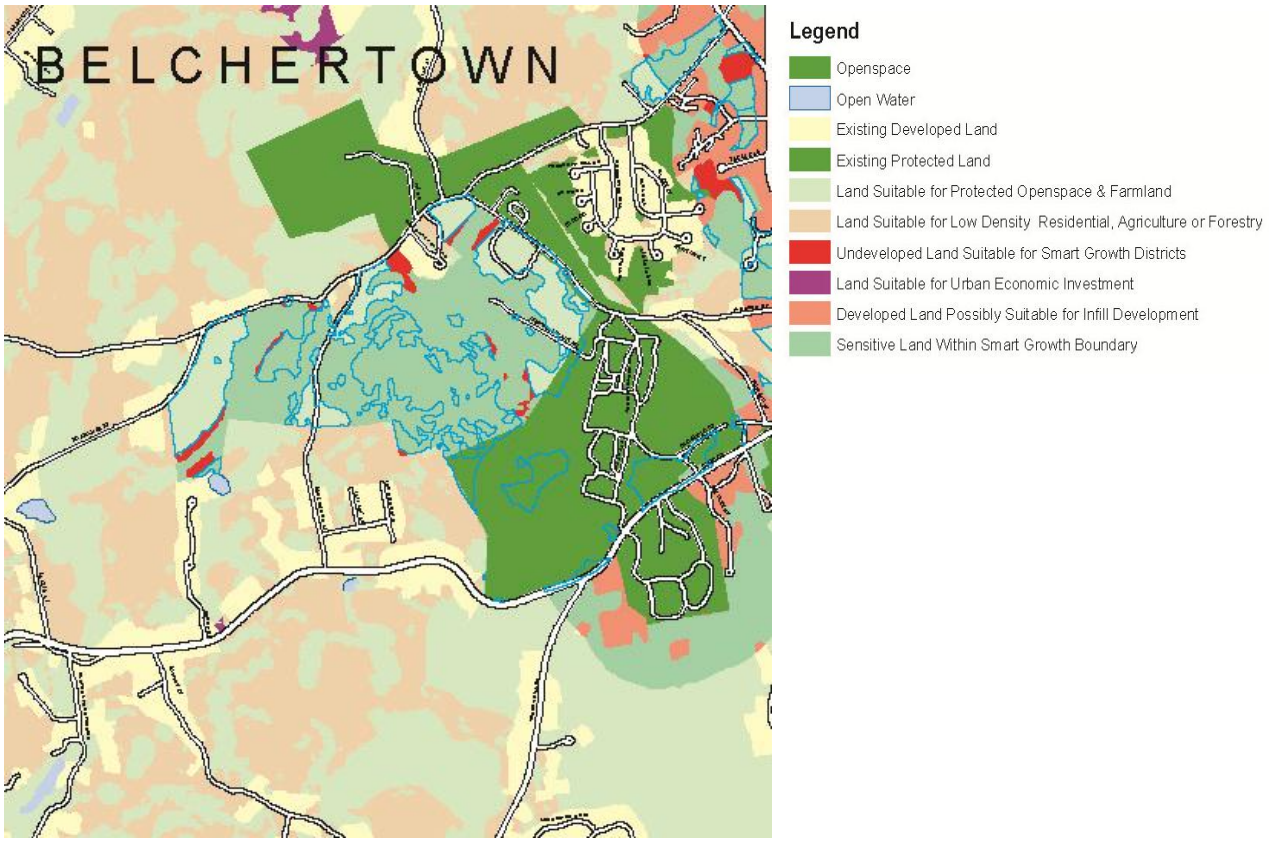
At the adjacent Belchertown State School site, a proposed mixed-use development is currently under review. Two alternative plans for the site include a 120,000 square foot assisted living/senior living facility, commercial/retail, light industrial, cultural/civic space, and possible single- and multi-family residential uses. Phase 1, which is currently undergoing MEPA review, would involve the 120,000 square foot assisted living/senior facility. Redevelopment of the Belchertown State School site as proposed would result in an updated wastewater and stormwater system.

2.2 Municipal and Regional Plan

The 2013 Belchertown Open Space and Recreation Plan (OSRP) recognizes the Lampson Brook Farm property as important to the Town's open space and recreation opportunities. The OSRP notes that the loss of the site to development, or inaccessibility created by adjacent development, would be a significant loss of open space in the town. Passive recreation opportunities are identified as a need for the Town, and the OSRP suggests non-profits and other organizations should be approached for protection of the adjacent lands.

The Pioneer Valley Planning Commission's regional land use plan, Valley Vision, identifies the Lampson Brook Farm Property as: Land Suitable for Protected Open Space and Farmland.

FIGURE 2-2: Lampson Brook Farm Property is "Land Suitable for Protected Open Space and Farmland"



3. Ecological Services Value of Lampson Brook Farm Property

The Lampson Brook Site provides ecosystem services worth $475,000-$1,375,000 per year

Ecosystem Services describes the useful functions that ecosystems provide to humans, including stormwater management, water quality protection, carbon storage, erosion control, and air pollution removal. These services can be quantified and given a dollar value. The value of ecosystem services contributes to a full picture of the inherent value of a site beyond just its real estate valuation or productive capacity.

PVPC calculated the value of ecosystem services for the Lampson Brook Site based on values per acre from two different sources (Trust for Public Land and Costanza, et. al.). Approximate land cover types were derived from aerial photo interpretation.

The estimated value of ecosystem services at Lampson Brook based on Trust for Public Land values are shown in the table below.

Cover Type	Annual Value/Acre	Acres	Site Value
Cultivated Crops	$167.00	10.3	$1,720
Deciduous or Mixed Forest	$1,220.00	189.3	$230,946
Developed or OpenSpace	$464.00	23.2	$10,764
Evergreen Forest	$1,180.00	23.2	$27,376
Open Water	$239.00	0.7	$167
Pasture	$58.00	79.9	$4,634
Shrub/Scrub	$434.00	11.8	$5,121
Wetland	$2,570.00	77.7	$199,689
			$480,419 TOTAL PER YEAR

Using values from Costanza et. al. the annual value of the site rises from **$480,419 to $1,376,439.** It is clear that Lampson Brook provides substantial ecosystem services to Belchertown.

Key

- Lampson Brook Farm Property Lines
- Cultivated Land
- Deciduous or Mixed Forest
- Developed Land or Open Space
- Evergreen Forest
- Open Water
- Pasture
- Scrub/Shrub
- Wetland

FIGURE 3-1: Estimates of Annual Ecological Systems Values for Existing Lampson Brook Property

Land Cover Type	Annual Value Per Acre (TPL)	Annual Value Per Acre (Costanza)	Acres	Site Value (TPL)	Site Value (Costanza)
Cultivated Crops	$167	$2,253	10.3	$1,720	$23,205
Deciduous or Mixed Forest	$1,220	$1,538	189.3	$230,946	$291,107
Developed or Open Space	$464	$2,696	23.2	$10,765	$62,538
Evergreen Forest	$1,180	$1,538	23.2	$27,376	$35,677
Open Water	$239	$5,063	0.7	$167	$3,544
Pasture	$58	$1,686	79.9	$4,634	$134,705
Shrub/Scrub	$434	(use forest)	11.8	$5,121	$18,146
Wetlands	$2,570	$10,393	77.7	$199,689	$807,516
TOTALS				**$480,419**	**$1,376,439**

Sources: Costanza, Robert, et al. "Changes in the global value of ecosystem services."*Global Environmental Change* 26 (2014): 152-158.

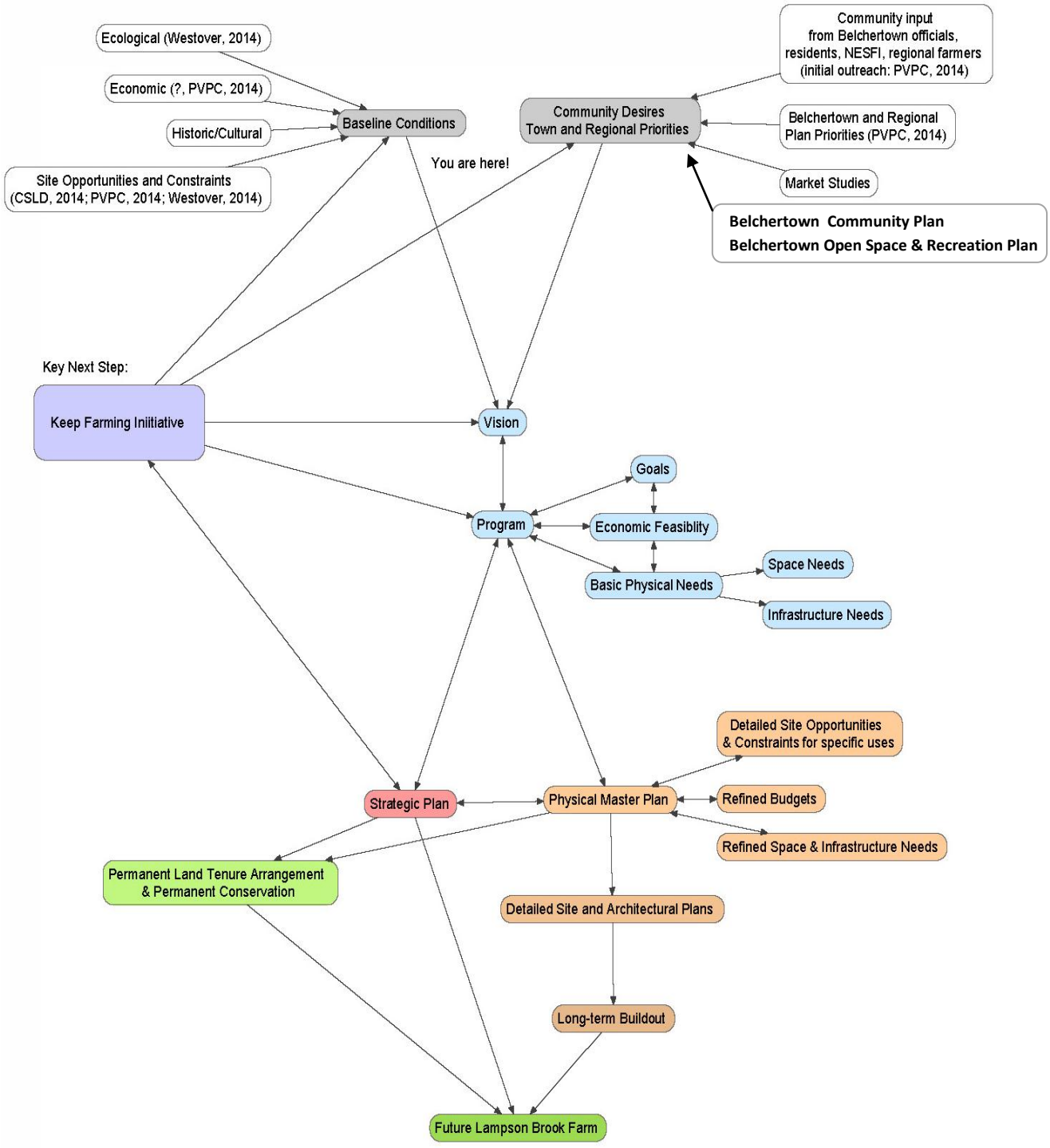
4. Information Needs and Decision Process Considerations

