IN PRAISE OF SWEET CORN

Contemporary Farming
at Minute Man National Historical Park
In Massachusetts

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The farmer in deep thought
is pacing through the rain
among his blank fields, with
hands in pockets,
in his head
the harvest already planted.

—William Carlos Williams, "The Farmer"

My advice is don't go to the supermarket in summer, go to farm stands for fresh vegetables. And, of course, I love corn on the cob.

—Famed Boston restaurateur amd chef Jasper White,
quoted in The Improper Bostonian

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PREFACE

Most Americans probably do not think of their National Parks as agricultural landscapes, as places where farmers till the soil to make a living. When I asked several of my Boston University students what came to mind when I said "National Park," not one replied, "farming" or "the agricultural history of the United States." Nor had they given much thought to the largely agricultural society that produced the American Revolution.

Most often, they thought of National Parks in terms of wilderness. They had a wilderness model of National Parks. Yet agriculture plays a vital role in several National Parks and Recreation Areas, from the hay fields and market gardens of Minute Man in Massachusetts to the orchards at Capitol Reef in Utah.[1] Dairies continue to operate at Point Reyes Peninsula National Park, where dairying over the span of more than a century wove together an immigrant tapestry (Livingston, 1993). Some four thousand acres are leased for agricultural purposes, mostly haying, at the Delaware Water Gap National Recreation Area.[2]

While agriculture may have no place in wilderness parks, it has a significant place in historical parks. Such parks memorialize eras and events in American history. The events they memorialize often took place in a rural setting, in an agricultural landscape of fields, orchards, and woodlots, in a historic cultural ecology created by the largely agrarian society the United States once was. The running battle with the British in 1776 that ushered in the Revolutionary War, commemorated at Minute Man National Park, took place in part in the open, farmed countryside between the New England towns of Concord and Lexington. The Civil War raged across the rural landscapes of the North and the South.

Other aspects of American history also have a rural dimension, a connection with the landscapes and seasons of agriculture. The ebb and flow of immigration did not deposit people only in the cities of the United States. Immigrants also settled on farms, making the ethnic mosaic a rural as well as an urban phenomena.

So to preserve historic places is, often, a process of preserving agricultural landscapes, of sustaining an agricultural ecology, in ways that make tangible the history of a place.

Many people cherish heritages associated with agriculture and rural life. Agricultural has had a key role in the historical development of the country, and perhaps in the formation of value-concepts and concepts of national character, as the celebrated cultural anthropologist Walter Goldschmidt long ago pointed out. Even today, when most Americans reside in cities and suburbs, agriculture

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1 Westmacott (1994 draft) reports that agricultural use of park lands is found in about 25% of national parks.

2 Wayne Millington, personal communication.

continues to represent for many such values as self-reliance, community, and closeness to the land.

Clearly, farming needs to be recognized as a way of life with great historic and cultural significance; it deserves a place in the national consciousness. Moreover, contemporary agriculture can play an important practical role in maintaining historic landscapes. If historic places were farmed in the era they commemorate, keeping them in agricultural use today can help give a sense of the historic landscape that would be lost if urban or residential development occurred or if the land was allowed to revert to brush or forest. If contemporary farming can aid historic preservation, it can also in principle be integrated into programs of biological conservation. Some species are associated with agricultural ecologies; others make use of the open space agriculture maintains. Especially in urbanizing areas, farming can help preserve a diverse landscape, complementing land kept in a wild, natural state. As Thoreau put it, the sun shines down alike on wild places and bean fields.

If agriculture can help preserve historic landscapes and open space, if it signifies national values and offers ways of nurturing biological and cultural values, then the concept of a partnership between National Parks and American farmers makes sense, at least in principle. The question is, can such partnerships—and the multiple use and mutual adjustments they imply— be practical? In what ways can farming and parks enhance and support each other? Ethnography can help answer these questions. I hope this report provides useful information for thinking about these issues at one park, Minute Man National Historical Park in Concord, Massachusetts.

The primary audience for this reports consists of professionals who are neither farmers nor social scientists. It is not addressed to anthropologists or economists. Nor is it written for an audience of historians or rural sociologists, agronomists or plant scientists . This is a study in applied ethnography, written for people who have the responsibility of managing federal lands. As a consequence, this document does not address many issues that might interest a social scientists, or a historian of the rural United States, or some one with a specialized, technical interest in the science of plant production. What this report attempts, rather, is to document, and build a context for understanding, what anthropologist Clifford Geertz has called "local knowledge"—in this case, local farming practices that relate to past and future management actions at Minute Man National Park. It addresses its findings not to technical specialists in anthropology or agriculture, but to people whose expertise lies elsewhere, who in some cases may have little knowledge of farming but nonetheless must make decisions about agriculture in their roles as managers and custodians of land in the National Park System.

Boston, 1996

ACKNOWLEDGMENTS

I wish to thank the farmers in the Concord, Lincoln, and Lexington area who participated in this study, and who sustain the farming tradition of New England.

This project benefited greatly from the support, knowledge, and insights of the staff of Minute Man National Historic Park. I wish to give special thanks to Nancy Nelson, Superintendent, and to Dan Datillio, Chief Park Ranger, who are entrusted with the management of one of the most important historical parks in the country. They recognized that agriculture has a vital role to play in the stewardship of Minute Man. They had the foresight to ask for a study that would help them address issues in the Park's agricultural program. They offered vital logistical support and shared their vision and knowledge of the Park. They made it clear that working with farmers was an important priority for them, and that they needed ethnographic data to help them make informed decisions about the Park's agricultural program. I trust the ethnographic description and analysis of this report will help them with the management challenges they face.

This study was sponsored by the Northeast Field Area Applied Ethnography Program of the National Park Service. This program is managed by Dr. Rebecca Joseph from the New England System Support Office in Boston, and I wish to thank her for her help and expertise. The National Park Service is fortunate to have an administrator and researcher of this quality in its employ. Dr. Joseph and the Applied Ethnography Program she manages demonstrate a commitment on the part of the Park Service to addressing in an active, innovative, and effective way the cultural and ethnographic issues that arise in the management of National Parks. The Ethnography Program of the New England System Support Office is a model program that should be studied by other federal agencies.

I wish also to thank Ranger Flo Smith, Supervisory Park Ranger, for taking time from her many duties to discuss the Park's agricultural program with me. Others who deserve thanks include Wayne Millington, Bill Barlow, Geoff McGean, Julia Huang, Irene Kang, Tina Yin, Bill, Harry, Kelly-Ann, and Rita. At Boston University, Tom Barfield and Janet O'Neil gave essential help.

ONE

INTRODUCTION

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Statement of Purpose

The primary purpose of this report is to provide a basic understanding of contemporary farming at Minute Man National Historical Park. Farming at Minute Man helps maintain and reinforce the historic character of the landscape. It represents a viable and cost-effective way of preserving an open agricultural landscape of the kind that existed at the beginning of the American Revolution. Contemporary farming can help the Park recreate aspects of the agricultural world of the Minute Men.

Without farmers, the Park would face the considerable, and expensive, task of clearing and maintaining land now farmed itself. Keeping one hundred acres of land cleared costs the Park approximately $100,000 annually (Source: Chief Park Ranger). Currently, about 140 acres are kept open by farmers, who lease land from the Park for agricultural purposes. Developing and managing its agricultural program thus represents an efficient use of scarce management resources.

An agricultural program, however, cannot be managed in an information vacuum. Informed, effective, decision-making about this program requires information about contemporary agriculture.

In order to work with farmers and wisely manage agricultural uses, the Park needs to know something about local farms and farmers, and their agricultural practices, as these actually and potentially interact with the Park and its policies and management practices. The topics covered in this report were made the focus of research either because they are current management issues, or because they represent aspects of agriculture relevant to developing and strengthening the Park's agricultural program.

This report presents the findings of an ethnographic study. Ethnographic fieldwork was used to collect information regarding, and to assess, the Park's

agricultural program in terms of the terms of the structure of leases, relations with farmers, critical crops, agricultural practices, and other issues. The report describes and analyzes the nature of farming at the Park and in near-by communities, providing background non-farmers need to understand the farmers who farm at the Park under its leasing program and occupancy reservations. The report documents farming practices and offers ethnographic context for understanding farmers and farming operations. It discusses implications this data may have for the management of the Park's agricultural program, and analyzes some of the consequences Park management actions may have for farmers and farm operations.

Research Activities

The research involved four months of research and analysis conducted between June, 1995 and May 1996. This included nearly three months of ethnographic fieldwork between June and December 1995, when the Principal Investigator was resident at the Park. Five site visits were made between January and May 1996 to observe winter and early spring activities. Preliminary analysis was done during the fieldwork phase. The budget included funds for a part-time graduate research assistant, who helped with library and archival research, helped prepare a map, and worked on aspects of the production of the final report.

More than sixty hours of open-ended, focused interviews were conducted with 18 farmers, former farmers, and members of farm families. In addition to farmers who farm at the Park, three non-leasing farmers were interviewed. Additional time was spend in conversation and discussion, and in informal contacts. Interviews focused on the subjects discussed in the separate chapters of this report: the structure of leases with the Park, the question of housing for farmers, the IPM program, crops and markets, values and attitudes. More than one hundred hours have been spent in observation of farm practices and operations in the Park and its environs. Local and state agricultural and conservation officials were contacted regarding leasing and IPM programs. Interactions with Park staff have proven valuable.

Please see Appendix A for a discussion of research design, research methods, and the data generated.

The Setting: Minute Man National Historical Park

Minute Man National Historical Park celebrates a day in American history: April 19, 1775, the day of the first battle of the American Revolution. On that day in 1775 British forces and Minute Men clashed at the Old North Bridge in Concord and fought a running battle along the road from Concord to Lexington. In 1959, Congress established the Park with the aim of preserving "for the benefit of the American people certain structures and properties of outstanding national

significance associated with the opening of The War of the American Revolution." [1] The Park was created to "consolidate, preserve, selectively restore and interpret portions of the Lexington-Concord Battle Road...so that the visitor may better appreciate and understand the beginning of the American Revolution." The Park is about 16 miles from Boston, within the towns of Lexington, Concord and Lincoln.

The Park consists of three units at different locations: The Battle Road Unit, the North Bridge Unit, and the Wayside Unit. While some haying and grazing occurs at the North Bridge Unit, the Battle Road Unit is the largest area of most agricultural use, and the area most intensively farmed.

Eastern portions of the Battle Road Unit are in the town of Lexington, while sections of the Battle Road unit and the entire North Bridge Unit lie within Concord. Some sections of the Park fall within the town of Lincoln. The designation "town" should not be misconstrued: it does not mean that these communities are entirely urban in character, that all the land within them has been developed into residential neighborhoods and commercial districts. In this part of New England, the term "town" does not simply designate an urbanized locality smaller than a city; rather, the town is a unit of governance and administration that may include both developed and rural areas. Agriculture is found on private and public lands within these towns. They are, however, no longer predominantly rural in character. These New England towns do not exist in pristine isolation, but are linked to regional urban development. They form part of the outer suburbs of the larger Boston and Cambridge area.[2]

The Battle Road Unit stretches along both sides of Route 2A, a heavily traveled two-lane highway which bears both local traffic and some of the burden of commuter traffic to Boston and its inner suburbs. Driving through the Park on Route 2A, what one sees is a landscape filled in with forest and scrub brush, opening up occasionally into a small meadow or hay fields. The brush and trees are dense: only at a few points at this end of the Park does the landscape open up into a vista. In the summer even the visitor center in this section of the Park is barely visible from the road behind a screen of vegetation. A number of houses, either occupied by residents or park staff or awaiting some future use or removal, also punctuate the landscape.

