

Building Local Food Connections

A Community Food System Assessment

Concord, Massachusetts



Prepared for the town of Concord represented by the
Concord Community Food Project Steering and Advisory Committee

“Find the shortest, simplest way between the earth, the hands, and the mouth.”

—Lanza del Vasto

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EXECUTIVE SUMMARY

Rising fuel costs, unpredictable climatic changes, and volatile global economic conditions threaten the stability of towns all over the world that rely on global markets for food. The Concord community is reviving a local food network to protect social and ecological health, and to improve resilience in the face of uncertainties.

A group of nearly thirty Concord citizens, town officials, and local experts formed a steering and advisory committee in 2011 to discuss ways to promote a sustainable food system in Concord. These members represent an array of stakeholders, such as farmers, educators, business owners, town policy-makers, chefs, and local organization representatives (see Appendix A). They recognize an opportunity to bring various local food agendas out of isolation and into an integrated discussion in order to amplify Concord's budding local food movement. In addition, the committee is interested in learning how Concord can contribute to its broader, regional foodshed.

An assets- and needs-based study of Concord's food system resources (including land use, food production, distribution, processing and storage, preparation and consumption, and food waste recovery) highlights major challenges and opportunities. Many efforts are already underway by schools, food establishments, organizations, home gardeners, and others to spread awareness. Growing concerns, ranging from diet-related illnesses and school lunch nutrition, to farmland protection and suburban development, are bringing town residents together to discuss a common denominator: food.

The town is committed to preserving its agrarian heritage and historic farmland, but faces many challenges. Concord has been losing farmland to subdivision and development over the last several decades and only a small percentage of Concord's farmland is under permanent protection. Once farmland is gone, it cannot be easily replaced. Though there is a large amount of land suitable for local food production, much of it is privately owned, and it is challenging for new farmers to gain access to it. Property values in Concord are prohibitively high for new farm start-ups and Concord's seasoned farmers are concerned about how farmland will be passed to the next generation. Affordable housing for new farmers also needs to be addressed to support future generations of farmers in Concord.

Livestock is a major component missing in Concord's food system. Concord has an abundant amount of pastureland, yet relatively little livestock and no slaughterhouses or dairies. Existing open space and zoning ordinances suggest that the number of small livestock could be dramatically increased on private house lots and farms alike. Concord could coordinate with neighboring towns in the region to begin filling in gaps in local meat, poultry, and dairy production in order to reduce reliance on industrial feedstock operations and distant markets. Also, the introduction of animals onto the landscape enables more of a closed nutrient cycle: rotational grazing methods can be employed by farmers on pastureland, and manure—a natural fertilizer and source of nitrogen—transfers nutrients back to the fields, and completes the cycle.

Much of the current discourse on local food systems addresses the route that food takes from farm to table, but food waste recovery is also a critical component. An immediate opportunity to redirect food waste away from landfills and back into the landscape as compost lies within schools and institutions, which generate regular and large enough supplies of food waste to warrant a cooperative food waste collection service or program. Local food establishments and retailers could pool resources and explore similar cost-saving and waste-diverting operations. The town operates a yard-waste facility that may be a candidate for expansion into a compost facility for all organic matter, including food.

Perishability of food and the shortness of New England's growing season create a huge seasonality gap in the local food supply for half the year. If New England is to feed more of its population throughout the colder months, communities must concentrate efforts to process and store produce (fruits and vegetables) and meat in a safe, affordable, and efficient manner. This task will require major infrastructural changes and the collaboration of producers, distributors, and food retailers on a regional scale.

The recommendations presented in this report are addressed to the community at large as well as specific stakeholder groups. Some of these suggestions may be more readily achieved than others, and range in complexity, difficulty, time frame, and scale. Many require a large leap in communication and collaboration among individuals, businesses, and organizations. Community members might consider forming

an ad hoc Food Council to function as a forum for communicating issues, forging working relationships, and balancing stakeholder interests pertaining to local and regional food systems. The Food Council could oversee the planning and implementation of future projects, and monitor the progress of the community in the long-term process ahead.

Private property owners and local government can assist with land leases or alternative arrangements with growers to increase access to expensive land to help new farmers.

Interest in home gardening is growing in Concord, and community members can teach each other important home economic skills, such as cooking, canning, drying, freezing, pickling, cheese-making, and fermenting. Homeowners can convert resource-intensive lawns to productive, vital, edible gardens. Neighbors can pool resources and space for shared-use community gardens. In doing so, Concord residents, scattered throughout forests and farmland in this rural-suburban town, can re-establish connections with each other, with the land, and with their food.



Green beans and tomatoes being harvested in late summer for canning.



I. INTRODUCTION

The town of Concord, Massachusetts, has an extraordinary opportunity to revolutionize its food system for the twenty-first century.

From a highly sophisticated mixed-husbandry and tillage system in the seventeenth and eighteenth centuries, followed by a thriving market-based system of concentrated agriculture in the nineteenth and early twentieth centuries, Concordians—along with other rural New Englanders—have transformed the landscape to meet their food needs while adjusting to new markets, adopting new technologies, and making space for an ever-growing population.

New England formerly had all the functioning pieces of a robust, sustainable, regional food system: farmland; diversified food production; distribution networks with nearby towns and markets; processing facilities like canneries, grist mills, slaughterhouses, and dairy barns; root cellars and food storage dug-outs; household skills like gardening, cheese-making, fermenting, pickling, canning, and drying; and food waste recovery for animal feed and fertilizer for pastures and cropland. With the expansion of global markets and the subsequent decline of agriculture in New England over the last century, this local food system infrastructure has been almost entirely dismantled. Concord's food story is a case in point.

Many stakeholders throughout the Concord community—including farmers, educators, policy-makers, planners, food distributors, environmental activists, and health

professionals—are beginning to discuss how to organize a collective effort to “relocalize” their food. Rising fuel costs, unpredictable climatic changes, and unstable global economic relations threaten towns all over the world that rely on global activities for food. The Concord community envisions a revival of local food to protect social and ecological health and improve resilience in the face of uncertainties.

A preliminary inventory of Concord's land resources, food system infrastructure, and social capital can help the community understand where it makes sense in the town—and throughout the region—to scale down global food inputs and scale up local food supply and infrastructure.

The main objective of this report is to assist the community members in their effort to apprehend the complexities of localizing their food system. The primary goals are to:

- Explore the interactions between a local food system and social, ecological, and economic health in Concord;
- Encourage a community-wide conversation about Concord's participation in its regional food system; and
- Recommend next steps and future projects.



Children planting seeds at Gaining Ground in Concord, Massachusetts. Photo Credit: Emily Wheeler

INTRODUCTION

A community's food system influences everything from jobs and public health to air and water quality. Individuals interested in fostering a healthy, resilient community enter the conversation about local food from different entry points, reflecting their different concerns and areas of expertise. Different entry points, or gateways, can categorically represent these various avenues that lead people to consider the where, what, why, when, and how of a food system. Building working relationships and balancing stakeholder interests are fundamental for this exploration of common ground, and a community food assessment can help further productive community conversations about its assets, needs, and opportunities.

Concord presents an exemplary case of various stakeholders joining forces in the interest of maintaining a healthy community. Citizens are beginning this exciting process of integrating conversations—regarding land use and development patterns, history and culture, education, economic vitality, public health and nutrition, social justice, and ecological health—as they relate to food.

THE GOOD FOOD VISION

The Good Food Vision is the result of a study conducted by local historian, farmer, and professor Brian Donahue that projects food needs for the six states of New England in 2060 and outlines the major changes required to meet these needs by optimizing regional food production. Donahue argues that by collectively adopting a healthier diet and increasing food production (especially more fruit, vegetables, some meat and dairy, and beans), New England could potentially meet up to eighty percent of the nutritional needs of its projected population (seventeen million people) in 2060. In order to do this, New England must triple its current acreage of farmland. This means restoring about fifteen percent of New England's land to agricultural use, similar to the percentage of New England's farmland around 1945.

How can Concord contribute to this progressive, long-range vision for a healthier New England food system?

“We might do well to recreate a regional food system resembling the one we had a century ago, when we at least provided a large part of our own vegetables, fruits, milk, and eggs, along with some of our meat.”

—Donahue, *Reclaiming the Commons*, 74



Concord community members come together to brainstorm about Concord's assets and needs pertaining to local food.



Figure 1.1: Through food, community members with various interests and areas of expertise enter the conversation about community resilience.



II. COMMUNITY VISIONS

Concord has a long history of civic engagement and ecological stewardship. These traditions continue to appear in current activities supporting healthy, local food. Concord families shop at local farm stands, participate in Community Supported Agriculture (CSA) programs, organize garden clubs and community gardens, and advocate for nutritious, locally sourced school lunches.

The following examples of ad hoc committees, town planning reports, and active organizations demonstrate that the community is already engaged in the issues that appear in this report.

THE STEERING & ADVISORY COMMITTEE

A group of nearly thirty Concord citizens, town officials, and local experts formed a steering and advisory committee in 2011 to discuss ways to promote a sustainable food system in Concord. These members represent an array of stakeholders, such as farmers, educators, business owners, town policy-makers, chefs, and local organization representatives (see Appendix A). The individuals recognized an opportunity to bring various local food agendas out of isolation and into an integrated discussion forum to promote Concord's budding local food movement.

On behalf of the committee, Brooke Redmond, Concord resident and Communications Director of the Farm-Based Education Association, coordinated a partnership with the Conway School to prepare a community food report for the town. In an initial project meeting, the committee asked the Conway team to assess the current status of Concord's food system and provide recommendations for critical next steps toward a more sustainable local food system, or in the words of Redmond, "What is our food story and where do we go from here?" In addition, the committee is interested in learning how Concord can contribute to its broader, regional foodshed (see Defining Key Food Concepts, page 16).

To assist the committee in the effort to draw community attention and activity to this food agenda, this assessment takes into account an array of diverse yet interrelated topics, such as public health, education, sustainable agricultural practices, and strategies to maximize opportunities for local production, distribution, and consumption within the context of Concord and its surroundings.



The committee comes to the table to discuss the project.

FOOD FOR THOUGHT:

THE CONCORD GOOD FOOD NETWORK

The idea for Concord's food assessment emerged from conversations between members of Food for Thought, a network of people actively working towards a sustainable and vibrant food culture in Concord and surrounding communities in Massachusetts.

In November 2009, The League of Women Voters of Concord-Carlisle, with ConcordCAN (Concord Climate Action Network), Carlisle Climate Action, and Concord-Carlisle Adult & Community Education hosted a screening of the film "Food, Inc." and a speaker forum as part of their Life in the Balance public forum series. From these events, committees were created to establish agendas, action items, and outreach strategies in Concord to improve school food, support the growing home gardening community, support local agriculture, and build community around the important issues of sustainability, wellness, and climate change. These committees (Gardening for Life and Kid Eat Smart) were the start of the Food for Thought Network.

Opposite page: Local science teacher Joe Karr shares ideas about local food in Concord schools at the community meeting on February 2, 2012.

LOCAL LEADERS

The Farm-Based Education Association

The Farm-Based Education Association was established in 2006 to strengthen and support farm-based education programs and professionals. Managed by Shelburne Farms in Vermont and supported by a volunteer group of advisors, the FBEA is a collaborative network that has attracted a large and diverse following serving both a national and international audience. The FBEA believes that regional networks of farm-based educators are important to the long-term success of farm-based education efforts.

The FBEA's mission is to inspire, nurture, and promote education on farms. It accomplishes this work by facilitating opportunities (workshops, conferences, and other gatherings) within this fast-growing network of farm-based education professionals to connect them with and allow them to learn from one another; by hosting a dynamic online clearinghouse of resources and a venue for information exchange; and by creating a collaborative structure of partnerships and affiliations that cultivates and promotes programs in the fields of agriculture and education. Through its work, the FBEA strives to protect the viability of working agricultural landscapes and the local food and environmental systems that support human health and happiness.



A recent FBEA workshop at Appleton Farms in Ipswich, Massachusetts: "The ABC's of Farm-Based Education." Photo Credit: Brooke Redmond

CONSERVATION PLANNING

Town planners have demonstrated a conservation-oriented agenda, valuing natural resource protection as an integral component of community health. In recent years, as development pressures have increased and threatened Concord's open, scenic, and historic sites, the town has generated a number of valuable guiding documents. The *Open Space and Recreation Plan* (2004), the *Comprehensive Long-Range Plan: A Vision for 2020* (2005), and the *Concord Reconnaissance Report: Freedom's Way Landscape Inventory* (2006, revised 2007) are three examples of the town's focus on taking inventory of its important social, cultural, and ecological resources to create criteria for and prioritize preservation. Notably, farmland preservation is a common theme in these documents.

The top list of Priority Heritage Landscapes identified by locals and documented in the Concord Reconnaissance Report are Barrett Farm, Estabrook Woods, Flood Meadows, Massachusetts Department of Correction Land, Nine Acre Corner, Virginia Road, Walden Woods/Route 126 Corridor, and West Concord Village. Half of these priority heritage sites are farmland—Concordians clearly value their agrarian heritage and scenic, open fields (see Appendix C for complete list of Heritage sites).

A volunteer Agriculture Committee works to voice farmer concerns and support farming efforts in the town. In their brochure "A Guide to Concord's Farms," the Agricultural Committee provides a list and a map of over twenty farms, farm stands, and garden centers in town.

The Agriculture Committee's goals are to establish a procedure to match farmers with underutilized agricultural parcels, including town, state, federal, non-profit and private lands; assist and encourage young farmers; address agricultural worker housing; and address the future of the Prison Farm (see page 72) at the Northeastern Correctional Center ("A Guide to Concord's Farms"). In 2011 the Agriculture Committee drafted and submitted a Farming Bylaw, which the Town Meeting approved. Such farming bylaws help foster understanding of, acceptance of, and support for farming operations. The annual "Ag Day" (Concord farmers' market) and Stone Soup Suppers sponsored by the Agriculture Committee are examples of the Committee's outreach in the community (Wheeler).



Pigs roam the pastures at Pete & Jen's Backyard Birds, a small livestock operation in Concord, Massachusetts. The farm is situated in Nine Acre Corner, a historical agricultural area located at the southern edge of town. Photo Credit: Pete Lowy and Jennifer Hashley

LOCAL LEADERS

Kids Eat Smart

Kids Eat Smart is one of two action groups that resulted from Life in the Balance: Food for Thought campaign in 2009. The group's goal is to provide health-promoting, nutrient dense, affordable lunches to all children attending Concord's public schools and to educate the school community about healthy and sustainable food options. Kids Eat Smart believes that healthy food, sustainable farming practices, and food-based education are key to human and environmental well-being.

Their objective is to improve what kids eat at school and at home, get children cooking, and help schools acquire what they need to support healthy food in the cafeteria and the classroom. They offer Serve Safe certification for parent volunteers in the school kitchen.

The group works with the Food Services Director to bring freshly prepared food into Concord school cafeterias and to source this food from local farms with sustainable farming practices. New initiatives include taste tests of upcoming food items on the menu to encourage kids to try them when served for lunch.

Kids Eat Smart also provides educational opportunities for students around healthy and local food options, including after-school cooking classes and school gardens.

Kids Eat Smart parents are inviting local K-12 educators and students to participate in experiential, place-based activities to engage students in urgent and relevant work happening in their own community.



Kids Eat Smart parents on a field trip to gardens in Cambridge, Massachusetts.
Photo Credit: Karen Graziani

Did you know?

There is a nation-wide effort going on to spread awareness about strategies to implement food-based education. The Food Studies Institute is a national non-profit organization dedicated to improving the health of children through food-based solutions. Founder and Director Antonia Demas, Ph.D., has developed a curriculum called Food is Elementary that has been used successfully in more than two thousand schools in thirty-three states. The Institute offers lesson plans and teaching tips available online for educators and parents to promote healthier school lunches and inform kids about food options and proper nutrition (The Food Studies Institute).

HEALTH AND NUTRITION

Concordians see the opportunity to defend against diet-related illnesses by spreading education about health and nutrition and increasing access to fresh, whole foods.

Concord participated in a Community Health Assessment conducted in 2010-2011 by the Regional Center for Healthy Communities (RCHC). Concord was grouped together with eleven other nearby towns (Acton, Bedford, Boxborough, Burlington, Carlisle, Lexington, Lincoln, Littleton, Wilmington, Winchester, and Woburn) to form Community Health Network Area 15 (CHNA 15), one of twenty-seven geographical areas that participated in the statewide study. A volunteer advisory board for CHNA 15 voted on four focus topics for the study, one of which was Healthy Foods and Nutrition. With this focus in mind, the board collected the most current data available and conducted surveys to assess priority areas, which resulted in a focus on access to healthy foods and overweight/obesity problems.

Data revealed that 48 percent of adults in CHNA 15 are overweight; 15 percent of those adults are obese.

People identified numerous barriers to accessing healthy food and meals including transportation to grocery stores, farmers markets, or meal programs. In addition, access to knowledge and education about what foods are in season, how to prepare fresh food, and how to access affordable and healthy food were also identified as barriers to proper nutrition (CHNA 15 Community Health Assessment).

Community concerns (see Figure 2.1 for summary) led the advisory board to suggest the following actions:

- Provide more education to families and individuals about nutrition and cooking affordable and healthy food.
- Increase public transportation to improve access to farmers markets, food pantries and supermarkets.

How can Concord work with other towns in its Community Health Network Area to address these issues and improve public health in the region?

**CHNA Concerns Related to Food and Nutrition
From Survey Results**

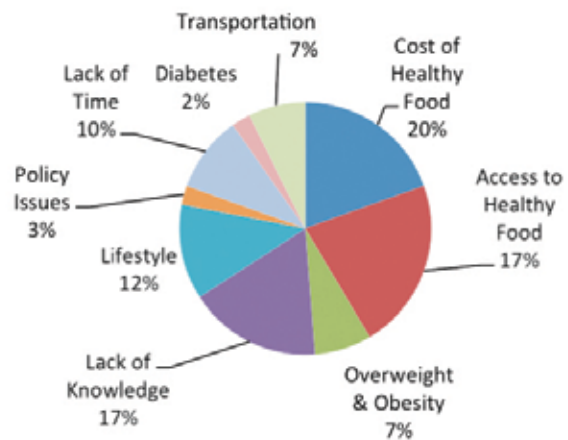


Figure 2.1: Chart summarizes community feedback about health and nutrition concerns in Concord's Health Network Area, a geographical grouping of twelve towns in eastern Massachusetts.

In Massachusetts, the adult obesity rate is 22%, with adult diabetes at 8% (Food Environment Atlas).

“The current generation of children has a shorter life expectancy than their parents due to the top four killers related to diet: stroke, type-2 diabetes, heart disease, and cancer” (Anderson).

LOCAL LEADERS

Debra's Natural Gourmet

When Debra Stark's family moved to Massachusetts, her mother insisted they settle in Concord in order to be near a farm—Hutchins Farm—that was all organic. Debra's appreciation of organically grown food and awareness of good nutrition growing up inspired her to open an independent natural foods store on Commonwealth Avenue in 1989. Today the store thrives, and Debra credits the community for its support and its suggestions of what customers hoped to find at the Natural Gourmet. Direct communication with consumers has enabled Debra to expand and diversify her product offerings.

Health is one of Debra's prime concerns. She believes that if more people ate nutritious, natural food, health care costs would drop significantly. She is also convinced that preaching will not convert people to choosing natural foods. However, community can make a difference. The store is more than a place to shop; it's a communication venue about good nutrition and responsible food choices. Here people can learn from staff and each other, through films, public speakers, and conversations in the aisles.

Debra focuses on educating consumers about the proliferation of GMOs (genetically modified organisms) in U.S. grown foods. She strongly advocates for GMO labeling by producers and distributors, and has recently secured Verified Non-GMO status for her own value-added product, Stark Sisters Granola. Debra is pleased to witness a growing awareness in the community about where food comes from, and hopes to see more demand for local products. She is thrilled about the revival of home gardening, and is optimistic that widespread support for local, grass-fed, non-GMO meat is around the bend.

Since Debra's opened in 1989, the store has expanded its floor space threefold and now employs forty-five people. It is a vibrant part of the Concord Independent Business Alliance and the West Concord Business District, groups that sponsor community events that bring residents, consumers, and local businesses together to promote a strong, local economy.

LOCAL LEADERS

Concord Climate Action Network

ConcordCAN is a grassroots organization whose vision is to build a resilient and sustainable community that can withstand the impacts of climate change. This group of active citizens networks with many stakeholders, including community groups and town and school staff to foster positive change in the community.

In the fall of 2011, ConcordCAN initiated the Food for Thought: Focus on Food campaign to start a public conversation about the sustainability of Concord's food system. Several CCAN members serve on the ad hoc community group that advised the Concord Community Food Assessment project.

Focus on Food events include educational films, state and local speakers, potlucks, and farm and garden tours and composting workshops organized with Gardening for Life (see page 56).

In April 2011, Concord Town Meeting passed a petition brought by ConcordCAN that requested the Board of Selectmen to develop and adopt sustainability guidelines for municipal decision making policies and practice. The Town has adopted four principles to be applied by town staff and boards to governance policies and practices.

To support the Town's sustainability goals, CCAN started hosting monthly Sustainable Concord Coffees that feature local speakers with a global reach, and bring together thirty to forty interested citizens, school representatives, and town officials to discuss sustainability principles and issues like waste management, energy, school green initiatives, water and food.

ASSETS AND CHALLENGES IN LOCALIZING CONCORD'S FOOD SYSTEM

Integral to the collection of information for this community food assessment was the engagement of local citizens to voice their opinions and ideas. In two public meetings, one survey, and numerous personal interviews, the community identified food system assets and challenges that informed the recommendations of this report (see Recommendations section).

According to the community, some of the greatest assets and challenges pertaining to the local food system include:

Greatest Assets

- An educated, well-informed populace;
- An abundance of good farmland and knowledgeable farmers;
- A strong, vibrant community with increased interest in promoting local food;
- A history of environmental stewardship; and
- Private wealth.

Greatest Challenges

- A lack of readily available information about existing farms and resources;
- A disconnect between growers and buyers, both whole- and direct-sale;
- Greater demand by institutional wholesale buyers in town, such as schools, than the available supply of local products;
- A lack of public food processing and storage facilities in the town;
- A shortage of affordable housing for farm laborers;
- A lack of affordable and accessible land for new farmers;
- A general lack of skills and knowledge about gardening, cooking, and preservation techniques like canning;
- A general problem of access to fresh, healthy, and affordable food for some members of the community, such as elderly residents;
- Diminishing farmland due to property fragmentation and development;
- Compromised and fragmented wildlife habitats and ecosystems due to fragmentation and development; and
- The preponderance of lawns in town.

The community appreciates that these challenges represent exciting opportunities to gather around the cause of local food and improve social connections, infrastructure, food skills, and overall vitality as a community. This growing body of engaged citizens positions Concord to address the missing pieces of their local food system in a holistic, participatory fashion. In doing so the town continues to honor its own legacy of progressive thinkers and activists, while participating in a worldwide movement toward food sovereignty (see Defining Key Food Concepts, page 16).



Nearly fifty community members gathered for a public visioning meeting on February 2, 2012, at the Harvey Wheeler Community Center.

“What many people refer to as the ‘food movement’ is actually a collection of social movements: food justice, fair food, fair trade, organic food, slow food, food security, food sovereignty, family farms... and local folks just trying to make things better.” (Alkon et al. 48)



III. CONTEXT

A BRIEF HISTORY OF AGRICULTURE IN CONCORD

When the glaciers receded roughly 12,000 years ago from present-day New England after the last ice age, they left behind a network of rivers and floodplains, and deposited stones of all shapes and sizes. These deposits, called glacial till, were the parent material of New England’s mix of rocky and sandy soils.

English colonists settled along Concord’s rivers and grassy meadows amidst the forest—a landscape that had been shaped by the Musketagid Native Americans for thousands of years prior—in 1636, establishing the first inland settlement of the Massachusetts Bay Colony. The settlers managed to subsist here by creating an agricultural system that resembled an adaptation of English mixed husbandry to the soils and climate of New England (Donahue 2004, xv). Colonial farming relied upon this “careful balance and integration of diverse elements across a varied and difficult landscape” (Donahue 2004, xv)

During the seventeenth and eighteenth centuries—the “yeoman period of mixed husbandry”—livestock were at the heart of the farming system and the pastoral economy. Mixed husbandry combines livestock and tillage into a single, integrated system whereby, among other things, the stock fertilize the crops by recycling or transferring nutrients (see pages 84-85).

Farmers struggled to find enough grass to feed their cattle, and worked for generations to make native meadows more productive to supply more supplemental hay to feed their cows through the harsh winters. These farmers were also constantly working to prevent their pastureland from succeeding back into forests.



Early settlers clear forests and remove stones for pastures and cropland. Circa 1740. Photo Credit: John Green. Courtesy of the Harvard Forest Fisher Museum



Widespread farmland abandonment begins. Circa 1850. Photo Credit: John Green. Courtesy of the Harvard Forest Fisher Museum

Though this was a labor-intensive system, the payoff was in the closed nutrient loop: the low-lying meadows were replenished by the annual flooding of rivers, and livestock manure was returned to the fields as fertilizer, which grew more crops for people, and more hay for the livestock. Very little in this cyclical system went to waste.

THE RISE AND FALL OF MARKET GARDENING

Around 1850, when the first trains began to bring in grain, meat, wool, and other products from the Midwest, New England farmers began to participate in the market-based agricultural economy. This began the era of market gardening in New England (Donahue 1999, 116).

After two hundred years of struggling to manage their pastures and improve the native meadows, many farmers abandoned their pastures as a source of livestock feed and began importing the cheap Midwestern grain to feed their cows. Whereas the previous economy was an almost self-contained, subsistence economy, the new market economy required specialization of agricultural products to gain a competitive advantage. Concord farmers began specializing in

fruits, vegetables, and dairy that were in high demand to feed the growing population in the Boston area. Asparagus, strawberries, and rhubarb were Concord specialties (Garrelick 133-134).

However, food production elsewhere expanded rapidly and began to infringe upon Concord's agricultural markets; after 1920, Midwestern agriculture (set in vast, unencumbered fertile plains) almost completely undercut New England farms (Donahue 1999, 67). Interstates and automobiles meant greater connection to distant markets and less connection within farming communities. "Land that had been growing fruits and vegetables was steadily settled upon by people who drove to supermarkets to buy produce trucked in from the far corners of the earth" (Donahue 1999, 68).

"Concord raised more asparagus than any other town in the area and 'Concord Grass' was a standard of excellence."

—Concord resident Laurence Richardson, as quoted by Renee Garrelick, *Concord in the Days of Strawberries and Streetcars*, 133



In addition to asparagus and strawberries, rhubarb was a popular specialty crop grown in Concord's market gardens in the late 19th and early 20th centuries and sold into the city of Boston. Photo Credit: Wikimedia Commons

CONNECTING THE PIECES OF FOOD SYSTEMS

While Concord has rich land resources and strong agrarian roots, it participates in global food systems just like any American town. But there is a growing awareness among Concord citizens of the negative implications of the global food markets on human and environmental health and the need to prepare for a sustainable food future in the face of energy shortages, climate uncertainties, diet-related health crises, and unstable economic conditions. Cultivating a

familiar, reliable local food supply is a way to systemically address these issues. By rebuilding connections between local food production, distribution, processing and storage, preparation and consumption, and food waste recovery (see Figure 3.1), Concord can fill the voids that have been created by the expansion of global food markets over the last century.

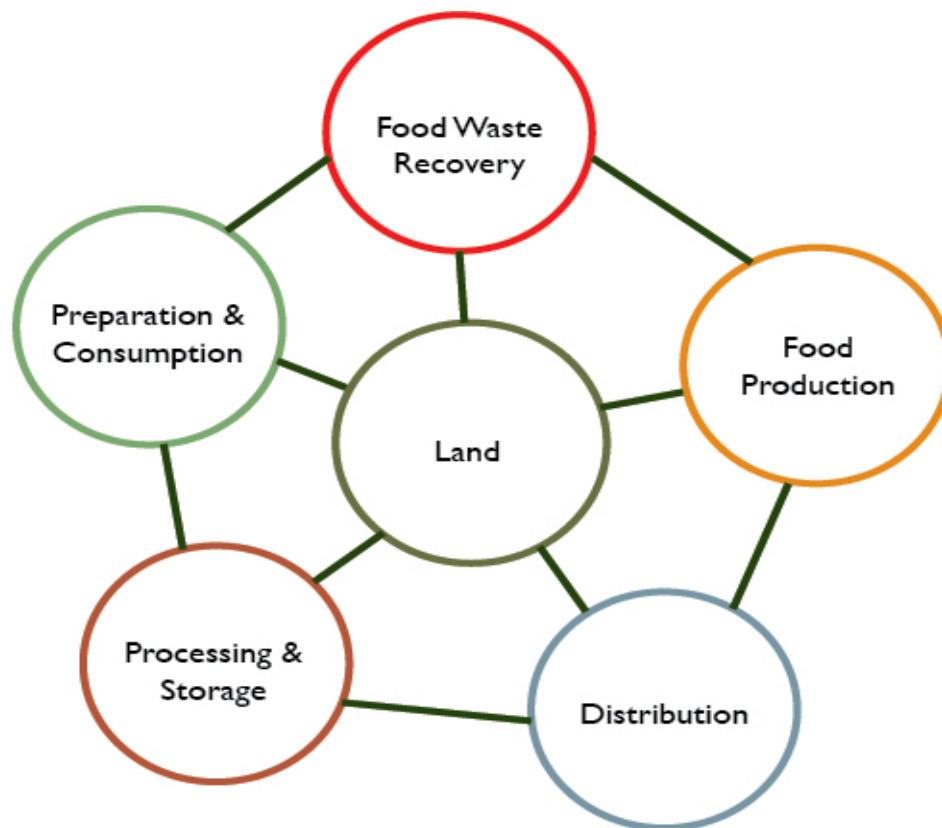


Figure 3.1: Grounding the components of a food system to a more local scale wherever possible enables greater connectivity, and therefore, greater resilience.

THE SPRAWL OF GLOBAL FOOD MARKETS

The gradual disappearance of agricultural activity in Concord in the last century is typical of many rural American towns. Small-scale farming activities have gradually declined over the last hundred years in New England, with more rapid decline in more recent decades: between 1997 and 2007 alone, Massachusetts lost approximately 60,000 acres of farmland (State Fact Sheets USDA).

Due to the advent of cheap oil, the automobile, associated technologies and market forces, industrial food systems have molded Concord's landscape into something that would be unrecognizable to farmers of only a hundred years ago.

Many people are unaware of the origins of the food at their dinner table, let alone that the average food item travels 1,500 miles from the farm where it was produced to our dinner plates (Pollan). Rising energy prices will likely limit the transport of fresh foods over long distances, increase the price of food for all consumers, and threaten the supply of healthy food in regions that are entirely dependent on distant suppliers.



Food travels to Massachusetts from around the globe. Source: Dresdale et al., The Conway School

“The estrangement of consumer and producer involves a process of oversimplification on both sides. The consumer withdraws from the problems of production, hence becomes ignorant of them and often scornful of them; the producer no longer sees himself as an intermediary between people and land—the people’s representative of the land—and becomes interested only in production. The consumer eats worse, and the producer farms worse.”

—Wendell Berry, *The Unsettling of America*, 38

Defining Key Food Concepts

Food system: a complex, adaptive network; the flow of food products through production, processing, distribution, consumption, and waste management.

Foodshed: a metaphor derived from the unifying concept of a watershed, used to “connect communities with the agricultural land base needed to produce food to support them” (Freedgood et al. 85).

Food sovereignty: typically discussed as a human rights issue, e.g., “people’s right to define their own food and agricultural systems” (Via Campesina, 1996, as qtd. in Carney 9).

Food security: often framed as a social justice issue, e.g., “when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (Carney 3).

LOCAL AND REGIONAL CONNECTIONS

While the concept of local food has become part of common discourse, there is no real consensus as to what “local” really means (Martinez et al., iii). Previous food system and foodshed studies attempt various frameworks for defining local. Sometimes distances are employed to define “local,” such as any products grown within a 100-mile radius or a 400-mile radius (Philadelphia 2010, Martinez et al.).