Planning for the future of such a large property with excellent resources near a town center requires a good deal of information for decision-making.

This section presents a diagrammatic illustration of the various information needs and decisions involved in achieving a sustainable future for the Lampson Brook Farm property. The intent is to ensure the long-term economic viability of Lampson Brook Farm, while also fulfilling town-wide and regional needs related to farming, conservation, education, economy, and access to open space.

The following figure identifies the information needed and decisions that are likely necessary to planning for a sustainable future for Lampson Brook Farm. This graphic illustrates what work has been done; identify the crucial next steps (including initiating a Keep Farming program); and show the steps that can lead to the long-term program for the site that will protect its natural and cultural resources, provide services to the community, and keep it in agricultural and passive recreational use.

FIGURE 4-1: Information Needs, Process Considerations and Decision-making for Creating a Long-term Sustainability Program at the Lampson Brook Farm Site



5. Summary of Community Future Vision for Lampson Brook Farm

Residents and stakeholders described a future vision for the Lampson Brook Farm property that included the following:

- Enhanced Agriculture Through a "Keep Farming" Program
  - NESFI core mission and activities
  - Sublease parcels maximized: more vegetable crops, "pick your own" on accessible parcels
  - Community garden enlarged, more gardeners, active membership
  - Facilities improved to better support dairy, livestock, grains and food processing and sales

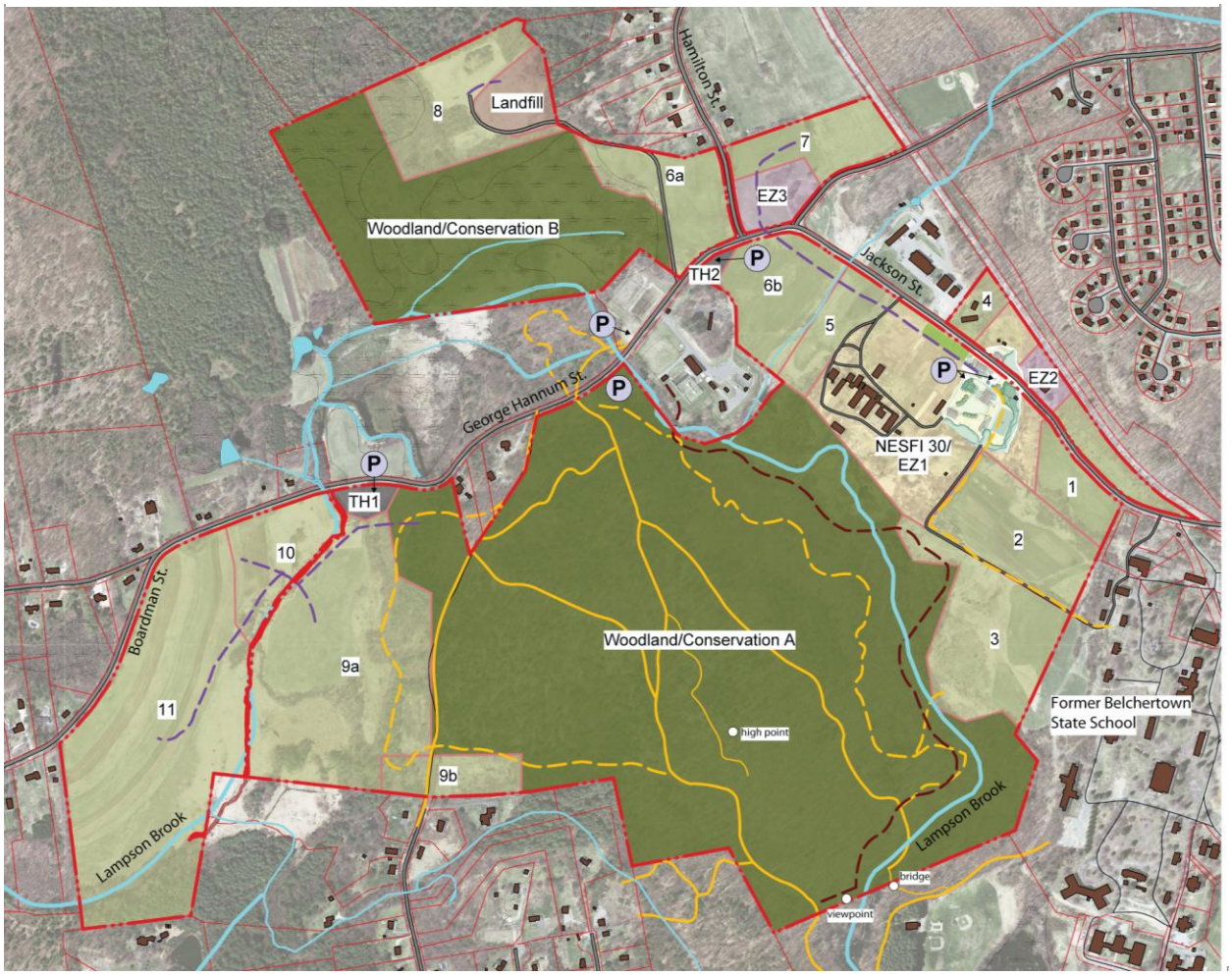
- Create Economic Activity
  - Improved processing facilities for agricultural products
  - Farm stand and retail sales
  - Restaurant/café (seasonal or year 'round)

- Education and History
  - Discovery Center with information kiosk and community center
  - Connections to former state school redevelopment and town center

- Conservation and Recreation
  - Improve existing trails and access points
  - Add new trails including multi-access to serve former BSS clients, families and friends
  - Bird and wildlife observation
  - Add signage, benches, other amenities to support passive recreation
  - Cross country ski trails
  - High quality wildlife habitat (mix of forest, wetland, open) supports many species

- Clean Energy
  - Solar PV on farm structures, buildings and parking area canopies
  - Gas heat from anaerobic digester
  - Small-scale hydro (e.g., at Lake Wallace outlet dam)

Figure 5-1: Current Uses and Future Vision



Parcel 1 (7.7 acres)
Current Use: Fruit, berry, and nut CSA using ag practices that mimic natural ecosystem
Possible additional future use: Pick your own, Agricultural demonstration.

Parcel 2 (11.5 acres)
Current Use: Grows a diverse variety of high-quality vegetables, fresh cut flowers and herbs. Available via wholesale and at area farmers' markets. CSA shares are offered in Belchertown. Leasee also sub-leases Parcel 4 and acreage within the NESFI Core bounds.

Parcel 3 (14.8 acres)
Current Use: Managed under an annual hay contract
Possible additional future use: Birdwatching

Parcel 4 (1.9 acres)
Current Use: This parcel is the site of two greenhouses. Same leasee as Parcel 2, above.

Parcel 5 (4.8 acres)
Current Use: Parcel and adjacent "necessary and related land" includes a cut-flower wholesale enterprise, a cordwood processing facility and a small portable mill. Leasee has a contract to harvest timber from Lampson Brook Farm's central woodlot, and grazes heifers for local dairy farms.

Parcel 6a and 6b (17.6 acres)
Current Use: Breeding and pasture for low-line angus for sale as breeding stock and beef products; harvests hay for own use; and has interest in establishing silvi-pasture along field boundaries. Leasee also sub-leases Parcel 9a and 9b.

Parcel 7 (6.9 acres)
Current Use: Managed under an annual hay contract. Currently produces hay; future plans include production of vegetable crops.

Parcel 8 (11.8 acres)
Current Use: Agricultural composter. Feedstock includes yard waste and food and vegetative material as well as agricultural "waste" from the Lampson Brook Farm site. 50% of product available for application to the site's farmland and gardens at no cost.

Parcel 9a and b (37.1 acres)
Current Use: See Parcel 6, above.
Possible additional future uses: Birdwatching

Parcel 10 (7.6 acres)
Current Use: A market garden, explores "habitat farming" techniques, offers CSA shares, and sells wholesale to local grocers and restaurants.
Possible additional future uses: Agricultural demonstration.