In 1995, only one well-drained irrigated field in the eastern end of the unit was used to produce vegetables. Deer that inhabit the woods surrounding the fields ate most of the beans and peas planted here, but the farmers harvested the early sweet corn they had planted, scaring off crows with modern scarecrows:

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[1] General Management Plan, Minute Man National Historical Park, 1989, p. iii

[2] By "larger Boston-Cambridge area," I mean to include developments along Route 128, an area renowned for technology companies. By labeling Concord an "outer suburb," I do not mean to imply it is the outermost suburb: localities even more distant from Boston, Cambridge, or Route 128, such as Acton, serve as bedroom communities.

poles on top of which were mounted balls on which the eyes and beaks of birds of prey were painted.

Signs direct Park visitors to sites of interest. If one followed one of these signs, along a section of the Battle Road that loops away from Route 2A, one would arrive at Ephraim Hartwell Tavern, where in the summer Park staff dressed in period costumes greet visitors. Adjoining the Tavern is an which a area is being cleared as paddock and pasture for a few cattle. Visitors often pause to observe and remark on them, or snap a photo of them grazing. Having livestock here may give a more palpable sense of the historic scene: cattle were important in agricultural world that existed in the era the Park commemorates.[3] If events at Concord helped launched the Revolution, Concord agriculture helped provision the fighting. Concord supplied beef to feed the army (Torres-Reyes 1969:48).[4]

Returning to the flow of traffic on 2A and continuing westward, one might glimpse a few old apple trees in front of the historic and handsomely repainted Noah Brooks house: the trees hint at the historic importance of apple orchards in the area. After passing these vestiges of the past, you reach the western end of the unit, the trees ands scrub brush diminish, replaced by farm fields that open up the landscape and give some suggestion of what the land might have looked like in the past, during the historic period the Park commemorates.

A barn with a silo marks the beginning of this area of more intensive agricultural use, where pumpkins, squash, peppers, and a variety of other crops are grown. The barn and farm house stand in one corner of a broad expanse of cultivated land that stretches away from the road, rising gently to the top of a hill, where a stone wall overgrown with brush separates it from the fields on the other side of the hill, which drop away gently again down towards more trees. Continuing west, one comes to another field north of the road, where sweet corn was planted in the summer of 1995. The land here is flatter and the area under cultivation has precise rectilinear boundaries; it runs up against forest and overgrown orchard in the back.

Next, after passing two houses, the road passes by a flat hay field with rolling boundaries. The field stretches back behind a small rise in the land. Then on the other side of the road—where the land is lower—appear level fields that lie below the plane of the road, on the other side of a stone wall. Unlike the other fields still farmed at the Park, drainage ditches cross these fields, an adaptation to the topography of the fields. Sweet corn and truck crops were grown here in 1995.

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[3]Donahue (1993:163), Appendix A of A Management Plan to Balance Cultural and Natural Resources: The Minute Man National Park Case Study.

[4]Drawing on tax records for Concord as his source, Torres-Reyes (1969:48) writes that "From October 1780 to July of the following year, Concord alone furnished 42, 799 pounds of beef for the army."

On the other side of the road, there is one more small field, used to grow sweet corn for several years, tucked away just behind the historic Meriam house. Passing this historic structure, one leaves the Battle Road unit, and enters a residential section of Concord. Here one passes by the Wayside Unit of the Park, which houses that the Alcott family and Nathaniel Hawthorne lived in. To reach the North Bridge Unit, one must pass through the heart of Concord Center before turning up Monument Street, which will take you to the North Bridge, a destination for a majority of people who come to visit the Park. The North Bridge Unit also contains the administrative headquarters of the park. A swathe of hay is cut in the summer, and a few horses or some cattle could be grazed here, but it is clear that the most extensive and intensive agricultural activity at the Park at present is confined to the Battle Road Unit, and in particular to the western section of that unit.

A Note on History

The historian of New England agriculture Howard Russell has written a virtual elegy to the farmers who gathered and fought on April 19, 1775:

The events of Lexington and Concord and the deeds of the farmers of Middlesex and neighboring counties on the fateful morning of April 19, 1775, are the province of the political rather than the agricultural historian. Yet certain observations deserve a place here....Much has been written of the merchants and politicians whose commercial interests and political ambitions are said to have brought on the conflict, and of the Boston mobs whose actions culminated in the Tea Party. Yet the men who first stood their ground and took the bullets in their bodies at Lexington and Concord and Bunker Hill were neither political nor commercial, nor yet a mob. They were mainly sober, responsible farmers....They were the product of a century and a half of a vigorous, self-supporting agriculture on this continent.....(Russell 1982:123)

The events of April 19, 1775 took place against the backdrop of an agricultural landscape. If you look at exhibits in the two visitor centers at the Park, they portray the battle as it took place, along roads bordered by farm fields. On April 19, 1775 the British forces and the Minute Men moved not through the dense tangle of a pristine, natural forest, but across an open, cultivated, agricultural landscape. Leaving the Battle Road visitor center, this is not one sees today. From a car, brush and trees blur by--much of the historic landscape has vanished.

Brian Donahue strikes a sobering note needed to balance the celebratory tone in Russell: "The farms along the Battle Road in 1775 were part of a traditional agrarian society in trouble...there was a strong sense of diminishing prospects. This was the result of a farm system that had reached its ecological limits: the land had all the subsistence farms it could support, given the traditional farm

methods."[5] The present ethnographic study will address the question of the prospects of agriculture today along the Battle Road. Today, not only are there ecological and economic limits, but limits represented by the Park, its nature, its goals and priorities.

The Park's History and Development

The Park is about history, but it also has a history. The facts of this history shape the Park today; it has been constrained by the circumstances that prevailed at the time it was constituted as a Park. These circumstances condition the use of land on the Park, determine its availability for restoration or for agricultural use. These circumstances directly reflect the Park's history and must be taken into account in assessing the status of programs at the Park. In detail, the discussion here applies only to the Battle Road Unit, where most of the Park's existing or potential farm land is found.

The first historical circumstance is this: the Battle Road Unit was not created out of pristine wilderness. Nor was it pieced together solely from rural parcels, although a number of farms were acquired. Rather, it was assembled out of a semi-rural, semi-suburban area beginning in the 1960s. Far from being pristine wilderness or farm land, then, the land from which the Park was assembled bore the marks of 20th century processes of urbanization and suburbanization: tracts of houses, commercial buildings, roads, underground tanks, waste disposal dumps, and other amenities and infrastructure of 20th century life, use and occupation.

When the Park was established to commemorate the past, traces of the present did not simply disappear by magic: the physical artifacts of the built environment of the 20th century have been removed piece by piece by the Park.

The Park has been working towards recreating a semblance of the 18th century landscapes by removing the 20th century landscape that prevailed at the Park's founding. This on-going process has required significant effort and expenditures. It has tied up resources and limited the Park's capacity to move ahead with other goals. In the interim, while the present is being erased, the past has not been fully restored: much of the land has remained in a transitional state, neither the 20th century landscape it was, nor the historic parkscape that some envisioned, where even Route 2A, a modern road busy with suburban commuter traffic, would be removed.

Another factor complicating the restoration process is the fact that the land that became the Park was not donated or willed to the Park, nor was it always purchased from willing sellers. Some of those who owned land now part of the Park say they did not wish to relinquish it. They report that they felt they had

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[5] Donahue (1993:163), Appendix A of A Management Plan to Balance Cultural and Natural Resources: The Minute Man National Park Case Study.

no choice, that they were compelled to accept terms offered by the government. In some instances, these terms provided for the previous owners to continue to live on what had been their property for life or for twenty-five years. A number of homes continue to be inhabited under these term and life occupancy reservations.

Some of those who surrendered their land to the Park feel that they were deeply wronged in the process. Park staff who came to their jobs after the era of land acquisition (all the present staff) have had to deal with a painful legacy of mistrust and resentment. Former owners argue that the government's acquisition of the land disrupted their lives. They argue that the process by the Park acquired their land was acquired was flawed and often unfair. They tell stories of the pressure put on them, and the consequences for their lives. Some of them still mourn the farms and homes they lost. While recognizing that the present generation of Park staff was not involved in the acquisition of the land, they retain a deep sense of grievance against the federal government.

In sum, the National Park Service has engaged in three major types of action to develop Minute Man National Historical Park: it acquired land: it initiated a multi-decade effort to remove the signs of 20th century occupation of this land; and it has restored historic buildings and landscapes. While these activities continues to this day, the relative salience of each also mark three major periods in the history of the Park. The Park began with a turbulent and painful era of land acquisition, which left a legacy of skepticism and bitterness; it continued with a period where the major focus was the removal of signs of 20th century habitations. This remains an ongoing process, but the Park appears to have gone far enough in expunging traces of 20th century occupation of the land that restoration and interpretation become relatively more important.

Obviously, the acquisition of land in modern use, from people who were reluctant to surrender their properties, and for whom term and occupancy reservations were offered in an effort to make the transfer of land more acceptable, has direct implications for the Park's management of resources. When one observes the unevenness of restoration and development in the Battle Road Unit—trees and brush alternating with farm fields, modern residences with restored historic structures—one is seeing visible signs of the history of the Park. With this history in mind, one can understand some of the reasons for the uneven texture of development in this, the largest unit of the Park. Not only is this a relatively new Park, legislated into existence in 1959, but its development has been constrained in a number of ways since its inception by the status of the land it acquired, and by decisions, arrangements, and commitments made in the course of its rather brief history.

The Battle Road Unit, at least, is not a finished product, but a work-in-progress. If it has not fully coalesced as a Park, this reflects the circumstances of the Park's founding. The nature of the Park's achievements and the limits of what it could accomplish must be understood in this context. The terms of the

transfer of land to the Park mandated a partial moratorium on development; where the land continued to be occupied under term and life occupancy reservations, the Park could not restore it to a facsimile of what the land had looked like in 1776. While some land was set aside in occupancy reservations, significant resources had to be committed at other sites to expunging the 20th century landscape that had been built over the site of the historic landscape. This modern "built environment" complete with gas station, office building, a car dealership, stood in the way of the goal of restoring the land to a semblance of what it had been in 1776. Expunging it became a major Park task. Given the magnitude of the task, the presence of occupancy reservations, and budget limitations, it has been a task conducted over many years.

While there is no way of knowing precisely what would have occurred on this land if the Park had not come into existence, it is plausible to extrapolate from what was there when the Park did acquire the land, and on the basis of what has occurred in surrounding areas. Park staff and some local residents do so. They argue that without the Park there would be no open space, no farm land, no woods in this area. Without the Park, they believe the stretch of land along Route 2A that makes up the Battle Road Unit would be just another strip of suburban development: office parks, strip malls, gas stations, residential developments.

Those who take this view stress the way the Park has sheltered land from development. In their view, the Park took a segment of the urbanizing, suburbanized, homogenous landscape that surrounds Boston and Cambridge and converted into a different kind of landscape, preserving open space and agricultural land in perpetuity. They feel has value for the public, even if it is still an uneven landscape, a work-in-progress. They feel the Park has preserved agricultural land from development, and has maintained open space in an area that had undergone rapid and rampant development. They underscore the Park's accomplishments and progress in restoring historic buildings and the historic appearance of the landscape.

As Park staff see it, the Park stands poised to enter an era when restoration and interpretation of the historic landscape, not expunging signs of 20th century use, will become the primary focus of their efforts. Among other things, this shift involves efforts to improve access to the Battle Road Unit. The key initiative here is the development of a 5.5 mile long multi-use trail with visitor support facilities. Park staff see the trail as a way of ensuring that the public has an opportunity to experience the landscape and learn about its history. In their view, the Park stands poised to offer this experience of landscape and history, where the landscape and the history express and symbolize each other. They see the Park's relationship with farmers as having an integral role in this process.

While restoration has been a continuing focus at selected sites, there are a number of reasons why restoration of the landscape has only now become a primary focus for the Park as a whole. On much of the land in the Battle Road

Unit, the legal arrangements made with previous owners, which granted them term and life occupancy reservations, necessitated a moratorium on restoration and development on land held under these reservations. Also, restoration of the land to a semblance of eighteen century landscape had to wait until 20th century buildings has been torn down or removed, and the marks of the contemporary era on the landscape removed or muted.