What does “local” mean for Concord? Infinite food routes and markets create inherent complexities in food systems. Given these complexities, attempts to localize food risk drawing boundaries and isolating localities from each other in order to simplify solutions for identifying local food. Concord is by no means an island; it is integrally connected to other towns, cities, villages, and communities in the Northeast by its highways, railroads, economies, and more. How, then, can Concord identify its obligations and capture opportunities to strategically localize food system networks in the context of the region without drawing artificial boundaries or limits?

Food systems educator and consultant Molly Anderson emphasizes the benefits of loosely defined regional food systems instead of intensely local ones. Establishing a strong, regional food network can result in greater resilience in the event of disturbances, she argues. For instance, when a social or environmental disturbance threatens the food supply of a locality, the effects can be mitigated more readily if market ties and working relationships between regional producers and distributors in other localities are already in place (Anderson).

Members of the Concord community are demonstrating an interest in rejuvenating a regional food system. They are actively seeking innovative solutions to the complexities of localizing food in hope of generating a useful, practical model for other towns and communities to emulate. Therefore, as a precursor to a larger regional process, this assessment takes inventory of the components of Concord’s food system, analyzes the degree of functional connections between them, and points to the biggest opportunities for Concord to recreate a robust network and optimize its participation in the region, however those connections may manifest.



A local food system can provide access to fresh, locally grown fruits and vegetables, while providing jobs for farmers and keeping money within the community. Photo Credit: Marcia Rasmussen.

“In some cases, it’s possible to get our food from the farmer down the road. In other cases, regional collaboration makes a lot of sense.”

—Margaret Christie, *Scaling Up Local Food*, 6

DID YOU KNOW?

One hundred years ago, there were well over 10,000 acres of land in vegetable production in Middlesex County (Donahue 1999, 63). Today, only 1,500 acres of county land are harvested for vegetables (2007 Census of Agriculture).



Figure 3.2: Concord (red) is situated in the heart of Middlesex County (pink) in eastern Massachusetts. Photo Credit: Wikimedia Commons

SUBURBAN SETTING

Concord spans twenty-six square miles in eastern Massachusetts, about twenty miles west of Boston’s metropolitan hub (see Figure 3.3). Concord is in the center of Middlesex County, the most populous county in all six New England states with 1.5 million people (“City-Data”). Suburban, residential sprawl has steadily crept into Concord; however, the population in the town has leveled off in recent years around 18,000 (including 2,000 inmates at the state prison on the western outskirts of town) (CLRP 2005).

Many Concordians commute to Boston for work. Dining out, shopping, and other attractions and amenities offered by the city draw non-commuters into Boston as well, creating a heavy traffic flow throughout the web of roads and highways that connect Concord to the city. Major interstates encompass the town and the MBTA commuter rail line (which runs from Boston in the east to Fitchburg in the

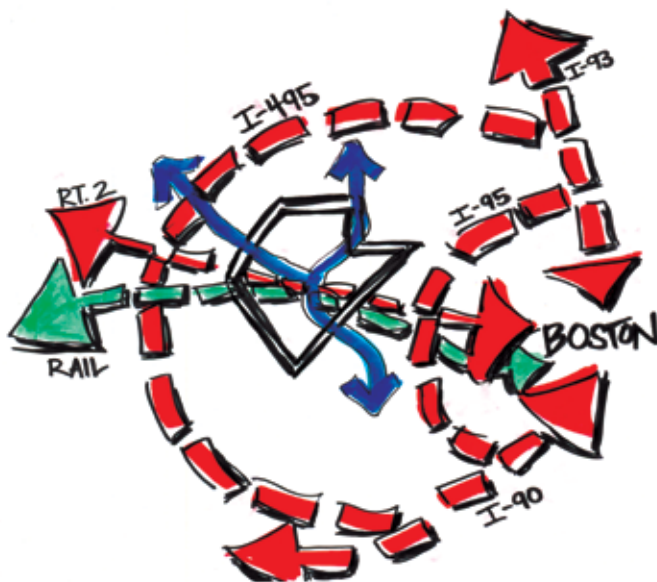


Figure 3.3: Circulation through and surrounding Concord.

west) winds through it. State highway Route 2 (which runs westward from Boston across the state to New York) adds to the traffic circulation of travellers and commuters in the region. Concord is centrally located to a lot of movement, and highly connected via automobile and rail to other parts of the region.

TOURISM MAGNET

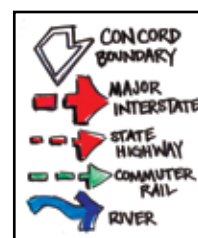
Nestled into this highway system near the region’s largest city and airport, Concord is readily accessible by tourists from all directions; Concord draws nearly two million visitors a year who flock to see the birthplace of the American Revolution (Minute Man National Historical Park) and visit the epicenter of the nineteenth-century Transcendentalist literary movement. Both historical movements defined Concord as a place where revolutionaries, progressive thinkers, and environmentalists reconsidered social systems and rewrote history. Could Concordians today honor this legacy by challenging dominant food systems and demanding more socially and ecologically responsible ones instead?

Historical preservation of land resources, from the farms that provided for yeoman settlers and Minute Man revolutionaries, to the forests, rivers, and meadows held sacred by the Transcendentalists, continues to influence land uses and route development patterns in Concord, especially as the land grows increasingly overburdened by population.

DEMOGRAPHICS

The population increase in Concord has slowed in recent decades, and Concord residents are aging. Average age has risen faster in this town over the past thirty years than in most communities in Massachusetts—from 27.7 years old in 1970 to 42.2 years old in 2000 (CLRP 53).

Median annual family income in Concord is about \$116,000 and continues to rise. As demand for property by a sprawling Boston population increases, land available for development decreases, and housing costs rise (OSRP 36). The average land value is \$19,000 per square acre; the average selling price for a single-family home in Concord is over \$700,000 (CLRP 31).



High property values coupled with increasing age demographics suggest a waning population in coming years, which could have significant impact on agriculture, public health, and economic activity in Concord, factors that are considerably influenced by both the input and output of a local food system.

A COMMUTER TOWN WITH A HOSPITALITY ECONOMY

As a general trend, most Concord residents do not work within the town, but commute out of town to elsewhere in the greater Boston area via car or commuter rail. Conversely, many people working in Concord live in other towns and commute to Concord. The service sector is the largest employment sector in town, comprising more than half of the jobs in Concord (OSRP 71). Concord's high-volume stream of tourists has enabled a thriving hospitality industry, which also creates jobs for residents of neighboring towns. However, while the agriculture sector saw over thirty percent growth in sales between 1990 and 2001, only approximately 100 jobs were provided by this industry (compared to nearly 7,000 in the service sector) (71).

While the town currently contributes economically to the region by providing employment opportunities in the service sector, these commuters must rely on fossil fuel transportation to get to and from work every day. Concord must be prepared to address critical questions: what are the implications of a local economy based on transportation methods that are threatened by a non-renewable and increasingly expensive resource? As the costs of energy rise, what happens to the restaurants and hotel kitchens that

depend on imported food? What happens when the employees in the service industry opt to work closer to home in the interest of saving on fuel?

What about when the number of local food producers has diminished because farmers in an aging population have retired, and no new farmers have arrived because young generations are priced out of acquiring land for cultivation?

“Economy as we know it is not an inevitable form, growth does not necessarily mean more waste, prosperity does not have to be measured by kilowatts used, autos produced, hamburgers flipped and consumed. Value is what we ascribe. Prosperity is what we make it to be. So what will it be?”

—Paul Hawken, *The Ecology of Commerce*, 59



Concord's Main Street provides a host of opportunities for shopping and dining. The town has a thriving hospitality industry and its largest employment sector is the service sector.

COMMUNITY CONVERSATIONS

Climate Change Effects on Food Supplies

Farmers and gardeners have grown increasingly sensitive to “climate weirdness” over the past few years, from flooding to droughts to tomato and potato blights to disease problems they have never before witnessed. As these changes continue to affect farmers and growers in New England, having crop diversity on individual farms and across several farms, and strong social and economic connections throughout the region, may help to ensure greater food access and availability.

Over the past 30 years there has been a nationwide temperature increase of 5 degrees Fahrenheit.

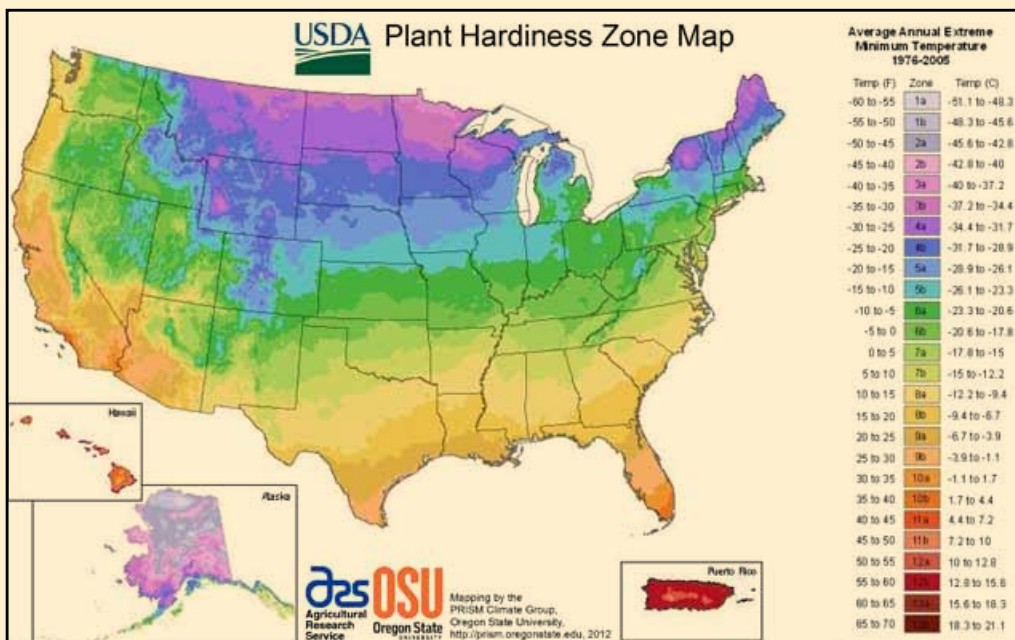
How can farmers in the Northeast create a more resilient agricultural system? One strategy is to plan ahead. While climate scientists do not know exactly how each region will be affected, there is a general consensus that the Northeast will be getting warmer.

For the first time since 1990, the USDA has revised its Plant Hardiness Zones map, a guide for farmers and gardeners suggesting planting times that indicates the Average Annual Extreme Minimum Temperature for a given location. Zones 1-13 represent ten-degree Fahrenheit lateral bands, which are then further divided into “a” and “b” five-degree Fahrenheit zones, e.g., 5a and 5b (USDA).

The map released in 2012 reflects an overall warming trend nationwide, using measurements from weather stations from 1976-2005 (USDA). (The former map published in 1990 was based on temperature data from a thirteen year period of 1974-1986.) Many zone boundaries have shifted by nearly half a zone (indicating about a five-degree-Fahrenheit average temperature increase) across a large portion of the United States. For the first time, the USDA added two new zones, Zones 12 and 13, to reflect the warmest temperatures on U.S. land, occurring in Hawaii and Puerto Rico (USDA Plant Hardiness).

What does this mean for Concord’s land, food, people, and plant communities? The 2012 map places Concord at around Zone 6a, where the average low temperature is -10 degrees Fahrenheit (USDA). Many farmers and gardeners noticed these rising temperatures and erratic weather trends long before the USDA published their new map. The town of Concord has already acknowledged the need to adapt and plan according to change. Concord’s *Open Space and Recreation Plan* (2004) advises that “agriculture should be able to remain robust. Natural ecosystems should have more plants and animals of today’s Mid-Atlantic States and fewer species of Northern New England” (OSRP 63).

The key to adapting—and for showing resilience in the wake of sudden disturbance—is diversity. Many different kinds of crops can and should be grown in numerous locations to increase biological and social resilience.



The USDA’s updated Plant Hardiness Zones Map, indicating a five-degree Fahrenheit average warming over the entire country from 1976 to 2005. Source: USDA

In contrast to monoculture farms—where just one kind of crop is grown and threats of disease and pests are constant—a healthy mix of annual and perennial crops grown in appropriate locations can increase the survival rate of farm and garden ecosystems. Likewise, if one farm is thoroughly damaged or wiped out in a storm, in a strong, regional, diverse farming network, other farms can step in to fill the gaps in the food supply.

REGIONAL MODELS

Transition Towns

“In the Transition movement we define ‘resilience’ as the capacity of a system to withstand shocks. The combined challenges of economic instability, higher energy costs and supply instabilities, growing inequity and environmental crisis—especially climate change—pose daunting problems for communities. The financial costs of these combined challenges will be enormous, and increasing.

“High and rising energy costs—especially oil costs—will increase the costs of food globally. One-third of oil and natural gas usage in this country is attributed to food production, processing, transport and preparation—‘from seed to plate.’ As inexpensive conventional oil supplies are depleted, the world is entering the period of permanently high energy costs. The International Energy Agency believes that the world passed the ‘peak’ of conventional oil production in 2006. Global demand for oil remains high, in spite of global recession. This means that the days of inexpensive oil are rapidly coming to an end. Conventional food production and food transportation costs will increase.

“Transition Towns is a global movement of cities, towns, suburbs, neighborhoods, islands—and whatever form of local community a group of neighbors decide to create—to increase local resilience. Rather than waiting for rising costs of energy and other resources to force change in our lives, and rather than continuing the combustion of fossil fuels that threaten catastrophic runaway global warming, Transition Initiatives are ‘bottom-up’ collaborations of neighbors seeking to increase resilience and improve well-being. Transition emerged out of *permaculture*, a design system for sustainable living. It seeks to expand food and materials production in ecologically sensitive ways.

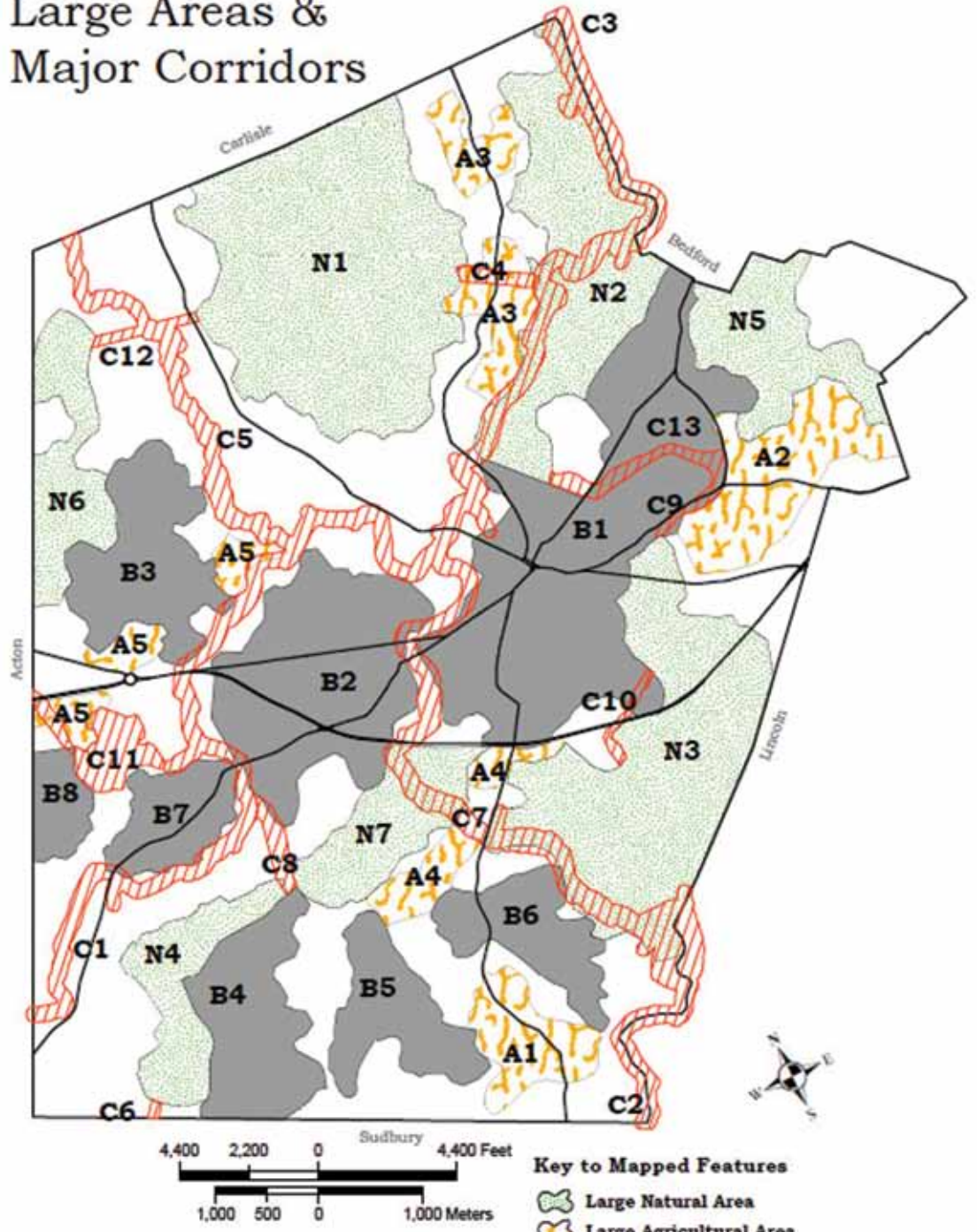
“By focusing on increasing resilience in all aspects of community life, the Transition process helps us significantly increase local food, local energy, local economic activity and neighborly relationships so that all essential aspects of life are better secured in a time of growing instability.”

—Tina Clarke, Transition Trainer



Town residents brainstorm about potential waste management and environmental stewardship strategies to plan for a more resilient future.

Open Space Framework: Large Areas & Major Corridors



Based on visual analysis of aerial photos. Boundaries approximate, and rounded to indicate large areas of a more-or-less continuous land use. Small and narrow areas excluded, except for major corridors. Built areas with approximately 2-acre lots or smaller.

Source: *Open Space and Recreation Plan 2004*. Natural Resources Commission. Town of Concord, Massachusetts.

“Concord depends on major inputs or outputs of food, fuel, goods, and jobs. Yet it also supplements these by contributing its own resources, including valuable water, wildlife, aesthetics, recreation, soil, and food products. Establishing the integrated open-space pattern for these resources provides, over human generations, a more sustainable balance between people and the land.”

—Richard Forman, *Land Mosaics*, 469

LAND PATTERNS IN CONCORD

Landscape ecologist and Concord resident Richard Forman conducted a study in 1995 on land patterns in Concord and identified three large patches: built areas, natural-vegetation areas, and agricultural areas. He outlined the values of each patch-type to the town, presenting the case for why it should be kept intact when land use decisions are made.

1) **Built areas** are “centers for citizens to live, work, shop, and interact” (Forman 464). The built environment in Concord is most dense around three town villages: Concord Center, Thoreau Depot, and West Concord.

2) **Natural-vegetation areas:** “Water and biodiversity are the primary values. A large vegetated area protects surface and

ground water (60 percent of Concord’s drinking water comes from wells in town). Many wildlife and plant species are primarily restricted to the large vegetated patches. We can find large home-range animals and healthy populations of plants and animals that essentially require patch interior conditions. The large patch maintains natural microhabitat conditions in proximity to one another for species requiring diverse habitats. It provides for a natural disturbance regime required for survival by many species” (Forman 464).

3) **Agriculture areas:** “Concord citizens value the historic symbolism of farmland, the active roles of farm families, the educational dimensions of farms, the availability and convenience of fresh produce for residents and metropolitan markets, and protecting prime food-producing areas in a world where hunger grows. Farmland near roads, railroads, and paths helps preserve scenic vistas and some rural character in this town. Agricultural areas enhance game populations. They also increase the biodiversity of the town and region, by providing habitat for species requiring large open areas” (Forman 466).

“Special sites” in town were also identified by residents in this study in order to be incorporated into land use decision-making criteria (see Figure 3.4).

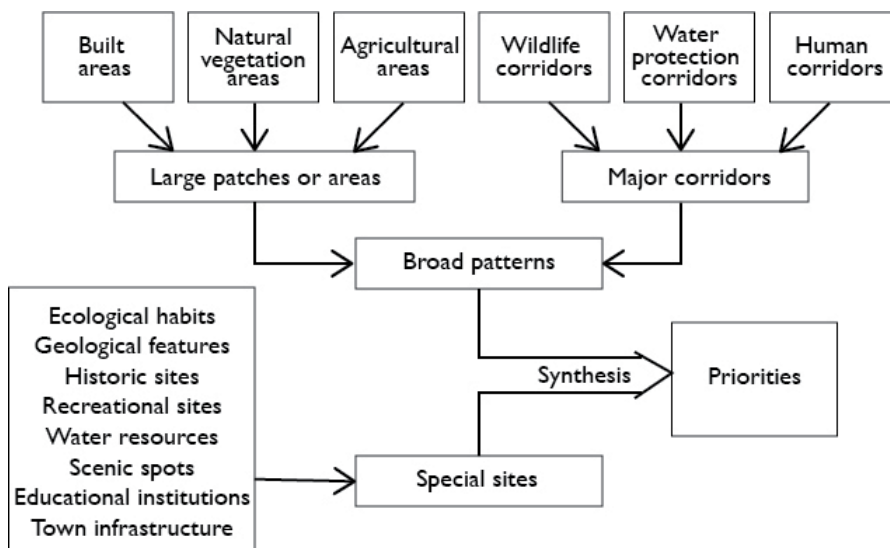


Figure 3.4: The flow of information used by Forman and Concord’s planning department to create an open space and recreation plan for the town.



IV. LAND USE

Concord values the protection of its natural resources and scenic views. Agricultural preservation is also an important value within the town (OSRP 21). A healthy local food system is contingent upon preserving the agricultural land which makes food production possible.

While over half of Concord's land is under some form of protection (CLRP xviii), this does not equate with permanent agricultural protection. According to the town's 2005 *Comprehensive Long Range Plan*, Concord has been losing farmland at a rate of about 36 acres per year for the past twenty years (xviii).

FARMLAND PROTECTION IN CONCORD

In Concord today, there are approximately 1,350 acres designated as agricultural land (CLRP 24). Between 800 and 850 of those acres are not currently protected for agricultural use (Rasmussen). While there are no official figures for lands that are in permanent agricultural protection, only an estimated 250 out of the 1,350 acres designated as agricultural land are thought to be permanently protected (Rasmussen).

Over half of Concord's farmland is under Chapter 61A (a voluntary agricultural tax incentive program, see Appendix D) (CLRP 42), but landowners can take their properties out of this program at any time.

“Almost all unprotected 61A land will be gone by 2020. This may threaten the viability of agricultural businesses in Concord and would certainly change the scenic character of the Town. This is an issue that must be addressed soon.”—Comprehensive Long Range Plan, 42



Hutchins Farm is one of three privately-owned properties that are protected by permanent agricultural preservation restrictions (APR). One of the oldest family farms in Concord, today it grows certified organic fruits and vegetables, which it sells at its on-site farmstand throughout the season and at local farmer's markets. Photo Credit: Marcia Rasmussen

Zoning Districts

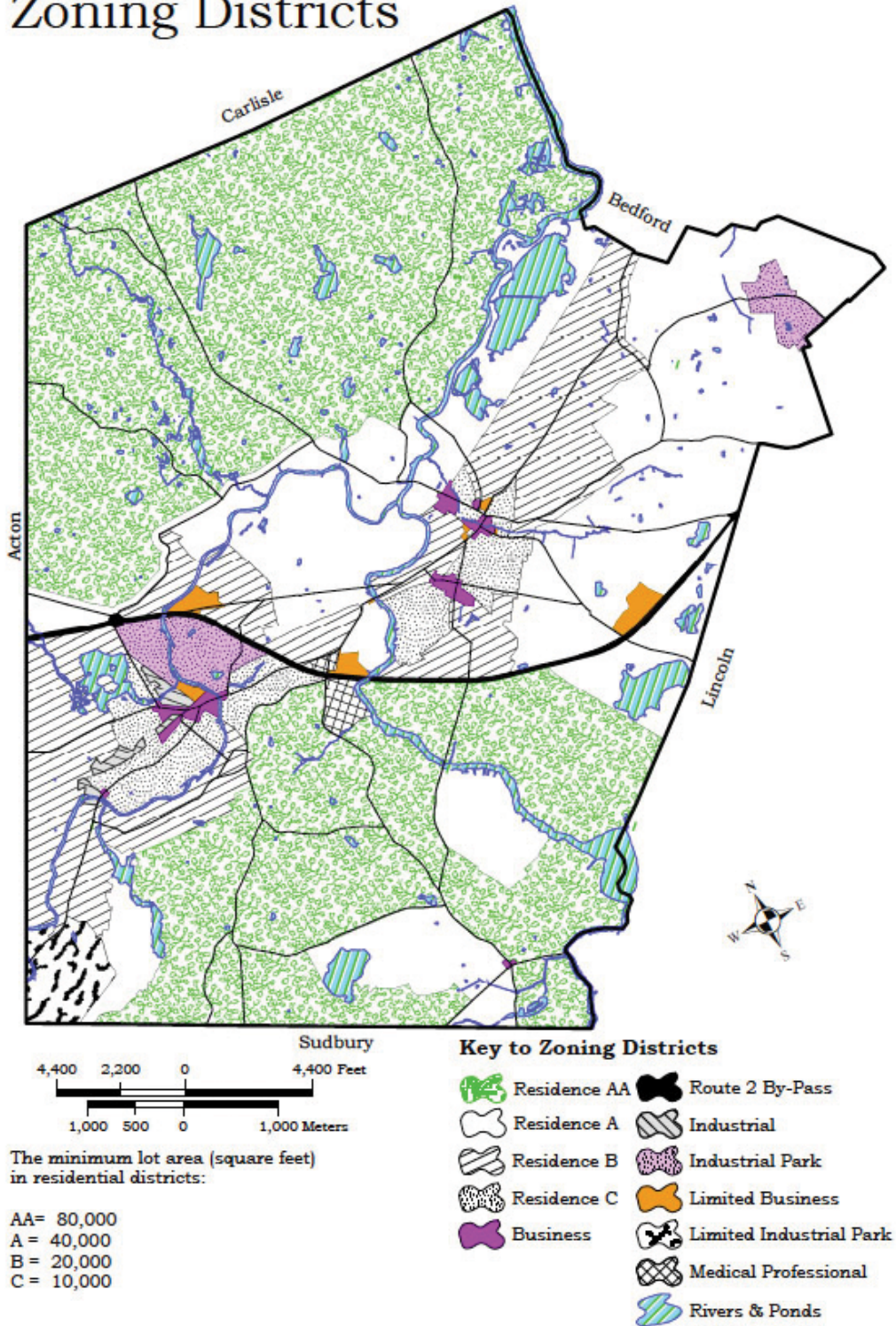


Figure 4.1: Approximately 95% of the town is residentially zoned, with large minimum lot sizes composing over half of the town. Credit: Town of Concord, *Open Space and Recreation Plan* (2004).

ZONING DISTRICTS

Unlike some towns in Massachusetts, there are no official agricultural zoning districts in Concord. About 95 percent of Concord is zoned for residential use (see Figure 4.1), but this zoning allows for many different kinds of uses in addition to houses. Minimum lot sizes range from 10,000 square feet near the village centers to 80,000 square feet in the northern and southernmost parts of town. While large minimum lot sizes can serve to preserve an adequate land base for farming (Esseks et al.), many of these large lots are not being farmed. In Concord, “residential development has fragmented the agricultural landscape but significant areas of good farmland remain” (Catterton).

Many homes in Concord sit on prime agricultural soils, but instead of producing food, the land is often kept as traditional, mown lawn (see From Lawns to Productive Landscapes, page 42). There is great potential to utilize portions of these parcels to create more productive landscapes.

With many of these suitable agricultural soils on privately owned properties, it may be difficult for farmers and growers to gain access to them. However, due to the high cost of landscaping and maintenance, homeowners may be interested in alternative kinds of productive and cost-effective practices on their properties.

“Most residential development in Concord occurred on good agricultural soils in former farm fields. The result is that many homeowners in Concord have backyard soils that are well suited to agriculture and gardens. While there is considerable room for expansion of farming in Concord, there is also considerable opportunity for more backyard gardening.”

—Jim Catterton, Agriculture Committee Chair

ZONING BYLAWS

In addition to zoning districts in town (dictated by the town by-law), there are also state zoning laws, which govern what Massachusetts’s towns can and cannot do. Towns must adhere to state laws, but are allowed to pass their own zoning ordinances with a two-thirds vote at town meeting.

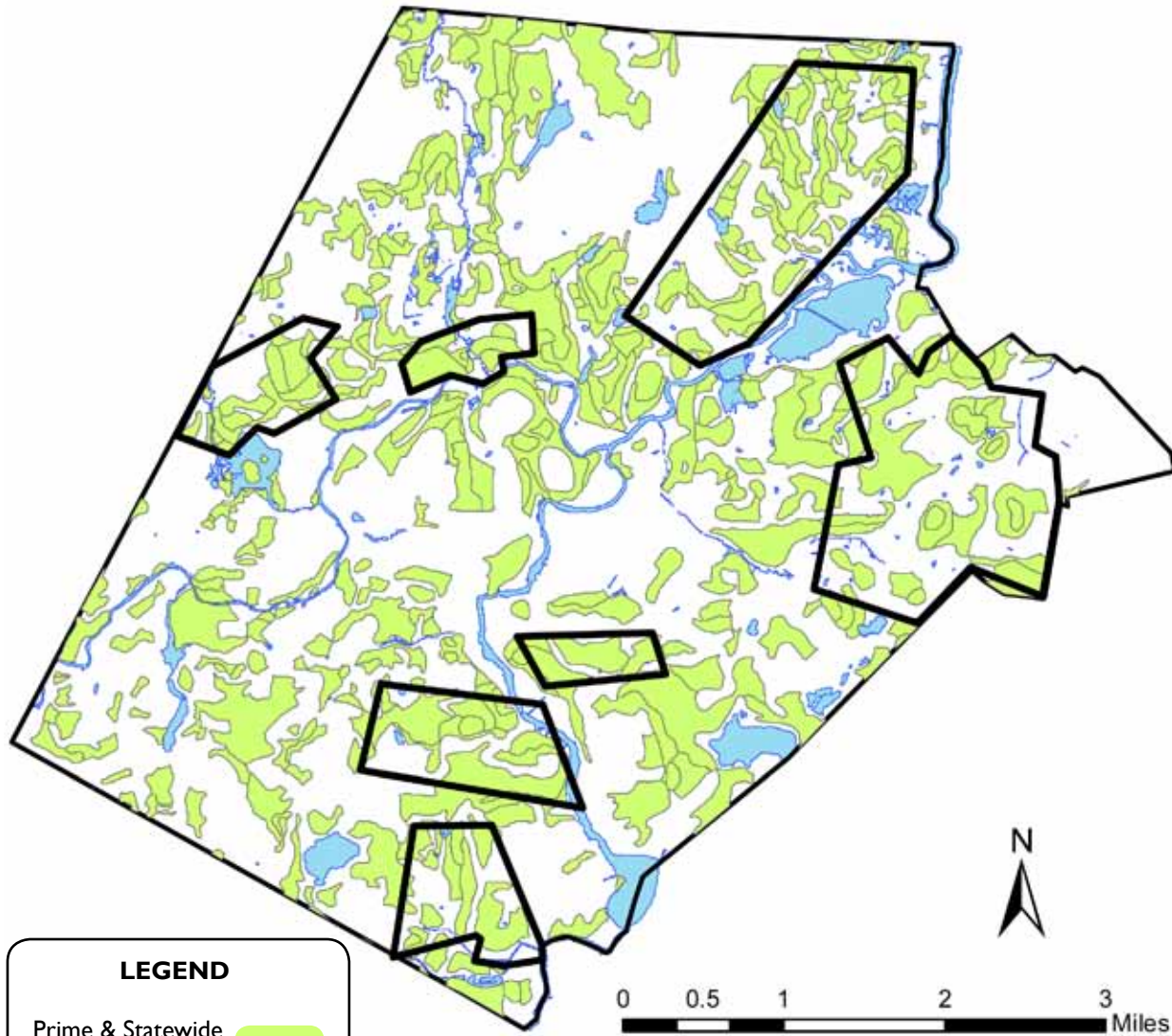
Massachusetts General Law Ch40A, Section 3, protects commercial farmers from unnecessary regulation. Until recently, the law stated that parcels had to be five acres or larger to be a commercial operation—in other words, if the parcel of land was less than five acres, the owner could grow whatever they wanted, but could not sell it on site (Minty). Chapter 40A has recently been changed to reflect the growing support of farming by the state, by extending the law to parcels of two acres or more, on the condition that the farm produces \$1,000 per acre annually (Farming Bylaw). Concord’s bylaw—which would need a two-thirds vote at town meeting—could be revised to reflect the state law, and this could create more opportunities for new farm businesses to establish themselves on smaller parcels in Concord (see New Entry Sustainable Farming Project, page 86).