Parcel 11 (41.3 acres)
Current Use: Production of hay and grain on the contours.
Possible additional future uses: Birdwatching

NESFI 30 / EZ1
Fields
- 2 acres sub-leased by leasee of Parcel 2
- 1 acre sub-leased by Belchertown Community Garden (1 acre)
- Possible additional future uses: Pick your own operation. Expanded Community Garden. Beginning farmer plots.

NESFI Core (6 acres)
- Parking
- Jepson House (EZ1 on north side of Jackson Street): housing for farm leasees
- First Barn: NESFI's administrative offices, library, kitchenette, and a public restroom connected to town sewer.
- Horse Barn: meeting room, kitchen, and storage space. Not connected to town sewer.
- Chicken Shed: unused
- Greenhouse
- Possible additional future uses: Discovery Center (museum). Retail. Restaraunt. Expanded Education . Event and Meeting Space. Renewable energy, especially solar on roofs and parking lots. Trailhead.

Former BSS Dairy Complex which includes:
- The Open Shed: used for manufacture of biochar
- Store Room: storage of, among other things, mobile Granary
- Farm Shop
- Possible additional future uses: Enterprise Zone. Regional Food Hub; Discovery Center (small museum). Retail. Restaraunt. Expanded Education function. Event and Meeting Space. Renewable energy, especially solar on roofs and parking lots, possible anaerobic digestor. Parking and loading.

Miscellaneous spaces:
- Home-base for mobile "Open Air Mobile Poultry Processing Unit" and "Adam-Retort" (biochar manufacturer)
- Possible additional future uses: Parking. Home for other mobile ag infrstructure.

Trailhead 1 (TH1) (1.4 acres)
Possible future uses: Parking & trailhead for future woods trails, and Ag Interpretive Trail on Parcels 9a, 10, 11.

Trailhead 2 (TH2) (.6 acres)
Possible future uses: Parking for future Ag Interpretive Trail on Parcels 7, EZ3, 6B, 5 and NESFI30. Birdwatching parking.

Woodland Conservation A (178.6 acres)
Current Use: Sustainable timber and cordwood harvesting with stand improvement. Conservation and habitat enhancement. Trails and recreation.
Possible additional future uses: Expanded trail system. American chestnut research. Forestry demonstration.

Woodland Conservation B (43.6 acres)
Current Use: Conservation use
Possible additional future uses: guided birdwatching

Landfill (4.1 acres)
Current Use: Landfill
Possible additional future uses: ecological restoration, habitat enhancement, and demonstration.

EZ2 (1.7 acres) & **EZ3** (3.6 acres)
Possible additional future uses: Enterprise Zone.

6. Draft Program for Lampson Brook Farm Property

The Draft Program provides details about how the vision can be carried out and begins to sketch out space, infrastructure, budget and operational needs.

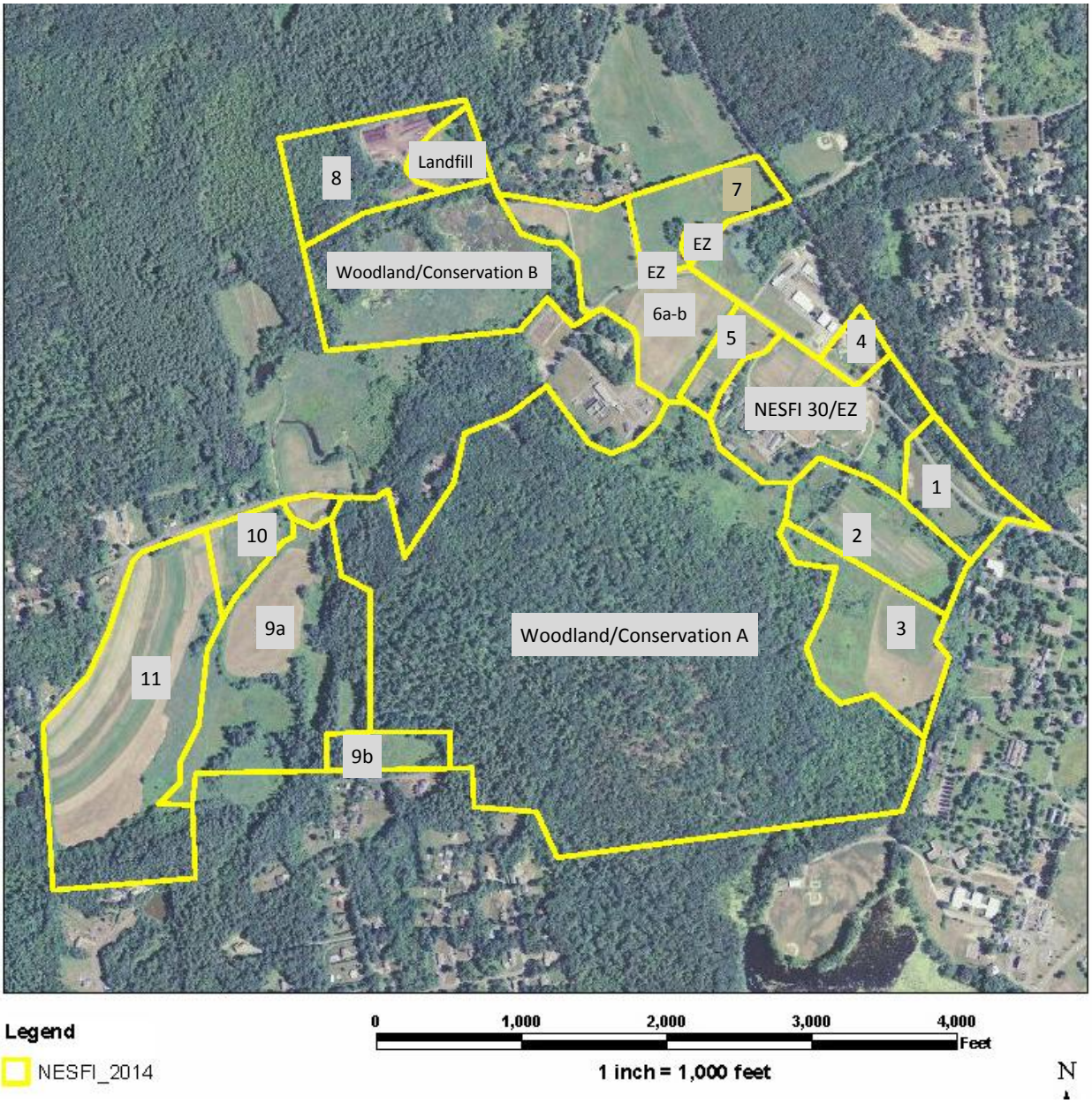
This draft program offers a strategic approach to charting core objectives and helps prioritize how to use resources (e.g. staff time, money, and land availability). Both the future vision and draft program are essential precursors to site master planning, which is an iterative process through which the broad goals expressed in the future vision and draft program are proposed as physical forms and locations on the site. Throughout the master planning process, goals, program, site, and budget are continuously balanced and checked against one another.

Lampson Brook Farm is a unique and valuable resource that will be a key element of planning at both the town and region scales for a variety of concerns, chief among them: conservation, food security, agricultural business development, recreation, and economic development.

Because of the significant potential for enhancing agricultural production, processing and commercial activities at this historic farm property, it is recommended that the Belchertown Agricultural Commission in collaboration with NESFI and other interested town groups and individuals undertake a "Keep Farming" program before pursuing additional Master Planning or Strategic Planning. A Keep Farming program will identify the future agricultural context in which Lampson Brook Farm will fit. It will provide much needed information about the current state of agriculture, including market needs, land and agricultural infrastructure needs, and community resources. This information will set a solid framework for refining the Visioning, Programming, and Master Planning for Lampson Brook Farm. It will also build a base of community support that will help ensure the long-term viability of Lampson Brook Farm and agriculture in Belchertown more generally.

The information below needs much greater detail before it can be laid out on the site with any level of reality. In particular, business plans and budgets should be developed so that the scale and feasibility of the program can be confirmed before expensive design work begins in earnest. We recommend that Belchertown engage in a Keep Farming Program in order to provide much needed context and input for the draft program below.

FIGURE 6-1: Lampson Brook Parcels



Source: U.S. National Resource and Conservation Service. Hadley Mass. 2014

Lampson Brook Farm Agricultural Parcels Current and Potential Future Program Uses

Parcel 1 (7.7 acres under development)

Current Use: Fruit, berry, and nut CSA using ag practices that mimic natural ecosystem.

Possible additional future use: Pick your own, agricultural demonstration.

Parcel 2 (11.5 acres)
Current Use: Grows a diverse variety of high-quality vegetables, fresh cut flowers and herbs. Available via wholesale and at area farmers markets. CSA shares are offered in Belchertown. Leasee also sub-leases Parcel 4 and acreage within the NESFI Core bounds.
Possible additional future use: TBD.

Parcel 3 (14.8 acres)
Current Use: Managed under an annual hay contract. Orchard; winter recreational use as 'sledding hill.'
Possible additional future use: Bird watching

Parcel 4 (1.9 acres)
Current Use: Two greenhouses. Same leasee as Parcel 2, above.

Parcel 5 (4.8 acres)
Current Use: Parcel and adjacent "necessary and related land" includes a cut-flower wholesale enterprise, a cordwood processing facility and a small portable sawmill. Leasee has a contract to harvest timber from Lampson Brook Farm's central woodlot, and grazes heifers for local dairy farms.
Possible additional future use: TBD

Parcel 6a and 6b (17.6 acres)
Current Use: Pasture and hay for low-line angus for sale as breeding stock and beef products; lease harvests hay for own use, and has interest in establishing silvi-pasture along field boundaries. Leasee also sub-leases Parcel 9a/9b.