Enough of the Park has had signs of 20th century use removed that the Park can turn its attention to restoring the historic landscape: it becomes a kind of race between restoration and the growth of scrub brush and trees. Having gone to the expense of clearing away the signs of modern occupation and development, the Park does not want the expense of clearing away trees and brush to restore the historic landscape: this has been a major reason for keeping agriculture going at the Park over the years, on land farmed when it was acquired for the park. (See map 2, following page 148. showing vegetative cover circa 1775 and today.)

Management Resources and the Agricultural Program: The Capacity Issue

The fact that the Park is entering a new stage of its development poses dilemmas for the management of the Park, and for the agricultural program. The agricultural program plays a vital and integral role in maintaining and restoring the landscape. Yet Park staff is already stretched thin, and their work load is increasing. They are not always able to respond to the needs of the agricultural program in a timely, effective way. Nor does the Park at present have the capacity (in the form of trained staff) to enhance and develop the agricultural program in ways that would help the Park achieve its goals and ensure that farmers will want to continue to farm at the Park. Additional staff is needed merely to maintain the present program as the total management load at the Park increases. It is vital to have more staff to iron out wrinkles in the present program. Enhancing the program—for example, by developing a program of conservation farming to promote biodiversity, by linking farming to interpretive programs, or by reintroducing agriculture on land not currently farmed—would require additional staff capable of developing expertise in each of these areas.

Some administrative changes, such as converting from annual to multi-year leases, will help reduce the burden of managing the agricultural program. Yet what the agricultural program really needs is an agricultural specialist who can not only maintain the viability of the program, but expand and enhance it. The Park has had the same number of full-time-equivalency positions (approximately 35) for the last 15 or more years (Source: Chief Park Ranger). Given the increase in work load in recent years—the Park has assumed responsibility for five additional historic structures, for 200 acres of additional land, and for the new trail system—there is not enough staff to manage and develop the agricultural program. Many of the complaints farmers have about the agricultural program can

be attributed to the shortage of staff relative to increasing demands on staff time, compounded by a lack of knowledge about what farmers need and what farming practices entail.

In sum, the Park lacks the capacity to develop and expand the agricultural program in the mutually beneficial ways the Park and local farmers would like to see. Several sections of this report point out ways in which the lack of trained staff tends to pose problems for the agricultural program. The next section introduces some of these issues.

Study Issues

The landscape of 1775—the setting of the events that the Park commemorates—was largely agricultural in character: a landscape of farmed fields, hay meadows, pasture, orchards and wood lots. By the mid-20th century, much of this landscape had disappeared, replaced by the suburban and semi-urban environment characteristic of the 20th century: suburban housing tracts, gas stations, a car dealership, and other structures integrated into the mobile, motorized culture of a highly urbanized, industrial society. Yet some farming continued on the best land, a living link with the agricultural world that existed at the beginning of the American Revolution. A critical issue for the Park is how to restore and maintain the agricultural character of the landscape today in ways consistent with its mission of preserving and interpreting natural and historic resources.

It is easy to understand the appeal of having the historic story of national significance that Park commemorates told in and by the landscape itself. The historic story is intimately related to the cultural story of people whose hands shaped the landscape, who had built stone walls and a way of life in the agrarian society of the historic period of significance. Surely, it follows, the ideal would be for visitors to experience the kind of open, diverse, agricultural landscape of that era.

Today, as in the period the park commemorates, one finds farmers working fields along the route of the fighting between the British and the Minute Men. Some sites on the Park have been farmed since 1775. Agricultural uses and the landscape they create constitute ethnographic resources. They also offer one means of achieving the goal of keeping some Park land cleared and open. The National Park Service wishes to understand how management actions might affect agricultural uses and farm operations and the ethnographic values these represent, to farmers and to others in the communities adjoining the Park. It also desires to find ways to support agricultural uses that are both consistent with, and contribute to, achieving Park goals..

At present, visitors only experience an open, agricultural landscape in those sections of the Park that are still actively farmed or in cleared area that are maintained in an open state by the Park. Elsewhere trees and scrub-brush have grown

up on much of the land in the Park. In the absence of farming or Park efforts to prevent it, trees and brush would creep into cleared areas. A partnership with contemporary farmers offers a possible means of restoring and maintaining an open, diverse, agricultural landscape—if farmers continue to have an interest in farming the land, and if future Park policies and actions do not make it impractical for farmers to grow and harvest crops on land within the Park.

Before it acquisition by the Park, the land currently in agricultural use at the Park was owned and farmed by local farm families. In two cases, land continues to be farmed by members of these families on occupancy reservations set up when the Park acquired the land. This represents a small portion of land currently farmed at the Park—not much more than twenty acres. At present, most farmland within the Park, approximately 130-140 acres, is cultivated by local growers who lease land from the Park on the basis of annual special use permits. These local growers form a community which has a stake in the agricultural program of the Park.

The primary purpose of this research project is to assist the park in understanding the relationship these farmers have with the park, by providing an ethnographic account of farming practices and operations, and of farmers' circumstances, needs, and lives. This applied ethnography will help the park assess the impact of management actions. [6]

The establishment of Minute Man National Historical Park represents one of the most significant socioeconomic developments in the recent history of the area, and certainly one of the most vital for those who continue to grow crops on land within the park. In sharp contrast to farming on privately owned land, farming occurs within the physical boundaries of the park, on public land, and in association with other uses and users, including the approximately one million visitors who come to the park each year.[7] Even more importantly, farming occurs within the bounds of a relationship with the park, its interpretive missions, and its evolving policies. This relationship has a social, economic, and legal reality that may have important consequences for farming practices on park lands, for farm operations that lease this land, and for farm life in the local farming community. It is one of the primary goals of this study to understand this relationship.

This relationship must also be viewed in the context of conditions that affect both farmers and the Park. The Park is a custodian of a historic place that was rural and agricultural in character; but it exists within an environment that is increasingly urban and suburban in character. Farmers want to farm, and make a living at farming, but they face the problems of farming in environs that in some respects are today more semi-urban and suburban than rural. Both Minute Man National Park and local agriculture are impacted by changes occurring in the sur-

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[6] Much of this is a summary of the "scope of the study" for this project (Joseph 1993).

[7] From the Master Plan. Figure confirmed by the Chief Park Ranger. The Chief Ranger expects annual visitation to increase when the Battle Road Trail opens in 1997.

rounding communities and the region, by commercial and residential real-estate development, by processes of urbanization and suburbanization, and by all that these processes imply and bring with them, from increased commuter traffic on Route 2A (the major artery that runs through the park) to altered lifestyles and the decline of farming in the area.

The relationship of farms and the park has implications for how each weathers these changes in the larger social and economic environment. If the management goal is to build on this relationship in mutually beneficial ways— to support farmers and enhance farming in the park, and to help the park better manage and interpret resources —it is important to achieve a clear understanding of farmers and their operations, the nature of their association with the park, and of the ways these are impacted by park use and by park management practices. This ethnographic study aims to make clear the heritage, constraints, requirements, and possibilities of farming on park lands, as these are shaped by the circumstances, goals, and needs of farmers associated with the park.

The report is divided into two parts, the first focusing on defining the nature of local agriculture, while the second part discusses specific management issues. Part I provides a basic overview of local farming for non-farmers. Chapters 2 and 3 present oral histories of two farms acquired by the Park. These farms form the core of the Park's active agricultural land. The histories of these two farms give a sense of the heritage of local farming, makes apparent what farming has meant to some families, and suggests patterns of diversification and transformation in local agriculture.

Chapters 4 and 5 attempt to give an overview of local farmers and farming practices. These chapters are designed to inform non-farmers about farming. For this reason, they discuss certain very basic features of farm life and farming practices. While these might be assumed to be common knowledge and left tacit in works written for those with some background in agriculture—whether academic or practical—my view is that in this case what federal land managers with no knowledge of farming may most need to understand are precisely these elementary features of agriculture. The farmers also seem to think these are items the Park should understand. The farmers do not complain about academic abstractions debated in the ivory-tower literature on agriculture, but about practical impediments to their work. It is evident from interviews with farmers that they think the Park does not understand ordinary farming practices. What concerns them is that the way farming works and the way the Park operates are not always commensurate: the way each party responds to an event (crop damage, for example) has much to do with the exigencies of what they do, with the nature of their work, and with institutional factors beyond their control that shape what they must do. To put it more simply, farming in a place like Concord and managing a National Park have a different organization, different needs. Reconciling these is not always going to be easy: it is going to require management resources and effort, and knowledge of agriculture, on the part of Park staff. It will likely

require the kind of judgment calls that only a trained agricultural specialist is going to feel confident making.

What works for managing a Park may not work for farming, and vice versa. A realistic appraisal of what each party faces—of the constraints under which they labor, and the underlying reasons for their actions—would at least promote mutual understanding, and might help resolve some issues because it would clarify what is at stake for farmers and the Park.

If one were to boil this down to something just short of oversimplification, the message would be this: what the Park needs to understand about farmers is that their livelihood depends on growing crops; this simple fact shapes how they respond to the actions and policies of the Park that affect farming. For them, time is money. Their income depends on crop sales. When they perceive something may threaten their crops, their livelihood, they want action. On the other side, the Park often lacks the capacity to act quickly, and lacks the capacity to support the agricultural program in an optimal fashion. On the Park side of the equation, the present level of understaffing, combined with the need to sort through conflicting priorities and polices, means action is often deferred or delayed, even though individual Park employees often attempt to do their best for the farmers, in the context of competing demands on their time.

It is important to be balanced in an assessment of the agricultural program. Despite certain problems that need to be addressed and improvement that could be made if resource were available, the agricultural program largely works. While thought needs to be given to these issues, it is also worth recognizing that the program is largely successful in terms of saving the Park money and giving farmers access to land. The program benefits the Park and farmers. It also help preserves open space and an agricultural landscape for the public.

That the program has wrinkles that need to be ironed out does not mean the program has failed to provide important, mutual, benefits to the Park and to farmers. The program has provided such benefits, and the partnership deserves to be strengthened, so that each partner can benefit even more. Understanding farmers and their farming practices is a necessary for this to occur, and it is for this reason that I have written chapters 4 and 5 to provide a basic introduction to farming for non-farmers, providing context and amplification for the material found in the farm histories of chapter 2 and 3.. Clarifying the nature of farming practices for Park management, and pointing out how Park actions affect farming, as called for in the scope of work for this study, is an appropriate step, even though it may not lead to the resolution of all the issues that concern farmers—this depends on how much flexibility the Park itself has to reengineer its procedures and whether the Park will be given the resources to manage the agricultural program in a more sophisticated fashion.

Specific Management Issues

Part II addresses specific management issues. One issue facing the Park is how to structure and implement agricultural leases. At present, farmers lease land on the basis of one-year special use permits. For a variety of reasons, the present system is not optimal for agriculture. Most crucially, in the opinion of most farmers interviewed, farmers have no assurance they will be able to farm the same fields for several years in a row, and so hesitate to invest in the development of the soil and the fields. The consensus of farmers is that annual leases should replaced by multi-year leases. Chapter 6 of this report will discuss the question of short-term vs. long-term leases, and other features of leases that affect farming operations.

Another issue facing the Park concerns a proposal offering farmers housing at the Park. The intent is to help ensure that farming continues at the Park. In chapter 7, I pursue the question of whether this would be a useful or a necessary measure to keep farmers farming at the Park. To summarize the argument made there, at present, it does not appear necessary to offer housing to farmers in order to lease land that is already being used to produce crops. Housing might be offered as an option, and might be attractive to some local farmers under certain conditions. While neither necessary nor sufficient as a means of ensuring the continuity of agriculture at the Park, the provision of housing may be useful as a means of encouraging some one to tackle the challenge of taking land that is not currently farmed and restoring it to agricultural use. The issue of agricultural reintroduction is addressed in chapter 8.