In all zoning districts, individuals living on parcels that are less than two acres are still permitted to grow crops and raise livestock (if they are in compliance with the Concord Board of Health’s *Minimum Standards for Keeping of Animals* and renew their Board of Health permit annually). There are a number of backyard gardeners in town who raise small livestock and grow vegetables; however, growers are limited in their ability to have a small business because they are not legally allowed to sell farm products through a farmstand or retail store off their property.

In light of this, some innovative methods might be employed to utilize small parcels in creative ways for increased food production and local food access in the town (See Rad Urban Farmers, page 36). Land share programs, leases, and “sweat equity” are all arrangements being employed by farmers to access land in light of high land costs (see Food Production section, below).

Potential Agricultural Overlay Districts have also been proposed in the town (see page 28). These areas of contiguous farmland pose an opportunity to enhance zoning bylaws in a way that could offer greater protection of farmland.

Prime Soils and Potential Agricultural Overlay Districts



LEGEND

- Prime & Statewide Significant Soils
- Potential Agricultural Overlay Districts*

Data Sources:
 Soils: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database for Concord, MA. Available online at <http://soildatamart.nrcs.usda.gov>. Accessed March 2012.
 Additional Layers: Town of Concord, MA, Matthew Barrett, GIS Program Coordinator

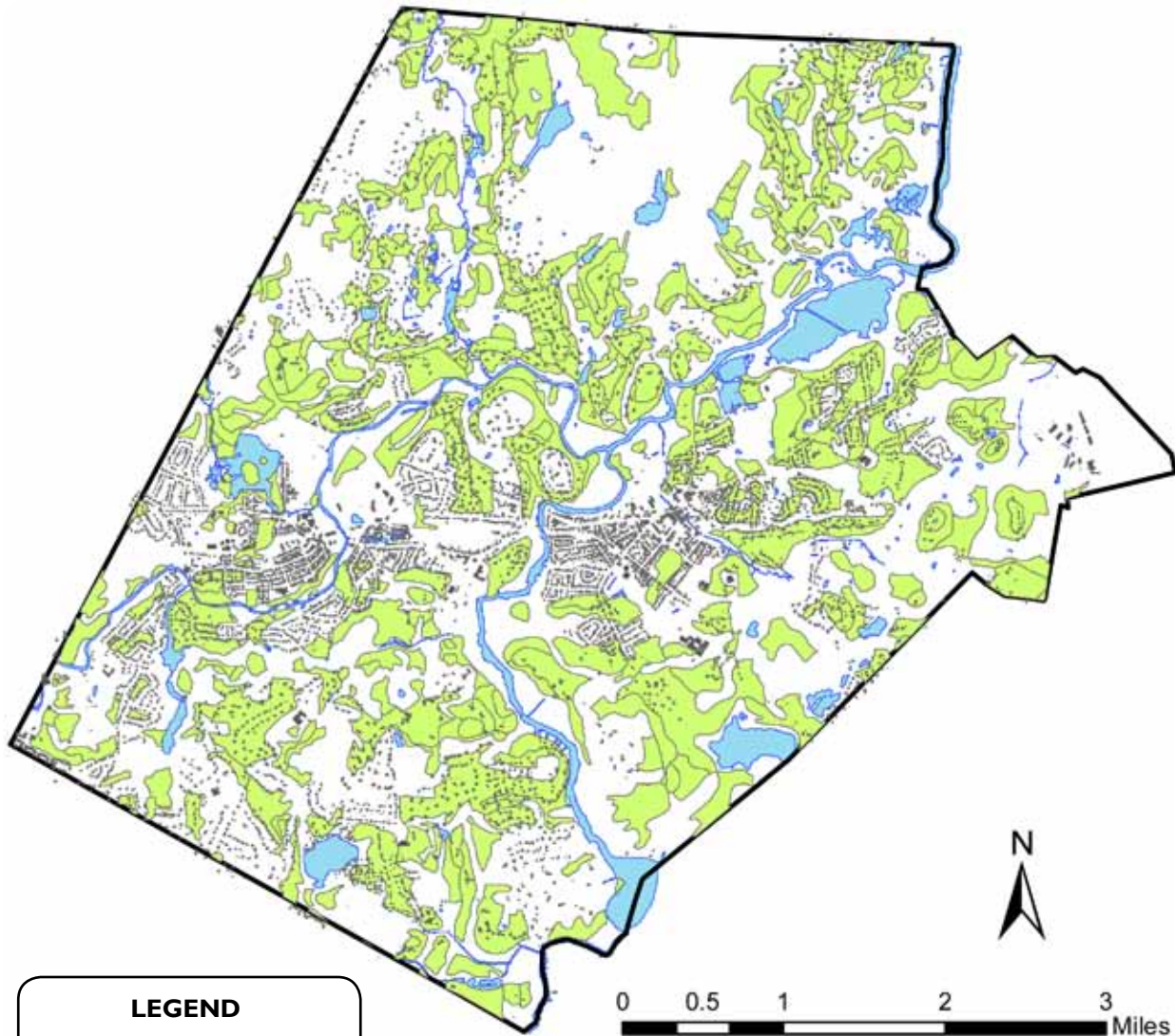
OBSERVATIONS

The proposed Agricultural Overlay Districts (*from the 2005 Comprehensive Long Range Plan) are situated on large areas of prime soils. There is also land on prime soils that is not included in the overlay districts.

IMPLICATIONS & DIRECTIVES

The districts could be implemented by the town to protect existing farms from subdivision (or non-agricultural uses) and encourage new farm operations on these large patches of good soils. Best practices, (e.g., crop rotation, diversified production, and organic methods) could be continued or adapted by farmers in these districts to protect the soils (and also maintain the nutritional integrity of the crops).

Prime Soils and Buildings



LEGEND

Prime & Statewide Significant Soils

Buildings

Data Sources:
 Soils: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database for Concord, MA. Available online at <http://soildatamart.nrcs.usda.gov>. Accessed March 2012.
 Additional Layers: Town of Concord, MA, Matthew Barrett, GIS Program Coordinator

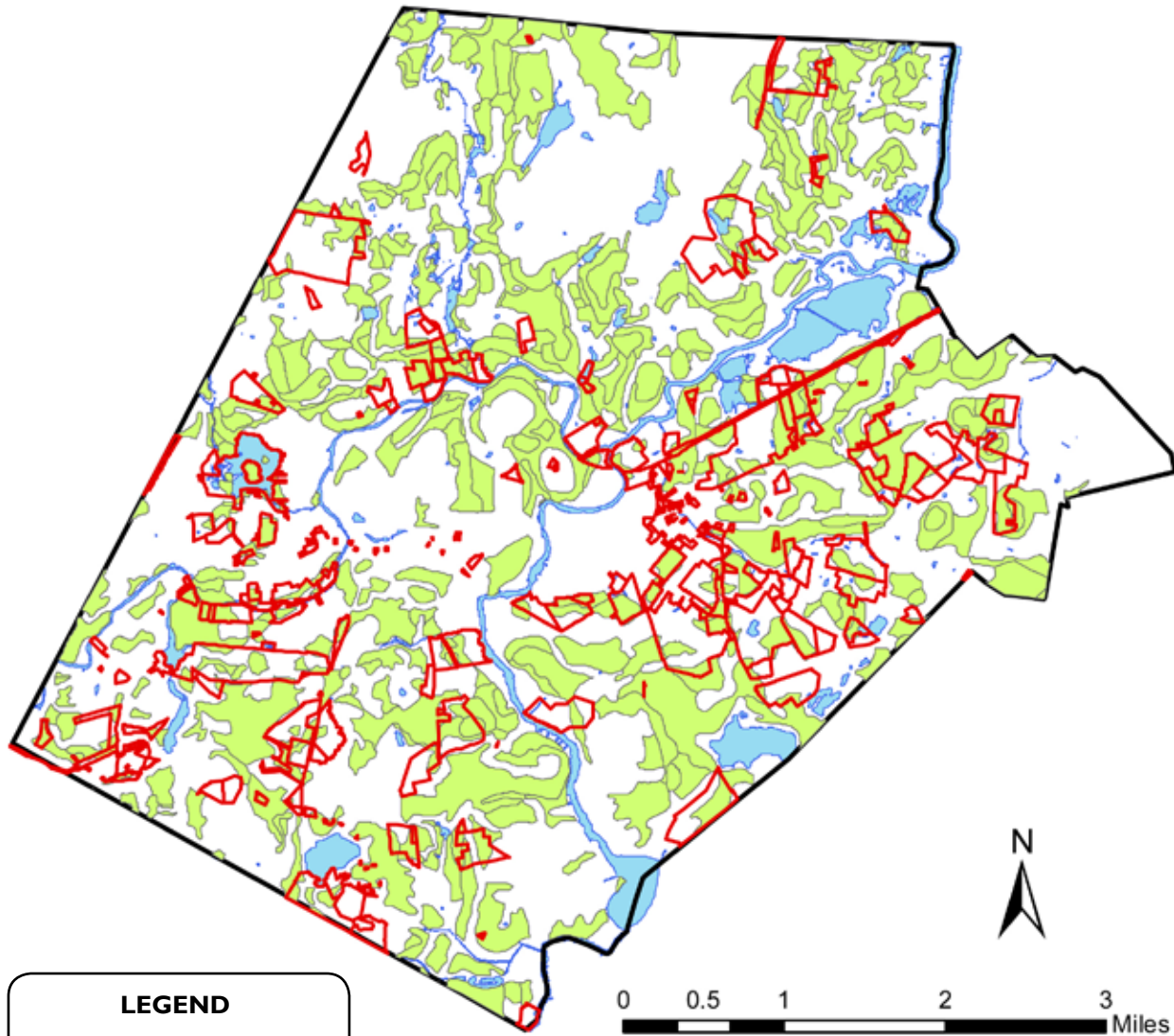
OBSERVATIONS

Buildings are widely distributed throughout the town (including residential, commercial, and industrial ones) and many are located on prime soils.

IMPLICATIONS & DIRECTIVES

Polluted water runoff from building materials and soil compaction are among the factors introduced by built structures that compromise the health of soils. There are many opportunities for diversified food production on properties that also have buildings. Prime, healthy soils should be protected from synthetic fertilizers and polluted water runoff as much as possible. New building construction should avoid fragmenting and encroaching upon prime soils where possible, to protect areas of fertile ground for food production and ecosystems.

Prime Soils and Town-Owned Lands



LEGEND

Prime & Statewide Significant Soils

Town-Owned Lands

Data Sources:
 Soils: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database for Concord, MA. Available online at <http://soildatamart.nrcs.usda.gov>. Accessed March 2012.
 Additional Layers: Town of Concord, MA, Matthew Barrett, GIS Program Coordinator

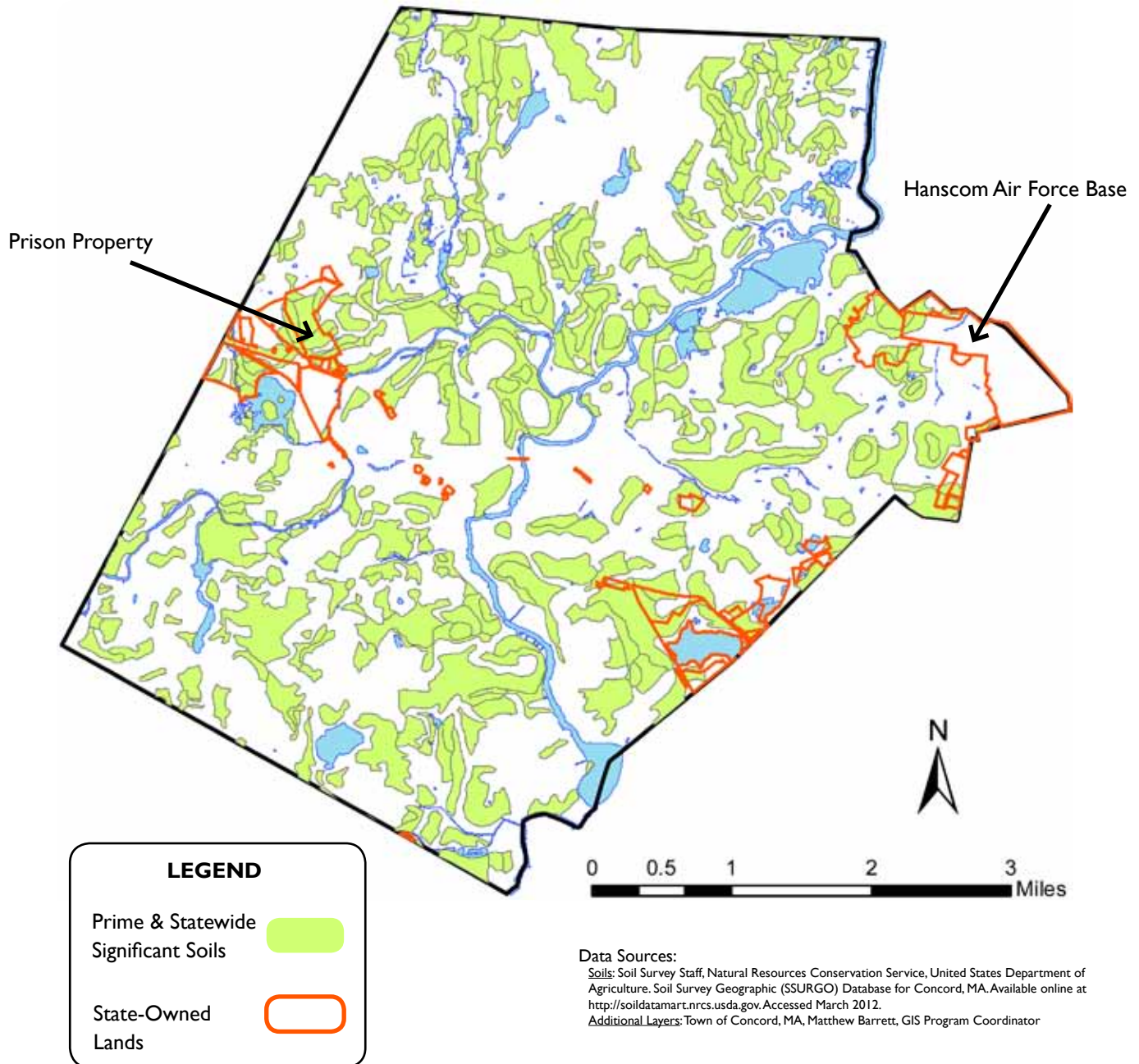
OBSERVATIONS

The town owns many scattered, small- to mid-size land parcels situated on prime soils. There are also areas of town-owned land that do not coincide with prime soils.

IMPLICATIONS & DIRECTIVES

The town might consider parcels that do not coincide with prime soils when siting new town facilities. Municipal properties located on good soils that are not occupied by buildings could be leased to new, small farm start-ups at an affordable price. More community gardens could be sited on prime town-owned land, especially on sites near schools, neighborhoods, churches, etc., to promote town-wide exposure to small-scale food production and ecologically responsible gardening practices.

Prime Soils and State-Owned Lands



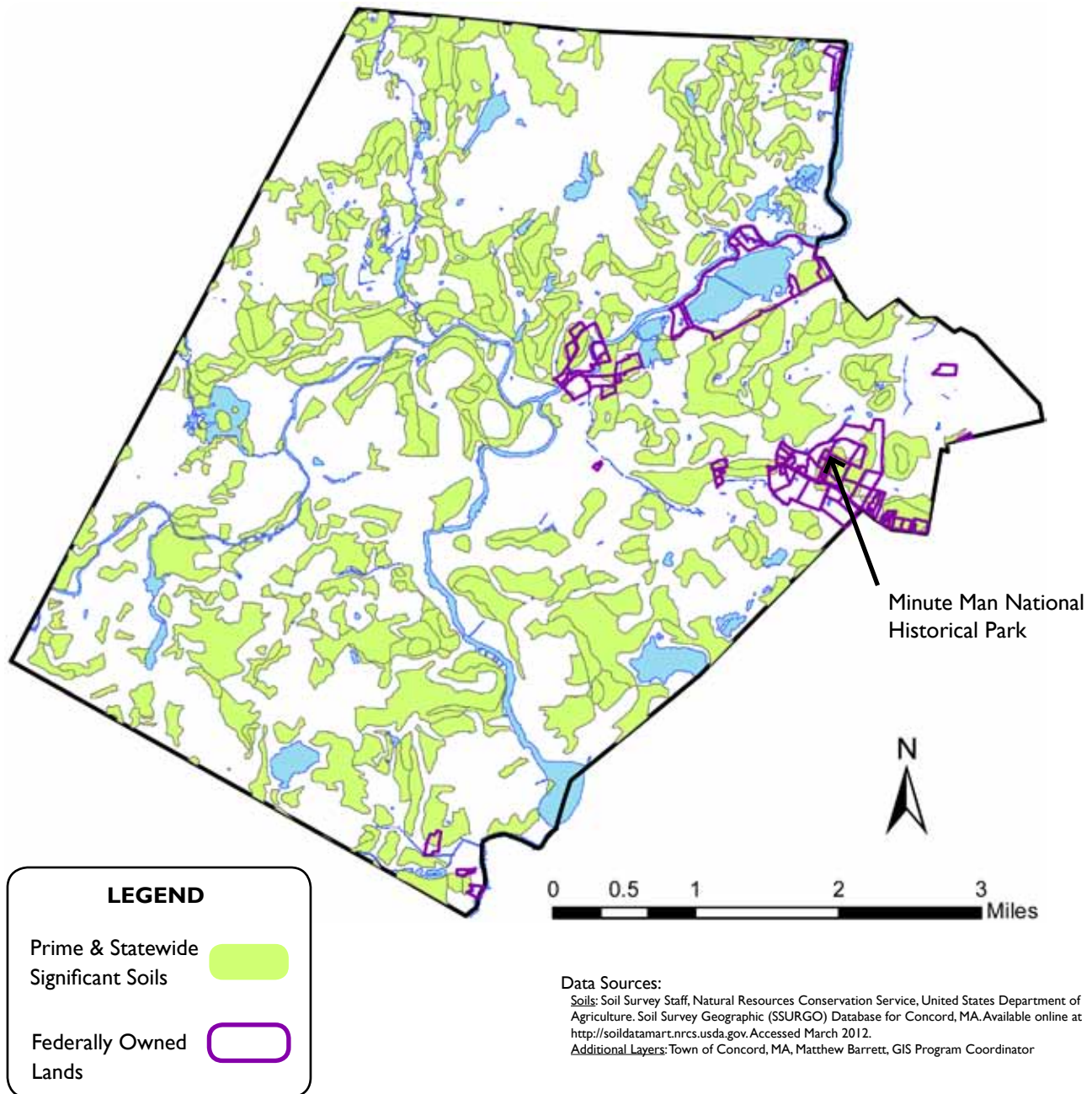
OBSERVATIONS

The coincidences of large areas of prime soils and large tracts of state-owned land include the prison property (MCI-Correctional Center and NECC) in the west and the Hanscom Air Force Base in the east.

IMPLICATIONS & DIRECTIVES

Institutions are densely populated, highly trafficked, and resource-intensive. Water, soil, and air quality may be at risk in these environments. The state could prioritize land conservation and agricultural use on these properties to protect resources and maximize utility at the same time (see Recommendations, page 88).

Prime Soils and Federally Owned Lands



OBSERVATIONS

The Minute Man National Historical Park is a large tract of federal property in the east-central part of town, attracting nearly two million visitors a year. The park is a highly trafficked tourist destination and a national landmark. A large portion of the park is situated on prime soils.

IMPLICATIONS & DIRECTIVES

Due to the flow of visitors, the park should protect the soils from threats of erosion, pollution, and compaction wherever possible. These issues could potentially be alleviated by maintaining a diverse mix of both wildlife habitats and food production to keep healthy soils in place and nutrient-rich. More farming operations in the park could expand its services to the community and enhance the visitor experience (see Recommendations, page 87).

LOCAL LEADERS

Gaining Ground Grows Food on Town Conservation Land

The non-profit Gaining Ground grows and gives away some 20,000 pounds of fresh organic produce and fruit each season to area meal programs and food pantries, with the substantial help of community volunteers of all ages and abilities. The Gaining Ground model combines partnership with the Town of Concord, which owns the conservation land that Gaining Ground farms, hunger relief through the distribution of fresh organic produce locally (within 20 miles of the farm and 24 hours after harvest), and meaningful community-service opportunities for volunteers eager to make a difference and learn about food and farming. The year 2012 marks Gaining Ground's nineteenth growing season.









Gaining Ground's main site—a nine-acre organic garden located at the historic Thoreau Birthplace property in Concord. This specific site has been continuously cultivated since 1635, making it one of the oldest farms in America (Gaining Ground). Photo Credit: Gaining Ground



Farm-based educational opportunities could be expanded for students at the federally-owned Minute Man National Historical Park. Above, students in the second grade take a trip to Battle Road Farms in the MMNHP in Fall 2010. Photo Credit: Brooke Redmond

CONCORD ZONES: LAND PATTERNS & FOOD PRODUCTION



	INTACT FOREST	HOUSES IN THE WOODS	CONTIGUOUS FARMLAND
Concord's Land Use Types			
Concord's Land Use Patterns			
Description	Large forested areas are concentrated along the perimeter of the town and buffer the three rivers.	Clearings with houses interrupt large swaths of forest.	Most contiguous farmland is located at the outskirts of town.
Food Production Opportunities	Small livestock, forest gardening (see Further Research)	Small livestock, forest gardening	Small to large farms (e.g., fruit and vegetable crops, large and small livestock)

FOREST GARDENING
SMALL LIVESTOCK (e.g., pigs, chickens)

LARGE & SMALL LIVESTOCK
SMALL-TO-LARGE FARMS
SEASON-EXTENSION METHODS

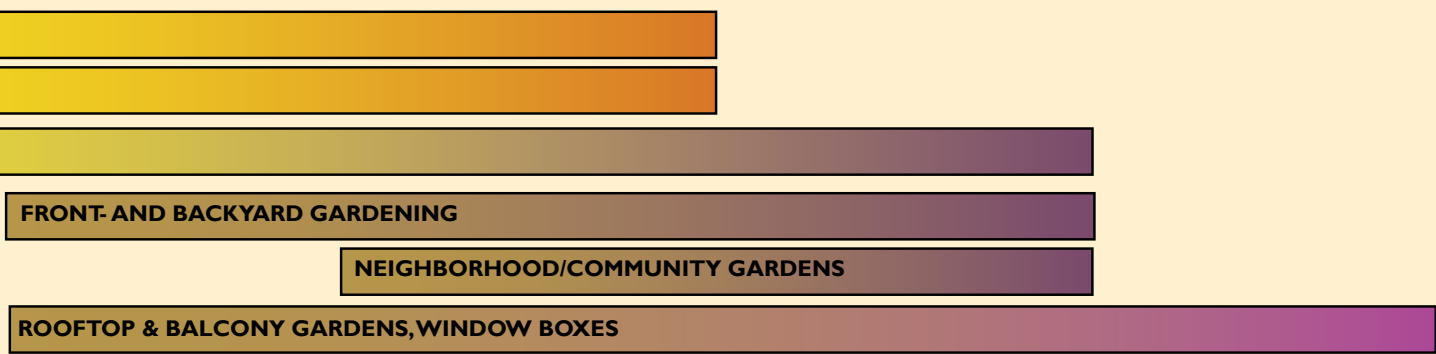
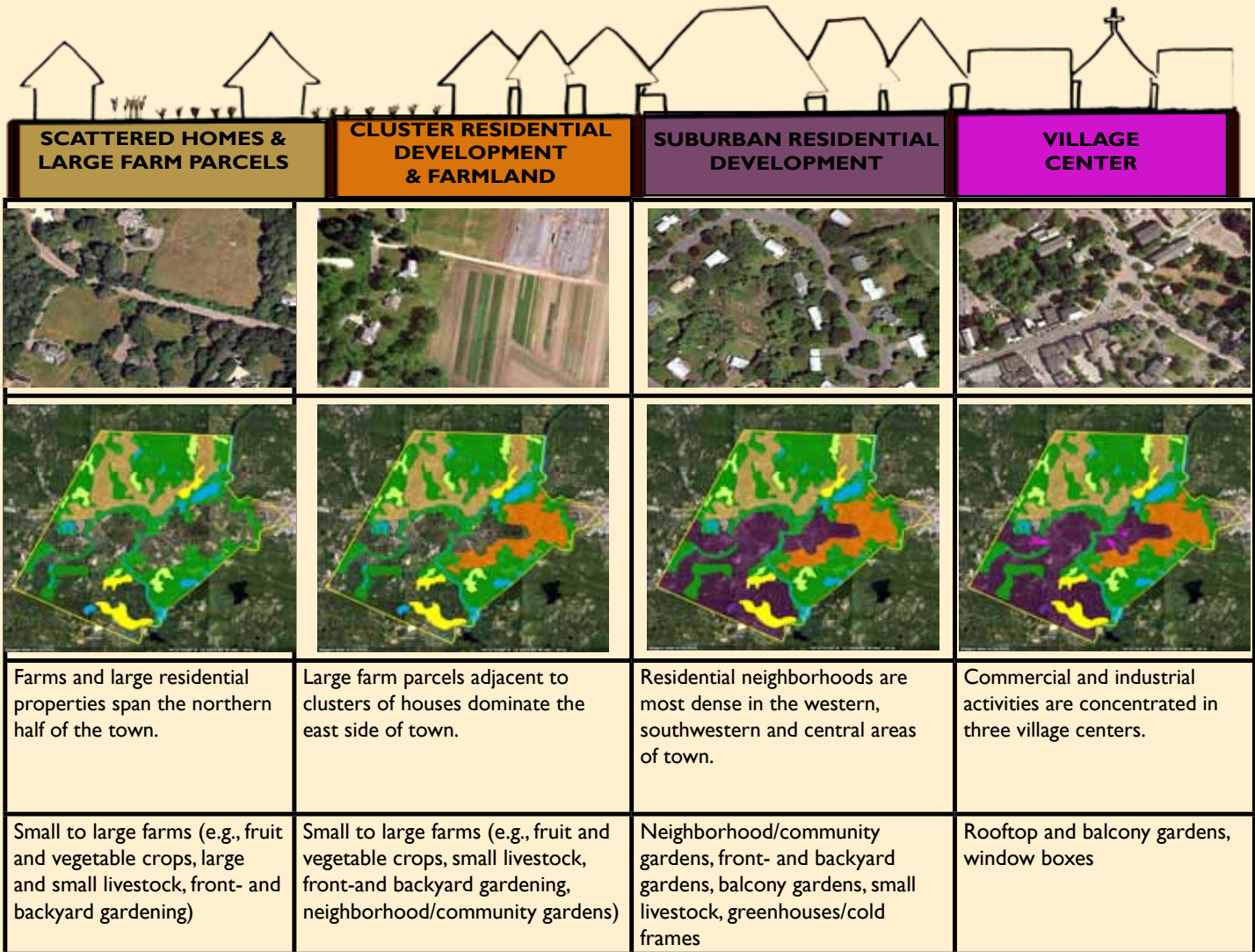
TRANSECT MODEL

A transect model can be applied to isolate the various zones of land use and development patterns within the town of Concord—from least developed to most developed. In isolating Concord's land uses, one can better understand the relationships between people and the landscape:

- Where can food distribution sites be strategically located to maximize accessibility and visibility for consumers?
- Where can future development take place so as not to encroach upon farmland and forest resources?
- Where does commercial activity intersect with farmland?
- Where could distribution and/or processing sites be located to minimize transportation costs for farmers?

What kinds of food production can take place in different areas around Concord?

Where are farm parcels adjacent to residential neighborhoods?



LAND USE SUMMARY

ASSETS

- Intact forests
- Three rivers with forest buffers
- Areas of contiguous farmland
- Concentrated development around three village centers
- Some permanently protected farmland
- Agrarian heritage that the town is committed to preserve

POTENTIAL NEEDS

- More farmland under permanent protection
- An inventory of permanently protected farmland
- Zoning ordinance for on-site farm sales on parcels of two acres or more (or enabling farm products to be sold off of any parcel size)

LOCAL LEADERS

Rad Urban Farmers

What creative solutions are small-scale growers employing to sell produce grown on less than two-acre parcels? Those interested in growing food and those with unused spaces in their yards have begun to connect and devise some unique models. One exciting example is the concept of micro-farming, which is very popular in California, and has begun to take hold here in New England.



Charlie Radoslovich working at one of the backyard plots he borrows from community members to run his farm business. In exchange, Charlie supplies the homeowners with boxes of fresh fruits and vegetables throughout the season. Photo Credit: Charlie Radoslovich

“In backyard farming, you’re not only selling the veggies, you’re selling the experience.”

—Charlie Radoslovich

Rad Urban Farmers, run by Charlie Radoslovich, is a micro-farming enterprise across three towns—Arlington, Lexington, and Belmont. Charlie wanted to grow food but didn’t own enough land. He started out asking a few friends and neighbors if he could use their yards, and his enterprise grew from there. Using a Community Supported Agriculture (CSA) model, he gives each landowner a weekly box of fresh produce from a compilation of fresh vegetables from all the yards he farms. Many property owners are attracted to the idea of a productive yard-scape, even if they are not interested in farming it themselves.

“In backyard farming,” says Radoslovich, “you’re not only selling the veggies, you’re selling the experience” (quoted in Paffrath). Charlie’s “farm” now spans seventeen backyards, and what he doesn’t give back to his members, he sells at the local farmer’s market. All this he accomplishes on less than a quarter of an acre (Radoslovich).

COMMUNITY CONVERSATIONS

Solar Energy and Farmland Criteria

In Concord, two worthy causes compete for open space to harness solar energy: solar panels and farmland. While the state is actively working to protect farmland, there is a coinciding movement to increase solar energy.

Massachusetts is undoubtedly at the forefront of green energy legislation. In response to Governor Deval Patrick's 2007 Executive Order 484 for state agencies to use renewable energy, the Department of Corrections (DOC) installed 432 solar panels at the Northeastern Correctional Center (NECC) in December 2010. These panels are projected to generate 18 percent of the annual power needed by NECC, saving \$11,000 per year (Concord Journal 2010). At MCI-Concord, 224 panels were installed, which are projected to generate 10 percent of the power needed and save \$7,000 per year (Concord Journal 2010).

The Prison Farm farm manager at the NECC, Dave Grinkis (see Prison Farm, page 72), is in support of solar power. But when the state sited solar panels on the prison farmland, as part of E.O. 484, they logically selected the best south facing hillside on the property—one of Dave's best crop fields.

In 2011, the Concord Municipal Light Board adopted a long-term renewable energy strategy to increase renewable energy sources in Concord's energy supply to 30% by 2020. The board identified solar power as the energy source with the greatest potential in Concord. In a companion Utility Scale Solar Strategy, the board set an ambitious goal of generating some 25MW of power from ground-based solar arrays by 2035. This project will require 125 acres of land (Solar Siting Committee).

Concord's Board of Selectmen appointed a Solar Siting Committee to identify town-owned land that could accommodate the solar facilities required to implement the Light Board's strategy, and to seek public comment on its findings (Solar Siting Committee). The committee's report identified six potential sites, including a parcel farmed by a local farmer, and noted that all of the sites were likely to be controversial because all involved competing uses and values.