Parcel 7 (6.9 acres)
Current Use: Managed under an annual hay contract. Currently produces hay; future plans include production of vegetable crops.
Possible additional future use: production of vegetable crops and tree fruit TBD; potential demonstration "permaculture farm."

Parcel 8 (11.8 acres)
Current Use: Agricultural composter. Feedstock includes yard waste and food and vegetative material as well as agricultural "waste" from the Lampson Brook Farm site. 50% of product available for application to the site's farmland and gardens at no cost.
Possible additional future use: TBD.

Parcel 9a and b (37.1 acres)
Current Use: Same as Parcel 6a/b above.
Possible additional future uses: Silvi-pasture.

Parcel 10 (7.6 acres)
Current Use: A market garden, explores "habitat farming" techniques, offers CSA shares, and sells wholesale to local grocers and restaurants.
Possible additional future uses: Agricultural demonstration.

Parcel 11 (41.3 acres)
Current Use: Production of hay and grain on the contours.
Possible additional future uses:TBD

NESFI 30/EZ1 (fields)

- 2 acres sub-leased by leasee of Parcel 2
- 1 acre sub-leased by Belchertown Community Garden (1 acre)
- Possible additional future uses: Pick your own operation. Expanded Community Garden. Beginning farmer plots.
- Miscellaneous – Other mobile agricultural/food processing infrastructure. (Note: Out of concern for public safety, NESFI encourages demolition of severely deteriorated Dairy Complex structures.)

  NESFI Core (6 acres -- Subject of Conway School Site Planning Program)
  - Parking
  - Jepson House (EZ1 on north side of Jackson Street): housing for farm leasees
  - First Barn: NESFI's administrative offices, library, kitchenette, and a public restroom connected to town sewer.
  - Horse Barn: meeting room, kitchen, and storage space. Not connected to town sewer.
  - Chicken Shed: unused
  - Greenhouse
  - Possible additional future uses: Discovery Center (museum). Retail. Restaraunt. Expanded Education . Event and Meeting Space. Renewable energy, especially solar on roofs and parking lots. Trailhead.

  Former BSS Dairy Complex which includes:
  - The Open Shed: used for manufacture of biochar
  - Store Room: storage of, among other things, mobile Granary
  - Farm Shop
  - Possible additional future uses: Enterprise Zone. Regional Food Hub; Discovery Center (small museum). Retail. Restaraunt. Expanded Education function. Event and Meeting Space. Renewable energy, especially solar on roofs and parking lots, possible anaerobic digestor. Parking and loading.

  Miscellaneous spaces:
  - Home-base for mobile "Open Air Mobile Poultry Processing Unit" and "Adam-Retort" (biochar manufacturer)
  - Possible additional future uses: Parking. Home for other mobile ag infrstructure.

Trailhead 1 (TH1) (1.4 acres)
Current Use: Unimproved; informal parking area.
Possible future uses: Parking & trailhead for future woods trails, and Ag Interpretive Trail on Parcels 9a, 10, 11.

Trailhead 2 (TH2) (.6 acres)
Current Use: Unimproved; informal parking area.
Possible future uses: Parking for future Ag Interpretive Trail on Parcels 7, EZ3, 6B, 5 and NESFI30. Bird watching parking.

Woodland Conservation A (178.6 acres)
Current Use: Sustainable timber and cordwood harvesting with stand improvement. Conservation and habitat enhancement. Trails and recreation.
Possible additional future uses: Expanded trail system. American chestnut research. Forestry demonstration. Applied research and demonstrations of sustainable forestry management practices.

Woodland Conservation B (43.6 acres)
Current Use: Conservation
Possible additional future uses: Guided bird watching

Landfill (4.1 acres)
Current Use: Landfill
Possible additional future uses: Ecological restoration, habitat enhancement, and demonstration.

EZ2 (1.7 acres) & **EZ3** (3.6 acres)
Current Use: Accessory to NESFI 30.
Possible additional future uses: Enterprise Zone.

6.1 Agriculture (166 ac)

Includes necessary and related land and bordering conservation and biodiversity management land.

Potential Program and Related Considerations

- Support and enhance sublease farming parcels. Currently 11 sublease areas.
- Support and enhance conservation/biodiversity management practices and measures on commercially managed agricultural land
- Determine most desirable type of crop or use
- Recently re-mapped and characterized by Charlotte Bidet/NRCS and characterized by ConservationWorks (Pete Westover) 2014
- Community Garden(s)
- Currently "over 20 community garden plots on one sub-leasehold" (Source: Farm Partner Memo February 2014)
- Assess need for additional community garden plots (community survey?)
- Determine optimal size, needs, overlap with farming subplots
- Locate space and infrastructure needs for additional community garden plots. Guidelines:
- Plot size: 20x20'
- Requires irrigation (one spigot per 8-12 plots?)
- tool shed (1 per garden)
- picnic table (1 per 8-10 gardens)
- Shared compost area (with additional materials like woodchips). One per approx 25 gardens.
- Vehicle accessible.
- Provide beginning farmer plots (for new commercial farmers) [Is this desired by NESFI?]:
- Assess need
- Locate space and infrastructure needs for additional community garden plots. Guidelines:
- One-quarter up to 2 acres
- Require irrigation
- Good vehicular access
- Food processing station (vegetable wash, packing)
- Mitigate runoff into brook, other resource areas
- Require organic farm practices?
- Assess community support, geographic area and funding available for a Keep Farming initiative (would need to include surrounding towns)
- Establish and enforce management standards for highly visible fields that border public roads

6.2 Conservation (222 ac)

Potential Program and Related Considerations

- Protect streams, wetlands, and vernal pools, rare species habitat.
- Buffer conservation resources from abutting residential, working woodland and recreational uses.
- Conserve Forests (consistent with any municipal or state forestry plan that may exist).
- Identify working forest areas
- Identify forest areas managed for conservation value
- Identify non-managed forest areas
- Protect and enhance wildlife corridors
- Provide connectivity to adjacent resource areas and water
- Buffer conservation resources from abutting residential uses
- Assess biodiversity characteristics
- Define maintenance responsibilities
- Provide publicly accessible areas:
- Forest demonstration projects
- Agricultural demonstration projects or areas
- Self-guided educational and/or recreational trails
- Occasional events such as organized bird walks
- Trail head (likely at small landing along George Hannum Street, per Judith)
- Small parking area
- # of cars? Proposal:
- regular use: 2 parking spots
- Tours require approx. 10 parking spots, unless there is reasonable on-street/road shoulder parking)
- Kiosk with trail map and info

NESFI has stated that is supports further inquiry regarding the eligibility of the site's conservation acreage for payment in lieu of taxes (PILOT) payments to the Town.

6.3 Recreation

A field survey of the Lampson Brook Farm property conducted in May 2014 by ConservationWorks identified a network of trails that traverses the forested area of the property. The trails generally follow the ridge running northwest to southeast on the property. Forest abutting the NESFI fields are generally on steeper slopes and do not contain established trails. There is evidence that established trails elsewhere are actively used, though to what degree and by whom remains to be determined.

According to ConservationWorks, trails running through the central portion of the property pass through deer and moose habitat, beaver ponds, and bird habitat. They extend to trails in the southeast portion, also passing beaver ponds as well as vernal pools, open marsh, and swamps, which is prime bird habitat. A trail appears to extend to a corner of the Belchertown State School campus. In the southwest portion, the trail extends from Underwood Street and leads into pine stands that may also serve as good bird habitat. The northern portion of the site includes many wetlands, including islands of white oak. There are no trails, but there is evidence of ATV activity in the area. There are currently no trail connections to NESFI's leased fields.

Considerations for continuing or expanding recreation on the Lampson Brook site include, first, enhancing the existing trail network through the following:

- Trail markers and signage
- Parking area (best area may be off George Hannum Road across from Sewage Treatment Plant)
- Trail amenities such as footbridges, benches, trash barrels, etc.

Enhancing trails is consistent with Belchertown Community Plan implementation action OSR7. Existing trails are primarily on state- and town- owned, though trailheads to the site are located on some private land. If parking and layout is determined to be accommodating to public use at these sites, trail easements may be the best method to secure access to the trailheads. Outreach to adjacent neighborhoods could also help develop goodwill and a possible "Friends of Lampson Brook" or similar organization that may be willing to oversee some stewardship responsibilities.

There is also a special consideration for the site related to accommodating the desire and need of former residents of the adjacent Belchertown State School, along with their families and friends, to visit the site. The existing trail system was used in the past for patient outings designed to encourage social and physical activity. Consultation is now underway for design of a "multi-access" trail to assess potential for this type of trail at Lampson Brook Farm for a similar use. Sometimes known as "adaptive hiking," this type of recreation offers individuals with disabilities assistive equipment and therapeutic guides to enjoy outdoor recreation. Several participants in the process for this plan said that the best way to memorialize the many human stories that took place at the former school is to offer positive, enjoyable access to the site for those who chose to visit.

An in-depth study of the habitats and human uses of the non-agricultural portions of the site is needed to best determine the most appropriate program, such as the placement of trails and identification of bird communities for bird watching. Trail placement would also be influenced by forestry practices such

as logging, if desired. A study of bird communities would also support the development of a "niche" attraction for the site that could be promoted through interpretive signage.