While intended to help farmers, implementing a plan to offer housing to farmers could have drawbacks for both farmers and the Park, depending on how it is set up. If leases were structured so that farmers could only get access to land by leasing housing, farmers who do not need housing might in effect be excluded from the program. Less qualified farmers might have more of an interest in such housing than more qualified farmers.

Another question addressed in chapter 7 is whether the housing that might be leased to farmers it is compatible with their needs. Some housing units the Park has under consideration for farmers seems compatible with the needs of farmers and farming, but other housing—in particular a set of apartments—does not. The ideal housing for farmers would include outbuildings such as barns and equipment sheds and be as close to fields as possible. Housing that approximates the ideal exists. Another issue is whether housing would be or could be used in ways compatible with the Park's needs.

Finally, there is the question of how much housing the Park needs for farmers, assuming a "fit" can be found between what farmers require and what the Park has to offer. The housing units that the Park could make available exceed the number of farmers it needs to farm Park land, based on the land available and the scale of local farm operations.

In interviews, farmers expressed a number of concerns about restrictions on agricultural uses written into leases, and about restrictions on pesticide use at the Park. I will discuss the nature of some of these concerns in the discussion of farming practices in chapter 4, since the discussion of what farmers do, and why, provides a context for understanding their concerns. The reservations farmers have about the Park IPM program is discussed in chapter 9.

While recognizing for the most part the legitimacy of Park interests and goals, the farmers also take the view that some restrictions on agricultural use are arbitrary and unnecessary. Moreover, they feel that Park or National Park Service sometimes take too long to make decisions and take actions that affect farmers. In general, farmer's concerns reflect the fact that they are struggling to make a living by farming. Farmers experience what they perceive as unnecessary restrictions any excessive delays as costing them time, money, and energy.

What are for farmers issues of efficiency are for the Park issues of capacity. The Park lacks the capacity—the resources and the staff—to be as responsive to the needs of farming as it would like. Moreover, at present it lacks the capacity to integrate farming into the development of the Park. In essence, the complaints of farmers are a sign of structural management constraints: the Park does not have the resources, the capacity, or the staff to meet all the demands on management time, budgets, and personnel. Park staff does the best it can with its limited resources and within institutional constraints to support farmers, and has taken what steps it can to make the process of working with the Park less burdensome. The farmers acknowledge there has been improvement and appreciate these efforts; they also recognize that local Park staff face resource and institutional constraints. Recognizing this does not, however, make the practical issues go away, and does not offer farmers any comfort when facing what they perceive as an unnecessary obstacle to making a living or as a threat to their crops and livelihood.

This report documents what the farmers contacted said about these and other issues in interviews. The report also puts the issues and farmers' perceptions of them into perspective. It provides ethnographic context needed in order to understand farming practices and the way these shape farmers' concerns about, and responses to, management actions. Thus, the report offers an analysis of some of the reasons local farmers operate as they do, describes some of the constraints they face as farmers, and makes an assessment of the way management actions affect farming practices. It describes local farming practices in terms of how these are affected by the tenure and terms of leases, the size of parcels leased, the IPM program, a proposal to provide housing for farmers, and the potential for reintroducing land not currently farmed to agriculture.

It is clear that agriculture can play a role in maintaining the historic agricultural character of the landscape. There are farmers ready, willing, and able to farm the land. The presence of farmers on the land makes palpable the agricul-

tural heritage of the area. The Park has significant—perhaps even a unique—opportunity to show the continuity of agriculture and interpret its place in American life, from the period of significance to the present, if the practical issues can be ironed out.

SUMMARY OF MAIN FINDINGS

The Park, Its Mission, and Agriculture

Farming at Minute Man National Historic Park helps the Park achieve its goal of preserving sites related to the historic events of April 19, 1775, the beginning of the American Revolution. The Park may currently be saving more than $100,000 per year by leasing land to farmers (source: Chief Park Ranger).

Since the Park hopes to restore more land to the open, agricultural character it had in the historic era, the savings associated with farming will likely increase. The cost of the agricultural program is modest. The Park receives revenues from its agricultural leases that can be used to support its land management program.

Maintaining the program does, however, require management inputs: it requires Park personnel to devote time and attention to the operation of the program. Since demands on Park staff are increasing, but staffing levels have not increased, the Park does not currently have the staff required to assure the smooth operation and continued success of the current agricultural program, much less to undertake the expansion that would make optimal use of agriculture to achieve Park goals. Current staff does not have a background in agriculture or training in the management of agricultural programs. Moreover, they have too many other duties to give the agricultural program the time and attention required to ensure that the savings and benefits to the Park are maintained and increased. This is true even though the program saves money and helps the Park maintain the historic open character of the landscape. The lack of sufficient staff seem related to problems farmers reported having with the program. A danger exists that this understaffing may erode the agricultural program, or prevent the Park from enhancing the program to maximize benefits to the Park.

The Park and its agricultural program keeps land in open space and active agricultural use that might otherwise have been developed for other uses. It is likely that if the Park did not exist, this land would have undergone the urban-suburban development found in adjoining areas. Indeed, the Park has removed many of the signs of 20th century use, occupation, and development that existed on the land when the Park was established. The Park is preserving and restoring land to open space, restoring the historic character of the landscape, and keeping land in agricultural use in a period when agriculture has declined in the local area.

The Organization of Local Agriculture: Sweet Corn and the Local Market

One of the main findings regarding farming in the Park concerns markets. Local farmers, including those who lease farm land from the Park, depends on sales at farm stands. Another finding is that sweet corn is a critical crop, with a key role in making markets for local produce. In fact, sweet corn is the most important crop for farm stand sales, even more important than fresh tomatoes, because sweet corn draws customers in a way no other crop does. Fresh sweet corn has a mystique in New England that makes it an essential crop.

If it was not for sweet corn, farming might not exist in Concord, Lincoln, and Lexington. Sweet corn is the most critical crop in the market niche—sales from farm stands—that permits local farmers to survive and, in some measure, flourish.

Sweet corn is important not just because it generates a good cash flow for farmers. It also shelters them from competition, since consumers prefer fresh, locally-grown corn over corn shipped in from other parts of the country, since shipped corn does not taste as good.

In fact, corn helps generate the market niche that local vegetable growers depend on: the roadside farm stand. The roadside farm stand in turn support local farming: farming survives in the local area because farm stands make it possible for farmers to make a living. Indirectly, then, farm stands and sweet corn make it possible for the Park to have the agricultural program that saves money and keeps the historic landscape from disappearing under trees and brush.

Local farmers say they must operate in market niches such as the one created by sweet corn, if they are to survive. Farm stand sales shelter them from competition with farmers elsewhere who possess a competitive edge in terms of land, costs, scale of operation, and other factors.

Local farming is not competitive in national and global markets. If area farmers had to compete exclusively in such markets, it is unlikely they would survive: they lack the acreage, the soils, the capital, the labor pool, the climate, the institutions and infrastructure needed to compete with the large-scale producers who supply grocery chains and canneries.

The data on crop selection and decision-making shows a pattern of diversification out of competitive regional and national markets into local markets focused on premium, fresh produce. While the farm stand is the key institution in this local market, Boston-area restaurants that wish to make use of fresh, seasonal, premium quality herbs and vegetables in their menus might constitute a market on a scale appropriate for local farms, if they can achieve the quality and maintain the reliability of supply required for this market.

Few farmers—and none of the younger farmers—make a living exclusively from farming. Non-farm sources of income are clearly important, and may be

critical to the survival of farm operations. Second jobs and the sale of non-farm items at farm stands are examples of non-farm sources of income.

One way the Park can support agriculture is to find ways to support farm stand sales or sales at farmers' markets.

Agricultural Leases

Farmers want long-term leases, in the range of 5-10 years. The justification for this appears compelling: it permits planning and investment and encourages good farming practices.

Farmers would like as few restrictions on ordinary farming practices as possible in the leases.

The Park needs to be extremely clear about what is being leased: is it just the use of the soil, or does it include other resources, such as water supplies and drainage ditches? Such decisions need to be made in advance of leasing.

Agricultural Reintroduction

For reintroduction by farmers, the most likely scenario is to begin with livestock grazing, gradually develop some haying, and then perhaps introduce berries, orchards, vegetables.

Established farmers have a low level of interest in reintroduction. The Park may have to work with less-established farmers. The Park at present lacks the staff capacity to manage an agricultural reintroduction program.

Integrated Pest Management

The farmers make the case that the National Park Service IPM program does not work for them. From their point of view, the NPS decision-making process is not timely, but rather causes delays that cost them money and allows pest problems to increase. The program has lost credibility because of errors.

Some of the problems seem to be a by-product of the administrative structure of the NPS IPM program. As one NPS official pointed out, the staff in Washington that processes IPM requests may be overburdened. Yet appreciating this fact is not likely to make a farmer feel any better when he faces losses to crops that impact his livelihood. An agricultural specialist at the Park could help address some of the problems farmers report.

Crop Hazards

The data suggests that there will be problems of crop theft and vandalism in fields farmed at Minute Man. Theft and vandalism occur at farm fields in surrounding towns as well as at the Park. It seems reasonable to assume such problems will also be associated with the trail system being built in the Park, but there appears to be no reason to assume the incidence of theft and vandalism associated with the trail will be greater than what prevails elsewhere in Concord or Lincoln, or with the rate already associated with traffic along Route 2A. The situation needs to be monitored. Farmers should be encouraged to report crop losses so that the Park can identify problems, should they occur, and can prepare measures to keep theft and vandalism below the threshold where farming ceases to be viable. The preventative steps the Park proposes to take (such as increased patrols, efforts to educate the public) are prudent. Patrol rangers should know who the farmers are and be able to identify their vehicles when they are in the fields.

Farmers report that the destruction of crops by wild life (deer and raccoons) is severe in some fields. They think this problem is increasing. The Park may need to work with farmers on measures to manage this threat to crops.

Housing

While not strictly essential for the agricultural program, providing housing could be helpful under certain circumstances and with particular farmers. If housing is provided, it would ideally be a house with outbuildings near the land farmed. Barns and outbuildings could be important resources for agriculture, and should be evaluated in this light.

Housing farmers implies letting them center their operations on the Park. This might mean a more intensive use of Park land for storage and the processing of produce. The idea of an on-site commercial farm would also entail such uses. Working with farmers with off-site operations may be more practical than setting up an on-site farm, since the Park may want some of the operations, facilities, and infra-structure necessary to modern agriculture kept "back stage," off the Park. For example, green houses and warehouses are part of many local farm operations, but the Park may not want such facilities set up on the Park. Such uses and facilities—integral to contemporary agriculture—might not be consistent with Park goals of recreating a historic landscape.

General Recommendations

Key recommendations based on findings of the ethnographic study can be summarized briefly as follows: The Park should attempt to work with fewer farm-

ers, leasing them bigger parcels on longer-term leases. The Park should attempt to set up its agricultural program so it offers more flexibility to farmers, within the limits set by NPS policies and the needs of the Park.

Given the benefits and savings that flow from the agricultural program, and the expectation that these benefits and savings will increase in the future, the allocation of an agricultural specialist to the program seems justified. Many of the specific problems of the present program can be attributed to the overburdening of present staff, and to the fact that the Park does not have an agricultural specialist.

It is essential that the Park seek technical assistance in assessing proposals for agricultural use when it requests such proposals as part of any leasing system it should develop. Land should not be leased to the highest bidder unless the proposed use is both consistent with the mission of the Park, and has technical merit as judged by objective agricultural experts with knowledge of local markets and growing conditions.

TWO

IN PRAISE OF SWEET CORN

A History of the Palumbo Farm

As told by Joseph Palumbo

"People were ice skating on this land in 1926," Joe says, looking out at the fields his family began to farm just before the Great Depression. That year his father, Antonio Palumbo, originally from Palermo, Sicily, came up from New York to Massachusetts to make a farm for his family.