Community feedback documented in the report indicates that while there is support for solar energy, there is also concern about the protection of scenic views, wildlife, and farmland. According to one resident, "Agricultural land should not be converted to power generation use. Concord can replace the power, it cannot replace farmland" (Solar Siting Committee 89). Decisions on siting utility-scale solar arrays currently rest with Concord's Board of Selectmen and Town Meeting.

In addition to implementing the utility-scale solar strategy, the town plans to launch a program to foster smaller installations on residential rooftops and backyards.

As a town committed to both farmland preservation and solar energy production, how can Concord reconcile conflicting agendas and prioritize land uses? The question remains an important one, especially since food production and harvesting solar energy both represent ways of meeting energy supply and addressing environmental uncertainties. The recently passed Farming Bylaw (passed by "Near Unanimous Vote" in April 2011) shows widespread town support for farming, but does not hold any legal weight.

How can the criteria for locating solar installations be balanced with that of preserving farmland? What legal measures might serve to protect valuable open space with prime soils and good solar aspect while still allowing room for clean, renewable solar energy in town?



Both crops and solar power compete for the sun's energy at the Northeastern Correctional Center in West Concord. This solar array was sited on good quality farmland that had excellent southern exposure.



V. FOOD PRODUCTION

While Concord today is no longer a primarily agrarian society and has lost a great deal of farmland to development, roughly 8 percent of the landscape is still in some kind of agricultural use (MassGIS Land Use 2005). Despite an overall decline in Massachusetts' farms over the last decades, Middlesex County's farms are still going strong, generating the highest agricultural sales of all Massachusetts counties in 2007, with nearly \$82 million and 16.7 percent of total state sales (State Fact Sheets, USDA).

Did you know?

Between 1997 and 2007, Massachusetts lost approximately 60,000 acres of farmland (State Fact Sheets, USDA).

FARMING IN CONCORD TODAY

According to the most complete data available, Concord's pasturelands and croplands each total roughly 670 acres, bringing total agricultural lands to approximately 1,350 acres (MassGIS Land Use 2005). However, this coarse data does not accurately represent the current state of active farmland.

The Concord Agricultural Land Parcel Inventory (started in 2010 and still on-going) is the first comprehensive listing of agricultural parcels attempted in Concord (Catterton). Members of the Agriculture Committee and a few partners have identified the land use in approximately 300 separate parcels in the town, including 1,150 acres of fields. Cross-referencing Natural Resource Conservation Service soil data with farmers' knowledge of the land, they have come up with these initial figures:

- Actively farmed: 400 acres
- Farmed to some degree, but greater potential: 550 acres
- Potential, but not currently farmed: 200 acres

Total: 1,150 acres of existing and potential farmland

Data for each parcel includes sector, agricultural use, owner, assessors' number, address, acreage, field acreage, acreage of prime soils greater than two acres, deed reference, Chapter 61A status, conservation or agricultural restriction status, lease information, and road frontage (Catterton).

This land inventory will be useful for generating criteria for farmland protection and for connecting new farmers with suitable lands.

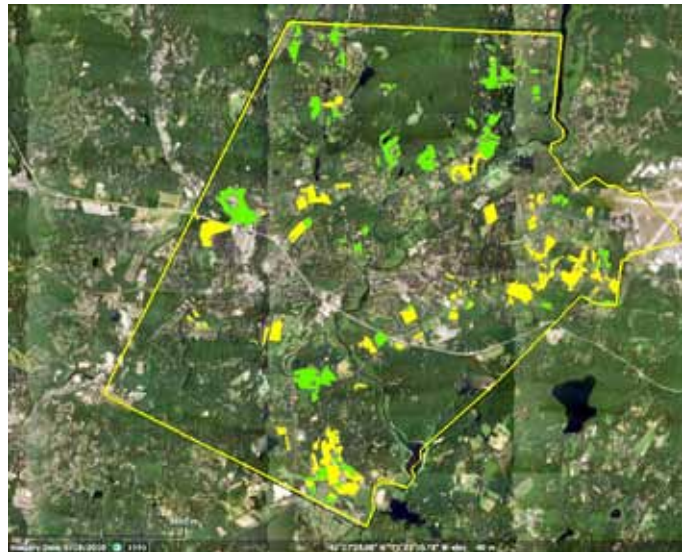


Figure 5.1: According to the coarse data, both croplands (yellow) and pasturelands (green) each total roughly 670 acres, bringing agricultural lands to approximately 1,350 acres—roughly 8 percent—of the total area of the town (MassGIS Land Use 2005). Preliminary findings from the Agricultural Land Parcel Inventory have identified that only approximately 400 acres are being actively farmed (Catterton).

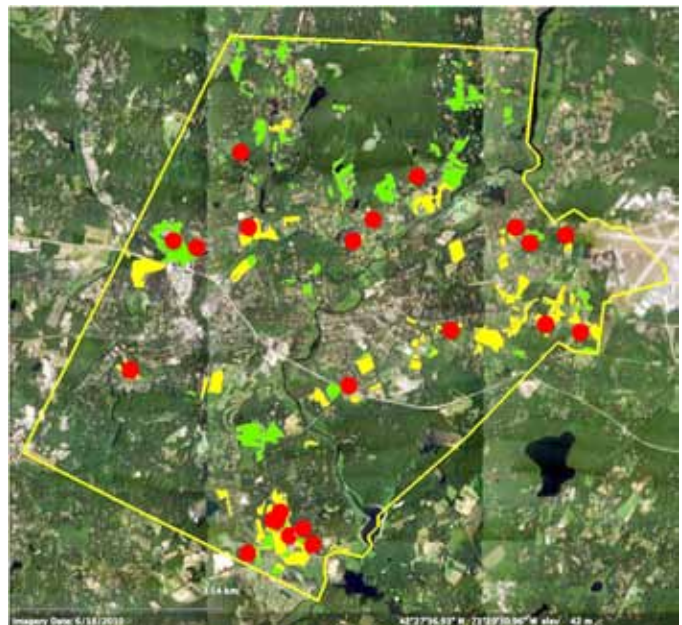


Figure 5.2: Croplands (yellow) and pasturelands (green), with approximate locations of known farm addresses (red dots) (MassGIS Land Use 2005). There are about two dozen farms, garden centers, and farmstands in Concord today.



The Concord Agricultural Land Parcel Inventory will catalog parcel information and protection status.

PROFILE OF CONCORD'S FARMS

While the Agricultural Land Parcel Inventory has not yet been completed, a general profile of Concord's farms can be made. Approximately two-dozen commercial farms, garden centers, and farmstands with known addresses have been identified for this assessment (see Figure 5.2). Over half of these farms have farmstands, while others have explored new distribution models, such as Community Supported Agriculture (CSA) programs or participating in local farmer's markets (see Distribution section).

While roughly twenty farms appear to be commercially active today, the land use data, in tandem with the information from the Agricultural Land Parcel Inventory, indicates that there is potential for increased agriculture in Concord for both croplands and pasturelands. Indeed, with prime soils on much of the town's land (see page 30) there is a great opportunity to capitalize on the rich soil bank, improved by countless generations of Concord farmers.

Concord's farms range from a half-acre to two hundred acres. Farmers use both conventional and organic methods, and most sell produce. Very few farmers raise and sell livestock or livestock products commercially (see Livestock Processing, page 59), and Concord now produces very little of its own poultry, meat, dairy, and eggs. Most of the existing farms today are located in the areas historically supporting the most farms—the East Quarter, Nine-Acre Corner, Monument Street, and Old Bedford Road.

Many of these are old family farms, such as Hutchins Farm, Kenney Farm, and Verrill Farm (see Kenney Farm, page 45) that have been passed down for multiple generations and have managed to hold on to their land, despite increased

development and economic pressures. Older farms generally distribute through farmstands, a historically important form of distribution in Concord. Concord's newer farms tend to be smaller, more diversified, and more likely to distribute their products through alternative distribution methods (see Saltbox Farm, page 52).

Preliminary findings of the Agricultural Land Parcel Inventory divide the town into six sectors by geography:

East Quarter: 296 acres of fields

Sudbury Road: 64

West Concord: 211

Monument Street: 239

Spencer Brook: 135

Nine Acre Corner: 207

(Catterton)

PROFILE OF CONCORD'S FARMERS

The older generation of Concord farmers has a wealth of experience, skills, and knowledge, and many are concerned about the transition of Concord's farms to the next generation (*A Report from the Agricultural Committee 2011*)—what the National Young Farmers Coalition calls a “crisis of attrition” (Shute 9).

The average age of farmers in the country is around fifty-seven years old (2007 Census of Agriculture), and as these farmers retire, there are few mechanisms in place to help farmers transition from farming to retirement and to transfer the land to new farmers (Baker et al.).

A younger crop of farmers have begun to enter the farming scene (see First Root Farm, page 87), but many would-be farmers have been deterred by the extraordinary and often prohibitive cost of land in Concord.

HIGH LAND VALUES

Some of Concord's seasoned farmers have begun to lease lands to the next generation, but many new farmers struggle to afford farmland due to high land values and lack of capital (Shute 20).

The state of Massachusetts ranks first in the nation for farmland value at \$12,202 per acre (“Massachusetts Ag”). Farmland values in Middlesex County (and other property values in Concord) are even higher. The average market value of land and buildings in Middlesex County is \$908,000 per

farm and \$19,000 per acre. The average selling price for a single-family home in Concord is over \$700,000 (*CLRP* 31), (2007 Census of Agriculture). According to the *Comprehensive Long Range Plan*, “rising land prices threaten open land, natural resources, agriculture, [and] historic and cultural assets” (42).

The lack of affordable land and housing are obstacles that are often insurmountable for new farmers, especially if these farmers are not inheriting land from the current farm owners (Esseks et al.). However, some farmers have devised creative solutions for access to land, such as farming on town-owned conservation lands (see *Gaining Ground*, page 33) or in the Minute Man National Historical park (see *First Root Farm*, page 87).

AGRICULTURAL LAND VALUES IN MIDDLESEX COUNTY

Total market value of farmland and buildings = \$908,000
Average value of farmland per acre = \$19,000

SMALL-SCALE FOOD PRODUCTION

In light of a renewed focus on local food in the Northeast and the rise in food prices nationally (USDA), there is a growing number of home-scale growers in the town. While no inventory of food production on parcels under two acres has yet been conducted (Catterton), there has been a growth in home-scale livestock raising over the past few years (White).

Figures from Concord’s Board of Health for the number of non-commercial animal operations inspected in 2011 indicate that chickens, geese, ducks, goats, guinea hens, and turkeys are the most popular among homeowners (White).

Concord’s three community gardens—East Quarter Farm, Hugh Cargill, and Cousin’s Field—which total over 100 plots, all have long waiting lists (Catterton). There are opportunities for more community gardens throughout the town—such as the town-owned land at the Harrington House in West Concord and other unused parcels with good agricultural soils (Catterton).



A young farmer taking a rest after a long day of haying.

CHALLENGES FOR YOUNG AND BEGINNING FARMERS

According to a 2011 national study, lack of capital and land access were identified as the biggest challenges faced by young and beginning American farmers (followed by health care, access to credit, business planning and marketing skills, profitable markets, and education and training) (Shute, 20).

COMMUNITY CONVERSATIONS

From Lawns to Productive Landscapes

How might Concordians begin to think differently about their lawns—that is, to see them as part of the broader landscape and contributing to human and ecological health? How can lawns be part of the local food movement?

Historically, grass was absolutely fundamental to Concord's food system; it provided the food for the cattle upon which Concordians' lives and livelihoods depended (Donahue 1999, 116). These native and English grasses were the foundation of the mixed-husbandry system employed by the early settlers up through the mid-nineteenth century (116). Today, most grasses on residential properties are lawns that are recreational and ornamental, but tend to be an energy and resource burden, when they could serve as a land resource.

These residential parcels also tend to fragment the landscape, reducing wildlife movement and making it difficult for threatened and endangered species to regain a foothold.

“Any plan for Concord must address the fragmentation problem in the town.” —Richard Forman, Landscape Mosaics

Lawn, or turf grasses, is effectively a monoculture crop that supports very little wildlife, provides very few ecosystem services, requires frequent mechanized mowing, and often requires chemicals and fertilizers. In fact, “lawns use more equipment, labor, fuel, and agricultural toxins than industrial farming, making lawns the largest agricultural sector in the United States” (Flores).

In addition to environmental impacts, lawns are expensive to maintain. “Today fifty-eight million Americans spend approximately thirty billion dollars every year to maintain more than twenty-three million acres of lawn” (Flores). According to a National Gardening Association study, Americans spent \$45 billion to hire professional lawn and landscape services in 2006 (“Garden Market Research”). Concordians spend a great deal of time and resources maintaining their lawns and the ornamental shrubs that adorn them.

“Lawns use more equipment, labor, fuel, and agricultural toxins than industrial farming, making lawns the largest agricultural sector in the United States.” (Flores)



Simple management strategies can turn a typical lawn into a multi-functional, ecologically-diverse, productive ecosystem.

A landowner need not transform his or her entire lawn: “a small lawn, incorporated into a whole-system design, helps provide unity and invites participation in the landscape” (Flores). Transforming lawns into productive ecosystems can have other social and environmental benefits, such as increased food production, pollinator habitat, shade, carbon sequestration, outdoor gathering areas, and wildlife corridors.

According to the Natural Resource Conservation Service (NRCS), which has adapted conservation strategies for farmland to fit the backyard scale, landowners might employ strategies such as planting trees, creating wildlife habitat, digging backyard ponds, managing nutrients, terracing, employing water conservation strategies, maintaining wetlands, composting, mulching, and managing pests (NRCS, 4-5). Approaches that increase nutrient cycling and efficiency, create habitat, and conserve water can all save the landowner time and money, while creating a more resilient, multi-functional landscape.

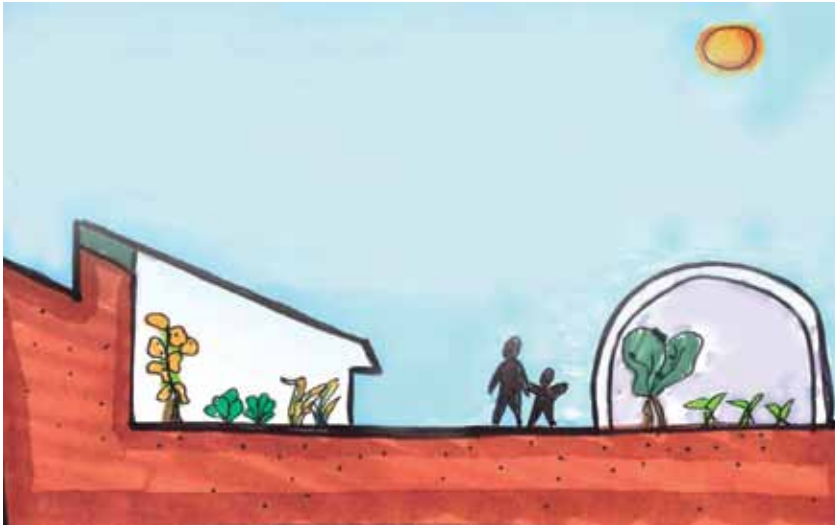


Figure 5.3: Simple greenhouses and hoophouses can increase home production yields and extend the growing season.



The East Quarter Farm is one of three community gardens in Concord. Located in eastern Concord, East Quarter Farm hosts over 25 garden plots for residents. Photo Credit: Cherrie Corey

FOOD PRODUCTION SUMMARY

ASSETS

- Prime soils and suitable land for agriculture
- Some protected farmland
- Approximately twenty active farms
- Three community gardens
- Agrarian heritage that the town is committed to preserve

POTENTIAL NEEDS

- More livestock operations
- More farmers and gardeners
- Affordable access to under-utilized land
- Season-extension infrastructure, e.g. cold frames, greenhouses, hoopouses
- Gardening and farming education for new growers

LOCAL LEADERS

Sage Farm

David Bearg of Sage Farm uses several approaches to extend the growing season in Concord. A major component is his modestly sized greenhouse that he built himself around 1970. David has found his greenhouse to be an effective season-extender, both in the food production itself, and in the nurturing of seedlings that go into coldframes and into the garden soil.

David's degrees in Chemical Engineering and Environmental Health instilled in him the importance of taking more responsibility for where his food comes from.

While David is limited in terms of his growing space, he can make progress in extending the growing season, both later in the fall and earlier in the spring, and maybe even harvesting greens during the dark of winter.



Concord Farmer David Bearg's homemade greenhouse serves him well to extend his season early in the spring and late into the winter. Photo Credit: David Bearg

LOCAL LEADERS

Kenney Farm

“If you do retail, you’d better love dealing with the public. It’s like keeping cows, you gotta be there every day.” That’s not to say that Concord farmer Bill Kenney isn’t a people person. But he knows from experience the differences in direct sale versus wholesale distribution, and he prefers to stick with what has worked for Kenney Farm for the better part of ninety years in the business: wholesale.

When Kenney’s grandfather, Phillip Kenney, moved the family to Virginia Road (once called Virginia Flats and one of the town’s first farmlands) in 1922, he brought with him a one-horse plow, a tipcart, a manure wagon, a market wagon, a wheelbarrow, a cultivator, and two hoes (Garrelick).

After a lifetime in the family business, Bill Kenney still diligently farms what’s left of his grandfather’s land and resides in the original farmhouse on Virginia Road in the East Quarter, which was once a vibrant community of Irish, Italian, and “Yankee” farming families (Garrelick). Kenney barely remembers the “truck farming” days beginning in the late twenties and thirties when his father and uncle carted vegetables to Boston for commissioners to sell at Faneuil Hall Market—an early, local form of wholesale distribution.



Lawrence Kenney, Bill Kenney’s father, harvesting lettuce on his farm on Virginia Road in 1941. Source: Garrelick. Courtesy of Bill Kenney



Concord farmer Bill Kenney in front his barn on Virginia Road.

Beginning in the thirties and lasting into the sixties, Kenney Farm sold its produce exclusively to A&P Grocery Stores at wholesale value (but any surplus still went to nearby Faneuil Hall). Lean times forced many small farms like Kenney to scale down operations in the sixties, when federal government cost-sharing declined, demand for houses increased, and farmland began to be partitioned and sold for residential development. “The best land in Concord has houses on it now,” says Kenney.

Kenney adapted by taking a second job at age twenty-two as a truck driver by night, continuing to help his father on the farm by day. As the viability of small-scale farming continued to dwindle, he continued his second job as a truck-driver to supplement the farming income until his recent retirement. Upon retirement, he found the time to attempt a radical move for Kenney Farm by starting a CSA. After two years (with nearly three hundred members by the second year), Kenney decided against the direct sale approach for several reasons: he needed someone to manage the logistics and customer service, the labor costs were too high, and he priced his shares too low.

Kenney expresses gratitude to the “organic people” and the “Buy Local” movement, and is not opposed to another attempt at direct sales. As for the future of the family plot, he nods to the land’s history: “It’s what my father left, and we want it to stay a farm.”

ROASTS, Assorted



\$ 8.99 / lb



flavorful & juicy!

100% grass fed beef

VI. DISTRIBUTION

While Concord has many successful farms, one of the major challenges expressed by the community at the public forum was the difficulty for producers to get their products to certain markets, while buyers expressed difficulty accessing those products. According to a 2010 report conducted by the USDA analyzing the local food movement across the nation, Concord farmers are not alone. The report indicates that one major barrier to local food systems is the “lack of distribution systems for moving local food into mainstream markets” (Martinez et al.).

While food grown by local farmers can take a variety of routes to get to the tables of consumers (Figure 6.1), Concord’s distribution models can very crudely be broken down into 1) direct sale and 2) wholesale. These two models have their pros and cons for producers and consumers alike.

DIRECT SALES

Direct sales—when food is sold directly from a farmstand, CSA farm, pick-your-own operation, or farmer’s market to a consumer (Christie 5)—composes 8 percent of annual sales in Massachusetts (2007 Census of Agriculture). This is much higher than direct sale figures nationally, which constituted 0.4 percent of total agricultural sales in 2007 (USDA).

Why do so many Massachusetts farmers sell directly to consumers? In general, direct sales can bring producers a higher price for their products than selling wholesale on the open market (Day-Farnsworth and Morales 229). By contrast, producers selling to commodity markets typically must capitulate to terminal market prices regardless of their cost of production (229). For certain products, like milk, the wholesale price is set by the government, and dairy farmers are at the mercy of the milk market (Pyenson 60-61). This process has forced many New England dairy farmers out of business, with nearly a quarter of Massachusetts’s dairy farms ceasing production between 2003 and 2009 (USDA NASS). Conversely, many of the dairy farmers still in business have been the ones still selling directly to consumers, and/or who have found ways to add value to their milk, by turning it into butter, cheese, yogurt, or ice cream and selling it for a higher price (Christie 11-12).

Furthermore, consumers are often more willing to pay a higher price when aware that they are supporting the farmers directly and because there can be a higher level of transparency with face-to-face interactions. Perhaps that is why, despite the food system fragmentation, there are forty farmer’s markets in Middlesex County alone (USDA Food

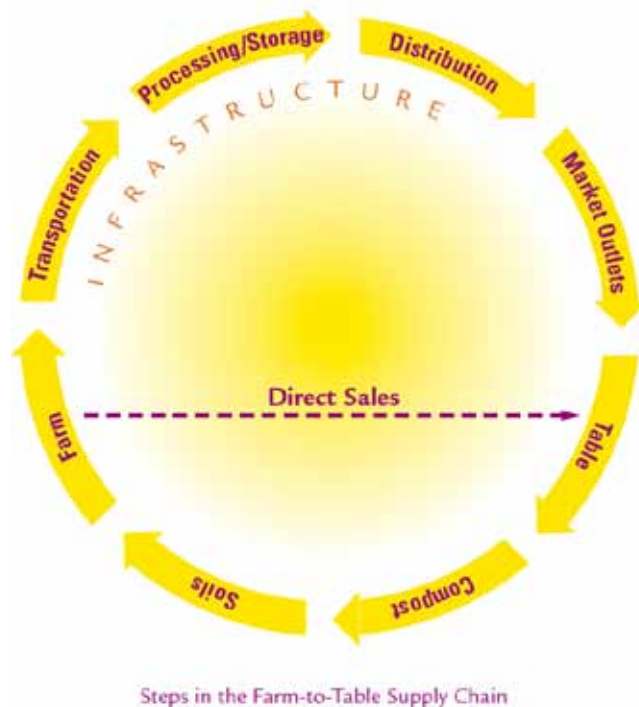


Figure 6.1: One example of a food distribution model. Source: Christie.

Environment Atlas). Also, when farmers do not have to pay a middleman, they can often retain more of the proceeds from their products.

FARMSTANDS & FARMER’S MARKETS

While Concord does not currently have its own farmer’s market, there have been recent efforts by citizens in the town to start one. Many community members have expressed a desire for a centralized location—a one-stop shop—within the town to access fresh, local food, meet their farmers, and increase social interaction in the context of food. Others are concerned with issues of access, noting that one must have a car or be able to drive to get to the farmstands. Although Concord farmers understand this desire, over half of Concord’s farms have existing farmstands, and many farmers find it more efficient and cost-effective to focus their energies there. Many farmers expressed concern that a farmer’s market might take business away from their stands (Catterton).

Farmstands are convenient for farmers who can open them seven days a week and have customers come to them, while attending a weekly farmer’s market can often be burdensome and take time and energy away from the farm (Hashley).



Chase Hill Farm in Warwick, Massachusetts' was the first certified organic raw milk dairy in the state. They sell their award-winning raw milk cheese directly at farmer's markets and festivals, and wholesale to food retailers in western Massachusetts.

There are existing farmer's markets in nearby towns (at which some Concord farmers do sell their products), and many farmers do not necessarily see the need for one in Concord (Hashley). For over a century farmstands have been one of the main distribution models employed by Concord farmers, and many do not see a need for change.

How can producer and consumer preferences be reconciled? Many alternative distribution models exist and are being successfully employed around the country. These will be examined in the Recommendations section.

COMMUNITY-SUPPORTED AGRICULTURE

In addition to farmstands and pick-your-owns, direct sale models in Concord take the form of Community-Supported Agriculture farms, or CSAs. With a CSA, customers generally pay the farmer anywhere from \$400 to \$600 in advance, and in turn receive a weekly box of produce with varied fresh fruits and vegetables throughout the twenty-or-so weeks of the summer growing season.

This model, which first appeared in the Northeast in the mid-1980s, has been hugely successful, with over 1,400 CSAs nationally (ERS Report Summary), and around 200 in Massachusetts (Local Harvest). This model has been modified in many places in Massachusetts to include winter shares that extend into the colder months. Some CSAs offer other products, such as meat, fish, or grain. Three farms in Concord currently employ the CSA model (see Saltbox Farm, page 52), and have been quite successful.

WHOLESALE TRANSACTIONS

In the discourse around food systems, the term wholesale is used to describe high volume or bulk transactions in which the distributor tends to be at the mercy of the market price, regardless of the cost of production.

Why would a farmer sell wholesale? In contrast to direct markets, selling wholesale requires more infrastructure for the farmer because selling to larger markets generally implies the need to produce greater volumes of food, keep food fresh, store and transport products, and make more business arrangements. Often, this added infrastructure is cost-prohibitive for small-scale farmers, who can generally set a higher price when selling to customers directly.

As compared to a CSA, however, where the farmer must manage customer service and the planting, harvesting, and packaging of many different crops every week, wholesale distribution of a select number and variety of crops is often a simpler, more attractive business model. Additionally, wholesale growers are often able to produce enough volume of their product to sell to larger markets, e.g., supermarkets and institutional buyers.



West Concord Super Market, one of the oldest markets in Concord, has been in business since the early 20th century. The family-run business supports local farmers, purchasing from one Concord egg producer, and a few fruit and vegetable producers from neighboring towns, but finds it difficult to get enough quantity to stock their shelves.

Selling wholesale also enables more local food access for more consumers (Christie 5). According to the USDA, most Americans purchase food from supermarkets (32 percent), restaurants (36 percent), or warehouse or superstores (10 percent) (Christie 5). While a CSA may serve a dozen to a few hundred families for a season, wholesale markets can extend that access to many more consumers in bigger markets.

In the burgeoning local food movements around the country, common parlance is to call any sale of food from a producer to a buyer "direct," even if a buyer is purchasing in bulk and even if it goes through a distributor (this is especially apparent in the farm-to-school and farm-to-institution movements).

A way to better incorporate the concept of wholesale bulk distribution into these new models, such as farm-to-institution, is perhaps to call this type of distribution “local wholesale value chains” (Day-Farnsworth and Morales). These have three defining characteristics: aggregation, or “the consolidation of products sourced from multiple growers,” transparency and source identity, and fair pricing (Day-Farnsworth and Morales 229). One major step toward creating a stronger regional food system will be the incorporation of the cost of production into high volume (or wholesale) transactions.

WHOLESALE CHALLENGES IN CONCORD

Concord is home to one regional supermarket and five smaller, independent grocers. Responding to consumer demands, some of these grocers are actively trying to procure some of their products locally and regionally. However, at the community forum and in subsequent conversations with food retailers in Concord, many stated that though they would like to purchase from local farmers, they have found that Concord farmers often do not produce the volume that they need, nor can they reliably provide set quantities throughout the year. Additionally, New England’s long winters create a local food shortage, and some buyers are unable to purchase any local food during those months.

While a handful of local farmers are already selling some of their products to food retailers, buyers stated that there is an

increasing demand for more local products on the shelves of grocery stores and on the menus at restaurants.

In addition to food retailers, a major effort is underway in Concord’s public school system to provide more local food options and “home-cooked” meals in the cafeterias (see Local Food at Concord’s Public Schools, page 57). With growing concern about children’s diets and health (see Preparation and Consumption section), there has been a rapidly growing demand for increasing the amount of fresh, healthy, local foods served in schools (Adams 2). To date, the Massachusetts Farm-to-School program connects around 250 institutions with over 100 farms in the state (Massachusetts Farm to School Project). A recent study of over 70 of these farms indicated that most found this to be a profitable venture and plan to continue (Adams 3, see Benefits of Farm-to-School Programs, page 80).

However, across the state, the success of these programs in creating an institutional demand for local food has not been matched by an increase in local food supply (Fitzsimmons 13). According to Alden Cadwell, the Food Services Director of Concord’s public schools, local farmers appear to have their existing markets and lack some of the equipment necessary to accommodate larger buyers at reduced, bulk prices. Along with Concord’s food retailers, schools are having a difficult time finding local suppliers who can meet their demand (Cadwell).



The Town of Concord sponsors “Ag Day,” an annual farmer’s market on Main Street. A great time for farmers and residents alike, Ag Day is a true celebration of community and local farmers. Photo Credit: Marcia Rasmussen



Food Services Director, Chef Alden Cadwell (right), has been trying to incorporate more local food products into the school lunches at Concord's public schools, like potato wedges shown here using nearby Verrill Farm's potatoes.

Concord farmers may need incentives and support to explore wholesale models, as well as infrastructural additions (e.g., processing equipment, cold-storage facilities, and refrigerated trucks) (Fitzsimmons 31), to meet the demands of local schools and other institutions, while major infrastructure gaps on the processing side will need to be addressed (see Processing and Storage).

The infrastructure gaps in Concord's schools highlight many of the challenges associated with farmers and institutional/retail buyers working together. For Concord farmers and buyers, and those all across Massachusetts, there are "real infrastructure needs" that must be met (Christie 5).

LOCAL LEADERS World PEAS Cooperative

World PEAS (People Enhancing Agricultural Sustainability) Cooperative is a program of the New Entry Sustainable Farming Project (see page 86). The program, launched in 2005, helps immigrant and refugee farmers coordinate their production and marketing with local consumers. Roughly three dozen small farmers originally from North America, Southeast Asia, Sub-Saharan Africa and the Caribbean now farm in the greater Lowell, Massachusetts area and distribute their fresh produce to local markets with support from World PEAS.

The program consolidates and distributes the farmers' products through a CSA model from June through November, supplemented by fruit and vegetable products from other small farms in the greater Lowell and Boston areas. World PEAS has seventeen distribution locations, including one in West Concord. They also sell to institutional food services and restaurants, and at farmer's markets ("World PEAS Marketing Cooperative").



Chef Roxanne Bispham, from Debra's Natural Gourmet in West Concord, showing off some Raspberry Infusion Vinegar made by Concord's own Silberleaf Farm.

REGIONAL MODELS

The Intervale Food Hub

The Intervale Center, a non-profit organization in Burlington, Vermont, is widely known for its innovative farmer “incubator” training program. In recent years, the Intervale has added to its array of services by creating the Intervale Food Hub. The Food Hub is a collaboration of staff and farmers who work together to aggregate, market, and distribute local food efficiently, through both a wholesale and a year-round, multi-farm CSA program.

The Intervale Center recognized that challenges associated with marketing, distribution, volume of goods produced, and proper storage often limit farmers from reaching potential buyers. In response to these challenges, the Intervale Center acts as the local distributor. The Center purchases from about thirty local farmers and coordinates the packaging, marketing, distribution, and business operations (Schmidt et al. 157). These local products are distributed to individuals, businesses, grocers, restaurants, and institutions. In addition, the Center provides a shared space used for short-term storage and business operations (157).

Aggregated models allow small-scale farmers to “scale-up,” increasing their capacity to sell to larger markets and a wider range of buyers than they would have selling directly. Supply and demand background research about farmers’ needs informed the structure of the Food Hub, while building

relationships and trust between the Hub and the farmers was crucial. The Intervale staff provide business advice and promote networking and information-sharing among farmers and businesses.

The Intervale Food Hub collaborated with local businesses to have them host drop-off sites for CSA shares and to generate more awareness about the local food movement.

Farmers find this avenue to be “reliable and fruitful” because of advance crop planning and product pricing that they help to set (Schmidt et al.). How well do these farmers make out? According to a recent study, these farmers generally net between 60 and 70 percent of CSA share revenue and 85 percent of wholesale revenue, receiving 25 percent of the gross CSA sales in advance (Schmidt et al.). Farmers also saved time through shared storage, marketing, and distribution, and because the coordinator acted as the middleman to organize and manage the business side.