To leverage the educational and recreational value of the site's innovative agricultural uses, an interpretive trail through NESFI's actively farmed areas would bring increased recognition and build community relations. A similar trail recently opened in Montague on Red Fire Farm in collaboration with Mount Grace Land Trust. The land of Red Fire Farm was sold to Mount Grace Land Trust to be held as a community resource through a fundraising campaign, while the farm buildings, equipment, and other infrastructure and improvements remain under the ownership of Red Fire Farm. The self-guided trail circles working fields and adjacent forest and habitat, and includes a stream crossing (by wading).

As another regional example, there is also a short footpath leading from Main Street through the working Yazwinski farm in Old Deerfield. The short trail includes interpretive and historical signage, and passes cow and pig barns, pasture, and an occupied farmhouse.

Trail System: Existing and Proposed

On the following page is a trail system as envisioned by the Conway School based on mapping by Pete Westover of Conservation Works. The trail vision addresses several needs and ideas:

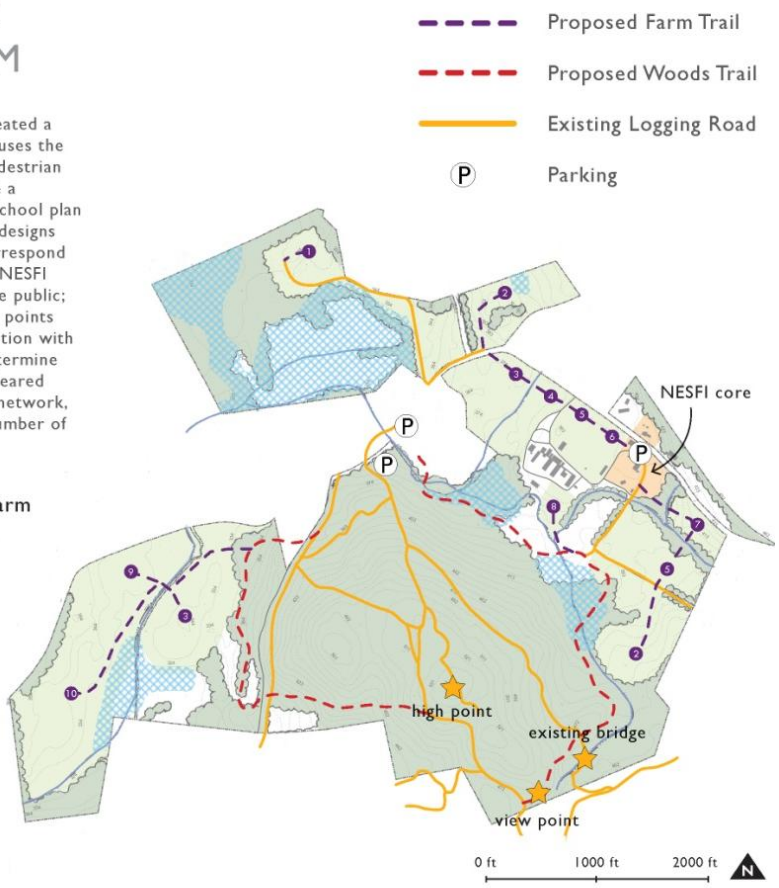
- Support cross-country track and competitive events
- Parking needs
- Gathering areas (shade, picnic tables)
- Trail design and construction
- Define maintenance responsibilities
- Establish appropriate areas for dog walkers and policies
- Support birding – prime areas in publicly accessible locations
- Define maintenance responsibilities

LAMPSON BROOK FARM
PROPOSED TRAIL SYSTEM

Pete Westover, of Conservation Works LLC, created a conceptual woods trail design for the site that uses the existing logging roads as the basis for a new pedestrian trail network. He proposed new trails to create a woodland circuit (shown in red). The Conway School plan expands upon his design to include conceptual designs for a farm trail (shown in purple). Numbers correspond with the farm enterprises subleasing land from NESFI that could be part of an educational trail for the public; they do not correspond with actual destination points along the trial. Additional analysis and collaboration with sublessees should be conducted in order to determine the precise route of the farm trail. Three flat, cleared parking areas have been identified for the trail network, one in the NESFI core. This may increase the number of visitors to the core.

Agricultural Enterprises on Lampson Brook Farm

1. Farmer's Friend Compost
2. Lone Birch Farm / Austin Farm
3. Cold Springs Farm
4. White Oak Forest Products
5. Farmacy Gardens
6. Belchertown Community Garden
7. Tending the Wild CSA
8. Amend Organics
9. Solid Grounds Farm & CSA
10. White Oak Farm/Burgundy Brook Farm



Conceptual woods trail design (shown in orange) and assessment by Pete Westover, Conservation Works LLC.

6.4 Food Processing, Retail and Distribution Center (NESFI Core site? ~30 ac)

Potential Program and Related Considerations

- Farm Stand
- Determine scale (square feet).
- Determine refrigeration needs, capacity and energy source.
- Determine proportion of local products and off-site local agricultural products.
- Parking, truck loading, bike racks, showers and other access-related requirements
- Coffee shop/restaurant.
- Combined or separate from farm stand; determine requirements for electric power, natural gas/propane/solar PV/solar hot water, sewer system and septic
- Parking and bike access for employees and customers
- Use of bathrooms for other public events.
- Size/needs of delivery truck loading facility
- Size (square feet or number of seats)?
- Seasonal or year 'round operation?
- Inclusion of dining space indoors, or outdoors, or both?
- Location of "Pick Your Own" crop areas (ideally near farm stand and restaurant)
- Requires ample parking—parking can be seasonal (field and/or road shoulder)
- Processing/canning/packaging facilities for value added products (seasonal?)
- Size can vary greatly from home-scale kitchen to industrial facility. What is envisioned? Who are users? How many square feet?
- Requires power, water, sewer
- Expected number of employees?
- Requires loading facility if commercial scale
- Study potential for food hub function (is this same as EZ Enterprise Zones?)
- Functions?
- Market assessment?
- Dairy operation
- Define desired core mission (educational vs. revenue generation)
- Condition of structures?
- Establish Enterprise Zone(s)
- Is this the same as food hub above?
- May not be located in NESFI core
- Program to be determined—Conduct market feasibility studies? Or RFP?
- Event facility rental for weddings, etc?

6.5 Waste Recycling and Processing

Potential Program Elements and Considerations

- Compost organics
    - From onsite or offsite? Commercial operation?
- Waste water handling and treatment
    - What is current capacity? Expected capacity based on uses?
- Other solid waste handling

6.6 Clean Energy

- Potential Program Elements and Considerations
- Develop on-site renewable energy production to support 100% of NESFI's building energy needs (net-zero building goal) with a mix of the following technologies:
- Roof-mounted solar photovoltaic
- Photovoltaic parking shade structures
- Ground mounted photovoltaic
- Micro-hydro (location and feasibility TBD)
- Windmills and/or rooftop turbines

6.7 Civic Gathering Space

- Potential Program Elements and Considerations
- Provide gathering space (indoor and outdoor)
- Additional details and community input needed.
- Described in other categories, unless there is a community space that is not directly tied to conservation, recreation, agriculture, food processing

6.8 NESFI Core Mission and Operations (addressed by Conway School Master Plan)

Development of this part of the Lampson Brook site will be the focus of a NESFI Business Plan. This plan is now under development but is contingent on state action. Investment in the Lampson Brook Farm property requires that it move beyond "surplus real estate status," into the hands of mission-appropriate agencies or entities and that those entrusted with investing in, developing and sustainably managing the site be provided with necessary security of tenure.

- Potential Program Elements and Considerations
- Offices
- How many, how big?
- How many employees?
- Educational
- Classroom(s)? How many, how big?
- Meeting space? How many, how big?

- Auditorium? How many seats?
- Provide staff accommodations
- What style: dorm, suites, efficiency, 2-3 bedroom apartments, single-family?
- How many staff?
- Does it need to be adjacent to any other functions? Or away from any other functions?

6.9 The Small Farm Discovery and Education Center

Potential Program Elements and Considerations

The market/target audience for this center will include general public as well as local schools, public officials, and people interested in acquiring farming, gardening, food processing knowledge and practical skills. It is envisioned as much like the Great Falls Discovery Center in Turners Falls, and would include history of agriculture in Lampson Brook Valley for over two and a half centuries – from settlement and subsistence farming; through small-scale family farm production of market goods, including the eventual decline of New England's small farms; the advent of the BSS farm – including its evolution from community food self-sufficiency to the industrial agriculture model; and the subsequent return to the site of small-scale, ecologically sustainable agriculture. It will also include NESFI's library and bookstore and be associated with Trail Head informational kiosks, workshops and a café. Additional considerations include:

- Function as hub for interpretive and recreational trail network
- Provide demonstration space (indoor and outdoor) as described above
- Development of Discovery Center facility
- Define mission, organizational structure, audience/market to be served, capital and operational funding,
- Size of display space and supporting office/restrooms/storage/exhibit staging areas (square feet?)—physical needs depend on intended displays (i.e. indoor or outdoor, climate control requirements, lighting control, sound control)
- Hands-on discovery space (e.g. practice tool use, plant things, work with animals, petting zoo, sit on tractors, etc). Physical needs vary widely
- Physically close to café, retail
- Shared parking and bike facilities with other buildings
- Septic handling requirements
- Parking needs? (based on scale)
- Bus drop off? (based on intended audience)

6.10 Economic Development

Potential Program Elements and Considerations

NESFI's current lease agreement permits establishment of a Natural Resource-based Business Park on the site of the derelict Dairy Complex. Recent consultation by NESFI with a food industry professional points out the challenge of locating a food processing facility at such a distance from the state's major highways (i.e., the Mass Pike and I-91). Considerations for attracting small businesses to the Lampson Brook Farm location would include:

- Small scale – probably less than 20-30 employees
- Locally owned and local target market
- Financially secure with a sound business plan
- A business mission that complements Lampson Brook Farm's public purpose, such as sustainable and organic agricultural production.
- Leverages/benefits from location in an attractive rural setting.
- Options available for creative financing, including attracting tax incentives or credits, flexible lease payment terms
- Flexible local regulations, including zoning.