Antonio Palumbo had been farming in Watertown, New York, growing onions and asparagus among other crops. He also peddled fruit and vegetables door-to-door from a horse-drawn cart. Among his early memories, Joe remembers his father coming back half frozen on the seat of his wagon at the end of the day.

Like his father, Joe's mother—her name was Fransesca—came from Sicily. Fransesca and Antonio had left Palermo to come to the United States, part of a wave of immigrants from Italy that swelled the Italian communities in Boston and elsewhere.[1] Joe believes his parents had known each other in Sicily, but they did not get married before they left there to come to the United States. They had made their separate voyages to the United States, and ended up in different parts of the country.

Joe believes his father may have farmed in Sicily before he came to the United States, but he is not sure what he grew in "the old country." Nor is he quite sure why his father left Sicily, although he feels father wanted to make a better life in this country. He knows his mother's father grew artichokes in Sicily. He was told that his grandfather had to leave Sicily because he had gotten into some trouble with the Mafia. So his grandfather left Italy with his daughters. They landed in Lawrence, Massachusetts.

Although Antonio and Francesca had settled in different parts of the country, they found or kept track of each other after arriving in their new world, and finally Antonio journeyed up to Lawrence to up to marry Frances.

After the wedding she went with him to Watertown, but she missed her family. It was not to find better land or to seek jobs in the mills of Massachusetts or to escape the the snowy winters of upstate New York that made the family relocate to Concord. Franseca engineered the move so she could be closer to relatives living in Boston and Lawrence. "Dad moved up here to be with Mum, " says Joe.

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[1] Other local farm families originated in other parts of Sicily.

It was 1926 that the family settled in the house on Lexington Road in the town of Concord, where Joe still lives, seventy years later.

Joe believes his father bought the farm because he could afford it. "It was dirt cheap, that's why he took it."

It was not the best land in Concord. Although it had been farmed before, by the time they arrived, trees and brush had grown back on much of it.

"My Dad and I cleared it up," Joe says, recalling how they cut the trees with a two-man saw. "Crkkk, crikkk, it went."

They used horses to pull out the tree stumps. Joe remembers his father doing this. He would wrap a chain around a stump, and have his team of horses pull the chain. Sometimes the chain would snap, and whip painfully around his father's ankles. His father, Joe recalls, would keep working. "He was not afraid of anything," Joe says, summing up his father's character.

At the time they moved in, some people were skeptical about clearing the land and farming it, but the Palumbo family managed to do it. They grew food for themselves and some for sale in a stand along the road. They worked hard at it. They made do, Joe reflects, rather than expecting to have everything given to them.[2]

He sees virtue in his own experience—work forms character, and the family that works together survives and gets ahead—although he also recognizes the hardships, the making do and scrapping by, that prevailed when he was a child. Back then, his family and others in the community made use of whatever resources were available to them.

One example of this is the way they "recycled" the work of earlier generations of farmers, who had cleared stones from the land, depositing these in stone wall along roads and field boundaries. Taking stones from a stone wall near their home, the Palumbos built a farm stand by the road, where they could sell what they grew. Recycling the stones of these walls was one of the things people in those days did "to survive." He thinks some stones went into the foundations of local houses. "Back then, that was survival."

The house they moved into was on the opposite side of the street from the fields they cleared an planted. The house—it has a slate roof held up by eight inch beams— had belonged to two brothers when they bought it, who had kept chickens, but it had been built as a school house. The previous inhabitants had heated it with stoves, and Joe remembers the family had to haul out ashes and

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[2]Thinking back to the experiences that shaped him and his attitude towards life and work, Joe feels concerned for what the young today learn. He is not sure they learn the value of work. From what he sees, they are accustomed to, even demand, a degree affluence and parental indulgence unknown in the world in which he grew up. He contrasts this contemporary attitude—this sense of entitlement, this expectation of reward without work—to the experience of his childhood and youth, when life was drawn from the land by hard work, and everyone worked, whole families together.

cinders that had been dumped in the basement. They put in central heating, and fixed it up.

Antonio Palumbo built their first barn right alongside the house. This was before they built the road down into the center of the fields, to where a shop and equipment sheds now stand. They kept a cow and a horse in this first barn, along with a few goats. Joe knocked this barn down after WWII, when it was dilapidated and falling apart. His father had built a second, larger barn across the road in 1929, which Joe also demolished later. They had more livestock in this barn: not only two cows, but hogs, goats and one billy goat, and of course the horses they needed for plowing and pulling wagons.

As a youngster, Joe remembers, he did chores in the morning before he went to school. Getting up at 5 a.m., he fed the horses and the other livestock. You have to feed the horses before you put them to work in the morning. "It's like the human body. They need to be fed." He walked to school, although there was a school bus, a Model T or A Ford, that came along Lexington Rd..

By the time he got up at 5 a.m. to do his chores, his Mum was already up. She'd milked the cows and the goats the family owned before any of her children got up. They used to drink goat milk then, but Joe doesn't like it now. He remembers that he used to gulp it down back then.

Cats inhabited the barn, and Joe remembers how he used to squirt milk into the mouths of kittens. His mother did not approve of such shenanigans. She was as much in charge of the barn and the livestock as she was of the house and children. "Only Mum could milk the cows without trouble," he says. "They knew her, were used to her. She'd wash their udders with warm water. She always talked to them. When Mum was ill, it was tough to milk the cows. We'd have to hold them by the legs to keep them still." Joe remembers getting kicked a couple time.

There were eight children in the family—four brothers, four sisters. Joe was the youngest brother, and is the last remaining one. There are three surviving sisters. Feeding this many children was a challenge to their mother, especially after their father died. His mother made bread for the family, fresh Italian bread with olive oil. In fact, she enjoyed a reputation as making some of the best bread around, so people used to come to ask her for bread: but she would refuse to give them any, saying, I have eight children, do you think it is easy to feed them?

Joe was the youngest son. Joe did not learn to speak fluent Italian because by the time he came along, his older siblings were in school and speaking English. He can understand Italian and speaks some. On the farm, Joe worked with his brothers in the fields, while two sisters tended the farm stand.

Joe feels his mother taught him to be honest. He says this has made him outspoken: he will speak his piece honestly, not calculate the consequences. While he sometimes a price for this willingness to speak his convictions, he's found that honesty is important for relationships. "It's the best way," he says.

Besides the value of honesty, he appreciates hard work. But he also stresses the value of helping people. He gives generously of his time, energy, and knowledge to others, saying he believes in "giving a hand," and that a person "should try to help his neighbors."

"Honest people end up poor," he reflects, adding that the crooks of this world always "come with their hands out" for your money. He expresses this with lively moral outrage.

His mother was determined that her children should make a good appearance in the world beyond the farm. Before they could go to school, their shoes had to be polished. She always made sure they and their clothes were clean. Before going to Sunday Mass, her children had to take bathes and shine their shoes. "She was the boss," Joe says, " the chief engineer." Her initiative and discipline was central to the life of the Palumbo family.

Sunday was a big day at the Palumbo farm. The relatives from the city came out—from Lawrence and Boston. They all had some trade—some were masons, others were carpenters—and they all pitched in to help the family.

Joe's father died at work on the farm. Joe was working with him one day, but his Dad thought the others needed him more, so he sent Joe to help them. Later, Joe's grandfather came by to tell him his Dad needed him in the barn. When Joe got to the barn, he found his Dad lying on the ground, his head opened up. Joe thinks he hit a spike as he fell, and that is what did it. His father was still breathing. He ran out to get help. They came, and they got some one in a car, a man with experience in the Merchant Marine, just back from China, who knew something of accidents. Seeing Joe's father was breathing, this man said, let's go, get him in the car. They loaded him up and Joe's mother went with him. She was talking to him but he did not answer. He grasped her hand. He was dead by the time they got to the hospital. Joe thinks he was dead by the time they left the farm.

His mother told him that at the hospital they had to break his father's fingers to release his grip on his mother.

After his father's death, Joe went into shock. He lost the ability to speak for a couple of days, he recalls. "I will never forget that day in 1933," he says, shaking his head and looking away.

He was fourteen years old. His family had been surviving the Depression better than some; but now real hard times would begin for the family..

After his father died, Joe's mother had to hold the family together, and provide for her eight children. She kept the family going with help from her two brothers. Joe says they helped with the mortgage, and made sure the family was fed. One of the uncles was Joe's godfather, and he recalls this uncle with great fondness. "Uncle Joe loved kids," he says of his namesake.

The uncles were wholesale importers of dry goods from Italy. They imported pasta, olive oil, and salami, among other items. Uncle Sam was the salesmen,

who traveled around the country, while Uncle Joe minded the business in Boston's North End.

Joe used to work for his uncles in the winter, along with his brother Frank, doing inventory, loading trucks, and other work. He remembers loading boxes of pasta, and rounds of cheese. The boxes of pasta were only 20 lbs., which was nothing to Joe's mind, but the rounds of cheese could be fifty pounds. He remembers the rounds of cheese were covered with a black layer of olive oil that could get into cuts. His brother got an infection once and had to be sent to the hospital.

Joe does not paint a picture of drastic discontinuities before WWII. Even the Great Depression was not, in his account, as hard on them as it was on some. Life was hard, and required hard work, and the Depression was just more of the same. On their semi-subsistence farm, they could feed themselves. With WWII, however, change came and transformed the agricultural landscape and the nature of farm operations. It also changed lives. Joe went into the army.

Just before he did so, in 1940, he met the woman who would become his wife. Her name was Alice, and she was not Italian, but the daughter of a Polish family that lived in Maynard. Joe first met her at a carnival—young people used to go to a carnival in a nearby town, since Concord did not have one. The next time he saw her was on the bus. It ran from Harvard Square, through Concord, all the way out to Maynard. He used to take the bus to go see movies. One day he saw her on the bus, and he started chatting with her. "Why are you always on the bus? " he asked his future wife, and learned that she worked in Concord.

Then he had to go into the service. Alice waited five years for him. They got married in 1945, when Joe came home on a three-day pass. He didn't want to wait, and told her they had to get married. So they did, and that's why, Alice recalls, they did not have a big wedding. The wedding may have been rushed, but the marriage has been enduring. They celebrated their fiftieth anniversary in 1995.

They had their first child in 1946, a daughter, and then two more daughters followed, and last, a son. None of the children have gone into farming. Joe does not seem to regret this. "He saw what its like," he says of his son. "It's hard." His son went into teaching instead, became a school principal, and then an educatinal consultant, affiliated with the University of California at Los Angeles, far from the corn fields of New England.

Drains and Drought, 1930s-1995

Water is critical to agriculture. In 1995, the local TV news carried a number of stories about the drought and how it affected farmers. Lack of rain needed for crop growth is indeed a problem, but excessive rains and dampness poses problems, too. Like Goldilocks in the children's story, farmers seek a middle

ground between extremes— "too little" rain is a hazard, but so is "too much." Amounts of natural rainfall may rarely be "just right."

Like other farmers, the Palumbos over the decades negotiated the hazards for agriculture of too much and too little water. They have adapted to the natural variations in rainfall that diverge from what is optimal for their crops. Their need to regulate water—to find the happy medium that's "just right" for agriculture—has led to capital investments in irrigation and drainage systems.

The most striking feature of the Palumbo farm is its drainage pattern. When the rains finally arrived in November of 1995, ending the drought that had lasted most of the summer, water spread over sections of the fields, and the rest of the farm looked as if another round of heavy rains would submerge it. The water formed shallow ponds where lettuce and corn had grown over the summer. .

Joe explains that the land underneath the Palumbo farm has a ledge under it. Water does not drain away quickly, and sometimes it forms these pools. This is the reason people could skate here, when the family first arrived.