Eastern Massachusetts farmers might find this model and others like it useful for getting their products to larger markets without the added work of transporting their goods and coordinating with buyers.



The Intervale Center in Burlington, Vermont, has created the Intervale Food Hub, which networks between thirty local farmers and aggregates their products, which are sold wholesale and through a CSA program. Photo Credit: Brooke Redmond

DISTRIBUTION SUMMARY

ASSETS

- Roughly a dozen farmstands
- Independent grocers selling some local products
- Regional supermarket in town
- Three CSAs (Community Supported Agriculture)
- Annual Ag Day
- One regional supermarket

POTENTIAL NEEDS

- Coordination between producers, distributors, and consumers to promote transparency and fair pricing
- Streamline farm-to-institution programs and infrastructure
- Centralized direct sale models or aggregated wholesale model

LOCAL LEADERS

Saltbox Farm

Saltbox Farm, located on Westford Road in Concord, was developed by Edward and Emilie Thomas in the 1940s. Ben T. Elliott, the Thomases' grandson, is now in the process of fixing up the family farm, and bringing it back to life. Currently, Ben is repairing infrastructure, making soil adjustments, and working towards implementing systems that will ensure the health of the farm for the long-term.

Ben grows a variety of vegetables and flowers, which he sells through his CSA, at his farmstand, and to local restaurants. He also keeps chickens for eggs, bees for honey, and has recently planted a small orchard that includes apples, peaches, pears, and cherries.

He chose the CSA model because he found it to be an efficient way to get perishable items into customers' hands. While he has had positive experiences participating in farmstands in the area, the CSA model has really worked best for him.

Saltbox Farm currently offers about forty shares a season, and is unsure whether he will increase production next year. His main hope is to have a well-functioning, diverse operation on a small scale.

Ben recognizes that he has a lot to learn, being relatively inexperienced as a farmer, and wants to grow the farm slowly to make sure he doesn't bite off more than he can chew.



Saltbox Farm's farmstand on Westford Road in Concord. The farm also sells through a CSA and to local restaurants. Photo Credit: Ben Elliot

LOCAL LEADERS

Main Street Market & Café



Formerly the grocery store L. Anderson and Sons Market, the Anderson's family store has been a food landmark for five generations. Source: Garrelick. Courtesy of the Concord Free Public Library



Main Street Market still stands today, and continues to be a popular food establishment in Concord Center.

“I wish I could find a CSA grower,” says Concordian David Anderson, who wears many hats in Concord’s food scene. He is the busy, fifth-generation owner and manager of Concord’s family-owned food landmark, known today as Main Street Market and Café. Meanwhile, he does his best to actively farm his family’s five-acre property in the historic Nine Acre Corner district.

Anderson and his family use the parcel to grow vegetables for use in the kitchen at Main Street Market. But he laments not having enough time or resources to farm the land at its full capacity. “It’s a shame,” says Anderson, “because it’s some of the nicest soil in town, it’s irrigated by the river, and it’s located on a main road with high traffic volume.”

Anderson says he would like to find a full-time farmer who can manage the land and optimize production. He envisions that the farm products would go primarily to the Main Street

Café to serve fresh food to locals and travelers, but that a farmer could also use a portion of the property to operate his or her own farm enterprise. He mentions some ideas for the farm that could benefit the greater community, such as running a CSA or an educational farm.

In the meantime, Anderson seems to be adapting with creative solutions. For example, when all of the green tomatoes were mistakenly picked clean before ripening, instead of simply turning them into the soil, they were chopped and canned for a delicious green-tomato salsa. Now he laughs at how they stumbled upon a new value-added product for their retail enterprise. “I think we’ll do it again next year” (Anderson).



VII. PROCESSING AND STORAGE

Perishability of food and the shortness of New England's growing season create a huge seasonality gap in the local food supply for the winter months. If New England is to feed more of its population with local foods throughout the colder months, communities may have to develop ways to process and store produce and meat in a safe, affordable, and efficient manner. This task may require major infrastructural changes and the collaboration of producers, distributors, and food retailers on a regional scale.

Instant access to a wide array of food choices year-round is a luxury afforded by the extraordinary feat of global food networks, but it is problematic and may not be entirely sustainable. People have grown accustomed to the freedom of choice at the supermarket and have simultaneously lost appreciation and understanding of crop seasonality. In addition, buying from distant farmers out of season can draw business away from local producers whose products and prices are subject to the seasons, climate, and soil conditions.

New infrastructure, such as food processing centers, can help strengthen a local economy through the local taxes that are paid, employees that are hired locally, and local inputs and services that are purchased. In addition, this infrastructure has the potential to create new markets for farmers, such as value-added products, while making these local products available to consumers (Christie 5).

PRODUCE PROCESSING

Over the last sixty or seventy years, preservation techniques, such as canning, fermenting, freezing, pickling, cheese-making, and drying, have been largely abandoned in Concord and elsewhere, coinciding with the growing convenience of buying out-of-season food items from global markets.



Canning and other preservation methods enable some of summer's bounty to be enjoyed in the winter; when fresh food is in short supply. According to Concord residents, many in the community want to re-learn preservation methods.

A processing center for produce is a certified commercial kitchen that is subject to an array of regulatory inspections by local and state health officials to ensure public safety (White). In order to can, dehydrate, or freeze fruits or vegetables for commercial sale, special licensing and training from the state is required. Processing facilities can be costly to build and operate, and many farmers and would-be small businesses typically do not have the capital to build their own.

In Concord today, the only commercial processing facilities are at private businesses or at a few churches in town, which are already at maximum operational capacity (White).

INSTITUTIONAL CAPACITY

Many institutions across the state once had the capacity and facilities to process produce. The Massachusetts Correctional Institute-Concord (MCI-Concord) state prison (see Prison Farm, page 72), for example, was home to a commercial processing center as recently as the early 1990s, enabling the Prison Farm to can tomato sauce made from their excess tomatoes and freeze greens, which the inmates consumed throughout the winter (Grinkis).



A bakery and deli share space in the bustling commercial kitchen at Verrill Farm's farmstand. Kitchen manager Kevin Carey also teaches culinary training workshops here for both kids and adults.

Today, Concord schools are not only limited in their cooking and preparation equipment (see Local Food at Concord's Public Schools, page 57), but are also short on storage capacity to keep local produce over the winter. The Massachusetts Farm to School Project, working with the Western Massachusetts Food Processing Center, is piloting a project to address this infrastructural gap by facilitating a partnership between a few medium- to large-scale farms and schools desiring frozen local vegetables. The Western Massachusetts Food Processing center acts as the third party processor for these farms and schools (see Farm to Institution Broccoli Case Study, page 81).

HOME PROCESSING

While a certified facility is required for commercial use, there is no such regulation for home processing (White). Canning, freezing, drying, and lacto-fermenting are all long-standing methods of preserving food, but many of these skills have been lost in Concord and elsewhere around the country. Fortunately, according to community members, there is a renewed interest in re-skilling in Concord, as well as a renewed emphasis on the health benefits of these practices.

Groups in Concord, such as Gardening for Life, are working to educate Concord residents about preservation practices to encourage healthier food choices (see below).



During WWII, popular magazines printed stories about victory gardens and how to grow and preserve garden produce. The government encouraged families to can their own fruits and vegetables in order to reserve commercial canned goods for the war effort. In 1942, the number of pressure cookers (used for canning) bought by American families was 66,000; just one year later it was 315,000 (Reinhardt). Photo Credit: Wikimedia Commons

LOCAL LEADERS

Gardening for Life

Food for Thought: Gardening for Life, founded in 2009, is a group of over 100 Concord citizens dedicated to promoting healthier and more sustainable food choices for everyone. Members learn how to grow, prepare, store and preserve food as an enjoyable and conscious step towards a healthy and more self-reliant life within a supportive community. Gardening for Life seeks to increase visibility of home-scale gardening, to educate the community about healthy, humane, and sustainable food choices, and promote the reform of state and national level policy related to the nutritional value and sustainability of our food supply.



Gardening for Life participants learn about hoophouses and at-home season-extension methods. Photo Credit: Debbie Barr

LOCAL LEADERS

Local Food at Concord's Public Schools

The 2011-2012 school year marked the beginning of significant changes in Concord Public School cafeterias: Chef Alden Cadwell took on the position of Food Services Director with a mission to drastically improve what Concord kids are eating for lunch. Chef Alden is committed to phasing in new, healthier recipes for lunch, sourcing food fresh and locally whenever possible.

Concord-Carlisle Regional High School has a commercial kitchen equipped for cooking meals from scratch; Chef Alden spends a lot of his time there, retraining the kitchen staff and crafting new recipes. His other main office is at the kitchen at Sanborn Middle School, also set up with ample storage space and cooking equipment. Each school day, Chef Alden and his staff prepare meals from scratch at Sanborn to be trucked the next morning to the other four schools, which have very little cooking equipment.



The fully equipped kitchen at Sanborn Middle School. Chef Alden and his staff cook meals from scratch here every day for distribution to the four other public elementary and middle schools that lack cooking and storage infrastructure.

Infrastructure for food preparation is limited in most schools; typical public school kitchens are simply not set up for cooking. Heavily processed “heat-to-serve” lunches have been the standard for so long that warming ovens are the most common feature found in school cafeterias.

Another challenge to cooking meals that are sourced locally is the school's food budget. Food Services is allotted \$1.80 per meal to work with (this figure changes based on sales from the previous year), so they must balance where and how the money is spent. For example, if they opt to serve hamburgers from grass-fed cows in Maine, which cost \$2.00 a patty—instead of conventional patties which cost \$0.40 each—they must then perform a balancing act to



Grass-fed beef from Maine is now served in Concord's public school cafeterias, providing a substitute to heavily-processed conventional patties in standard school lunches. Cows predominantly raised on grass are much healthier than conventional cows raised on corn; this means that Concord students are now eating meat that is healthier for them.

“We want to cook food that kids want to eat and will eat, and educate them about why to eat it.” —Chef Alden Cadwell

accommodate the budget the next day (e.g., by serving a less expensive, conventional meal, like grilled cheese and tomato soup). By strategically planning weekly meals in this way, Chef Alden and his staff are managing to introduce local and nutritious (albeit sometimes more expensive) foods into school lunches.

In addition to costs, issues such as gaps in seasonal availability, limited storage capacity (at both the schools and at the farms), and inconsistent supply can undermine attempts to contract directly with farmers.

In addition to purchasing from local growers, Chef Alden sees a tremendous opportunity for demonstration gardens in the schoolyards to complement what is being served in the cafeterias as an educational tool. However, he expresses that it may not be feasible at this point to actually supply the cafeterias from small school garden lots. Herbs, which are expensive to buy in bulk, may be an exception. Versatile, low-maintenance herbs like oregano, basil, and rosemary could be cost-effective to grow in school gardens for cafeteria use.

Currently, food waste at the schools goes into the garbage. Chef Alden says he would love to have the means to compost and recycle everything. He thinks one possibility is that the schools could hire a company to pick up compost and co-mingled recycling, allowing schools to avoid having to orchestrate rigorous training for the kids (regional companies like Save-That-Stuff and Planet Me even take meat and dairy products).

Chef Alden and another cook meet with a team of parents and teachers to discuss projects, taste-test new recipes, and solicit volunteers. He is also re-training kitchen staff to cook from scratch through what he calls “lunch lady boot camps.”

Chef Alden realizes that there is risk involved in changing the lunch recipes; when the chicken tenders were dropped from the menu this year, lunch sales also dropped immediately. However, the rebuilding process is coming along. Since abandoning the highly processed chicken nuggets and purchasing whole birds instead, he has introduced new dishes (such as lemon pepper and barbecue rotisserie chicken) that are gaining popularity with the students.



Chef Alden joins the children in the school cafeteria for lunch.
Photo Credit: Garbee

The kids are encouraged to participate in taste-testing as Chef Alden works to get new recipes standardized in the schools. “The main question that is the most basic, yet often overlooked, is: are the kids eating the food? We want to cook food that kids want to eat and will eat, and educate them about why to eat it. ‘Health food’ is a bad word in my line of work,” he laughs (Cadwell).

Short- and Long-Term Goals for Concord’s Public School Cafeterias

Short-term Goals (this year 2011-12):

- Reduce processed meat served to 0 percent (e.g., chicken nuggets)
- Have 6 days a month be vegetarian (without a dip in participation)
- Increase meal participation from 48 percent to 60 percent
- Cook 75 percent of meals from scratch
- Increase local in-season produce and meat products by 50 percent

Long-Term Goals (3-5 years):

- Create long-term purchasing contracts with local farmers (potatoes, zucchini, tomatoes)
- Increase participation to 75-80 percent
- Cook 100 percent of meals from scratch
- Purchase local milk and switch to milk machines instead of boxed milk (Cadwell)

REGIONAL MODELS

Crop Circle Kitchen and the Western Massachusetts Food Processing Center

Some small businesses in Concord have their own processing facilities for their culinary operations—mostly centered on Beherell Street in West Concord—while others must seek out other options. Culinary incubator kitchens, like Crop Circle Kitchen in Jamaica Plain, have the required infrastructure for food entrepreneurs to safely process their products. There are only a handful of these facilities in the region: Crop Circle Kitchen is a nearby example in the Boston area, and the Franklin County Community Development Corporation’s (FCCDC) Western Massachusetts Food Processing Center is a successful example located in Greenfield, Massachusetts.

These organizations have shared-use kitchens and are considered “culinary businesses incubators,” providing certified

equipment, training, and business skills to their members (Crop Circle Kitchen, FCCDC). The Western Massachusetts Food Processing Center (FPC) has supported over 200 businesses since it opened in 2001, and has recently established a new project to bolster farm-to-institution projects through extended season processing (Fitzsimmons 4). As an example of a successful business incubator and an infrastructure hub that is now serving the wider farm-to-institution movement, the FPC may be a good model for Concord as it considers increasing its infrastructural capacity to process and store more local food.

PRODUCE STORAGE

“One of Papa’s summer crops was Blue Hubbard Squash, he raised tons of them. When they were harvested in the fall, they were stored in one of the smaller sides of the large greenhouses. I suppose just enough heat to keep from freezing, yet to hold them over the winter and shipped as needed to the commission merchant in the Faneuil Hall district in Boston.” (Concordian Eirene Anderson, personal memoir, “Yesterday is Today’s Legacy”)

In New England, the main growing season runs from June to October. In addition to produce processing as a means of supplying local foods from November through May, other storage methods also enable people to continue eating locally, even when there is snow on the ground. Winter storage crops (e.g., carrots, winter squash, potatoes, parsnips, cabbage) can be planted in the fall, harvested, and kept relatively fresh if stored in the right conditions (e.g., root cellars or coolers). Another option is frozen produce (e.g., broccoli harvested fresh during the season, processed, and then frozen). Lastly, greenhouses and hoophouses (unheated greenhouses) can be used to extend the growing season.

As with processing facilities, there are no storage facilities in Concord other than those on private properties, which are only designed to meet the needs of the existing operation (e.g., the walk-in cooler at Verrill Farms).

Root cellars were traditionally commonplace in Concord, and some historical homes may still have them. On a larger scale, however, produce storage becomes a challenge. In the western part of the state, institutional demand has sent growers “scrambling to find and build adequate storage facilities to meet demand,” while institutions are also looking for cold



A large walk-in cooler at Verrill Farms preserves storage crops throughout the winter that can be sold directly or wholesale to buyers.



Pete & Jen’s Backyard Birds is one of the few farms in Concord raising livestock for meat consumption. They raise pastured meat and egg-layer chickens, pigs, sheep, and rabbits. Photo Credit: Pete Lowy and Jennifer Hashley

storage options (Christie 13). Often, the “costs of investing in on-farm capacity to fill the market gaps can be too high for individual farmers” (Fitzsimmons 7).

LIVESTOCK PROCESSING

In addition to a dearth of processing and storage facilities for produce, there is an absence of local and regional processing and storage facilities for livestock (i.e., slaughterhouses, meat lockers, butcher shops, and dairy processing facilities) and a general lack of knowledge about how to process one’s own meat products.

The Board of Health’s 2011 inspection of farms selling animal products commercially (for meat, dairy, eggs, or poultry) indicate that just three farms in Concord have livestock permits. Chickens—for meat and eggs—are the most common livestock type in Concord (1,150 birds), followed by 110 rabbits, and 175 cows (165 of these are at the Prison Farm, which sells its beef out of town at a live auction) (White). Figure 7.1 indicates pasturelands in Concord and the approximate locations of those farms that are permitted to raise and sell livestock and livestock products. A few additional farmers have expressed interest in raising livestock and may apply for permits (White).

It can be assumed that with this small number of local meat operations and a population of about 18,000 residents, most meat consumed in Concord comes from out of town. Furthermore, much of that meat comes from an industrial food system that extends from the western cattle ranches to large-scale confined animal feeding operations, to centralized slaughter facilities, to packaging facilities, to trucks that bring the meat to large grocery stores. The environmental and health costs of this system are extensive and unsustainable (Pollan).

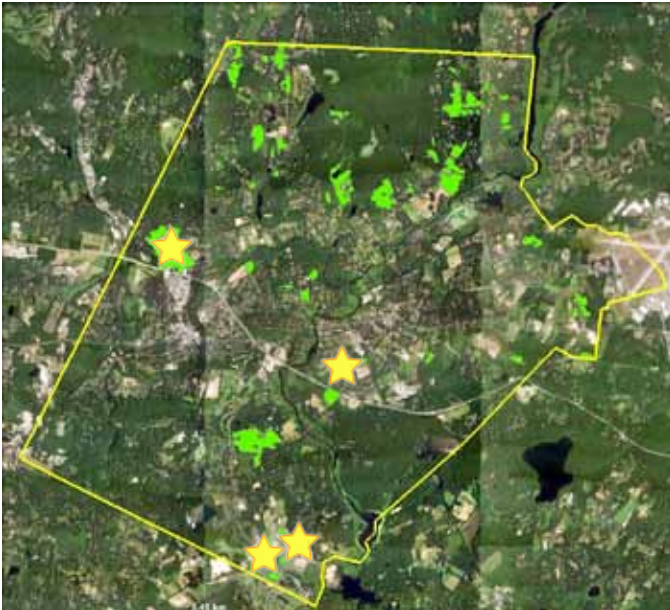


Figure 7.1: Only four farms in Concord had permits to sell their animals and animal products commercially in 2011 (White). Almost all of the cattle are sold out of town at a live auction, while the remaining animals and animal products are sold directly in Concord or at nearby farmers' markets. The number of commercial operations in town are disproportionate to the over 650 acres of pasture lands, shown in green (MassGIS Land Use 2005).

So with at least 670 acres of pasture in Concord, why are there not more livestock operations today? What are the obstacles preventing more farmers from raising livestock in Concord today?

CHALLENGES TO RAISING LIVESTOCK

For farmers in Concord (and regionally), raising animals for meat has a variety of challenges. First, there are only two USDA-certified slaughterhouse facilities in Massachusetts, and neither of these process poultry (see Figure 7.2). Concord farmers raising chickens for poultry have little choice but to drive their birds ninety miles to Westminster, Vermont. The transportation costs and processing fees are often prohibitively high, especially for small-scale farmers (Hashley). To address these challenges, innovative farmers like Pete Lowy and Jennifer Hashley of Pete & Jen's Backyard Birds in Concord have devised a creative solution to process their birds locally: they use a USDA-certified mobile poultry processing unit (MPPU) for on-farm chicken processing (see Mobile Poultry Processing Units, page 61).

Other obstacles to processing livestock include the multiple licensing and regulatory fees imposed upon the farmer, along with the often confusing health regulations with which farmers must comply (Hashley). For example, mobile poultry processing is regulated by three different state agencies, creating headaches for the farmer who must incorporate various policies into one management plan (Christie 14). In addition, Massachusetts is a "home rule" state, whereby each town can pass its own regulations above and beyond the state regulations—especially health regulations from local boards of health—that farmers must adhere to when selling their products in different towns (14). This creates redundancies and inefficiencies in the system, requiring farmers like Pete Lowy and Jennifer Hashley to pay for multiple permits for their operation (Hashley).

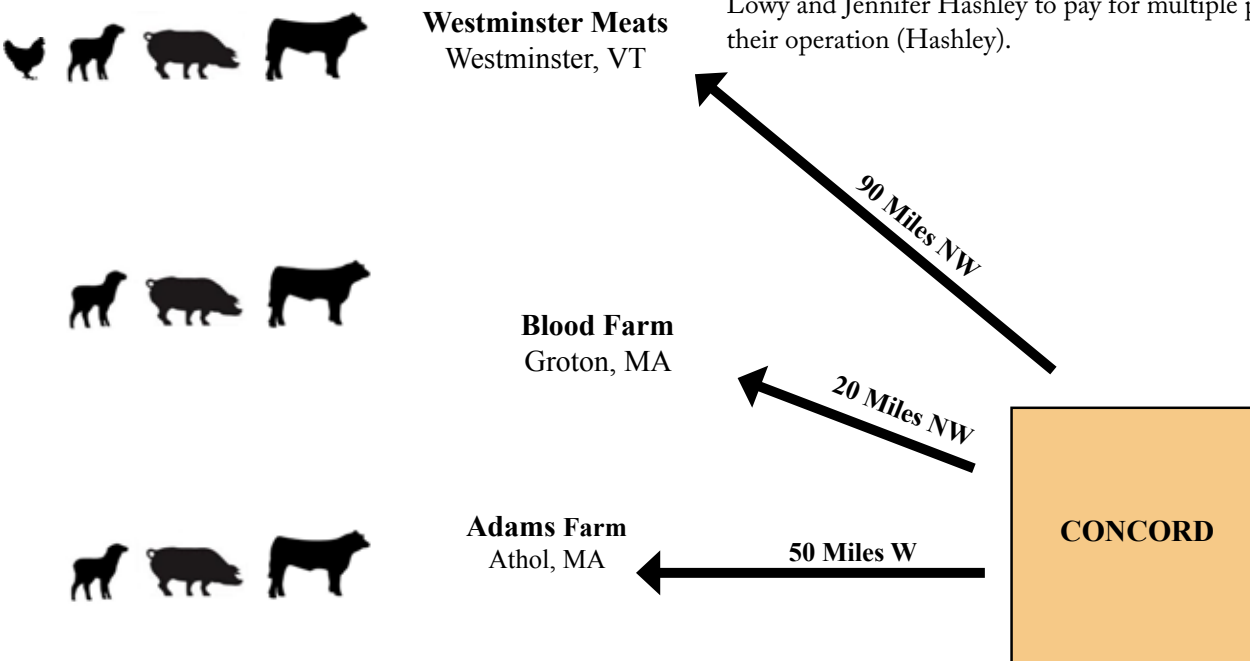


Figure 7.2: There are only two USDA-certified slaughterhouse facilities in Massachusetts. The nearest certified facility that processes meat birds is in Westminister, Vermont. Transportation time and costs, and regulatory fees are impediments for small-scale livestock producers across the region.

LOCAL LEADERS

Mobile Poultry Processing Units

“One of the challenges of being a diversified livestock farm is accessing appropriate slaughter and processing services,” says Concord farmer Jennifer Hashley.

In 2006, when Jennifer and her husband Pete Lowy of Pete & Jen’s Backyard Birds moved into commercial poultry production for meat, they discovered there is no commercial capacity for poultry processing in Massachusetts.

Finding a poultry processing facility became increasingly difficult and a barrier to further expansion of the business. To address this challenge, Backyard Birds began working with the New England Small Farm Institute (NESFI) to make progress toward approval of a mobile poultry processing unit (MPPU), which had been in development since 2000.

Jennifer, in her role as Director of the New Entry Sustainable Farming Project, solicited a grant from the Massachusetts Department of Agricultural Resources to partner with NESFI and later secured other resources to fund development of a statewide regulatory process to allow the MPPU to be used for commercial use.

Backyard Birds was the first farm to pilot test the unit to determine the volume of water and waste generated during MPPU use. From 2007-2011, this MPPU pilot project

helped train hundreds of small-scale poultry producer-processors in Massachusetts about the regulatory, food safety, and waste management aspects of operating the unit on their farms.

The MPPU project has now graduated from pilot mode and is now in “routine status” with the state health department. Pete and Jennifer were able to assist New Entry with fundraising from their broad customer base to build a second enclosed mobile poultry-processing unit for eastern Massachusetts, which came online in 2011.

The project has served as a model for other New England states and for other types of shared use infrastructure in agriculture.

“There is great need in the state for a legal, affordable, and humane way for small-scale growers to process their own chickens and sell directly to consumers.”

—Pete Lowy and Jennifer Hashley



Since there was no USDA-certified chicken processing facility in Massachusetts, Backyard Birds, in collaboration with the New England Small Farm Institute, got approval for an on-farm mobile poultry processing unit (MPPU), shown above. Photo Credit: Pete Lowy and Jennifer Hashley

PROCESSING AND STORAGE SUMMARY

ASSETS

- Commercial kitchens in Concord schools and churches
- Institutional kitchens that could be retrofitted and opened for shared or commercial kitchen use
- One mobile poultry processing unit
- Former dairy barn and unused buildings at the prison farm
- Existing spaces such as barns and old houses with root cellars that could potentially accommodate winter crop storage

POTENTIAL NEEDS

- Commercial food processing venues
- More produce storage facilities (especially for institutional buyers and bulk growers) to extend seasonal availability
- Local or regional slaughter facilities for both small and large livestock
- Cold-storage infrastructure for animal products

REGIONAL MODELS

Case Study: The Vermont Food Venture Center

The Vermont Food Venture Center (VFVC) is a shared-use commercial culinary incubator that “provides infrastructure and support for value-added production [and] minimal processing and business services to emerging and existing food businesses, organizations, and the community.” Three certified kitchens—one for hot processing, another for cold packing, and a bakery—are available 24/7 for hourly or contract rent to meet producer needs, e.g., for preparation, catering, baking, or teaching. The VFVC also offers business consulting (“The Center for an Agricultural Economy”).

The kitchen is operated by the Center for an Agricultural Economy (CAE), a non-profit in Hardwick, Vermont, that was founded to bolster the economy and health of the small, rural town. The CAE continues to research and support sustainable food systems and small-scale agriculture in Vermont and throughout the region.

The VFVC has been instrumental in restoring the local food system and rendering the town’s small-scale agriculture economically viable. The impacts have been so profound in revitalizing the community that Vermont farmer Ben Hewitt featured Hardwick’s inspirational food story in his book, *The Town That Food Saved* (Hewitt).

LOCAL LEADERS

Dairy in Massachusetts

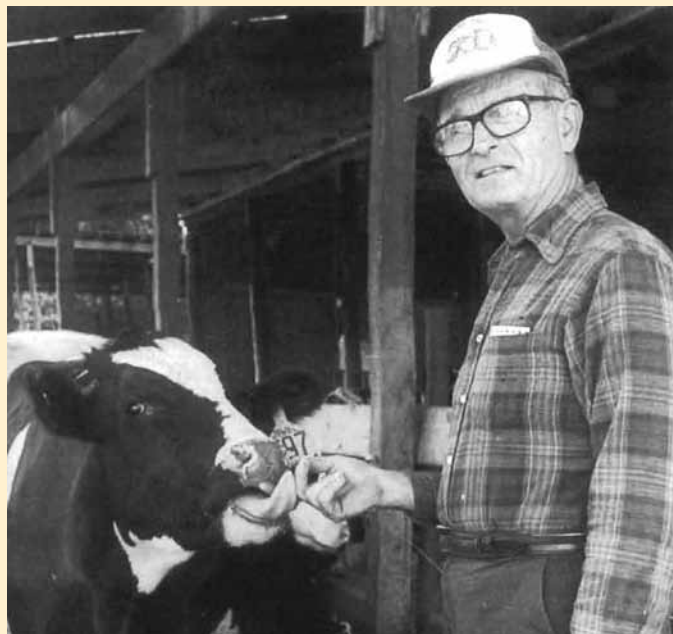
Dairy production was a keystone of Concord's agricultural activity and regional contribution in the late nineteenth and early twentieth centuries.

Late dairy farmer Floyd Verrill claimed, "At the height of our business we were selling 12,000 quarts of milk daily, including servicing two hospitals and delivering two trucks of forty-quart jugs to Harvard College. And with 22 dealers delivering milk in Concord at one time, competition was strong" (as quoted in Garrelick 135). Steve Verrill (Floyd's son), who was one of the last dairy farmers in Concord, shifted to growing vegetables and other products after his dairy operation became no longer viable in 1990. Concord's last dairy farm at the Northeastern Correctional Center had a 200 head dairy herd up until 2002 (see Prison Farm, page 72).

"I think I was the first to start pasteurizing in Concord and I was the first to put milk in the schools. We tried to get as much milk as possible delivered before breakfast." —Floyd Verrill (Garrelick 135)

In recent decades, dairy farming in Massachusetts has faced a rapid decline. Rising costs of feed, fuel, and other inputs, and the low and often volatile price of milk made it challenging for dairy farmers, like Steve Verrill, to stay in business. According to the USDA's National Agricultural Statistics Service, between 2003 and 2009 nearly a quarter of the Commonwealth's dairy farms ceased production, bringing the total statewide number to 180 (USDA National Agricultural Statistics Service).

Most of the dairy operations that have been able to stay in business in the region have been those selling directly to consumers, instead of wholesale through cooperatives (Pyenson 60). Farmers selling directly have been better able to garner a higher price for their milk and milk products (60).



Steve Verrill was one of the last dairy farmers in Concord, selling off his dairy herd in 1990. Source: Garrelick. Courtesy of the Concord Oral History Program

Many consumers have become aware of the health benefits of raw milk and raw milk products and are willing to pay a premium—and sometimes drive long distances—for them. Massachusetts laws permit the sale of raw milk on the farm, but not through retail avenues (RealMilk.com). Many groups are working to change this law to enable consumers better access to these products and greater choice as to what to feed their families. Once a thriving dairy economy, Concord could again support a successful dairy industry, selling value-added milk products and raw milk to consumers all across eastern Massachusetts and beyond.



VIII. PREPARATION AND CONSUMPTION

Coinciding with the rise of global food systems and processed foods has been the loss of home-cooked meals prepared with fresh, local ingredients. Regaining the ability of community members to prepare foods—and the infrastructure with which to do so—is another integral step in reviving local food systems. At the community forum held in February 2012, Concord citizens expressed a growing interest in reincorporating healthy meals into households and institutions.

COOKING AND NUTRITION EDUCATION IN CONCORD

In an effort to spread knowledge among Concord adults about nutrition and home-cooking, some residents are teaching cooking classes, while some non-profit organizations are working with residents to teach gardening skills and meal preparation techniques with home-grown produce. Other organizations are working specifically with kids to educate them about healthy eating and decision-making (see Kids Eat Smart, page 8).

As mentioned in the previous section, Concord's public schools are in the process of reinstating "home-cooked" meals and local purchasing practices (see "Local Food at Concord's Public Schools, page 57). Considering that between 2004 and 2007, U.S. middle and high school students consumed more than a quarter of their daily energy at school, and that there is evidence of a link between the school food environment and students' Body Mass Indexes, food choices made by the school system can have widespread effects on student health (Terry-McElrath et al.). But community members in Concord express the importance of parents reinforcing good nutrition habits at home.

DID YOU KNOW?

There is a clear correlation between home gardeners and home cooks. According to Michael Pollan, "The people who are vegetable gardening are cooking. Fifty-eight percent of Americans are still cooking, but the numbers are trending downward. The trends are away from home cooking and towards convenience food. Yet, if people garden, they will cook, and vice versa" (quoted in Ciesinski). For those who struggle to afford fresh, organic produce, growing their own food can be a practical solution.



Most of Concord's public schools have infrastructure for heating and serving meals, but not for cooking. Until recently, the public schools served almost entirely pre-packaged meals.

HEALTH FACTS

- Statewide, in 2007, only 41 percent of high schoolers were considered physically active.
- There are over 1,100 fast food restaurants in Middlesex County. That's .78 fast food venues per 1,000 people, compared to .03 farmers' markets per 1,000 people, and .12 grocery stores per 1000 people
- In Massachusetts the adult obesity rate is 22 percent, with adult diabetes at 8 percent (USDA Food Atlas).