7. Next Steps for the Agricultural Commission

- Consolidate information on Lampson Brook Farm planning processes.
- Work in partnership with the Conservation Commission on topics of common interest, especially recreation enhancements, and open space protection to maintain and enhance the value of the ecosystem services already provided by the site.
- Produce a concise set of goals and actions reflecting the community vision expressed by residents and officials in this report.
- Integrate goals into municipal master plan, open space plan and other relevant documents.
- Establish goals, funding and staffing for Keep Farming initiative involving neighboring municipalities (Granby, South Hadley, Palmer, others).
- Continue working with NESFI on development of long-term lease with Commonwealth.
- Identify opportunities for compatible and complementary agricultural, conservation and recreational uses the redevelopment of the adjacent former state school property.

APPENDIX 1: List of Public Meetings and Outreach Contacts

Date	Meeting/Contact	Location	Summary
8/14/14	Belchertown Agricultural Commission	Town Hall, 2 Jabish St	15 attendees. PVPC staff presented draft program, ecosystems services analysis, received feedback for focus and refinement of vision.
8/12/14	Belchertown Planning Board	Town Hall, 2 Jabish St	12 attendees. PVPC staff presented draft vision program. Received feedback on value of property and potential to enhance value of adjacent redevelopment of former state school.
6/9/14	Belchertown Conservation Commission	Town Hall, 2 Jabish St	15 attendees. PVPC staff presented preliminary vision information and solicited feedback from commissioners on existing conservation uses, wetlands and other regulated resources, woodlot uses, trails.
5/20/14	Belchertown Agricultural Commission	Town Hall, 2 Jabish St	6 attendees. PVPC staff reviewed project scope; received input from commissioners on range of program considerations for site
1/30/14	Belchertown Garce Adzima, Agricultural Commission Chair; Doug Albertson, Planning Director; Judith Gillan, NESFI Founding Director	NESFI office, 275 Jackson Street	PVPC staff review technical service application, develop scope of services and project timeline

APPENDIX 2: Keep Farm Program Supplemental Information

The Goal of a Keep Farming Program

- Engage the local community.
- Introduce an evidence-based method to local agricultural planning.
- Promote a community supported agricultural economic development initiative.
- Initial funding for start-up; up to $50,000 for an 18-month project.
- Active, on-going participation of residents and businesses.
- Challenging in a suburban/semi-rural area due to lack of resident awareness of agricultural history, value and activities. Massachusetts is a primarily urban state.

Glynwood is a not for profit organization headquartered in Cold Spring, New York. Glynwood's mission is to save farming by strengthening farm communities and regional food systems. Glynwood focuses on small- and mid-sized farmers in the marketplace. Their work has traditionally focused on the Northeast U.S. Glynwood operates its own farm, and is familiar with the challenges of agriculture.

Glynwood has proven expertise through their Keep Farming program in working hands-on with communities to help them develop policies and infrastructure that support their farm economies and conserve their farmland. Since 2003, Glynwood has worked with more than 40 communities in New York and Massachusetts to implement Keep Farming.

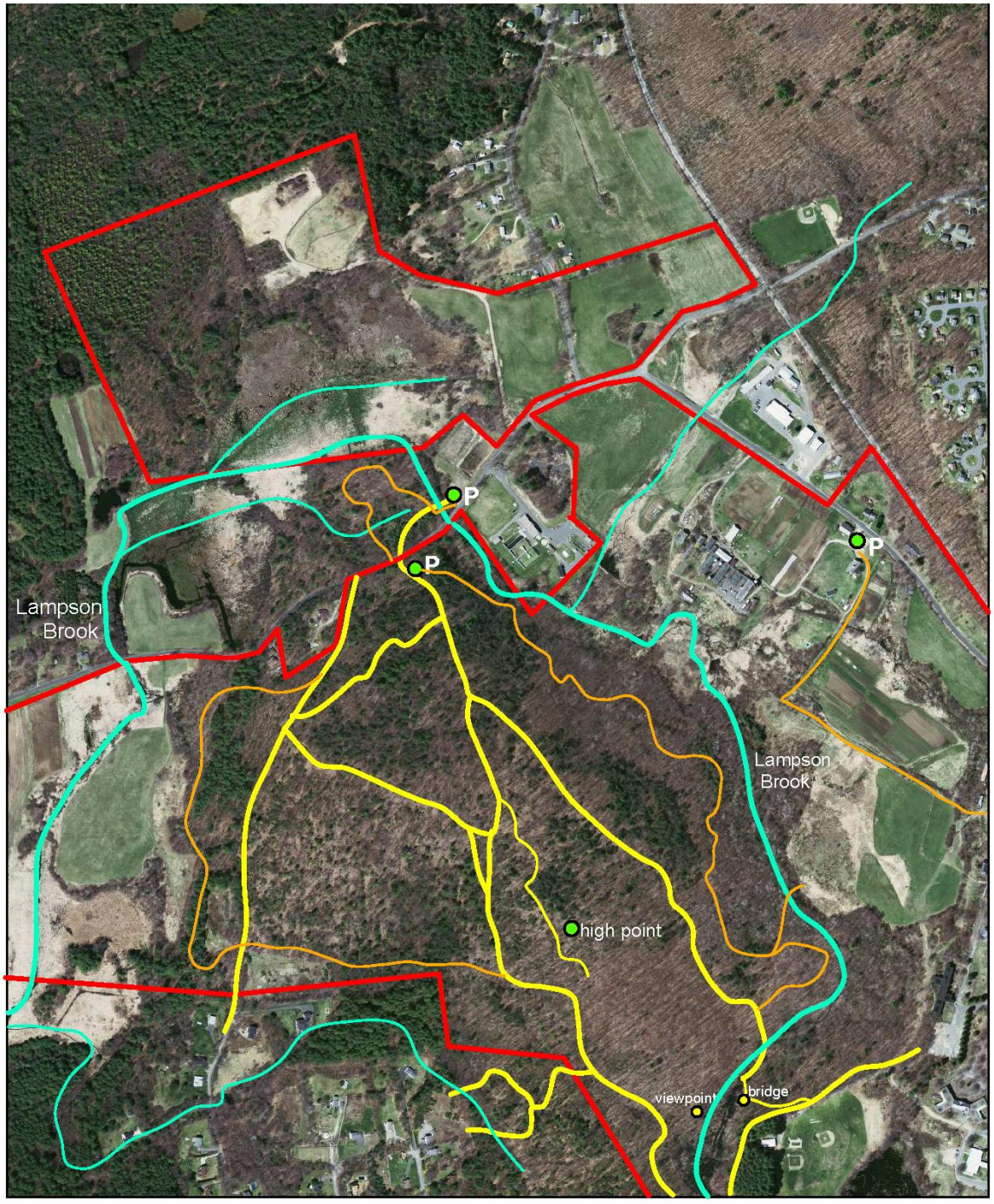
GLYNWOOD

www.glynwood.org.

Virginia Kasinki, Director of Community Based Programs, provides supervision and resources for Keep Farming projects. She is responsible for community-based initiatives offered by Glynwood including the *Keep Farming* Program. Virginia has extensive experience with planning community-based programs and in training and coaching local leaders. She is also an experienced meeting organizer and facilitator. Prior to joining Glynwood, Virginia was the executive director of a national volunteer organization. She holds a Bachelor of Science degree from Pratt Institute, a Master's of Science from Purdue University and a Master of Social Work from Fordham University.

Melissa Adams is the Massachusetts Representative of the Keep Farming Program at Glynwood. She has coordinated the Keep Berkshires Farming 2012-2014 initiative in partnership with the Berkshire Regional Planning Commission, providing hands on guidance to volunteer teams in 4 regions of Berkshire County.

APPENDIX 3: Existing and Proposed Trails (Conservation Works)