A series of ditches, lined with reeds, cut across the fields, running roughly north-south. These were dug in the 1930s, by hand and with horses dragging scoops, to carry excess water away. Even with these drainage ditches, however, water forms pools on the fields after heavy rains. Irrigation ponds were also dug, and Joe used irrigation extensively to combat the drought of this summer. Even in normal years, he would, like other local farmers, use irrigation to enhance yields and improve the quality of his crops. In this year, many farmers wanted to buy or expand irrigation systems, and Joe was selling some of his equipment. As a couple prospective buyers came up one day, he greeted them by asking, "Dry enough for you?" They laughed ruefully.

Joe prefers ponds for irrigation. He feels well water is harder on plants, because it is colder. He advocates pumping water into a pond before applying it to corps. He has a gasoline engine running one of his pumps. He puts enough gas in it for two hours, and lets it run. He uses over head irrigation, delivered by metal pines and sprinklers. For corn, he had a traveling irrigation gun, a large nozzle that moves along the field.

Joe Palumbo evaluates fields as either "hot" or "cold". He calls a fields "hot" if it can be plowed soon after a rain. The fields of the Palumbo farm are "cold," drying out rather slowly. Speaking of the soil of these fields generally, Joe says they are not sandy, but they aren't clay either. He describes them as a heavy loam. I've asked him, so he gives this general description, but in fact his knowledge of the soil of these fields is much more detailed than this global characterization would suggest, and when assessing what is occurring as plants grow—or fail to grow—on these fields he makes finer distinctions. For example, one day I caught up with Joe while he was weeding some newly planted beds of spinach. These "beds" are slightly raised strips of soil, with three rows planted in each strip. They run the length of the planting. Joe said up the spinach was coming up thin in stretches of the rows; he thought there had not been enough

moisture for proper germination. He pointed to one end of the rows and said "It [the soil] is heavier there," so the spinach was coming up better. He asked me if I could see thicker rows at that end. This kind of detailed knowledge and monitoring of the soil is typical of farmers, as is the joint referencing of soil characteristics and of transitions between soils of different characteristics.

There is a lesson about farming in this. Farming requires not just general knowledge of machinery, crop plants, cropping systems, but also an intimate knowledge of the soil in relation to all these. It involves the continual monitoring of soil and field conditions, and adjustments in production plans and farming practices on the basis of what the expert eye of the farmer sees. Decisions have to be made, plans and processes adapted to changing conditions. Detailed knowledge of crops and soil, and flexibility in decision-making based on close monitoring are key. Is the soil too dry for germination? Too wet or cold for proper germination of a particular variety? Is it time to irrigate (which should be done before plants show signs of stress, and at points in the growth cycle where irrigation will lead to the highest quality crops)? Do field conditions call for substituting another crop for the one originally planned? Fields and crops are always supplying farmers with feedback, and successful farmers pay close attention to what the soils and crops teach them. If what they learn this year cannot help them, the lessons may be valuable in future years.

The fact that the Palumbo fields tend to accumulate water complicates farming on them. The fields cannot be plowed as early in the spring as other land. Palumbo used to lease land in Concord that he could plow as early as March some years, and the first week of April many years. On their own land, they sometimes have to wait until June, fifty, sixty, or even more days later. This gap makes a difference—since an early crop of lettuce or spinach could virtually be grown in this interval between early April and early June.

Poor drainage affects crop growth. Too much water can kill the roots of plants. This happened to some of the spinach he had planted. Some of his spinach never germinated because of the drought, while some that did later drowned at the roots. Farming involves trying to get a crop in and harvested before changing conditions make it impossible to do so. Even a farmer with Joe's depth of experience cannot expect every thing to grow and to produce a good harvest. The effort to coordinate cropping practices with the changing conditions of soil, weather, and growing plants never ends.

Moreover, some things are beyond the control of any farmer, like this summers' drought, or the collapse of infrastructure beyond the borders of a farm. What Joe Palumbo calls his "creeks" were dug in the 1930s to provide drainage; they represent an effort to control water in these fields to make crop production possible. Joe maintains them today, but he feels that the larger drainage system of the Mill Brook has been neglected and that this affects the drainage of these fields.

Land and Crops, 1926-1996

In the 1920s especially, but continuing until the war years, the Palumbos grew food for themselves and their animals, while selling some crops for cash. The Palumbo farm, as Joe describes it, started out as a semi-subsistence farm, producing food for the family and for sale at a road side stand. This may have reflected either Antonio's experience as a peddler, or the tradition of roadside sales in Concord, or, quite likely, both. Later they would take produce to Boston markets, including the wholesale produce market at Fanueil Hall. As time went on, crops grown for cash became relatively more important. Even today, Joe continues to grow food for the kitchen; but the Palumbo farm always sold some produce.[3] The story of crop selection reflects market opportunities, which shifted over the years. Joe's account gives a sense of how life changed; at first, production was for subsistence and for sale at a roadside stand; later, production was tailored to markets. It appears that the ratio of subsistence to market production was shifting incrementally towards commercial production from virtually the very beginning, even in the years before the WWII,and then shifted decisively after the war. Something of the foundation for commercialization and the mechanization that went with it had been laid before the war years, but the specific catalyst for the Palumbos was the experience Joe's brother Frank had as a corportate farm manager during and just after the war.

Because they lived on a semi-subsistence farm, Joe does not remember the Depression years as being radically different from other years: they could feed themselves, and scrape out a living. He recalls that the government bought pigs, so people could get some money.

In the 1930s, the Palumbos grew celery and lettuce on the land people had skated on in the 1920s. They also grew greens, collards, a little corn, pumpkins and cabbage for sale. They grew fennel. Celery, however, was the main cash crop. They used to sell celery to a grocery chain. Joe says they "raised everything for the house." He recalls picking green peppers, canning tomatoes, storing carrots in the sand. They had a dry cellar for carrots. They used to dig a pit for storing celery every year; they would put in celery roots and all, "for early spring money."

Sometime in the decade, Joe recalls, they hit a rock in one of the fields while plowing with a team of horses. They stopped and starting digging, but couldn't get it dug out. Ever since, Joe always remembers where that rock is, and every year raises his plow to miss it. But now the plow rides on a hydraulic life behind a tractor.

Horses as plow animals disappeared with the mechanization of farming. The Palumbos got their first tractor in 1939. It was a 20 horse-power Case.

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[3] Many US farms grow commodities for the market, not for themselves, and all or virutally all the food consumed by the household comes from supermarkets. For the most part, modern farms are as highly dependent on the economy as any business.

"Not much of a tractor," Joe comments, "a toy, couldn't really do much." Until they got this tractor, however, they had relied exclusively on mules and horses. Since farm animals have to be fed, some of the back fields used to be pasture.

Thus the 1930s ended with the farm on the verge of entering the age of mechanized, commercialized, and market-driven agriculture. However, the war would produce a hiatus in these developments.

At the begining of the 1940s the lands owned by the Palumbos continued to be farmed, and was mostly in celery. The early 40s continued the pattern of the 30s on the farm. But during the war years it was not farmed as intensively. Joe went into the army (where he served in the Aleutians Islands). His brother Frank could not go into the service because he could not pass the physical exam required for military service. He was left with the dilemma of how to run a farm when everyone was gone; farming was labor intensive, but there was no one to do the work.[4] What he ended up doing was going to work as a farm manager for Andy Boys, a large commercial farm operation, which grew crops for canning and the large-scale commercial markets. Frank leased the Palumbo land to this large-scale farm operations. Frank picked up some ideas about farming from working for Andy Boys, says Joe, but he also showed them how to farm locally. What Frank learned—about mechanization and markets—the Palumbo brothers would later apply after the war to the revived Palumbo farm.[5]

After the war, Joe did not immediately get back into farming. He was not sure he wanted to farm, and he worked for a while as a truckdriver, first for the Andy Boys at 75 cents an hour, and then for Raytheon at $1.25 per hour. He found that the routine of driving the same route over and over wore on him. And so when his brother Frank suggested they could "go in together" to farm in Concord, Joe was prepared to give it a try. So Joe joined his brother in the early fifties (he thinks it was in either '52 or '53) to become a farmer again, returning to the family farm in Concord. Eventually, they farmed as many as 250 acres of land at various places in Concord and near-by towns.

By the 1950s, the Palumbo farm had made the transition from being a semi-subsistence farm to being a commercial operation. They made a series of interrelated changes in their farm operation. They changed their mix of crops, shifting

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[4] German and Italian prisoners of war from Ft. Devins and Wellesley college women worked on some area farms, Joe reports.

[5] Joe notes that the Andy Boys had farms in Arizona and California as well as here. He thinks they had as much as 22,000 acres under cultivation and that they were at one point number three among the biggest growers. He visited one of the Andy Boy farms in California once. In Massachusetts, they had a big packing plant, where they repackaged celery, broccoli, and other crops. Joe believes that only the Andy Boys had a "real" packing plant. They employed about fifty people there. Among other things, they used to make salad in poly-forms. They had gone out of business in Massachusetts by the time the Palumbos grew carrots. Joe thinks they were not making enough money after the war.

from celery and lettuce as their primary commercial crops to carrots and parsnips in the late 50s and early 60s.[6] They mechanized. In 1956, they bought two tractors. For carrot production, they needed seeders, bedders to make the beds in which the carrots were planted, and other machinery. They leased more land and increased the scale of their farm operations. They shifted from manure to chemical fertilizers. Chemical pesticide became widely available, and they used these.

They sold their carrots at the wholesale markets in Boston. They once sold seventy-five boxes of carrots to the ocean liner QEII when it was in port in Boston. They got a call from their broker, who said the ship needed them. Joe said, OK, come and get them. The broker replied that they had to be delivered right away, so Joe and Frank took the carrots to Boston.

They started out selling bunch carrots, then in the mid-sixties they sold cello carrots (carrots packaged in plastic bags). Their sensitivity to the market—and awareness of the way changes in the market can cut the ground out from beneath a farm operation—led them to abandon carrot production by the end of the sixties, however, despite the capital investments they had made (not all equipment can be converted to other crops) and the markets they had developed. They felt that carrots were not going to do so well as others started to grow them and as competition from other states intensified, so they got out of the carrot business. After this, they grew sweet corn, staying with it for the next 30 years, from the mid-sixties to present.

When they started into carrots, people questioned the move. But when cello bag carrots did well, they started growing them too, and Joe told his brother, "Well, its time to get out of carrots." Repeatedly in interviews, Joe stresses the need for cautious risk-taking, the need to experiment, to try things out, in order to stay ahead of the game. While averse to the idea of piling up debt, or rushing out to buy the newest, biggest, most expensive tractor—which might be a good investment for growing soybeans in the midwest, but for the smaller scale of farming in Concord—he feels that the attitude that "you'll never be able to do that" is sometimes the biggest obstacle to adapting a farm operation to take advantage of opportunities. Opportunities have to be perceived before they can be developed. Risk—but also rewards—come with this.

The Sweet Corn Years

A local grower says the Palumbo brothers "did about the best job of growing sweet corn" in the area. Stand owners from all over eastern Massachusetts—some as far away as the Cape—would come to Palumbo Farm to buy sweet corn. "Trucks used to line up at 7 in the morning," Joe recalls.

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[6] They continued to grow a variety of crops on the land they owned that is now in the Park, since it was too heavy for carrots. They grew some carrots here, but also beans, lettuce and other crops.

Joe and Frank used to sell wholesale to two grocery chains: Stop andShop and Star Market. They sold them corn, and also lettuce and other crops. However, Joe says these chains "got so big we couldn't supply them, so they went out of state." For their part, the Palumbos felt that the grocery chains were not willing to pay them enough—"were always trying to beat down the price"—and shifted towards the local market for fresh, premium corn, where they could get better prices and see their produce handled better.

The varieties of corn Joe grows have a poetic ring. Sweet Dawn. Calico Bell. Silver Queen. Delectable. Seneca Brave. Gold Nugget. In the naming of varieties, yellow corn becomes gold; white corn is silver or platinum; bi-color reminds the seed companies of honey and pearls, of butter and sugar. The names evoke summer, the freshness and sweetness of corn, in flights of fancy, and perhaps remind the buyer of the qualities and claim to superiority of a particular variety.[7]

Joe says, "Sometimes I think there are too many varieties." Local growers supply local markets with yellow, white and bicolor corn. Joe prefers yellow corn, himself. "Gold Nugget is about the best one," Joe says. He like yellow corn because "you get a better eating ear" than with bicolor corn.