PREPARATION AND CONSUMPTION SUMMARY

ASSETS

- Renewed interest in home cooking and preparation skills
- Some culinary skills workshops
- Nutrition education initiatives (e.g., Kids Eat Smart)
- Collaborative effort among educators and parents to increase nutritional value of school lunches in Concord Public Schools and an effort to procure more food locally

POTENTIAL NEEDS

- Further education about cooking from scratch with fresh, whole foods
- More focus on nutrition education in schools and in homes
- More education on preservation techniques (e.g., canning, dehydrating, freezing, fermenting, pickling, cheese-making, etc.)
- Consistency between good nutrition education at school and in homes

LOCAL RESOURCES

Churches as Food Focal Points

In addition to serving as historic landmarks and providing community spaces, churches can also serve an important function in the local food movement because they often have kitchens. The *Concord Reconnaissance Report* revealed that churches are a focus of town-wide concern for preserving heritage landscapes and preserving community character.

Community members see churches as prominent landmarks that are the “focal point of numerous social and community activities” (CRR 13). Many perceive the loss of active churches and historic church buildings as an issue that affects the whole community.

Concord residents have identified a lack of public commercial kitchens in Concord, as well as a lack of arenas in which to build community around local food. While most kitchens in Concord are not certified for commercial use, there is the potential for them to be retrofitted to provide small-scale facilities in which to prepare and preserve local food (White). Such functional uses in spaces already deemed community focal points could create opportunities for “re-skilling” and social gathering all around the community. Churches could be sites for local food potlucks, workshops (canning, seed-saving, cooking, etc.), or fairs for the sale of local farm products and crafts.



First Parish Church in Concord Center is the home of Open Table, which serves meals to those in need. As important sites in Concord, churches can be places of community connection and education around food.

LOCAL LEADERS

Verrill Farms

Concord farmer Stephen Verrill relinquished a dairy operation and a beloved herd of cattle in 1990, making him one of the last dairy farmers in Concord's history. But Verrill and his family proved their ability to adjust to a changing market with grace, maintaining the farm's integrity as a local landmark serving their community directly.

At the southern edge of Concord in the historic Nine Acre Corner agriculture district, Verrill Farms is a bustling hub of food-related activities year-round. The various operations at Verrill Farms represent a microcosmic model for a closed-loop food system. There are greenhouses for seed-starting and season-extension, and fields for crop production. The new retail store (or farmstand), situated in a highly visible location on the heavily trafficked Sudbury Road, invites passersby in to shop, where seasonal farm products are available among a selection of other specialty products from other distributors and local producers.



Verrill Farm's farmstand on Sudbury Road resembles a closed-loop system operation, incorporating food production, direct sale distribution, processing and storage, preparation and consumption, and food waste recovery on site.

Inside the store, a deli and a bakery gear recipes toward what's being grown on the farm and seasonal availability. The cooks and bakers share a large commercial-scale kitchen that is fully equipped for scratch preparation and processing. Ample dry storage and cold storage spaces are conveniently connected to the kitchen for direct access. The huge walk-in refrigerators have allowed for expanded production, according to kitchen manager Kevin Carey, who has been at Verrill Farms for nine years to witness the operation's growth.

Carey has launched a culinary workshop program in the kitchen to teach food preparation skills to children and adults alike. About fifty employees work at the farmstand, over twenty of whom are full-time kitchen staff.

All food waste generated on the farm, in the kitchen, and from the store is funneled back into the food system via the farm's massive compost pile. The compost operation, certified by the Department of Environmental Protection (DEP) is located only a few hundred yards down the road from the farmstand.

Verrill's compost pile is large enough—and therefore, generates enough heat—to compost animal waste from Pete & Jen's Backyard Birds, a small-scale livestock operation that leases land on Verrill's property (see Pete & Jen's Backyard Birds, page 85). Verrill, an established farmer and landowner, is demonstrating the power of helping a start-up farm business by providing access to land and infrastructure that may otherwise be cost-prohibitive.

Verrill Farms has displayed remarkable resiliency by adjusting their agricultural activities to meet market demands and accommodate new farmers. Verrill Farms grows, processes and stores food, shares land, employs season-extension methods, distributes directly to consumers, offers culinary training to customers, and recovers waste for compost. This robust operation exemplifies a business that is incorporating the components of a healthy, local food system.



Kitchen manager Kevin Carey and his staff cook fresh, ready-to-go meals in Verrill Farms' commercial kitchen, which are sold at the farmstand.



IX. FOOD WASTE RECOVERY

Much of the current discourse on local food systems addresses the route that food takes from farm to table, but food waste recovery (from table back to farm) is also a critical factor in creating efficient and responsible local food systems.

Food waste is categorized as either *pre-consumer waste*, such as food preparation waste or unsold food off grocery shelves, or *post-consumer waste*, such as leftover food or plate scrapings (EPA). A more closed-loop and efficient food system considers food's journey from farm to table, but also from table back to farm.

According to the EPA, more than 33 million tons of food waste were generated in 2010, less than 3 percent of which was recovered and recycled (EPA). Food waste accounted for almost 14 percent of the total municipal solid waste stream (EPA). These facts have severe environmental and economic implications.

Food waste disposed in landfills becomes a significant source of methane, a potent greenhouse gas, which, according to the EPA, has twenty-one times the global warming potential of carbon dioxide. The reduction and recovery of these wastes reduces greenhouse gas emissions and waste combustion from landfills, while turning that food waste into compost can improve soil health and reduce the need for imported nutrients (EPA). Food waste reduction and composting can also result in improved sanitation, public safety, and health, as well as reduce unwanted odors (EPA).

Responsible food waste management can help to protect regional air, water, and soil quality, and provide a valuable input for agricultural uses, such as compost or livestock feed (EPA). Food wastes also have the potential to be converted into renewable energy through anaerobic digesters, turning an ecological problem into an energy solution.

CONCORD'S FOOD WASTE

Where does Concord's food waste go? Historically, food waste in Concord either went back to the fields, was fed to livestock whose manure fertilized the fields, or was composted. Many of these animals provided food products or were eaten, helping to close the nutrient circle.

Today, however, nearly all of Concord's food waste goes into the municipal waste stream and is trucked to a landfill in Leominster, Massachusetts, roughly twenty miles west of Concord (Concord's landfill was capped in the early 1990s) (White). Concord has a municipal yard waste facility, but

there is no municipal organic waste composting facility in town.

Concord's food waste also has significant economic consequences for individuals, businesses, and institutions. Food is expensive, and burying it in a landfill indicates not only an ecological loss, but also a monetary one. In Massachusetts, waste disposal fees range from \$80-\$100 per ton (EPA). The EPA asserts that simple changes in food purchasing, storage, and preparation practices can reduce food waste, especially at commercial establishments.

Massachusetts' supermarkets are a major food waste generator: over 400 supermarkets in the state generate an estimated 90,600 tons per year (EPA). Since 75-85 percent of a supermarket's waste stream is biodegradable, composting can be a lower cost alternative to disposal for these stores (EPA). Many towns and cities across the country are transforming the food system through the simple conversion of food waste back into soil, using innovative methods such as vermicomposting food waste and applying the compost to highly-productive greenhouses (e.g., Growing Power in Milwaukee, Wisconsin).



A large, well-managed compost pile at Verrill Farm in Concord. The transfer of crop and animal wastes back into soil is an efficient use of resources that turns waste into a economic and ecological resource.

WHO IS COMPOSTING IN CONCORD?

In Concord, few if any grocers and businesses separate out organic wastes from their waste stream. Many hire private waste collectors that haul garbage to the landfill, with food wastes included. According to one produce buyer, their waste collector does not accept organics, therefore they are unable to compost food wastes through their existing waste management system. Another grocer reports that his store simply does not generate enough waste to warrant the costs of an organic waste program. Companies that collect compost may not find it cost-effective to circulate through a town like

Concord unless there are enough businesses and institutions willing to participate and make the route worth the trip (White).

The only consolidated waste pick-up in Concord is contracted by Concord's six public schools. The school system does not currently use the company's organic waste service, but the potential exists (White). Middlesex Academy currently collects food wastes that are delivered to a piggery for hog feed (White). While these modest efforts are underway, without a nearby compost facility or organized collection route that can accommodate organic wastes from Concord's businesses and institutions, it is a challenge to efficiently get those nutrients back into the food system via animal feed or compost.

Incorporating a composting program at the existing yard waste facility, or creating a new facility in the region could serve to vastly increase the number of households, businesses, and institutions that are composting.

HOME-SCALE FOOD WASTE RECOVERY

On a smaller scale, homeowners have a huge potential to turn household wastes back into soil. The Concord Public Works Department sells home compost bins for residents interested in composting their food scraps and yard wastes at home (Town of Concord). While it is unclear how many Concord residents are actively composting, incentives from the town could prompt more homeowners to compost their food waste, especially with home gardening on the rise.

Additionally, food waste pick-ups from residences to new composting facilities or compost operations on existing farms could help ensure that food wastes not being composted on-site are still getting composted locally.



Worms help to break down food wastes, along with leaves, newspapers, or other carbonaceous materials, and transform them back into soil.

HOUSEHOLD FOOD WASTE

“According to *Food Loss and the American Household*, a 2006 study, American households throw away 14 percent of the food they purchase, and an average of 470 pounds of food goes into the trash annually. This costs a family of four nearly \$600/year—money that could be spent on other consumer goods” (EPA).

“In 2010, 33 million tons of food waste was thrown away, making food waste the single largest component of municipal solid waste reaching landfills and incinerators.”
(EPA)



Home-scale composting is a simple and efficient way to recycle food and yard waste, and can be as easy as taking out the trash. Photo Credit (left): Wikimedia Commons

WHY LOCAL COMPOST?

“Compost is a really big stick with a lot of leverage,” says Tom Gilbert, an avid composter and farmer in Hardwick, Vermont. “For starters, these systems can create good, sustainable jobs that are based on renewal and agriculture. And by holding onto these resources, a community begins to free itself from dependence on externalities like fertilizer. So much of our food system is based on nutrients from far away. Compost is a giant step toward sovereignty” (Gilbert as quoted in Hewitt 123). Composting recycles energy, reduces harmful emissions, reroutes waste from landfills, saves money, and conserves resources all along the way. In addition, companies like Gourmet Butanol in Maine are turning compost into energy. They accept organic food waste to produce butanol, which they supply to the market as a sustainable gasoline and heating oil alternative.

FOOD WASTE RECOVERY SUMMARY

ASSETS

- Municipal yard waste compost facility
- Individual farms that compost food waste
- Homeowners who compost food scraps
- Single vendor that collects waste from all six public schools

POTENTIAL NEEDS

- Consolidated food waste management for independent food retailers
- Municipal-scale compost facility in town or shared regional compost facility
- Food waste sorting for compost collection from Concord's school cafeterias

REGIONAL MODELS

Case Study: The Shelburne Falls Collaborative Composting Program

In 2010, the Shelburne Falls Area Business Association piloted a collaborative composting program, collecting waste from food establishments and small businesses in downtown Shelburne Falls, Massachusetts.

Findings from a survey of food retailers and small businesses in the village district showed substantial benefits from this collaborative waste recovery system. The program is diverting an average of 50 percent of solid waste from participating businesses (up to 75 percent per business) away from landfills and into a municipal composting facility. Businesses witnessed up to a 30 percent reduction in annual waste disposal costs. The positive outcomes were not only environmental and economic, but also social: participants

reported a “sense of pride” to be rerouting their waste streams. Local art galleries, eateries and other attractions draw a steady influx of tourists, so these composting food establishments have the chance to showcase the town’s ecological initiatives (Shelburne Falls).

One future possibility being explored to expand the composting program is to directly interact with local farms. A proposed strategy is direct farm-to-business pickup and disposal to provide farmers with “much-needed free compost feedstock” and potentially reduce disposal costs to businesses (Shelburne Falls).

The Town of Concord could establish a similar program to reduce waste currently being trucked to the landfill, and reincorporate food waste back into the food system by providing this valuable resource to farmers.

LOCAL LEADERS

The Prison Farm

Concord residents driving around the rotary on the Route 2 by-pass in West Concord may have noticed cows grazing or corn growing on the state prison lands on both sides of the highway. On the north side is the Northeastern Correctional Center (NECC), a minimum-security state prison, and on the south side—bordered by the Assabet River to the east and Warner’s Pond to the west—is the Massachusetts Correctional Institute-Concord, or MCI-Concord, which is a medium-security state prison.

This state prison opened in 1878 and became the Massachusetts Reformatory for Men in 1884 (DOC). (There are town residents who still refer to the prison as the “Reformatory.”) This Reformatory trained men under the age of thirty to learn a trade that could be used to gain employment upon release. The prison operated numerous industries, including furniture, hat, clothing, and harness making, and inmates were often contracted to work outside the prison. The community took interest in and felt a lot of pride about the work that the men did there (Garrelick 36-38). In 1955 the Reformatory programs were largely eliminated, and the institution was renamed the Massachusetts Correctional Institute at Concord (DOC).

Historically, most state institutions had farms, and Concord’s state prison was no exception. In the early years the farm was designed to be self-sufficient, generating almost all of its own food. The prison first operated on the land on the original Reformatory grounds, but in 1935, the Farm Dormitory was established across Route 2 (DOC). In the early years, the farm had workhorses to plough the fields, and raised pigs, cows, chickens, turkeys, hay, and a variety of vegetables (Garrelick 36). This food supply fed inmates throughout the year (Grinkis).

CONCORD’S LAST DAIRY FARMER

Dave Grinkis has been working at the Northeastern Correctional Center’s Prison Farm for forty years. He has been the farm manager since 1978, and is respected by the inmates who get to work alongside him as part of the Farm Services Program. The program used to operate independently from the main prison operation. It was financially viable, and had sister farms in Shirley, Gardener, and Bridgewater. These other programs had their own operations, including beef cattle, vegetables, pheasants, pigs, and fish. Shirley was home to a meat processing plant that butchered the meat raised at the local farms (Grinkis). MCI-Concord had a processing center where fruits and vegetables grown during the season were either canned or frozen for use throughout the winter. However, this facility was dismantled and repurposed as a



The barn and silos at the Northeastern Correctional Center’s Prison Farm. Much of the newer infrastructure was built by Dave and inmates in the 1980s.

recycling center in the early nineties (Grinkis). The regional network of farm service programs enabled specialization of products, and inmate labor ensured services could be done on-site.

Beginning in the 1970s under Dave's leadership, the Prison Farm began specializing in dairy production; Dave built up a formidable, award-winning dairy herd of over two hundred cows. This operation was successful, and supplied milk to many of the DOC facilities. Using revenue generated by the dairy sales, the farm was able to purchase more farm equipment, which was meticulously cleaned and maintained by the inmates. The sale of milk and other products from the farm also earned a profit for the state.

According to Dave, the 1980s represented the "heyday" for the farm. However, support for the program declined, the administration sold off the dairy herd in 2002, and farm funding has since ceased entirely. In the vacant dairy barn that Dave and the inmates designed and built by hand, now full of boxes and various odds and ends, the atmosphere is somber. The milk room has been stripped of all the original milking equipment—tanks and pipes—which were sold as surplus.

The remaining animals—about two hundred beef cattle—are well-loved and well-cared for. As part of their early-release program, the inmates have the option to work with Dave, feeding the cows, helping with the birthing of the calves, and maintaining the aging farm equipment. Without funding, Dave and the inmates have had to be very industrious. For example, they have made their own parts to fix outdated equipment and designed and constructed new buildings themselves to save the cost of hiring architects and construction crews.

WHERE DO THE BEEF COWS GO?

Until recently, the Prison Farm cows were sold exclusively at the Farmer's Live Animal Marketing Exchange auction in Littleton, the largest livestock market in New England



Dave Grinkis, Prison Farm Manager, in the "calf-corral." Dave started as a herdsman in 1972 and has been the farm manager since 1978. "It's a challenge—I like what I do."

(FLAME). In addition to selling the cows, the rest of the income to sustain the program comes from the hay and corn grown on the property.

Even the remaining beef cattle operation is still in jeopardy: as the state continues to lease off parts of the farmland as "surplus," Dave has not been able to cut enough hay and corn to feed the cattle; when they run out of hay, they have to sell off the cattle they cannot feed. Penny pinching and ingenuity on Dave's part has kept the program afloat, but just barely. Over the years, some of the farm property has been leased to local farmers, while about twelve acres of prime hay land has been transformed into soccer fields.

Despite this series of setbacks, Dave displays remarkable resilience and optimism. "It's a challenge—I like what I do," he says with a grin. And, according to Dave, the inmates enjoy the farm activities, too. Under his tutelage, the inmates learn how to operate tools and heavy machinery, how to care for the animals, and how to grow vegetables on a half-acre garden plot that Dave started about five years ago. There are also two greenhouses that were constructed by inmates three years ago, where they receive instruction in seed starting and basic gardening skills.

Much of the produce they grow gets consumed on-site in the dining hall, and saves the kitchen manager somewhere between \$3,000 and \$6,000 a year in food costs (Grinkis). In addition to growing food, Dave and the inmates also used to can produce but stopped when it became more expensive to buy the tin cans than it was to buy a jar of peaches. Aside

from the small amount of produce used on site, today the prison purchases its food on contract from a wholesale food services provider.

According to Dave, “If you’re doing time, this is a good place to do your time. If you’re busy, time goes by faster.” The inmates in the farm program receive a small hourly wage for their labor, and many have positive experiences doing meaningful work with the animals.

THE CULINARY ARTS PROGRAM

In addition to the NECC’s farm program, the institution has operated another food-related service and training program that began in 1983: an inmate-run restaurant that is open to the public. For about three dollars, visitors and prison employees can order a five-course meal cooked and served by the NECC inmates involved in the Culinary Arts Program. This program provides



Dave and some of the inmates currently tend 200 beef cattle, which are auctioned live in Littleton. There is an effort underway to incorporate some of this meat into the Concord Public School system (Cadwell).

participating inmates with culinary skills that can be (and reportedly, are often) used for employment in the food industry upon their release. In the summer months, some of these inmates also help to grow vegetables in the half-acre garden plot, which provides some produce for the kitchen in the summer months.



The dairy barn at the NECC is now used to store boxes and various equipment. All of the milking equipment was sold off as surplus.



Prison Farm greenhouses, constructed by Dave and the inmates. Inmates learn about seed-starting and growing their own food in the greenhouse and on a half-acre garden.

THE FUTURE OF THE PRISON FARM

In 2008, through the great effort of many citizens, conservation groups, and town and state officials, eighty acres of the prison land were put into Article 97 (see Appendix D), to be held solely for the purposes of open space protection, management and conservation, agriculture, forests, and limited public access for recreation (Rasmussen).

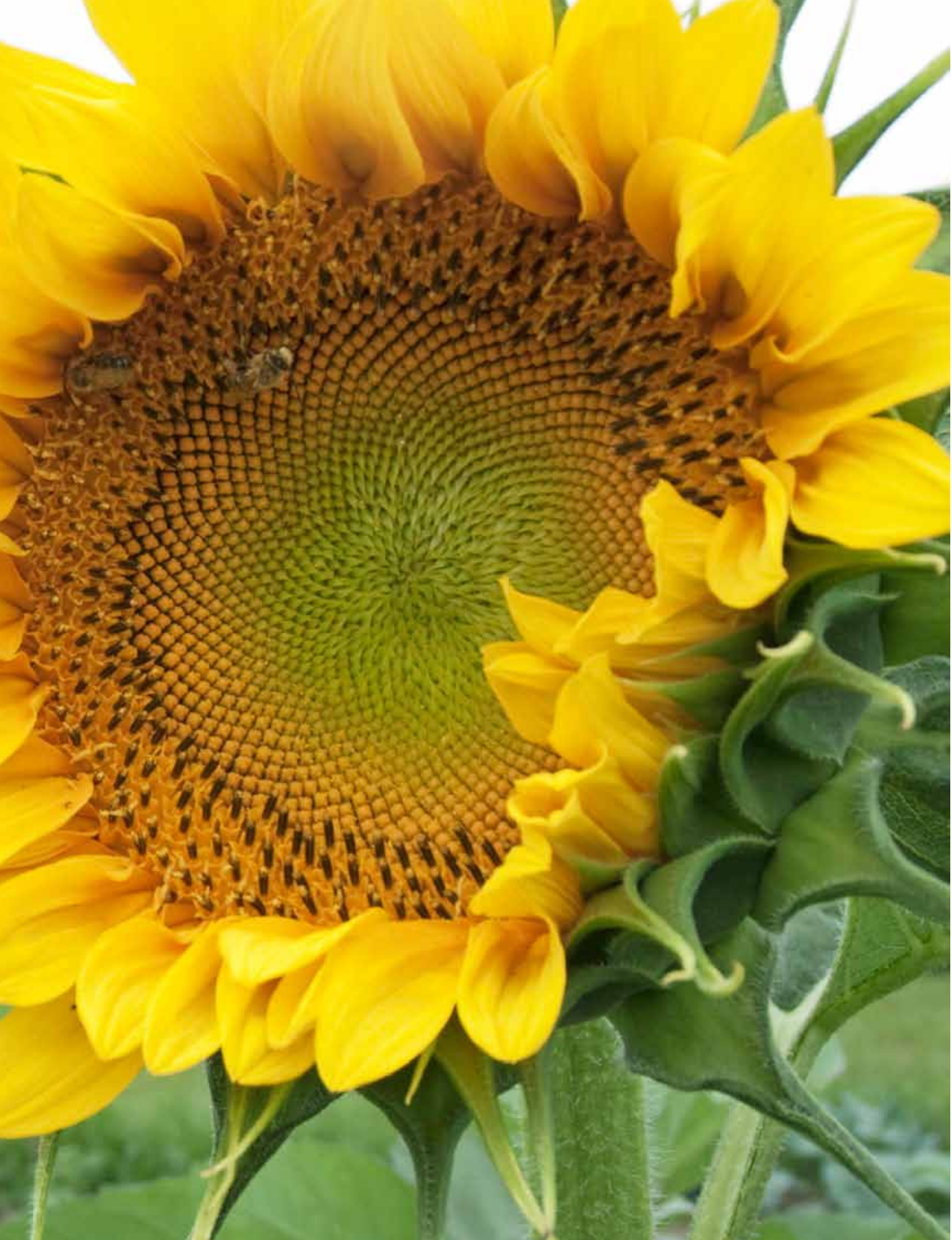
This status does not guarantee that the Prison Farm is protected as agricultural land forever, but it does mean that the state has recognized the land itself as an important asset to the community.

Members of the community have expressed interest in keeping the food produced on the Prison Farm within the community, either through a CSA program, or as a supplement to school lunches. The food services director of Concord's public schools recently started purchasing one beef cow a month, which is being incorporated into meals at the

schools (Cadwell). This translates into roughly 500 pounds of meat, or roughly 3,000 meals (Cadwell).

Such a renewed interest in farming must be encouraging to farmers like Dave who have stood by in quiet resistance, have adapted to changes beyond their control, and have managed to keep their farm operations alive. One of the greatest assets to Concord's local food movement is—and will continue to be—its experienced farmers. Knowledgeable farmers like Dave are well positioned to teach members of the Concord community and new farmers how a local food system might be realized.

As the last major cattle operation in Concord, and one of only a few remaining prison farm programs in the country, the farm provides not only a service to inmates striving to gain skills for re-entry into society, but also demonstrates an example of where farming has been resilient and continued to survive despite all odds.



X. RECOMMENDATIONS

Numerous opportunities await Concord residents for revitalizing their food system. The following recommendations are meant to support Concord's budding food movement as it moves into its next phases.

Six broad recommendations are outlined in this section, accompanied by related case studies. These six over-arching recommendations relate to some of the most critical gaps and opportunities in Concord's local and regional food systems—opportunities that deserve concentrated attention and timely, collective efforts among stakeholders.

An extensive list of other recommendations (organized in a table) follows the first six. These recommendations offer suggested actions to particular groups of stakeholders: town officials (all departments), institutions (Concord Public schools, private academies, MCI-Concord State Prison, Emerson Hospital, Hanscom Air Force Base, etc.), organizations and businesses (existing and potential), food retailers and establishments (restaurants, cafés, grocery stores, caterers, other distributors, etc.), farms (all sizes and all types), and households (families and individuals).

The recommendations in this table represent ideas and needs voiced in the community meetings, town documents, and individual interviews. They also reflect ideas that have served other communities and food systems well.

Some of these suggestions might be more readily implemented than others. They range in complexity, difficulty, time frame, and scale. Some acknowledge the proliferation of

ongoing programs, projects, and organizations in Concord, and recommend the continuation and expansion of these noteworthy activities.

Many next steps require a great leap in communication and collaboration among individuals, businesses, and organizations. Others are predicated on the confidence that, given these tools to foster a community-wide effort, Concord citizens are motivated, resourceful, and informed enough to make slight adjustments in their lifestyles right away. In doing so, the community can harness momentum toward the larger projects further down the road that may require more input and resources. The Concord community is diving headfirst into their own local food revolution, and in doing so, is perpetuating the town's legacy of progressiveness, innovation, and resiliency.

Six Critical Recommendations for Concord's Local Food System:

- A. Establish a local food council.**
- B. Implement farm-to-institution programs.**
- C. Promote a town-wide gardening movement.**
- D. Revitalize animal husbandry in Concord.**
- E. Match farmers and growers with suitable land in Concord.**
- F. Permanently protect farmland for agricultural use.**



Concord students on a field trip in the Minute Man National Historical Park. Children are the future of Concord and the actions taken today will help to ensure a safer, healthier community for them in the future. Photo Credit: Brooke Redmond

A. ESTABLISH A LOCAL FOOD COUNCIL

- Use the existing steering and advisory committee (see Appendix A) to organize a preliminary discussion for local stakeholders. Brainstorm possibilities, potential strategies, and objectives that a community food council could address together.
- Reposition the committee as a volunteer community food council; start small and garner support in town.
- Solicit involvement and meeting attendance from diverse individuals and groups in Concord to balance stakeholder interests and encourage open discussion of challenges.
- Balance responsibilities by rotating administrative management and meeting facilitators through a democratic selection process.
- Elect a representative to be responsible for communication and collaboration with other food councils, organizations, and stakeholders in the region.
- Develop planning, funding, and implementation processes for future projects.
- Long term: Examine and carefully consider opportunities to establish an official town- or county-wide legislative body to implement food policies and interact with the Massachusetts Food Policy Council (see below).



Figure 10.1: A food council can serve to bring together stakeholders with a variety of interests to discuss the influence of local food in fostering a more resilient community.

WHAT IS A FOOD COUNCIL?

Two forms of food councils are: 1) an ad hoc community organization or 2) a policy-making body at the town, county/region, or state governmental level. Although these local and regional councils vary widely in structure, they generally have four functions:

- To serve as forums for discussing food issues
- To foster coordination between sectors in the food system
- To evaluate and influence policy
- To launch or support programs and services that address local needs

FURTHER RESEARCH: Food First Institute for Food and Development Policy. See publications: *Food Policy Councils: Lessons Learned (2009)* and *Cutting Through the Red Tape: A Resource Guide for Local Food Policy and Practitioners and Organizers (2011)*. Visit www.foodfirst.org.

DID YOU KNOW?

The Massachusetts Department of Agricultural Resources established a Food Policy Council in 2010. The purpose of the FPC is to:

- increase production, sales and consumption of Massachusetts-grown foods;
- develop and promote programs that bring healthy Massachusetts-grown foods to Massachusetts residents through various programs such as:
 - targeted state subsidies;
 - increased state purchasing of local products for school and summer meals and other child and adult care programs;
 - double coupon initiatives;
 - direct market subsidies to communities with identified needs;
 - increased institutional purchases of Massachusetts-grown foods and other programs to make access to healthy Massachusetts products affordable, and increased access to healthy Massachusetts-grown foods in communities with disproportionate burdens of obesity and chronic diseases;
- protect the land and water resources needed for sustained local food production; and
- train, retain and recruit farmers and to provide for the continued economic viability of local food production, processing and distribution in the commonwealth (Massachusetts.gov).

REGIONAL MODELS

CASE STUDY: A Community Food Council: The Burlington Food Council

“The Burlington Food Council is a community group exploring ways to ensure that Burlington creates and nurtures a healthy, equitable and sustainable food system for all members of the community. They provide networking, partnership building, and educational opportunities around food issues, and provide strategic recommendations for decision-makers” (Burlington Food Council).

Goals:

- 1) To build food knowledge and experience for Burlington children, their families, the wider community and Food Council members;
- 2) To build local food appreciation and access for Burlington children, their families and the wider community beyond the school day; and

3) To establish stronger links between food producers - including gardeners – and school age youth, their families and other community members.”

Some examples of past projects include: the district-wide Burlington School Food Project; collaboration with the Association of Africans Living in Vermont to support grant applications for a mobile vegetable stand program; guidance and feedback for the city’s Climate Action Plan; and an action plan for fruit and nut tree mapping, planting, and maintenance throughout the city (Burlington Food Council).

CASE STUDY: A Regional Food Policy Council: Waterloo Region Food System Roundtable

In 2007, the region of Waterloo, Ontario, revised its Regional Official Plan (ROP) with a series of specific land use policies related to food. The region is an urban-rural mix, including three cities and four rural townships that contain several small towns and villages. Health and planning officials recognized combined issues related to urban sprawl, public health, environmental issues, and threatened farmland. A comprehensive food system plan was then compiled to amend and integrate policies to tackle their regional food system.

The plan identified the need for a representative body to oversee the implementation of the plan. Thus emerged the Waterloo Region Food System Roundtable in 2007, consisting of eighteen representatives from key sectors of the food system (planners, farmers, food manufacturers and distributors, restaurant owners, health professions, food poverty advocates, and researchers) with financial and staff support from the Public Health Department.

The Roundtable oversees the implementation of policies outlined in the plan, engages the community in discussions, and facilitates networking through regular meetings, public forums, letters of support for local projects, and a website designed to enable networking among individuals and organizations on food issues.

A food summit in 2009 resulted in a declaration that outlines priorities identified by direct community input. Specific land-use policies have been influenced and implemented by Roundtable support. Examples include a Countryside Line that became a permanent urban boundary to protect farmland from development; zoning amendments to enable a wholesale produce auction; and permits for temporary neighborhood farmers markets “wherever appropriate.” Overall, the partnership between stakeholders and government departments in this region has enabled a strategic process for change, monitored by the Food System Roundtable (Desjardins Lubczynski and Xuereb 2011).

B. IMPLEMENT FARM-TO-INSTITUTION PROGRAMS

- Consolidate small farm product supplies to meet institutional demands.
- Retrofit institutional kitchens with added storage and processing capacity.
- Connect regional medium- to large-scale producers with local institutional buyers (starting with the schools).
- Add processing equipment for freezing produce (see Franklin County FPC, page 81) to address seasonality gap during the school year.
- Institute system-wide institutional compost programs (starting with the public schools) to return food waste back to farms.
- Work with other institutions and municipalities to strategically site and build a food processing center for priority use by regional producers.
- Use additional processing capacity to extend supply throughout the year via freezing, canning, drying, and pickling. Canning, drying, and pickling for preservation have additional regulatory requirements which should be examined prior to creating additional processing space for those purposes (White).
- Place more of Concord's unused suitable agricultural land into production to serve the needs of local institutional buyers. Incentivize schools, hospitals, and other major institutions in the region to contract with local farmers.

Did you know?

"In 2010 there were 250 public and private schools, hospitals, and colleges in Massachusetts alone who purchased fresh local food. If only a quarter of those schools were interested in purchasing local frozen as well, and each school purchased on average 400 pounds of broccoli per month, the demand would be near 30,000 pounds of broccoli per month, or 360,000 pounds of broccoli per year. This quantity can be sourced from within [New England]" (Fitzsimmons 15).

THE BENEFITS OF FARM-TO-SCHOOL PROGRAMS FOR FARMERS

Across Massachusetts, there is increasing demand from schools for more local food throughout the year. How profitable are these arrangements for the farmers?

Assessing the impact of institutional sales on farm income by interviewing over seventy Massachusetts farms, the Massachusetts Farm-to-School Project found that 82 percent of the 51 farms that sold directly to institutions—including 105 public schools, 20 private schools, 15 colleges (public or private), and 6 other institutions—found it profitable or somewhat profitable (Adams 3). Most farms sell directly to institutions, while some sold their products through a distributor (3).