Aerial Photographs
From MassGIS 2009

Lampson Brook Trails and Streams

Present Trails & Woods Roads
Proposed Trails
Streams

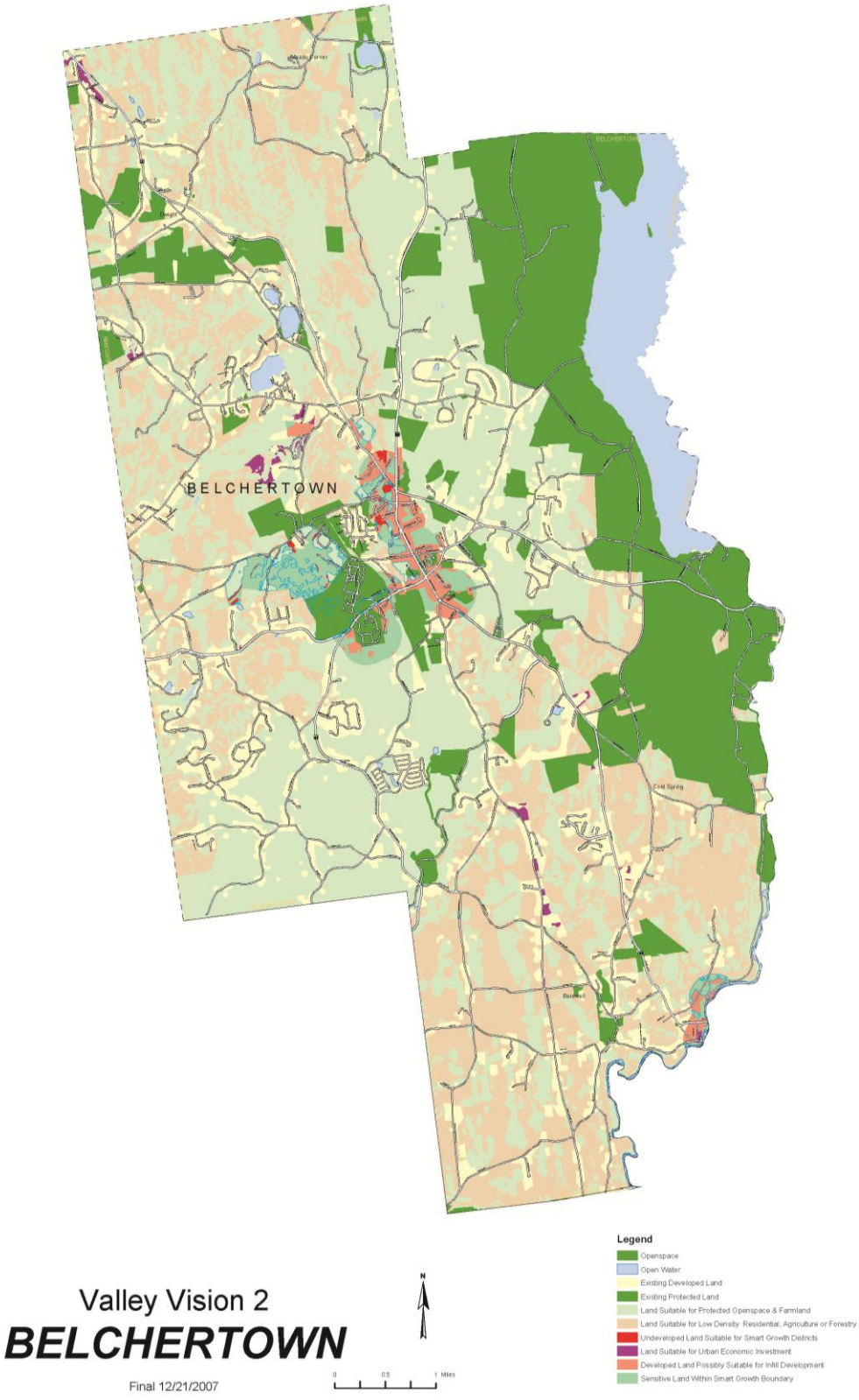
0 300 600 1,200 1,800 2,400
Feet

N
W E
S

This map is for planning purposes, with specific points subject to verification on the ground.
It is not to be used by itself for boundary definition.

Conservation Works - June 2014

APPENDIX 4: Regional Land Use Analysis of Belchertown Lands



APPENDIX 5: Ecological Systems Services Valuation Supporting Information

TECHNICAL MEMO: Ecosystem Services Value Estimates

Lampson Brook Farm Property

The economic benefits of open space and working land are among the most compelling reasons for preservation and protection of these types of land uses.

In Massachusetts, about 25% of all land is developed and another 25% is permanently protected. Our choices about how to manage and balance land use on the remaining 50% present some of the greatest opportunities for development and protection that adds value to adjacent properties and the community as a whole. Significantly, the Lampson Brook property, which is fee-owned by the Commonwealth of Massachusetts and leased to the New Small Farm Institute, is not permanently protected, and so falls into this third category of land use opportunity.

Typical leading financial benefits of the preservation of open space and working lands include:

- Strategic investment of limited public infrastructure funds and land conservation to locations where the greatest benefit can be achieved.
- Reductions in flood insurance costs to adjacent and downstream home and business owners.
- Taxable properties located adjacent to open space in urban areas often increase in value, generating a greater municipal tax revenue.
- Homes located near parks and open space typically sell for more than similar homes elsewhere.
- The presence of open space is often considered a quality of life amenity that businesses seek when deciding to relocate or stay in an area.
- The preservation of working lands for agriculture can support regional economies and typically reduces the cost of community services for residential development (Atlanta Regional Commission 2007).

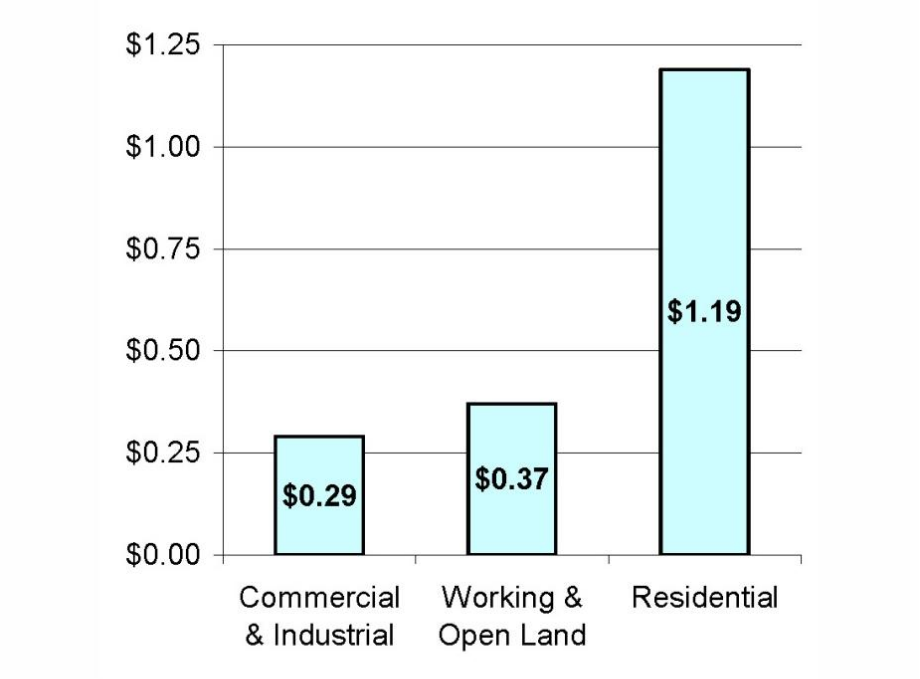
However, there is often a lack of general awareness among the public and decision-makers of the fiscal benefits of preserving natural resources and open space. This is because relevant information about the value of open space and working land is located in many different places.

There are also significant nonmarket benefits to the preservation of open space and working land that do not appear on a municipal ledger. Areas of natural beauty—from parks to rural scenic vistas, community gardens, trail systems and bikeways—support wildlife and plants. These areas also provide emotional and physical benefits to humans that are not part of traditional economic transactions. Different types of value are measures by different methodologies and expressed in different units. Converting to a standard unit (such as dollars) involves subjective judgments and is not always possible." Fausold and Lilieholm (1996)

Cost of Community Services Estimating Method

One commonly used method for estimating the economic value of open space and working land is the Cost of Community Services (COCS) impacts analysis developed by American Farmland Trust. Below is a summary of 125 COCS performed by AFT from 1992 through 2006. The analysis accounts for the reduced demand for municipal services associated with working space and open land, as well as anticipated tax revenue from each type of land use.

Cost of Community Services Impact Analysis: Average Municipal Cost Per $1 Dollar Received in Annual Tax Revenue of Different Land Uses (AFT 2006)



Aggregate data from 125 COCS studies 1992 through 2006
Reproduced from AFT Cost of Community Services Studies Fact Sheet. August 2006

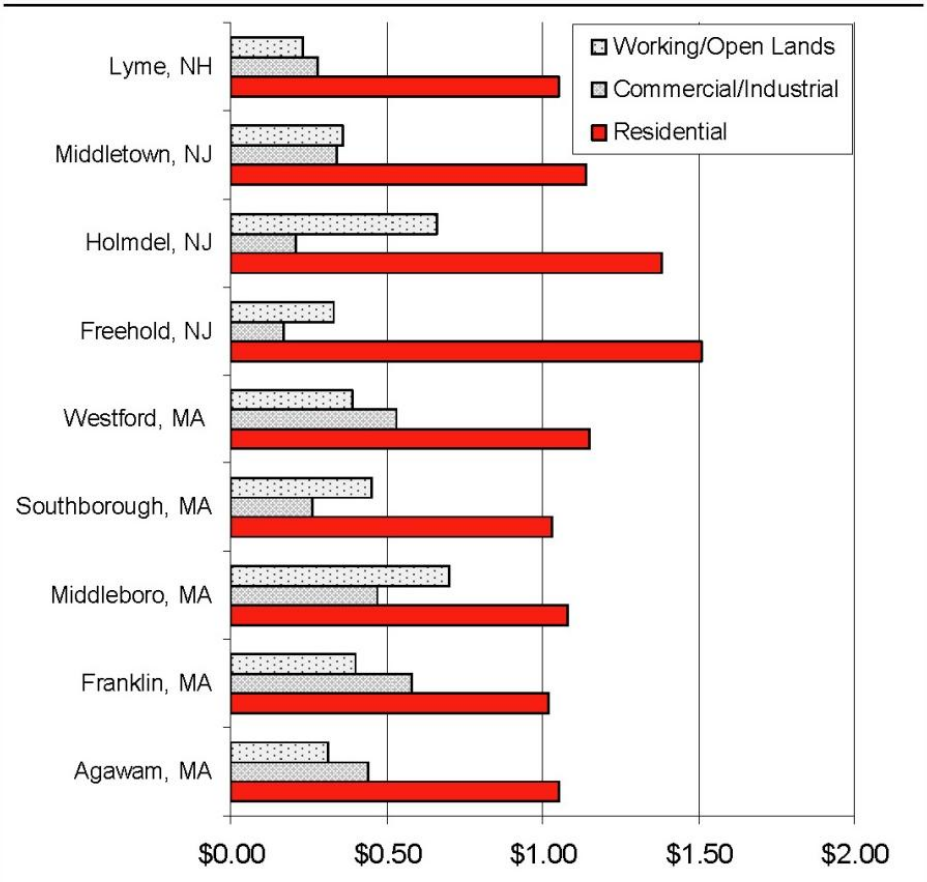
Applying this average finding of AFT's aggregate analysis to the 420 acres of the Lampson Brook site, keeping the land in open space and working farmland would help minimize demand for municipal services, and help focus growth of commercial/industrial and residential development in areas that are already better serviced by town infrastructure and a higher priority for more compact development.