Joe once grew a famous white variety, Silver Queen, but gave up on it because the plants would get too tall. The beautiful, towering green stalks would sometimes topple over in rainy, windy weather. He prefers corn with sturdy, medium size stalks.

One factor in choosing varieties to grow is the need to have a supply of corn from as early in the season as possible, until after Labor Day. He tries to stagger the maturities of his corn. He plants early varieties, maturing between 62-66 days, and then later maturing varieties, "right up the ladder" of maturity dates, to corn that matures in approximately 88 days. Thus, the seed catalogues describe Delectable, one of the varieties Joe mentioned, as a "mid-main season" corn, maturing in roughly 85 days. The seed catalog says of Seneca Brave, with a maturity date of 72 days, that it "gets you to market sooner."

The goal of growers is to fill in the season, making sure they have corn to sell for as long as possible. They want to get corn on the market as early as they can, by mid-July if possible. Staggering maturity dates is one strategy for doing this; staggering planting dates is another method. A picture of Joe that was published

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[7] In seed catalogues, we find American royalty. Sweet corn is the Silver and Golden Queen and Bi-Queen of summer. A variety may be a Legend, a Platinum Lady. There is a Yankee Belle and a Sweet Belle—the thesaurus lists goddess, enchantress, seductress, and femme fatale as synonyms for belle. Corn does seduce the sense, enchant the taste-buds. Sweet Corn, the catalogues imply, is the Ambrosia of summer, Delectable, playing a Calypso on the taste-buds. If Sweet Dawn or Seneca Dawn are supposed to make us think fresh and early maturing—as early and fresh as dawn mist or morning dew—then Seneca Starshine must mature even earlier , not even waiting for the sun to come up. Since, however, it is later maturing variety than Seneca Dawn, perhaps the person naming it merely got carried away.

in the local paper shows him bundled up in warm clothes, plowing up his fields in March.[8] He looks cold sitting on his tractor. Yet plowing early in the spring reflects the need to get crops planted early so that production can be sustained over as long a harvest season as possible.

Their may be trade-offs between early maturity and other factors. Joe tried out one variety that matured very early, but found that the ear was too small. "If people are going to pay $4 a dozen, people want a full ear of corn, not a miniature." He prefers a full size ear of corn for the premium market. Delectable is advertised as having "large, well-filled 9 inch ears," with "16-18 rows" of kernels.

Even before selecting specific varieties, growers must also choose between different kinds of hybrid corn, each of which comes in many varieties. "Sugar enhanced" varieties—abbreviated "se"—have kernels modified by a gene that produces a higher sugar content. Super sweet varieties (the sh_2 type) also have genes that produce a higher sugar content than found in other corn. The texture of these corns may vary—the se being creamier, while the super sweets have crisper, crunchier kernels. The super sweet varieties retain their sweetness better for shipping.

Joe does not grow the super sweet varieties, however, for two reasons. First, these varieties require isolation; they must be kept away from other corn, to avoid cross-pollination. He feels there is not enough land to isolate corn fields. Second, he believes the super-sweet varieties are better adapted to warmer climates, such as the South or parts of the mid-West. He says super sweet varieties shipped from Florida have cut into the early local market since the 1980s. Joe grows only se (sugary enhanced) varieties these days. They give him the sweetness and texture needed for "gourmet" sweet corn, but do not require isolation and do well in New England.

Sweet corn and the local market niche.

The Palumbo brothers got into corn because carrots and their other crops were subject to intense competition. Some of this competition came from local growers who saw that the Palumbos had tapped a market for carrots. "Everyone started getting into it," Joe remembers. However, this boom did not last long—"And then everyone got out," Joe adds.

Local production of carrots faced intense competition from other states. "California was killing us." He notes that "Canada started in, too," competing with Massachusetts grown vegetables. He goes on to paint the picture of international competition that vegetable growers face today, with vegetables coming not only from Florida and California, New Jersey and New York, but from Mexico and South America as well.

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[8] When farmers can get into their fields varies from year to year.

With the loss of markets to vegetables grown in other states and countries, sweet corn is left as one of the very few crops that local farmers can make a living growing. The biology of sweet corn helps protect local growers from the onslaught of national and international competition. After harvest, the sugar in corn turns into starch, and so sweet corn does not ship as well as carrots or potatoes. This characteristic helps preserve local sales and premium prices for local growers, who can pick corn fresh daily to supply local outlets. "Local corn is always a seller," Joe remarks. "Carrots can come from any place. But people want fresh corn."

For a while, the Palumbos used to sell wholesale to local grocery chains, such as Stop n' Shop and Star Market. Local growers also used to supply lettuce and other crops to these chains. However, local farmers could supply produce in the volumes and at the prices that grocery chains wanted. When Joe says of the grocery chains that "they got so big that we couldn't supply them, so they went out of state," he states a basic dilemma of local farming: larger operations elsewhere appear better equipped by virtue of the scale and organization of their operations, their access to land and resources, and a variety of other factors, to capture markets. Farms in eastern Massachusetts cannot compete. Moreover, out of state operations may have the advantage of extended growing seasons in climates more conducive to the growth of many crops. Since urban and suburban development severely limit farm expansion, local growers cannot compete by attempting to achieve the same scale as (for example) much of California agriculture; rather they adapt by changing what they grow, by specializing in crops for which local demand exists, and by seeking to create local demand for local crops. "Local produce has an edge. People would rather have local corn."

Even a few hours can make a difference. Joe says stand owners could buy corn in neighboring states, but " if a stand operator buys corn in Connecticut, he has to drive there and back, maybe wait for it to be picked. By the time the corn is put out on the stand, it'd be 8-9 hours old." The market niche available to the small family farm is for premium, fresh corn. In producing such premium corn, every hour counts, and this is what gives local growers an advantage. "People like to pick it early in the morning, and have it on the stand by nine." Joe adds that the old adage was, "Pick it and put it in the pot."

Without this niche, created by the demand for locally grown corn, local farming would be even more vulnerable than it already is. It is no doubt an exaggeration, but perhaps not a great one, to say that the biology of sweet corn has helped preserve farming in Concord from extinction. The peculiar biology of corn—the ways sugar races to become starch as soon as the ears are picked—gives the local grower their niche. Because of this characteristic, etched as it is into the minds of local customers, local farmers are able to shelter some sales from competition with larger farms and agribusiness located in other states and nations.

It is because of his skill as a grower of sweet corn, and his adaptation of his operation to the market niche sweet corn sustains, Joe was able to survive as a farmer in Concord for the last thirty years, which were generally hard years for American family farms. Growing sweet corn for a well-defined and developed local market, he managed to make a living during the long years of the nation's farm crisis, a period of farm failure and bankruptcy when many felt the American family farm was heading towards extinction (Barlett 1985).

THREE

DREAMS OF THE LAND: A FAMILY FARM IN CONCORD

The Nowalk Farm

As told by Helen Marchocki

The story of the Nowalk farm begins in Europe, with the strivings of a man who wanted to make a better life for himself. In the 1920s, Aleck Nowalk lived near what at that time was the border between Germany and Poland. He was Polish, but he crossed the border to find work on farms in Germany. It was on these German farms that he first learned to be a farmer.

He could not buy land or find work in his native Poland. He decided to seek opportunity by emigrating. He ended up first in Argentina, working on a large cattle ranch. But he wanted to come to the United States.

While in Argentina, he spotted an advertisement offering to sponsor people to come to the United States as farm laborers. He replied to the ad, and wound up working for a family of Yankee farmers in North Reading, Massachusetts.

While working on this farm, he met Anna. She had been born in Maine, but had returned with her mother to Poland when she was two years old. Later an uncle helped her return to the United States in time to meet and marry Aleck.

They had two children while Aleck still worked as a farm laborer at the Nichol's farm in North Reading. They named their son, Edward, and their daughter, Helen.

Aleck decided to strike out on his own. The Nowalks moved from the Nichols farm onto an 11 acre farm he had bought, on which he built their first home.

These were the years of the Great Depression, but they did not acknowledge it. "Their philosophy was to make do,"their daughter says

Times were hard, and people were lining up for assistance—but not the Nowalks, who felt they could survive if they worked enough jobs and farmed the land. "They never cried poor," their daughter recalls. "They were too proud to admit they were hurting. They took pride in supporting themselves. We felt we were well off as long as we had something to eat and father felt he could make the payments."

Aleck had three jobs during those depression years—he farmed, he worked in mills, and he delivered eggs and produce on a route in Chelsea. He found a market among the Polish residents of Chelsea for the produce of his market garden and for fresh eggs from the chickens they kept. Between the mill work, the farming, and deliveries, he worked long days and long weeks.

While at the North Reading farm, they brought Helen's grandmother over from Poland, to watch the children while they were off working.

Grandmother soon bought two cows for the family. Helen thinks it was grandmother's own initiative to buy these cows, and she doubts that her father ever wanted to get into the dairy business, even though dairying eventually became one of the mainstays of the family's farming operation. While Aleck Nowalk loved market gardening—growing sweet corn, potatoes, strawberries—he was not fond of cows.

Aleck and Anna wanted to buy another farm, a bigger and better one. Eventually they found a run-down farm in Concord. The land and buildings had been neglected by the people who owned it, but Aleck thought the soil was good. So the family moved to Concord just after WW2. The place was known as Maplewood Farm, and they decided to keep the name. Sitting in the kitchen of the farmhouse they bought, their daughter observes how much this farm meant to all of them. It was the culmination, she says, of years of effort. They had scrimped and saved, worked hard and labored long, to buy this place. This farm was their dream.

When they first moved in, however, the dream needed some work. The barn and the house urgently needed repairs. They had to put new beams and flooring into the barn; that was the first priority. The house also needed new beams and flooring: before they got it repaired, their feet would sometimes drop through the floor, and cold air would creep in. There was an old orchard that had to be cleared away, and brush had grown up on much of the land. The Nowalks set out to get all of this in shape. At the same time, they had to make money to support the farm, until such time as it might support them. They needed to buy farming equipment and supplies. None of the land had been cultivated for years, and that first year they plowed it up with a neighboring farmer's horse.

Helen recalls her parent's ambitions and anxieties from that time. "They were frightened that they might not be able to make it." They got jobs off the farm. They worked in mills in Malden and Arlington.[1] Her mother was a presser in a cleaning factory, and her grandmother did odd jobs in factories. "All for the farm," Helen adds.

The children worked, too. In fact, Edward had worked long enough even before they moved to Concord to save some money. He did odd jobs—mowed lawns, raked leaves. Helen recalls that he saved everything. When he finally decided to spend some of it, he used the money to buy his own John Deere tractor.

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[1] Helen thinks her father worked for the Sanford Mills, and that mill may have produced rubber products and possibly an early synthetic textile, but she is not sure about either the name or the products.

He did not tell any one what he was going to do, so he surprised the whole family. Everyone was very proud of him. It was his own decision, Helen says. He was 15. That was the year they moved onto Maplewood. Helen was 14.

Her brother showed Helen how to drive. They were both driving before they were old enough to get licenses—they'd drive farm equipment and the second hand pick-up the family owned.

Helen and her brother cleared the old orchard out so vegetables could be grown. Edward and Helen used a rented caterpillar tractor, a bulldozer, to take out the apple trees. The man who dropped it off showed Edward how to operate it, and he showed Helen. She remembers the trees splintering like toothpicks. "It was a thrill," she exclaims, "so much fun. " She says this with a broad smile, as if re-experiencing a little of the thrill.