Some of the farm products in highest demand were apples, tomatoes, and lettuce/greens, while the farms with the highest grossing income sold either dairy products or a wide variety of vegetables and fruits that included some partially processed items, like sliced carrots, peeled butternut squash, or frozen berries (6). Eight farms extended product lines or season, responding to institutional demand with activities such as adding a greenhouse, freezing products for winter use (turkeys and berries), cold storage and treatment of apples, and different packaging for milk products. While some farms already had season extension infrastructure, "having the capacity to provide products for more of the school year helps makes these farms a good fit for selling to schools and colleges" (6).

Some farms could not meet the product requests of institutions, or could not provide those products as far into the winter season as the institutions wanted (6).

According to this assessment, Massachusetts farmers involved in farm-to-school programs are benefiting from these partnerships, but do not have enough capacity to meet schools' demand. This may indicate a huge market opportunity for new farmers in the state.

FURTHER RESEARCH: Scaling Up Local Food: Investing in Farm and Food Systems Infrastructure in the Pioneer Valley. Published by Community Involved in Sustaining Agriculture (2011).

REGIONAL MODELS

CASE STUDY: Farm-To-Institution

The Western Massachusetts Food Processing Center (FPC), at the Franklin County Community Development Corporation (FCCDC), has worked with growers and food entrepreneurs in the region since 2001. The Food Processing Center (FPC) has recently (2009) launched the Extended Season Program to “increase our region’s capacity to lightly process fruits and vegetables (freezing and canning) in order to make local food accessible year-round” (FCCDC).

“In addition to adding new equipment to our processing line, we are working closely with farmers and wholesale and retail purchasers to develop a regional value-chain for frozen and canned products that offers a fair price to farmers and a competitive price to purchasers” (FCCDC).

“Our first, and perhaps most important, purchasers have been local schools and hospitals, as we believe that healthful food should be accessible to everyone. We have been working closely with the Massachusetts Farm to School program to build on their successes. We also work with local CSAs to process produce for winter shares and markets.” (FCCDC)



The Franklin County CDC's Food Processing Center has been in operation since 2001. Food entrepreneurs of all kinds create their value-added products in this facility, which has recently begun addressing the processing gap in making farm-to-institution programs feasible. Photo Credit: Franklin County Community Development Corporation

In 2010 the FPC conducted a pilot project with local schools and farmers, which successfully sourced 2,000 pounds of locally-grown broccoli from two local growers/aggregators, froze and packaged the broccoli at the FPC, and delivered the final product to a local public school district.

“The primary goals of this project are to provide growers with a fair price, to allow institutions to purchase at a competitive price, and for the processing to be a viable enterprise.” (Fitzsimmons 23)

According to the 2011 report, *Freezing Regional Produce for Western New England*: “In our 2009 survey of schools, every food service director we spoke with indicated an interest in purchasing local frozen vegetables, and we feel confident that a large proportion of schools already purchasing local fresh produce will be interested, as well” (Fitzsimmons 15).

This broccoli pilot project indicates the great potential for farms and institutions to continue to make strides towards addressing the seasonal food gap by investing in their own processing infrastructure or hiring a third party processor to aggregate, process, and transport the products from the farm to the institution.

C. PROMOTE A TOWN-WIDE GARDENING MOVEMENT

- Educate the community about gardening, edible landscaping, composting, and food preparation and preservation.
- Provide support for seed-starting, rainwater harvesting, home composting, soil tests, building raised beds, etc.
- Demonstrate season-extension infrastructure in community gardens (e.g., greenhouses, hoopouses, cold frames).

Did you know?

During World War II in the 1940s, the U.S. government put support and energy into encouraging Americans to grow their own food.

About 20 million victory gardens—in backyards, rooftops, balconies, and vacant lots—produced over 40 percent of the vegetables grown in 1943 for that year’s fresh consumption (USDA Extension). With help from extension services and 4-H clubs, food production in 1944 was 38 percent above the 1935-1939 national average (USDA Extension).

“Maybe backyard gardens will be back in fashion, like the victory gardens with World War II.”

—Concord Resident



Figure 10.2: Backyards can become multi-functional areas that offer productive, aesthetically-pleasing, and recreational space. Annual and perennial fruits and vegetables, small-livestock, honey bees, and woody plants of all kinds can thrive in Concord’s yards, creating bountiful landscapes with greater potential for a fairly closed-loop nutrient cycle.

“The people who are vegetable gardening are cooking... Fifty-eight percent of Americans are still cooking, but the numbers are trending downward. The trends are away from home cooking and towards convenience food. Yet, if people garden, they will cook, and vice versa.” —Michael Pollan



World War II posters sponsored by the U.S. government encouraged citizens to grow and can their own food. Source: USDA National Agricultural Library

REGIONAL MODELS

CASE STUDY: Wendell Local Food Security Project

The town of Wendell, located in Franklin County, Massachusetts, has launched an innovative initiative called the Wendell Local Food Security Project. This project is a “neighbor-to-neighbor network” collaborating to actively support local gardeners and farmers by helping to establish:

- Workshops and events about food production
- Labor shares and work parties
- Mentorship connections
- Cooperative purchasing
- Shared infrastructure
- Materials recycling
- A yearly seed-swap and seed banking
- Demonstration gardens at the Community Garden

The town has also hired a local food coordinator, who is contracted to support local gardeners. In addition, a self-appointed New Gardeners’ Ambassador—a farmer, herbalist, botanist, and seed saver—shares her forty years of local farming experience to help people in the town learn to farm and garden (The Wendell Local Food Security Project).

CASE STUDY: Growing Power’s Community Food Center

Growing Power, founded in 1993 by Will Allen, was originally designed to employ teenagers in building and renovating greenhouses in the city of Milwaukee, Wisconsin. It has since expanded into a model for “the young, the elderly, farmers, producers, and other professionals ranging from USDA personnel to urban planners” (“Our History”). In 1999, Growing Power established its Community Food Center. It has become the prototype for community food centers around the country, described as “local places where people can learn sustainable practices to grow, process, market, and distribute food” (“Our Community Food Center”).

The Community Food Center provides space for hands-on activities, technical assistance, outreach, large-scale demonstration projects, and for growing a wide variety of plants, vegetables, and herbs. On a two-acre lot, “in a space no larger than a small supermarket live some 20,000 plants and vegetables, thousands of fish, and a livestock inventory of chickens, goats, ducks, rabbits, and bees” (“Our Community Food Center”). Green Power offers schools, universities, government agencies, farmers, activists, and community members the opportunity to learn from and participate in the development and operation of community food systems (“Our Community Food Center”).



Growing Power’s prototype for Community Food Centers; their facility at 5500 W. Silver Spring Drive in Milwaukee, Wisconsin. The historic two-acre farm is the last remaining farm and greenhouse operation in the City of Milwaukee (“Our Community Food Center”). Photo Credit: Growing Power Inc.

“If people can grow safe, healthy, affordable food, if they have access to land and clean water, this is transformative on every level in a community. I believe we cannot have healthy communities without a healthy food system.” —Will Allen, Growing Power, Inc.

D. REVITALIZE ANIMAL HUSBANDRY IN CONCORD

- Increase the local animal product supply—meat, poultry, dairy, and eggs—through ecologically-sound animal husbandry practices.
- Encourage multi-species rotational grazing for most efficient use of pasture resources (see Figure 10.3).
- Recycle nutrients on farms and gardens; livestock can eat crop and food waste, while their manure fertilizes the fields.
- Deliver institutional food waste to animal operations for use as feed, reducing waste going to the landfill.
- Re-establish local and regional animal and dairy processing facilities to increase infrastructure that reduces transportation distances and costs, increases transparency, and provides local jobs.
- Investigate ways to make mobile poultry processing units (MPPUs) more economically viable to encourage more local chicken operations.
- Streamline the regulatory environment to reduce the licensing fees and paperwork required by livestock farmers.
- Get permit from the Board of Health to raise chickens and other small animals to provide for local food and fertilizer needs (i.e., chickens, rabbits, sheep, goats).

ROTATIONAL GRAZING

When given free range of a pasture, herbivores preferentially select vegetation, and over time, these pastures generally become recolonized by woodier species. Even with chainsaws and weed-wackers today, pastures can be difficult to manage; pre-oil, nineteenth century farmers grew tired of fighting forest succession.

A simple twenty-first-century technology—electric fencing—has made pasture management more feasible. Livestock are trained to avoid low-voltage electric fences, and can therefore be kept in smaller paddocks where they graze all the grasses, forbs, and browse woody plants. Fencing options include permanent or semi-permanent designs that can be easily moved to allow livestock access to a fresh paddock (see photo to the right).

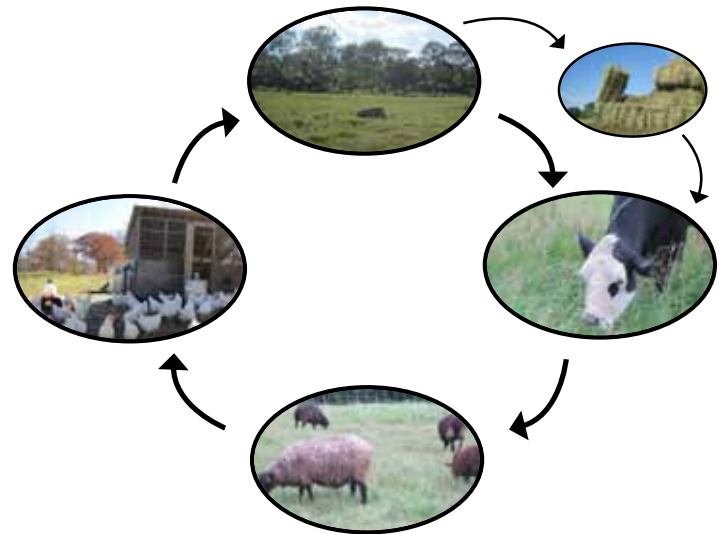


Figure 10.3: Multi-species rotational grazing is an efficient way to manage pasture resources, improve pasture fertility and yield, and reduce the need for supplemental feed.

HOW MULTI-SPECIES GRAZING WORKS

Multi-species grazing is an efficient way to manage pasture resources. Different species prefer different kinds of vegetation: cows and horses prefer grass, while sheep will eat grass, forbs (any herbaceous, broad-leaf plant), and some browse (usually woody plants). Goats prefer browse over grasses and forbs. Chickens will peck at grass and bugs, helping to manage parasites (Core).

In addition, different species prefer different lengths of vegetation due to the anatomical structure of their mouths. Cows prefer grass at 12-14 inches, while sheep prefer 4-6 inches, and goats prefer reaching for vegetation above their necks.

This system helps to preserve plant diversity, increase pasture capacity while reducing cost, increasing meat production, and increasing net income (Core).

Fencing options for rotational grazing include permanent or semi-permanent designs, enabling livestock to access fresh paddocks.

LOCAL LEADERS

Pete & Jen's Backyard Birds

Pete and Jen's Backyard Birds is a small-scale diversified farm operating near Nine Acre Corner in Concord. The business began in 2004 and is operated on a part-time basis by the husband and wife team of Pete Lowy and Jen Hashley.

The farm operates on approximately twenty acres of leased land from Verrill Farm, the Town of Concord, and the Concord Land Trust. Pete and Jen's Backyard Birds is committed to high-quality, local, sustainable, pasture-based, and humanely-raised livestock; organic vegetables, flowers and herbs; and specialty value-added products as a means of caring for the land and providing consumers with healthy, tasty, and premium quality food with flavor.

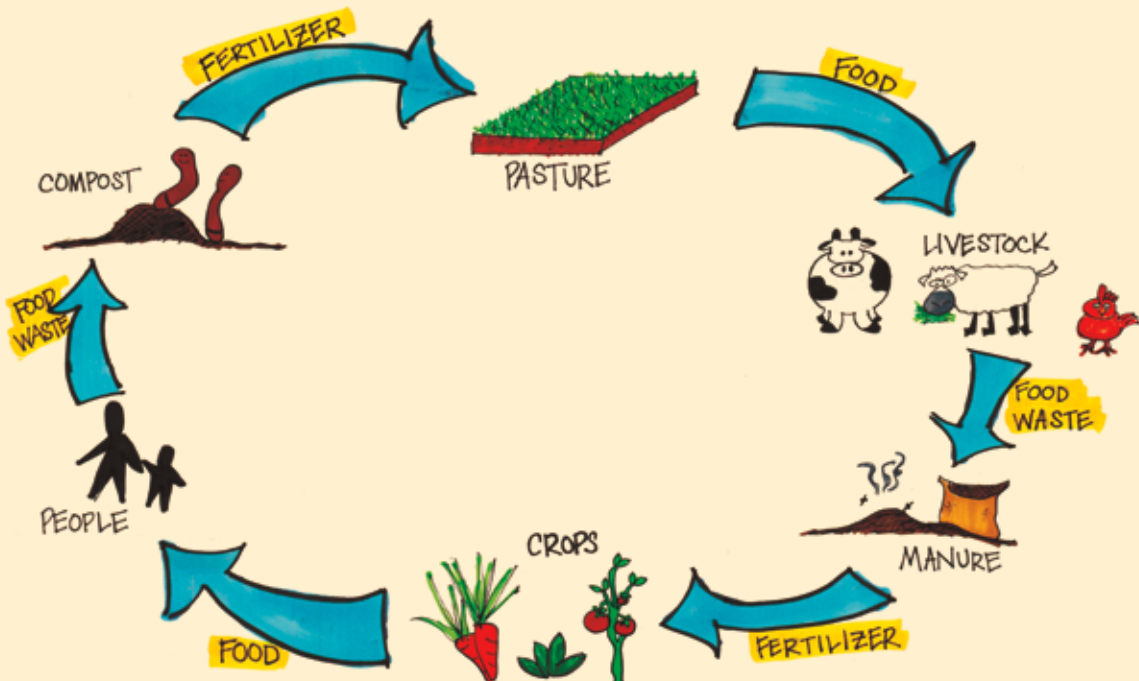
Backyard Birds is the antithesis of the industrial livestock production system, and raises heritage breeds in an ecological system that respects the animals and the land. They actively rotate their diversified livestock on pastures using portable electric fencing and mobile coops so that they can spread the animals' natural fertility (i.e., manure, a natural source of nitrogen fertilizer) to regenerate degraded lands, reduce invasive species growth, and revive native forages. Best of all, by not concentrating manures or keeping animals in confinement, the animals stay happy and healthy.

Year-round, Backyard Birds produces poultry for eggs, pasture-raised pork, and rabbit; and seasonally produces pasture-raised poultry for meat, grass-fed sheep, and diversified vegetables, herbs, and flowers. Backyard Birds sells its products via a self-serve mini-store on the farm, through direct pre-orders from consumers, to high-end chef-owned restaurants, and at select retail stores in Concord. A comprehensive website, email marketing, positive word-of-mouth, and positive media attention help maintain high visibility for the farm to continually increase product demand. Attention to high quality, tasty flavors and good customer service maintains a loyal customer base.



Pete Lowy with one of his happy free-range chickens at Pete & Jen's Backyard Birds. Photo Credit: Jennifer Hashley & Pete Lowy

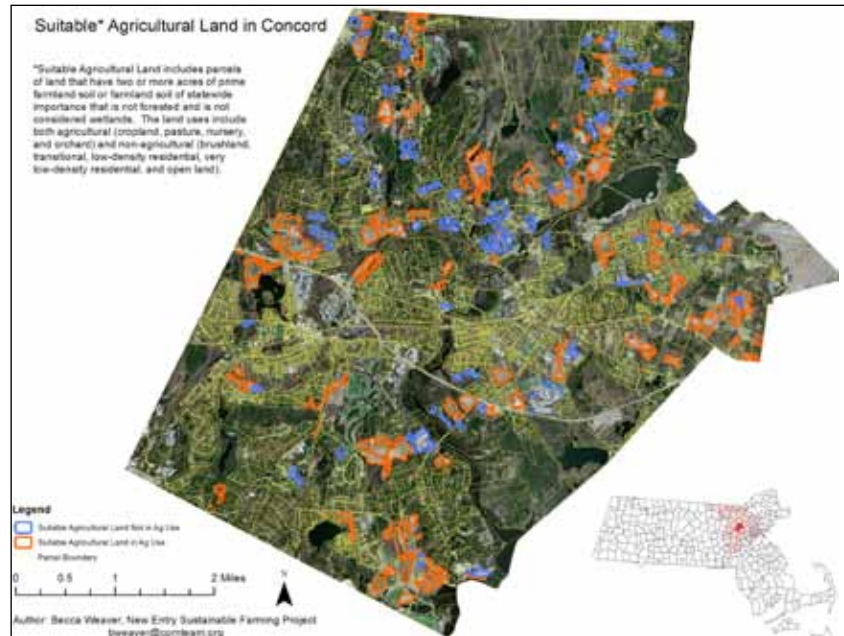
Figure 10.4: Returning livestock to the local food system helps to keep nutrients within a relatively closed-loop system. While most of the grain for livestock and people will need to come from other parts of the country, Concord and New England can go a long way in producing their own meat and produce in a sustainable fashion (Donahue).



E. MATCH FARMERS AND GROWERS WITH SUITABLE LAND IN CONCORD

- Encourage formal or informal partnerships, such as land shares, between farmers and landowners.
- Explore opportunities to offer incentives to property owners to lease land for agricultural use.
- Advertise parcels of two acres or more to match growers interested in commercial food production with suitable, under-utilized land (see Farmer Matching Program below).

In 2050, I hope the existing remaining farmland will still be growing food and will not be turned into houses and playing fields. —Concord Resident



Map created by the New Entry Sustainable Farming Project that may help to match farmers with suitable two-to-five-acre parcels of land in Concord. Parcels outlined in red indicate suitable agricultural land currently in use, while blue indicates suitable agricultural lands not currently in use. There is potential for more farming to take place on prime soils throughout the town.
Source: Becca Weaver

LOCAL LEADERS

New Entry Sustainable Farming Project (NESPF) - Farmer Matching Program

With a resurgence of interest in local food and farming, accessible farmland remains a key barrier to small-scale beginning farmer enterprises. In Massachusetts, 90 percent of farmland lost since 1982 is due to residential development concentrated in the Route 495-belt and the Pioneer Valley. These are the same areas where farmland is sought by new farmers today. Building on a 2011 pilot project, New Entry will use local partners, GIS technologies, and their farmland database and land matching programs to identify smaller parcels of land (2-5 acres each) (see Suitable Land In Concord, above) connected to homeowners or commercial interests in Concord and five other peri-urban communities.

According to Becca Weaver, The New Entry Sustainable Farming Project Farmer Matching Coordinator, such plots have typically not been considered as part of the farmable land base, yet are well-suited to beginning producers wanting to farm and direct market in their own communities. Landowners will be encouraged to make their land available

to interested local producers. Workshops will explain the specifics of leasing land and farming on small plots to all parties. Zoning and other concerns will be addressed by partners to facilitate each community's approval process.

New Entry and local partners will help match landowners to land seekers, addressing access, infrastructure needs, leasing terms, and any factors that arise. Resource Guides will be developed for communities, landowners and new farmers in these and other communities to expand the process statewide. A database will track the land base in each community, interested farmers, and successful match-ups.

This initiative may help solve a key barrier to the development of more sustainable community food systems.

LOCAL LEADERS

First Root Farm

Laura Sackton is a new farmer in Concord thanks to the farmer incubator program in the Minute Man National Historical Park:

“First Root Farm is a two-acre vegetable CSA, founded in 2009 as part of the Battle Road Farms farm incubator project. In collaboration with the Minute Man National Historical Park, Battle Road Farms has set up an incubator program for new farmers. The farmers get a free three-year lease on a piece of land and access to housing in the national park. First Root Farm is the first official farm established within the incubator program. It’s a win-win situation for everyone: we, as farmers, keep parkland agricultural, and bring business and new visitors to the park.

“The incubator program has allowed us to start a business without the often prohibitive cost of land and housing. In the three years we’ve been in business, First Root has been hugely successful. We’ve grown from a thirty-member CSA our first season to a sixty-member CSA in 2012. We’ve been able to support two full-time farmers. We grow a wide variety of vegetables, and folks involved in the CSA rave about the produce quality.

“The incubator program has allowed us to start a business without the often prohibitive cost of land and housing.”

“It is sometimes hard, as a new farmer, to break into an existing agricultural community. This opportunity has been wonderful, as it has given us a way to start a business without debt, and free of some of the risks involved with buying land and/or finding housing. As both a farmer and a business owner I have grown tremendously and learned invaluable lessons about how to run a successful small farm business. At this point, I believe I could take my farm business elsewhere, and still be able to support myself and run a thriving farm outside of the incubator net. I can’t imagine that being possible three years ago, and it seems to me that this is the beauty of the incubator model. Knowing what I know now, I am in a much better position to establish a more permanent farm business, in Concord or elsewhere.”



Farmers Ariel Berman and Laura Sackton founded First Root Farm in 2009 and run a successful CSA through the Battle Road Farms Project.



—Laura Sackton, First Root Farm

More Farmers in the Minute Man National Historical Park

- The mission of Battle Road Farm—a farmer incubator project in the Minuteman Park—is to “preserve the area’s rich agricultural history while offering new perspectives on how today’s farm relates to the environment, our food systems and our community.”
- By leasing more parkland to farmers, the park could stimulate the local agricultural economic sector, boost local food supply, and expand the educational opportunities at the park by demonstrating best management farming practices for healthy food.
- Active farming in the park would enhance and more accurately reflect the historical setting of Concord’s agrarian past.

F. PERMANENTLY PROTECT FARMLAND FOR AGRICULTURAL USE

- Protect privately-owned Chapter 61A lands whenever they become available for sale, either by permanently purchasing the development rights (through an Agricultural Preservation Restriction (APR)) or through outright acquisition (See Appendix D).
- Continue to promote APRs for lands with the most valuable agricultural soils.
- Continue to support farming as a use in the town.
- Assess conservation lands to determine where woodlands could be converted back to agricultural land.
- Consider retaining existing agricultural activities on town-owned land designated for municipal use.
- Create criteria for town decision-making when farmland protection conflicts with other municipal needs (see Solar Energy & Farmland Criteria, page 37).
- Gather all parcel information (soils, ownership, historic uses, etc.) for permanently protected lands in the town and catalog this data such that it is easily accessible and up-to-date. (There are currently no precise numbers on permanently protected agricultural lands in Concord.)
- Implement the recommendation of the 2005 *Comprehensive Long Range Plan* to create agricultural overlay districts that protect contiguous areas of farmland from development and fragmentation (see Figure 10.5).

SAVE THE PRISON FARM

Legislation approved in 2008 designated 80 acres of the prison farm as Article 97 land, to be held solely for the purposes of open space protection, management and conservation, agriculture, forests, and limited public access for recreation and enjoyment (Rasmussen) (see Appendix D). The Town and its residents should continue to promote the agricultural-focused programs at the Northeast Correctional Center and the agricultural use of the Concord land (see Prison Farm, page 72).

The Prison Farm:

- is the last major livestock operation in Concord;
- runs a Farm Program that provides inmates with valuable skills and meaningful work;
- is one of only a few prison farms left in the country;
- has a seasoned farm manager, ready labor, and existing infrastructure; and
- is situated on contiguous farmland with prime soils.



Verrill Farm is one of three privately owned properties in Concord subject to permanent agricultural preservation restrictions (APR). This means the right to develop the property has been purchased and it can never be developed. Measures like these help to ensure the long-term protection of Concord's valuable farmland and soils.

Prime Soils and Potential Agricultural Overlay Districts

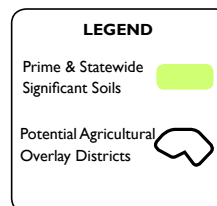
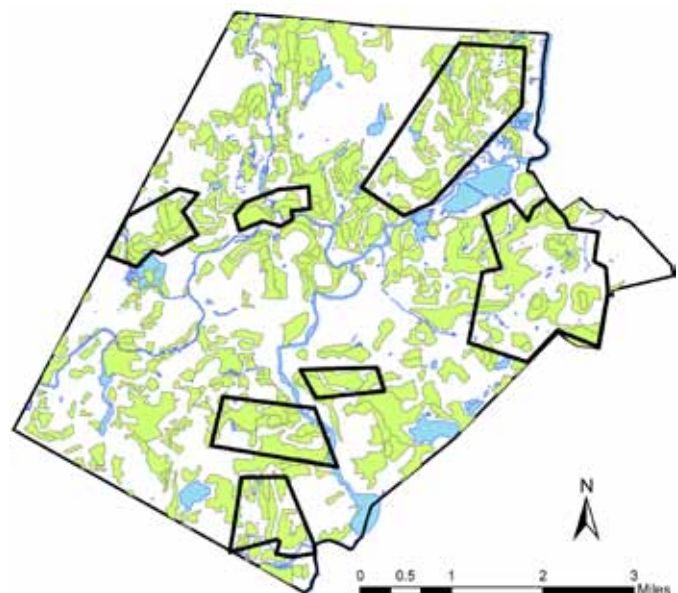


Figure 10.5: In 2005, Concord's Comprehensive Long Range Plan recommended "Agricultural Overlay Districts" over seven of Concord's most concentrated agricultural areas that would restrict development and protect contiguous farmland. These areas are also on areas of prime soil or soils of statewide significance.

Data Sources:

Soils: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture, Soil Survey Geographic (SSURGO) Database for Concord, MA. Available online at <http://soildatamart.nrcs.usda.gov>. Accessed March 2012.

Additional Layers: Town of Concord, MA, Matthew Barrett, GIS Program Coordinator

REGIONAL MODELS

CASE STUDY: Farmland Conservation District – Amherst, Massachusetts

Amherst, Massachusetts, located between the Connecticut River and the Quabbin Reservoir in central Massachusetts, is considered by the state to be a model for farmland protection (“Agricultural Preservation Case Study”). Since the 1970s, the town has worked to permanently protect many of its farms through promoting Agricultural Preservation Restrictions (APRs), and has promoted the health of farms in general by enabling accessory uses (such as farmstands and seasonal restaurants that support the farming operation), supporting summer and winter farmer’s markets and community gardens, and being one of the first towns to employ spatial mapping tools, like Geographic Information Systems (GIS). The Amherst GIS database identifies every town parcel, allowing for identification of active farms, acreage, ownership, and other features (“Agricultural”).

In addition, in 1989, the Town of Amherst developed a zoning provision that protects farmland, called the Farmland Conservation District (see Figure 10.6). The Farmland Conservation District is defined as “an overlay district, configured to include, and intended to protect those lands which, by virtue of their soils, acreage, location adjacent to and contiguous with other farm land, and lack of protection under existing underlying zoning, comprise the critical farmland of the Town of Amherst” (Town of Amherst Zoning Bylaw, Article 2).

The “district”—more like a group of areas—was determined by the town’s Planning Board and Agricultural Commission, which assessed the amount of prime agricultural soils per parcel, the parcel size, and the risk of that parcel of being developed. The bylaw requires cluster development within the district, thereby reducing farmland fragmentation and protecting agricultural soils (“Agricultural”).

Concord’s 2005 *Comprehensive Long Range Plan* recommended similar districts be created on seven of the most concentrated agricultural areas in the town. However, none of these districts have yet been implemented. The Town of Concord might use Amherst as a model for successful agricultural overlay district implementation.

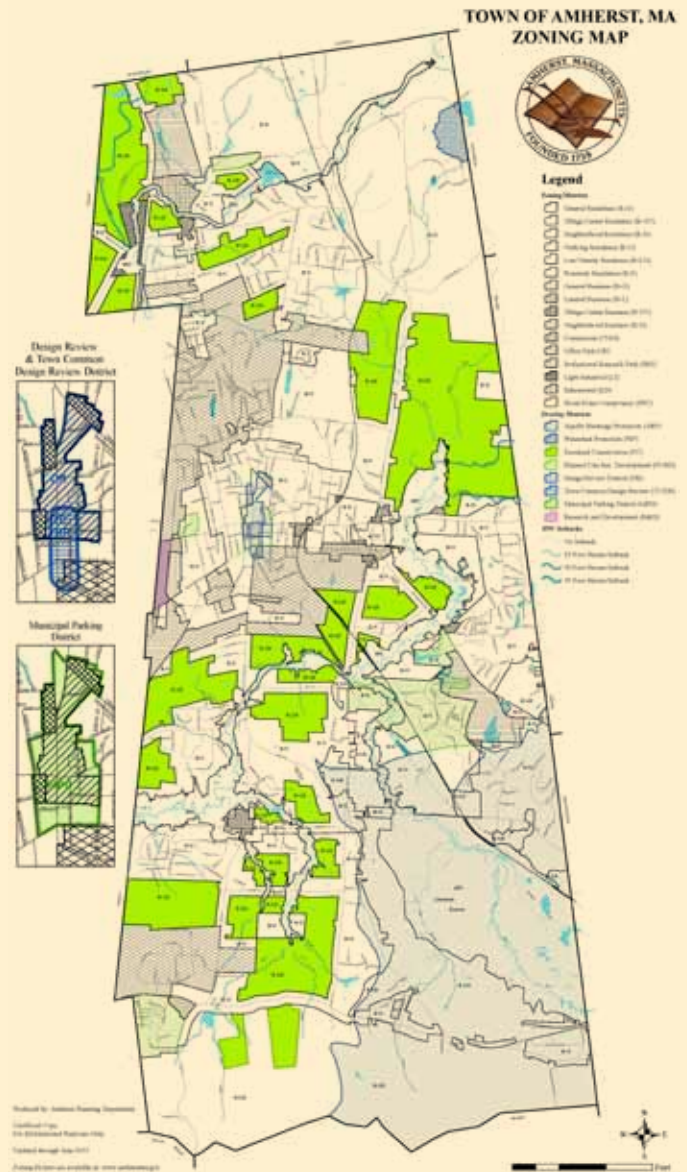






























Figure 10.6: Zoning map from the Town of Amherst, Massachusetts, with Farmland Conservation Districts in green.
Source: Town of Amherst, Massachusetts

RECOMMENDATIONS

The recommendations in this table represent ideas and needs voiced in the community meetings, town documents, and individual interviews. They also reflect ideas that have served other communities well, which Concord might look to in its effort to strengthen its local food system.

RECOMMENDATION	STAKEHOLDER	TASK
LAND USE & DEVELOPMENT		
Permanently protect farmland for agricultural use (Critical Recommendation F, see page 88)		Purchase farmland when it becomes available and lease it to farmers. Support private owners in establishing Agricultural Preservation Restrictions (APRs) on their properties.
		Consider placing a permanent Agricultural Preservation Restriction (APR) on farm properties.
Implement Agricultural Overlay Districts proposed in the 2005 Comprehensive Long Range Plan		Formally implement the recommendation of the 2005 <i>Comprehensive Long Range Plan</i> to create agricultural overlay districts that protect contiguous areas of farmland (see Figure 10.4, page 88).
Increase and promote ecological land management practices		Encourage property owners to adopt ecological land management practices.
		Incorporate agroecological practices on farms.
		Incorporate agroecological practices on Concord land.
		Incorporate agroecological practices on lawns and residential properties (see <i>From Lawns to Productive Landscapes</i> , page 42).
FOOD PRODUCTION		
Revitalize animal husbandry in Concord (Critical Recommendation D, see page 84)	 	Integrate animals into farm operations. Consider raising livestock at homes or at institutions.
		Educate the community about raising livestock. Provide support, workshops, and assistance to interested parties.
Employ season-extension methods		Partner with multiple regional farmers to extend food supply via hoopouses, winter storage, and freezers (see <i>Farm-to-Institution</i> , page 81).
		Employ season-extension strategies at both ends of the growing season (e.g. greenhouses and hoopouses) (see <i>Sage Farm</i> , page 44).
		Employ season-extension strategies at both ends of the growing season (e.g., coldframes, hoopouses, sunrooms).