Selected Communities: Cost of Community Services Impact Analysis: Average Municipal Cost Per $1 Dollar Received in Annual Tax Revenue of Different Land Uses (AFT 2006)

Municipality	Residential	Commercial/ Industrial	Working/ Open Lands	Year of Study
Agawam, MA	$1.05	$0.44	$0.31	1992
Franklin, MA	$1.02	$0.58	$0.40	1995
Middleboro, MA	$1.08	$0.47	$0.70	2001
Southborough, MA	$1.03	$0.26	$0.45	1997
Westford, MA	$1.15	$0.53	$0.39	1995
Freehold, NJ	$1.51	$0.17	$0.33	1998
Holmdel, NJ	$1.38	$0.21	$0.66	1998
Middletown, NJ	$1.14	$0.34	$0.36	1998
Lyme, NH	$1.05	$0.28	$0.23	2000

Source: American Farmland Trust August 2006

Selected Communities: Cost of Community Services Impact Analysis: Average Municipal Cost Per $1 Dollar Received in Annual Tax Revenue of Different Land Uses (AFT 2006)



Source: American Farmland Trust August 2006 (Selected Municipalities)

Natural Capital Method

This analysis helps determine the economic value of a natural system by comparing the services provided by these systems to the cost of man-made systems which would fulfill similar functions. Examples include shade provided by trees and vegetation for reducing air-conditioning requirements for human structures; the stormwater management and flood storage capacity provided by wetlands; and the wildlife habitat provided by forest and meadow lands for pollination. This analysis is necessarily incomplete because of the wide range and interconnected nature of natural functions, as well as the difficulty in choosing an appropriate time period for such analysis (Hawkins and Lovins 1999).

Rudolf S. de Groot (1994) developed a matrix of *ecological functions*, organizing them according to their ecological, social, and economic (raw-material production) value. Though these functions are not all measured in dollars, the matrix helps organize the total value of an ecosystem (Miller 1997).

With respect to water resource areas, green spaces such as wetlands help save many billions of dollars by providing natural flood storage areas to help minimize flood damage. Wetlands also provide effective stormwater management, reducing dramatically the amount of engineered water management that must be built to accommodate new and existing development. Benedict and McMahon cite the example of the $1.5 billion public purchase of additional land adjacent to water supplies in upstate New York. This ensured long-lasting water quality and eliminated the need to construct an EPA-ordered water treatment plant at a cost of $6 to eight billion.

Non-market Benefits Method

In addition to the COCS and Natural Capital analysis methods discussed above, as well as more consumptive uses of natural resources, such as mining, timber harvesting, or fishing, there are a wide range of other land uses for which the value of the resources involved cannot be measured in financial terms. These include "non-consumptive uses," such as hiking, boating, photography, bird watching, etc. There is also a category of "indirect uses," which includes the enjoyment of open space obtained by understanding the value of the benefits associated with its protection. These two types of benefits are difficult to measure in monetary terms because they often fall outside of free-market parameters (though many consumptive uses are subject to "administratively-set quasimarket prices"). Economists have attempted various methods to measure these benefits, including the "travel-cost approach," which considers outdoor amenities that are free to the public (i.e., beaches, hiking trails, campgrounds) and the number of people (the "demand") who are willing to pay to travel to utilize these amenities. Value is calculated based on demand and the cost of accessing to the site (Fausold and Lilieholm 1996). Also used in determining non-market benefits is the "benefit transfer" and the "contingent valuation" methods. The benefit transfer method estimates where economic values are by transferring existing benefit estimates from studies already completed for another location or issue. The contingent valuation method estimates economic values for virtually any ecosystem or environmental service. It is the most widely used method for estimating non-use, or "passive use" values where people are asked to directly state their willingness to pay for specific environmental services, based on hypothetical scenarios.

Valuation of Ecosystem Services and Functions

Most land use decisions are based on fiscal impact analyses and real estate market values rather than the natural capital and non-market benefits of ecosystem services and functions. Massachusetts Audubon Society points out the costs of unchecked development, "landowners are influenced by land prices as well as property tax assessments," governments are weighing the "costs and benefits of infrastructure development," while policy makers are evaluating the "tradeoffs between competing stakeholder demands in the marketplace" (MAS 2001)

The Massachusetts Audubon Society (MAS) performed an economic analysis to estimate the economic value of ecosystem services in Massachusetts. The analysis was based on existing literature and studies published in the economic literature that provides a basis for directing environmental policy and management. MAS utilized the ecological functions found in de Groot (1994) to help organize the total value of ecosystems. Some of the functions and services that MAS looked at and their exemplary benefit transfers are:

• **Climate Regulation:** Capture and storage of carbon dioxide by forest and other plant cover, reducing global warming. This function provides the service of a favorable climate, which is important to human survival and civilization through health maintenance, crop production, recreation, and cultural identity.

• **Freshwater Regulation and Supply:** Storage, control, and release of water by forests and wetlands, providing local supply of water.

• **Waste Assimilation:** Filtering of pathogens and nutrients from runoff by forests and wetlands, reducing the need for water-treatment systems.
- Massachusetts: waste treatment provided by marshes is worth $123,000 per hectare per year; phosphorus recycling is worth $47,000 per hectare per year, in 1984 dollars Oldfield 1984 via de Groot 1992).

• **Nutrient Regulation:** Cycling of nutrients, such as nitrogen, through ecosystem for usage by plants, reducing need to apply fertilizers.
- United States: biological nitrogen fixation is worth $8 billion each year (1998 dollars) (Pimentel 1998).

• **Habitat Refuge:** Value of contiguous patches of forest and wetland in supporting a diversity of plant and animal life.
- Colorado: the protection of wilderness areas is worth $32 per household per year in 1984 dollars (Walsh et al. 1984).

• **Soil Retention and Formation:** Creation of new soils and prevention of erosion, reducing need for dredging and mitigation of damage due to siltation of rivers and streams.
- United States: Conservation Reserve Program (CRP) land provides $227.5 million per year (1990 dollars) in soil productivity benefits. The CRP provides technical and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on

their lands in an environmentally beneficial and cost-effective manner (Young and Osborn 1990).
- United States: on and off site costs of soil erosion are $44 billion per year, in 1997 dollars (Daily 1997).

• **Disturbance Prevention:** Mitigation of flooding and coastal damage by natural wetlands and floodplains.
- Boston, MA: flood protection of a wetlands complex provided an annual savings of $17 million, in 1988 dollars (Hair 1988).

• **Pollination:** Services provided by natural pollinators such as bees, moths, butterflies, and birds, avoiding need for farmers to import bees for crop pollination.
- United States: 90 crops worth $4 billion (1980 dollars) depend on insect pollination (Pimentel et al. 1980).
- United States: native pollinators (not including honey bees) provide services worth $4.1 to 6.7 billion (in 1997 dollars) per year. (Nabhan and Buchmann 1997).

Recreation and Aesthetics:
Recreational value of natural places as well as positive impact on nearby property values.
- Amherst, MA: trees add $2,686 or 6% to house values, in 1980 dollars (Morales1980).
- Massachusetts statewide: the household willingness to pay to avoid low-density development on agricultural land was $28-60 (1984 dollars) annually; to avoid high-density development was $70-176 annually (Halstead 1984).

Mass Audubon: When these per-acre values are applied to the total acreage in Massachusetts for each land cover type, the resulting annual nonmarket ecosystem service value is over $6.3 billion annually. (This figure is in addition to the market value of timber and crops. Farms, agricultural services, forestry, lumber and wood products, and fishing contributed $1.9 billion to the state's Gross State Product in 2001.24)

Given the lack of available research for many service and land cover combinations in Massachusetts, MAS considers the nonmarket value estimate to be conservative.

Eighty-five percent of the nonmarket ecosystem value created in Massachusetts comes from wildlife habitat—water, wetlands, and forest—as opposed to land that has been altered by agricultural or recreational use. Forest cover provided the greatest annual ecosystem service value at $2.9 billion, with freshwater wetlands providing $1.8 billion and saltwater wetlands providing $573 million.

Reduced Costs of Flooding and Flood Insurance.
The dedication of flood storage areas to help minimize damage from flooding and other water-related natural disasters is one of the most effective strategies in terms of financial savings. The Maryland Greenprint Program estimates that land preservation for flood storage has **an 8:1 dollar savings** over manmade flood control structures. The number of flood claims in Massachusetts rose 8% from 2005 to 2006 and continues to rise.

FEMA's FloodSmart Flood Insurance Calculator shows that it now costs approximately $317 per year to insure the structure and contents of a $250,000 home in a noncoastal region that has not been flooded. But once any claim has been filed, the premium rises to $1,251. For a similarly sized business, the premium rises from approximately $1,500 per year to $2,743 (www.floodsmart.gov).

Shown below are the 100-year and 500-year flood zones on and adjacent to the Lampson Brook site. The greatest risk is to properties along the northwest portions of the site, where several structures could be affected by flooding. Both the wester and southern portions of the property, which are downstream from the upland wooded area of the land, provide significant flood storage areas that mitigate downstream flooding.