RECOMMENDATION	STAKEHOLDER	TASK
Promote a town-wide gardening movement (Critical Recommendation C, see page 82)		Identify unused town-owned open space for the installation of new community gardens in different neighborhoods.
		Advocate for more community garden space and organize gardening education workshops.
		Coordinate neighborhood gardens and share yard space.
	   	Increase food production in various site conditions across town (see Food Transect page 34-35).
	 	Hire a local food coordinator to assist residents in seed-saving, home-growing, preparation, and preservation skills (see Wendell Local Food Security Project, page 83).
		Conduct educational workshops for residential-scale food production and nutrition (see Gardening for Life page 56)
Match farmers and growers with suitable land in Concord (Critical Recommendation E, see page 86)		Provide incentives to encourage property owners to share their land for agricultural use (e.g., funding, local tax credit, etc.).
		Seek out and support new local farmers. Consider land share opportunities.
		Match farmers throughout the region with suitable agricultural land in Concord.
Complete the Concord Agricultural Land Parcel Inventory (started in 2010 and still on-going)	 	Continue to gather information from farmers and land owners about current farming practices and land use. Make this information publicly available.



TOWN



INSTITUTIONS



ORGANIZATIONS & BUSINESSES



FOOD RETAILERS & ESTABLISHMENTS

















FARMS










HOUSEHOLDS

RECOMMENDATIONS

RECOMMENDATION	STAKEHOLDER	TASK
DISTRIBUTION		
Implement farm-to-institution programs (Critical Recommendation B, see page 84)		Contract with multiple farms to meet institutional demand for local food.
		Establish an organization that serves as a distribution “middleman” between producers and consumers (see The Intervale Food Hub, page 51).
		Contract local foods from multiple farmers by employing a third party aggregator/distributor.
		Increase food supply to meet local demand by aggregating products with other nearby farms and coordinating distribution.
	  	Capitalize on tourism in the summer months by directing tourists to farmstands (e.g., through bike tours), or temporarily setting up mobile farmstands in villages and along major tourist routes during summer months.
Create centralized, collaborative distribution model(s)		Individual businesses can harness collective buying power through bulk ordering from local farmers.
		Consider organizing one-stop-shops for local products (e.g., farmer co-ops, winter farmers’ markets).
		Consider supplying products to centralized markets to increase accessibility to consumers.
		Explore options for forming buying co-ops to consolidate orders from local farmers.
Increase access to healthy food for those with limited resources and/or mobility		Expand shuttle service for elderly to local farmstands and food retailers.
		Agglomerate excess food products to be provided to those in need.
		Participate in food stamp programs (i.e., WIC and SNAP). Offer workshare options.



RECOMMENDATION	STAKEHOLDER	TASK
PROCESSING & STORAGE		
Create and/or retrofit facilities for produce processing and storage capacity (e.g. warehouse space, cold storage, commercial kitchens, community food processing centers/incubator kitchens)		Identify suitable locations for food processing and storage facilities. Examine feasibility of siting new infrastructure in town, and explore options for shared infrastructure in the region.
		Expand existing facilities to accommodate processing and storage needs (e.g., schools, churches, prison, hospital, air force base). Schools might lease space and equipment in the off-season for other users (e.g., incubator kitchen, preservation skills workshops). Use of these facilities will require review from the Zoning Board and the Health Department.
		Coordinate partnerships between institutions with facilities and the public.
		Pool resources with other retailers to invest in shared storage space.
		Pool resources with other farmers to invest in shared storage space.
Learn and adopt preservation techniques and invest in winter storage equipment and/or space		Attend local classes and workshops on home preservation methods. Invest in basic preservation and storage infrastructure (e.g., canning equipment, chest freezers, and root cellars) to keep food throughout the winter.
Site a regional animal processing center and investigate ways to make mobile poultry processing units more viable in the region. Site locations for meat storage infrastructure (e.g., meat lockers, cold-storage facilities)		Communicate with neighboring towns to assess industrial areas in the region that may be suitable for a slaughterhouse and storage facilities. Assist farmers in navigating the regulatory environment for on-site animal processing (see Mobile Poultry Processing Unit, page 61). Explore certified animal processing unit options. Investigate dairy processing potential.



TOWN



INSTITUTIONS



ORGANIZATIONS & BUSINESSES



FOOD RETAILERS & ESTABLISHMENTS








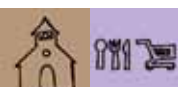





FARMS



HOUSEHOLDS

RECOMMENDATIONS

RECOMMENDATION	STAKEHOLDER	TASK
PREPARATION & CONSUMPTION		
Buy local and regional food		Develop a local food procurement policy.
		Educate residents about nutrition and cooking (see Kids Eat Smart, page 8).
		Purchase products from local farmers. Consider incorporating seasonally-appropriate products and recipes.
		Support local farmers by buying directly from the farm or from local food retailers.
Promote scratch cooking and healthy eating habits		Prepare healthy fresh-cooked meals. Develop a local food procurement policy.
		Buy local and cook nutritious family meals.
FOOD WASTE RECOVERY		
Divert food wastes from landfill		Create a municipal food waste composting facility or collaborate with other municipalities to site a regional facility.
		Create a food waste diversion program (e.g., a stream-lined collection route using one vendor, on-site composting, a partnership with a local farm, or a partnership with a renewable energy producer). Start with the public schools (see The Shelburne Falls Collaborative Composting Program, page 71).
		Promote composting education. Coordinate neighborhood compost pick-up routes and distribute to farmers and growers.
		Compost food wastes on site or at a shared facility. Incorporate waste back into production.
		Compost food waste at home. Introduce chickens or other small-livestock to consume food scraps.



Adams, Melissa. *Farmer Survey Report*. Massachusetts Farm to School Project. 2011. Web. 15 Mar. 2012. <www.mass.gov/agr/markets/Farm_to_school/docs/farmer-survey-report.pdf>

“Agricultural Preservation Case Study”. Smart Growth/Smart Energy Toolkit. Web. 13 Mar. 2012. <http://www.mass.gov/envir/smart_growth_toolkit/pages/CS-ag-amherst.html>

Alkon, Alison, Eric Holt-Giminez, Althea Harper, Frances Lambrick and Annie Shattuck of Food First and the Community Food Security Coalition. “Food Policy Councils: Lessons Learned.” Institute for Food and Development Policy: 2009. Web. PDF file. 22 Mar 2012.

Anderson, David (Main Street Market and Café, Concord). Personal communication. 6 Mar 2012.

Anderson, Molly (College of the Atlantic). The Conway School. Conway, MA. 12 Mar 2012. Guest lecture.

“Backyard Composting.” Town of Concord, Massachusetts. Web. 17 Mar. 2012. <http://www.concordma.gov/pages/ConcordMA_Recycle/backyard>

Baker, John, Parsons, Robert, Ruhf, Kathryn, and G.W. Stevenson. *The FarmLASTS Project: Farm Land Access, Succession, Tenure and Stewardship*. Burlington: University of Vermont, 2010. 13 Mar. 2012. <<http://www.uvm.edu/farmlasts/FarmLASTSResearchReport.pdf>>

“Basic Information about Food Waste.” *Food Waste*. U.S. EPA, Feb. 2012. Web. 18 Mar. 2012. <<http://www.epa.gov/osw/conserve/materials/organics/food/fd-basic.htm>>.

“Burlington Food Council.” Web. 22 Mar 2012. <http://burlingtonfoodcouncil.org/>.

Cadwell, Alden (Food Services, Concord Public Schools). Personal communication. 22 Feb 2012.

Carey, Kevin (Verrill Farms). Personal communication. 8 Mar 2012.

Carney, Megan. “Food Security’ and ‘Food Sovereignty’: What Frameworks are Best Suited for Social Equity in Food Systems?” *Journal of Agriculture, Food Systems, and Community Development*. Advance online publication. 19 Feb 2012.

Catteron, Jim (Agriculture Committee). Personal communication. Mar 2012.

“The Center for an Agricultural Economy.” Web. 25 Mar 2012. <http://hardwickagriculture.org/>

“CHNA 15 Community Health Assessment Report 2011: Selected Data for Concord Community Food Project.” Prepared by the Regional Center for Healthy Communities (Metrowest). 7 Feb 2012. PDF file.

Christie, Margaret. *Scaling Up Local Food: Investing in Farm & Food Systems Infrastructure in the Pioneer Valley*. Communities Involved in Sustaining Agriculture (CISA), 2011. 6 Mar 2012. PDF file.

Ciesinski, Therese. “A Conversation with Michael Pollan.” *Organic Gardening*. Rodale, 2011. Web. 16 Mar. 2012. <<http://www.organicgardening.com/living/conversation-michael-pollan>>.

Comprehensive Long Range Plan: A Vision for 2020. Comprehensive Long Range Plan Committee. Concord, Massachusetts. March 2005.

“City-Data.” Middlesex County, Massachusetts. Web. 20 Mar 2012. http://www.city-data.com/county/Middlesex_County-MA.html

REFERENCES

- Concord Reconnaissance Report: Freedom's Way Landscape Inventory*. Massachusetts Department of Conservation and Recreation & Freedom's Way Heritage Association. 2007.
- Crop Circle Kitchen. 2011. Web. 17 Mar. 2012. <<http://www.cropcirclekitchen.org/>>
- Davis, Richie. "Heart of Local Food Movement': Deputy Ag. Sec. Kathleen Merrigan visits her hometown and talks about new initiatives for small farms." *The Recorder*. Greenfield, MA. 27 Sept. 2011.
- Day-Farnsworth, Lindsey and Alfonso Morales. "Satiating the Demand: Planning for Alternative Models of Regional Food Distribution." *Journal of Agriculture, Food Systems, and Community Development*. 2.1: 227-247. Web. 19 Feb 2012.
- Desjardins, Ellen, John Lubczynski, and Marc Xuereb. "Incorporating Policies for a Healthy Food System into Land Use Planning: The Case of Waterloo Region, Canada." *Journal of Agriculture, Food Systems, and Community Development*. 2.1: 127-138. Web. 19 Feb 2012.
- Donahue, Brian. *The Great Meadow: Farmers and the Land in Colonial Concord*. New Haven: Yale University Press, 2004.
- Donahue, Brian. *Reclaiming the Commons: Community Farms and Forest in a New England Town*. New Haven: Yale University Press, 1999.
- Emerson, Ralph Waldo. "Selections from Nature (1836)." *The American Transcendentalists: Essential Writings*. Ed. Lawrence Buell. New York: Modern Library, 2006. 33-67.
- Esseks, Dick, Lydia Oberholtzer, Kate Clancy, Mark Lapping, and Anita Zurbrugg. *Sustaining Agriculture in Urbanizing Counties: Insights from 15 Coordinated Case Studies*. University of Nebraska Lincoln, 2009. Web. 17 Mar. 2012.
- Farmer's Live Animal Marketing Exchange (FLAME). 2008l Web. 8 Mar. 2012. <http://www.mass.gov/agr/news/fmr/2008/2_april_may.htm#flame>
- Farming Bylaw*. Town of Concord, Massachusetts. April 27, 2011. Web. 12 Mar. 2012. <http://www.concordma.gov/Pages/ConcordMA_Bylaws/Farming%20Bylaw.pdf>
- Fitzsimmons, Jill. *Freezing Regional Produce for Western New England: A Report on the Extended Season Farm-to-Institution Pilot Project*. Franklin County Community Development Corporation (FCCDC) & Community Involved in Sustaining Agriculture (CISA). 2011. Web. 17 Mar. 2012.
- Flores, H.C. *Food Not Lawns: How to Turn Your Yard into a Garden And Your Neighborhood into a Community*. White River Junction: Chelsea Green, 2006. Print.
- "Food CPI and Expenditures." USDA Economic Research Service. January 2012. Web. 18 Mar. 2012. <<http://www.ers.usda.gov/Briefing/CPIFoodAndExpenditures/>>
- "Food Environment Atlas." USDA Economic Research Service. Web. 16 Mar. 2012. <<http://maps.ers.usda.gov/FoodAtlas/foodenv5.aspx>>
- "The Food Studies Institute." Web. 22 Mar 2012. <http://www.foodstudies.org/>
- Forman, Richard T. *Land Mosaics: The Ecology of Landscapes and Regions*. Cambridge: Cambridge University Press, 1995.
- Franklin County Community Development Corporation (FCCDC). "Extended Season Farm to Institution Program." 2011. Web. 17 Mar. 2012. <<http://www.fccdc.org/ExtendedSeasonFarmtoSchoolProject.htm>>

- Freedgood, Julia, Marisol Pierce-Quinonez, Kenneth A. Meter. "Emerging Assessment Tools to Inform Food System Planning." *Journal of Agriculture, Food Systems, and Community Development*. 2.1: 83-104. Web. 19 Feb 2012.
- "FY2012 Property Value Information." Town of Concord, MA. 2012. Web. 12 Mar. 2012. <http://www.concordma.gov/pages/ConcordMA_assessor/FY12INFO>.
- "Garden Market Research: Homeowners spend a record \$45 billion on lawn and landscape services." 2012. Web. 20 Mar. 2012. <<http://www.gardenresearch.com/index.php?q=show&cid=2872>>
- Garrellick, Renee. *Concord in the Days of Strawberries and Streetcars*. Concord: Town of Concord, 1985.
- "Generators of Food Waste." Food Waste. U.S. EPA, Feb. 2012. Web. 18 Mar. 2012. <<http://www.epa.gov/osw/conservation/materials/organics/food/fd-gener.htm#food-hier>>
- Gliessman, Stephen. "An Ecological Definition of Sustainable Agriculture." Web. 28 Mar. 2012. <http://agroecology.org/Principles_Def.html>
- Graber, Cynthia. "In Search of Land." *Edible Boston*. Spring 2012: 68-69. Print.
- Grinkis, David (Farm Program Manager, Northeast Correctional Center, Concord). Personal interview. 8 Mar 2012.
- Hashley, Jennifer (Farmer, Pete and Jen's Backyard Birds; New Entry Sustainable Farming Project). Tufts University. Personal communication, 2012.
- Hewitt, Ben. *The Town That Food Saved: How One Community Found Vitality in Local Food*. New York: Rodale, Inc., 2009.
- Kenney, Bill (Kenney Farm). Personal communication. 8 Mar 2012.
- Local Harvest. Web. 21 Mar. 2012. <<http://www.localharvest.org/search-csa.jsp?st=23&ty=6>>
- Lovell, Sarah Taylor, S'ra DeSantis, Chloe A. Nathan, Meryl Breton Olson, Ernesto Méndez, Hisashi C. Kominami, Daniel L. Erickson, Katlyn S. Morris, and William B. Morris. "Integrating Agroecology and Landscape Multifunctionality in Vermont: An Evolving Framework to Evaluate the Design of Agroecosystems." *Agricultural Systems* 103 (2010): 327-41.
- Martinez, Steve, Michael Hand, Michelle Da Pra, Susan Pollack, Katherine Ralston, Travis Smith, Stephen Vogel, Shelley Clark, Luanne Lohr, Sarah Low, and Constance Newman. *Local Food Systems: Concepts, Impacts, and Issues*. USDA and the Economic Research Service. May 2010.
- "Massachusetts Ag Facts and Statistics." Massachusetts Department of Agricultural Resources. 2007. Web. 19 Mar. 2012. <<http://www.mass.gov/agr/facts/index.htm>>
- Massachusetts Farm to School Project. Massachusetts Department of Agricultural Resources. 2012. Web. 16 Mar. 2012. http://www.mass.gov/agr/markets/Farm_to_school/
- "Massachusetts Food Policy Council." MA Department of Agriculture. Web. March 20, 2012. <http://www.mass.gov/agr/boards-commissions/mfpc.htm>
- Massachusetts General Laws. 2011. Web. 4 Mar. 2012. <<http://www.malegislature.gov/Laws/GeneralLaws/PartI/TitleVII/Chapter40a/Section3>>.

REFERENCES

- Massachusetts Heritage Landscape Inventory Program. *Concord Reconnaissance Report*. Massachusetts Department of Conservation and Recreation and Freedom's Way Heritage Association, 2006, revised 2007. PDF file.
- "MCI - Concord." Public Safety. Executive Office of Public Safety and Security, 2012. Web. 10 Mar. 2012. <<http://www.mass.gov/eopss/law-enforce-and-cj/prisons/doc-facilities/mci-concord.html>>.
- Minimum Standards for Keeping of Animals*. Board of Health. Town of Concord, Massachusetts. 2007. Web. 8 Mar. 2012. <http://www.concordma.gov/pages/concordma_health/forms/2007AnimalRegs.pdf>
- Minty, John (Zoning Officer). Town of Concord. Personal Communication, 2012.
- Natural Resources Conservation Service. *Backyard Conservation: Bringing Conservation from the Countryside to Your Backyard*. Web. 20 Mar. 2012.
- "Our Community Food Center." Growing Power Inc. Web. 18 Mar. 2012. <<http://www.growingpower.org/headquarters.htm>>
- Paffrath, April. "Micro-Farming in the Backyard." Edible Boston. Edible Communities, 2012. Web. 7 Mar. 2012. <<http://www.ediblecommunities.com/boston/fall-2011/micro-farming-in-the-backyard.htm>>.
- "Pete & Jen's Backyard Birds and Farmyard." Web. 6 Mar. 2012. <<http://peteandjensbackyardbirds.com/>>.
- Pollan, Michael. *The Omnivore's Dilemma: A Natural History of Four Meals*. New York: Penguin Press, 2006.
- Pyenson, Andrea. "Got Cows?" *Edible Boston*. Spring 2012: 60-61. Print.
- Radoslovich, Charlie. (Rad Urban Farmers – Arlington and Lexington, MA). Personal interview. 6 March 2012.
- Rasmussen, Marcia (Planning Department, Town of Concord). Personal communication. 24 Jan 2012.
- Reinhardt, Claudia. "Farming in the 40s." Web. 16 Mar. 2012. <http://www.livinghistoryfarm.org/farminginthe40s/crops_02.html>
- A Report from the Agriculture Committee 2011*. Rep. Concord Agricultural Committee, 31 Dec. 2011. Web. 8 Mar. 2012.
- Sanders, Beth and Shattuck, Annie. *Cutting Through the Red Tape: A Resource Guide for Local Food Policy Practitioners & Organizers*. Institute for Food and Development Policy/Food First/Food First Books: 2011.
- Schmidt, M.C., Kolodinsky, J.M., DeSisto, T.P, and Conte, F.C. (2011). "Increasing Farm Income and Local Food Access: A Case Study of a Collaborative Aggregation, Marketing, and Distribution Strategy that Links Farmers to Markets." *Journal of Agriculture, Food Systems, and Community Development*. 1:4, 157-175. Web.
- Shute, Lindsey Lusher. *Building a Future with Farmers: Challenges Faced by Young American Farmers and a National Strategy to Help them Succeed*. National Young Farmers Coalition. November 2011. Web. 13 Mar. 2012.
- Skelly, Christopher. *Preservation through Bylaws and Ordinances*. Massachusetts Historical Commission. May 2003. Web. 13 Mar. 2012. <<http://commpres.env.state.ma.us/publications/PTBylaws/PTBO-5.pdf>>
- Solar Committee*. Town of Concord, Massachusetts. Web. 10 Mar. 2012. <http://www.concordma.gov/pages/ConcordMA_LightPlant/Solar>.

Solar Siting Committee. Rep. Town of Concord, MA, Oct. 2011. Web. 10 Mar. 2012. <[http://www.concordma.gov/pages/ConcordMA_Bcomm/Solar%20Siting%20Final%20\(10.12.2011\).pdf](http://www.concordma.gov/pages/ConcordMA_Bcomm/Solar%20Siting%20Final%20(10.12.2011).pdf)>.

Soma, Tammara and Sarah Wakefield. "The Emerging Role of a Food System Planner: Integrating Food Considerations into Planning." *Journal of Agriculture, Food Systems, and Community Development*. 2.1: 53-64. Web. 19 Feb 2012.

"State Fact Sheets, Massachusetts." Economic Research Service (USDA). January 2012. Web. 14 Mar. 2012. <<http://www.ers.usda.gov/StateFacts/MA.htm>>

Thomas, Benjamin. "Assessing the Shelburne Falls Collaborative Composting Program." Presentation by Shelburne Falls Small Business Association (SFSBA). <http://www.frcog.org/pubs/regional_services/conference2011/Assessing_Shelburne_Falls_Collaborative_Composting_Program.pdf> Toolkit Conference, Worcester, 01 Sept 2011. Date accessed: 25 Mar 2012.>

USDA 2007 Census of Agriculture. *Massachusetts State and County Data*. 2009. Web. 10 Mar. 2012. <http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/Massachusetts/index.asp>

"USDA Extension." National Institute of Food and Agriculture. April 2011. Web. 15 Mar. 2012. <<http://www.csrees.usda.gov/qlinks/extension.html>>

USDA National Agricultural Library. "World War II Canning & Garden Posters." Web. 15 Mar. 2012. <<http://www.nal.usda.gov/fnic/history/can.htm>>

"USDA Plant Hardiness Zone Map." USDA. 2012. Web. 15 Mar. 2012. <<http://planthardiness.ars.usda.gov/PHZMWeb/Default.aspx#>>

"USDA Unveils New Plant Hardiness Zone Map." USDA. 2012. Web. 16 Mar. 2012. <<http://www.usda.gov/wps/portal/usda/usdahome?contentid=2012/01/0022.xml&contentidonly=true>>

"The Wendell Local Food Security Project." Town of Wendell, Massachusetts. 2012. Web. 19 Mar. 2012. <<http://www.wendellmass.us/index.php/community/wendell-local-food-project.html>>

White, Gabrielle (Health Department, Town of Concord). Personal communication. 26 Feb 2012; 8 Mar 2012.

Wildlands & Woodlands: A Vision for the New England Landscape. 2012. Web. 11 Mar. 2012. <<http://www.wildlandsandwoodlands.org>>.

"World PEAS Marketing Cooperative." New Entry Sustainable Farming Project. Tufts University. Web. 26 Mar 2012.

Zoning Bylaw. Town of Concord, Massachusetts. April 2010. Web. 12 Mar. 2012. April 27, 2011. Web. 11 Mar. 2012. <http://www.concordma.gov/Pages/ConcordMA_BOA/zone/2011_%20Zoning_Bylaw_complete.pdf>

Zoning Districts. Zoning Bylaw Article 2. Town of Amherst, Massachusetts. 2011. 13 March 2012. <<http://www.amherstma.gov/DocumentView.aspx?DID=255>>

Zoning Map. Town of Amherst, Massachusetts. Nov. 2011. Web. 13 March 2012. <<http://www.amherstma.gov/DocumentView.aspx?DID=389>>

PROJECT STEERING COMMITTEE

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Alden Cadwell, Director of School Food Services for Concord Schools and Concord Carlisle High School

Ben Elliot, Chef & Farmer, Saltbox Farm

Julia Elliot, RD, LDN, Clinical Dietitian in the Cardiac Rehabilitation and Metabolic Syndrome Clinics and Emerson Hospital

Jennifer Hashley, Director of the New Entry Sustainable Farming Project, Co-Owner of Pete & Jen's Backward Birds, member of the Concord Agricultural Committee, steering committee member of the Massachusetts Food Policy Alliance, the Lowell Food Security Coalition, and the Lowell Community Garden Coalitions

Delia Kaye, Natural Resources Director for the Town of Concord, Natural Resources Commission (NRC)

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Polly Reeve, Director of Development, The Food Project, and Trustee, Concord Land Conservation Trust

Debra Stark, Owner, Debra's Natural Gourmet

Linda Booth Sweeney, Ed.D, Educator, researcher and writer

Emily Wheeler, Concord Climate Action Network (CAN)

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Elizabeth Akehurst-Moore, Owner, Trails End Café and Concord Corner Store

Bob Andrews, Concord Clergy-Laity Group, ConcordCAN Steering Committee Member

Debbie Bier, East Quarter Farms Community Garden/Thoreau Farm

Enid Boasberg, ConcordCAN Steering Committee Member, Librarian, Fowler Library

David Bearg, Farmer, Sage Farm

Hilary Boynton, Kids Eat Smart Co-Chair, Concord Public School Lunch Lead Team Member, Candidate for Holistic Health Counselor Certification

Leah Butler, Blossom Partners

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Brian Donahue, Professor of American Environmental Studies, Brandeis University; Author of *Reclaiming the Commons: Community Farming and Forestry in a New England Town* and *The Great Meadow: Farmers and the Land in Colonial Concord*; Chairman of the Board of Battle Road Farms

Hasso Ewing, Designer, Farmer, and Chair of ConcordCAN

Karen Graziani, Kids Eat Smart Co-Chair, Concord Public School Lunch Team Member

Nancy Hamilton, Co-Founder, Smiling Sauce Company

Joe Karr, Lower School and Grade 4 Science, Nashoba Brooks School

Judith Long, Associate Professor, Department of Urban Planning and Design, Harvard University Graduate School of Design

Nancy Nelson, Superintendent, Minute Man National Historical Park

Lucy Rossborough, Gaining Ground Board of Directors

Dan Schmid, Farmer, The Farm at Walden Woods

Gabrielle White, Town of Concord Public Health Inspector

Sarah White, Environmental Sciences Department, Minuteman Career and Technical High School

PUBLIC MEETINGS

The committees and the Conway team encouraged community engagement through a public process of visioning and consensus-building.

On February 2, 2012, the Conway team facilitated a public meeting to solicit community ideas and resources about Concord's current food system and suggestions for how to grow a more robust and resilient local food system.

Approximately forty-five local residents, including farmers, food retailers, town officials, educators, and representatives from environmental organizations, attended the event at the Harvey Wheeler Community Center in West Concord.

After a Conway student presentation, attendees self-selected into five groups to focus conversations on the following aspects of food: cultivation; distribution; processing and storage; education; access and local/regional connections; and waste management and environmental stewardship. These groups were each charged with identifying assets and challenges in Concord, locating existing resources and potential sites for new infrastructure elements on printed town maps, and positing ideas for improvements to the overall system. Groups were given reference maps of the town and asked to identify where certain elements are currently located or might strategically make sense in the future. Each group recorded their discussion and presented their findings to the entire gathering at the end.

A brief, open-ended questionnaire was administered at this first meeting. Eleven responses were returned.

The Conway team made preliminary recommendations at a public presentation held on March 8, 2012, at the Willard School Auditorium. The event also featured a meal prepared by Chef Alden Cadwell, Director of Food Services for Concord Public Schools. Again, nearly fifty committee members and other interested citizens (many of whom attended the initial meeting) showed up for dinner and a sneak peek at the findings of this assessment, and those in attendance had the opportunity to voice feedback to the Conway team to incorporate into the final recommendations.

The Concord Reconnaissance Report: Freedom's Way Landscape Inventory was conducted by the Massachusetts Heritage Landscape Inventory Program. Below is the list of agricultural land identified by the Concord community in a Heritage Landscape Identification meeting held on February 28, 2006 and fieldwork on April 11, 2006:

Barrett Farm, 448 Barrett's Mill Road. More recently known as McGrath Farm. Farmhouse is a Colonial building with historical significance and a high level of integrity. Property also includes agricultural outbuildings and fields that were actively farmed until recently. Critical parcel with conservation land across the street and other town-owned land to the north and east.

Barrett's Mill Road Area. Includes Prison Farm and Barrett Mill/McGrath Farm. One of six major agricultural areas identified in the *Comprehensive Long Range Plan* (LRP) and the *Open Space and Recreation Plan* (OSRP).

Farmland around Alcott School, Walden Street. Agricultural land.

Harrington Avenue Area. Marshall Farms. One of six major agricultural lands identified in LRP and OSRP. Includes town-owned Harrington House, with 15 acres on the Assabet River.

Lexington Road Area. Palumbo Farm and National Park. One of six major agricultural lands identified in LRP and OSRP.

Monument Street Area. Hutchins Farm (protected by APR). One of six major agricultural lands identified in LRP and OSRP.

Nine Acre Corner, Sudbury Road. Scimone, Burke, and Kenney Farms. One of six major agricultural lands identified in LRP and OSRP.

Prison Farm, Route 2. Part in Concord and part in Acton. This is a very visible part of the larger Massachusetts Department of Correction (MDOC) land. It is also listed in the institutional category and is part of a priority landscape.

Triangle Farm, Westford Road. Not in planning documents. No longer has any agricultural land. Two barns are scheduled for demolition. Northwest corner of town, goes into Acton and Carlisle.

Williams/Sudbury Road/Route 2. Mattison, Souter, and Arena Farms. One of six major agricultural lands identified in LRP and OSRP.

Agricultural Preservation Restriction (APR): This is a voluntary state program which offers a non-development alternative to farmers and other owners of agricultural land who are faced with a decision regarding future use and disposition of their farms. The program offers to pay farmers the difference between the fair market value and the “agricultural value” of their farmland, in exchange for a permanent deed restriction, which precludes any use of the property that will have a negative impact on its agricultural viability. Farmers whose land is accepted into the program are able to realize equity from their land without being forced to sell their farms for development purposes (*Comprehensive Long-Range Plan 2005*).

Agricultural Overlay District: Concord’s agricultural land is all zoned for residential use. If a special Agricultural Overlay District were created, then the regulations of the underlying residential district would be modified by stricter controls and/or the provision of additional development options for use of the property (i.e, a layer of regulations/options in addition to what is provided for in the underlying zoning and that would supersede the underlying regulations) (*Comprehensive Long-Range Plan 2005*).

Article 97: Approved in 1972, Article 97 amended the Massachusetts Constitution to declare that people have the right to clean air and water...and the natural, scenic, historic and aesthetic qualities of the environment; and the protection of the people in their right to the conservation, development and utilization of the agricultural, mineral, forest, water, air and other natural resources is a public purpose. Article 97 gave the general court the power to enact legislation to protect such rights. Lands and easements acquired for such purposes cannot be used for other purposes except by laws enacted by a two-thirds vote of the legislature (Rasmussen).

Conservation Restriction (CR): A legally binding agreement between a landowner (grantor) and a holder (grantee—usually a public agency or a private land trust), whereby the grantor agrees to limit the use of his/her property for the purpose of protecting certain conservation values. The CR may run for a period of years or in perpetuity and is recorded at the Registry of Deeds (it runs with the title). Certain income, estate, or real estate tax benefits may be available to the grantor of a CR (*Comprehensive Long-Range Plan 2005*).

Geographic Information Systems (GIS): A geographic information system (GIS) integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information. GIS allows people to view, understand, question, interpret, and visualize data in many ways that reveal relationships, patterns, and trends in the form of maps, globes, reports, and charts (ESRI.com).

Sustainable Agriculture & Agroecology: A whole-systems approach to food, feed, and fiber production that balances environmental soundness, social equity, and economic viability among all sectors of the public, including international and intergenerational peoples. Inherent in this definition is the idea that sustainability must be extended not only globally, but indefinitely in time, and to all living organisms including humans. Sustainable agroecosystems maintain their natural resource base, rely on minimum artificial inputs from outside the farm system, manage pests and diseases through internal regulating mechanisms, and recover from the disturbances caused by cultivation and harvest (Gliessman).

Transfer of Development Rights: A method of protecting land by transferring the “rights to develop” from one area and giving them to another. This means that there is a consensus established to place conservation easements on the property in agricultural areas while allowing for an increase in development densities of “bonuses” in other areas that are being developed. The costs of purchasing the easements are recovered from the developers who receive the building bonus (*Comprehensive Long-Range Plan 2005*).

The town of Concord, Massachusetts, is in the process of reviving a local food network to improve social, ecological, and economic resilience in the community. This community food system assessment analyzes the existing land use and food production patterns, food distribution models, processing and storage capacities, preparation and consumption patterns, and food waste management practices. Informed by community input, local case studies, and food systems research, this report offers suggestions that stakeholders in Concord and surrounding towns could use to bolster local food systems. This study assesses the early phases of Concord's long-term process towards greater food resilience, and highlights Concord's opportunities to boost its participation in the regional effort to produce more healthy food locally, protect farmland and natural resources, and increase community connections around food.

the **Graduate Program** in Sustainable
Landscape Planning + Design
ConwaySchool

The Conway School is the only institution of its kind in North America. Its focus is sustainable landscape planning and design. Each year, through its accredited, ten-month graduate program just eighteen to nineteen students from diverse backgrounds are immersed in a range of applied landscape studies, ranging in scale from residences to regions. Graduates go on to play significant professional roles in various aspects of landscape planning and design.