At that time, the house was in terrible shape, she says. "We were freezing. The furnace did not work. We all sat in the kitchen, where there were holes in the floor, all of us freezing. The stove in the kitchen only threw out a flicker of heat. To make it we sat around in overcoats. We would study in the kitchen." Helen recalls stacking hay against the foundation of the house to help keep what little heat there was in, and the cold out.

When the Nowalks arrived, the house at Maplewood Farm was connected to the barn by another building, an example of what Helen says is known in New England as the "ell". Edith Wharton in the novel Ethan Frome describes the "ell" in this way: "that long deep roofed adjunct usually built at right angles to the main house and connecting it by way of store-rooms and tool-house, with the wood-shed and cow-barn."[2]

One day Helen's parents told her and her brother to knock this down. So, she says, they got to work. They had taken their parent's instructions literally, and climbed onto the structure with sledgehammers. "We were doing a damn good job of knocking things down, when Louie Albano stopped his car and ordered us down." As he drove by, a neighbor had spotted them at work and was afraid they would hurt themselves. He screamed at them, "Get down, its going to fall." He threatened to tell their parents, and they replied their parents had told them to do it.[3]

If the Nowalks tore down to make way for the needs of their family and farm, they also built up. They put in a silo; and when this one fell over, they built the one that stands on the farm today.

The Nowalks put up a farm stand along the road. Helen was given the job of watching the stand and dealing with customers. "I can still recall my mother," Helen says. "She always made sure we were productive. I'm still that way. At

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[2] This passage from Ethan Frome was pointed out to me by Helen's daughter.

[3] Helen regrets tearing down this structure now, noting that they did not know its value back then.

first, all we had to sell in the stand were beets. And so to keep me busy, my mother, she brought out bushels of clothes for me to iron." Helen remembers how embarrassed she used to feel, on the road side ironing clothes when customers came by. She was embarrassed too because they only had beets for sale. Most of all, however, she values the work ethic her mother instilled in her.

Then they had their first corn crop. Her father had bought the farm because of its fertile soil and good farming potential. That year proved him right; the land and their work yielded a good harvest. Word soon got around about the Aleck Nowalks's corn, about his potatoes, his strawberries. These were their main crops, and Alec Nowalk's specialties, the crops he spend most of his time on. Helen says her mother would take care "of the carrots, the beets, the string, beans, the little things you need for the stand." The roadside stand soon got to be too small, and they had to build a larger one.

When they bought the farm in Concord, their neighbors helped the Nowalks get established. Helen feels there was a strong bond between farmers.

"We all looked after each other. If they knew some one was ill, they'd be there. In many ways, they were as much your family as your real family."

"When there was a problem, they were over here to offer help but they never wasted your time with gossip."

"People went out of their way to see we had what we needed to make it. They didn't want us to fail."

Helen describes the responsiveness of other farmers as teamwork, as help, as real concern. She sums up: "you could not ask for a better neighborhood." She credits Louie Albano and Eddie Carlson in particular as having helped put her family on their feet. Louie Albano would come by, asking "Is there anything you need? Do you need anything?" When they first moved to the farm, right after WWII, she remembers Eddie Carlson bringing a horse over so they could start plowing fields.

Helen remembers some of the challenges of farming:

> "The hardest thing was getting equipment. And we had only so much time in which to do things. And farmers have to fight the elements. If it rains too much, you lose the potatoes. The blight can get them. Corn is one thing you have to spray—or borers get in. "

The preferences of customers could also be a challenge:

> If people see a worm in the corn, they run out of the stand."

The Nowalk farm specialized in sweet corn and potatoes. Other crops were grown exclusively for their own stand, but Aleck Nowalk sold his corn and his potatoes to the operators of other roadside stands. Helen and her brother, as far as she can recall, made only one trip to the old Boston produce market at Fanueil Hall. (Helen, saying she must really have been a country girl, recalls that she found the hub-bub of the city market a dizzying contrast to the quiet of rural Concord.)

After that first year, the stand owners came, and the Nowalks did not need to go to Boston. Word got around about the quality of Aleck Nowalk's crops.

The dairy was the other part of the Nowalk farm operation. They grew hay for the cows on the back fields, where there was a lot of clover. They started out with two cows, and then added to their herd, "adding a cow here and there—they used money from the milk to get another cow." Helen notes that this was a combined effort on the part of her mother, father, and grandmother. Eventually, they had a herd of 20 cows. They made silage out of the corn stalks, after the sweet corn had been picked. They bought grain for the cows.

"It was grandmother who came up with the money to buy the first two cows," Helen remembers. Here family history repeated itself, since grandmother had also purchased two cows for the North Reading farm. Aleck Nowalk didn't want to get cows, but he was overruled by the women of the family: they wanted cows, and they got them. Helen thinks her mother and grandmother loved the cows as much as her father loved the soil, the land, the earth.

Helen and Eddie milked the cows by hand until they got milking machines. "At first, we went into Jerseys and Guernseys. We wanted the butterfat. In those days, people thought the more cream, the better the milk. Then we went into Holstein's because what was wanted later on was low butterfat milk."

Passed on to Edward Nowalk, the Nowalk farm was among the last dairy farms in Concord, as well as one of the area's last truly diversified general farms, since it combined livestock and truck crops in one operation. The farm continued to grow corn and other crops after the dairy closed in 1990.

In the third year at the farm, they started acquiring the equipment they needed. They began to accumulate tractors, mowers, balers, corn choppers, and other farming implements. The first two years had been very rough, since they worked by hand and horse and relied on the help of their neighbors. "It was touch and go for the first few years. Farming takes stamina. You wonder if tomorrow the elements will ruin everything you do."

A Typical Day

Helen describes what a typical day was like in the early years after the Nowalks moved onto Maplewood farm. A day would go more or less like this: chores, school, chores. Her brother would get up at 3:30 or 4:00 in the morning to milk the cows. At first this was done by hand, until they got surge milking machines. After milking, they fed the cows hay and silage.

The school bus would come for them before seven. Helen remembers that their place was the only place the school bus driver would wait at, and not yell at the kids who were late, because he knew Eddie and Helen had to get cleaned up after their chores.

> "The bus driver lived in the house at the corner of Bedford and Lexington. His name was Mr. Thorpe.[4] He had a fish market, and he drove the bus. He had no patience with tardiness, but he made an exception for my brother and I because he knew we had our farm chores. He would wait to let my brother and I wash up after milking and feeding silage."

Breakfast was eaten very fast, so they could catch the school bus. Then it was a long ride to school; the school bus route included Bedford Rd.

By the time the school bus came, in those early years, her father, mother, and grandmother had already left the house to work at their jobs in the mills.

Helen says she was a good student. She loved Concord, and loved history. She says she felt, and still feels, very proud of her American heritage, of the Revolution. she struggles to put her sense of history into words:

> "It is hard to put into words what I feel about Concord. I'm actually living on the land where freedom and liberty started. I really credit what those farmers [the Minute Men] did. They put us on the path to independence. They were wonderful rebels. I appreciate it. I hope all the generations to follow can appreciate it. It was the beginning of a new nation, a great one, for all its faults.

Reflecting on her experience as a young woman in Concord, Helen feels there were no class divisions in Concord, at least not in the schools and not in how people treated each other. "You got a good education. Farm kids and kids in wealthy mansions all got along, were all included. It was great. There were never cliques. There was an acceptance of each other."

Even though she was from a farm, she felt she was accepted by others. "You were never shunned in school," she reflects. In a later interview she adds: "Others respected who you were. I felt I really belonged. There was no peer pressure."

Being from a farm did limit her social life, because of the demands farm work placed on her time.. "I could never go to the beach, to school activities, with other kids," she says. "There was no youth," she adds, with no apparent regret. Asked if she did regret not being able to do what her school mates did, she says she did at the time, but no longer. She has made peace with this part of the past. She has found value in it. She feels farm work taught her the value of work and responsibility.

Helen and Eddie would get home from high school about 3:00 after the long bus ride in reverse. Eddie would not even come in the house. He'd go directly to the barn and change his clothes there. Then he'd get ready to milk, clean, and feed the cows.

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[4] Mr. Thorpe lived in a house now part of the Park, the house at the corner of Bedford and Lexington Rd, near Meriam House.

Her parents did not come home until about 5:30. Her mother and grandmother came home on the bus. Her father had a car. By the time they got home, Helen would have prepared the dinner. They would eat together. After dinner, people retired early, to get enough sleep so they could wake up by four or five in the morning. Helen says only she burnt the midnight candle, staying up to read about dairy cows.

Helen studied math and trigonometry in school, and loved the sciences. In her senior year in high school, she won the first science contest that her school held. She built her own radio set for the contest. She remembers the judges asking her questions about her radio, to see if she had made it herself. This achievement beyond the world of the farm may have made a difference for her. It is easy to imagine that an achievements such as this would enlarge a young person's horizons. Such experiences may have made education a value for her in a way it could not be for her parents, who held to what we might best describe as agrarian values (Bartlett 19xx)—land and family meant more than a higher education. Going away to college required a kind of rebellion against her parents on Helen's part. Yet the values she learned from her parents—including the love of land—are still central to her sense of self, and to her vision of the world.

Edward found schooling less interesting than farming, and did not always do his home work. He had a "excellent mechanical mind," says Helen, and developed good business sense. Eventually, he took the farm over from his father.

As teenagers, the Nowalk children had major roles on the farm. Eddie would do most of the work in the barn, but Helen would go out and help with the cows. This was in addition to domestic duties such as making dinner every night. Helen did washing and ironing and other work in the house. She also worked in the fields when needed, getting down to weed on her hands and knees.

> "I remember weeding way out, weeding and weeding. My mother would say, 'Don't come in for lunch, I'll bring it out to you.' This was the old Polish heritage—work, work, work. She would bring out sandwiches and lots of water, because it got so hot out here."

In later years, Helen tended the roadside stand. Wholesale customers, like Tom Napoli of Lexington (whose family now has the Idlewild stand in Acton), would arrive to by corn and potatoes. Retail customers would come mostly from Concord and Lincoln, but some even from as far as Cambridge. Helen says many of these customers "were interested in you personally. Customers became friends, a community, almost like a family." Women would ask Helen's mother if she could baby-sit for their families, and often she did.

Not every day on the Nowalk farm was the same, of course, even though the routine of milking and feeding the cows shaped their days, and the agricultural imperatives of planting, weeding, and harvesting filled the seasons with work that had to be done. Still, everyday life was more than drudgery at the Nowalk

farm, although Helen describes plenty of hard work and long days. But there were lighter moments, too. She tells of how one day some of the neighborhood kids came to play in their barn. One of them, a boy named David, falls through a hatch in the floor of the barn, through which manure was shoveled out of the barn, and lands in the pile of manure below. "Your mother better put you in a washing machine," Helen told him. Thinking back on those times, Helen stresses the value of, and pleasure of, the quality of neighborliness that existed then. "We all enjoyed each others' community."

Reflections on Her Years on the Farm

Helen lived and worked on the farm from age 14 to when she became thirty, or sixteen years. All except one of her four children were born there. Her husband, she notes, was part of the work team, too. He helped paint the barn when it needed to be done, going up in a boson's chair to do it. Everyone had a job.

Even after she became a nurse, she continued to tend the stand and do the cooking at the farm. Relatives would come to help, and they used to hire field hands, and these workers had to be fed along with the family, so there were "a lot of mouths to feed.". And she picked beans and strawberries. Even when she moved off the farm, she came back and worked.

Looking back, Helen reflects on the quality of relationships that people had back then, and wonders if it still exists anywhere. "I don't know if you can go anywhere in the US now and still find farmers who take care of each other."

Helen's affirmation of the past stands also as an implicit critique of the present. "Something about Concord was unique. There were no class distinctions. The most precious thing I remember about Concord was that we all treated each other as equals. People treated each other with respect and dignity."

Helen feels that, with this farm, her family had realized the American dream. She defines the American dream as "success and independence achieved through hard work."

> "America, this country, it gives us the ability and freedom to ahieve and to seek success through hard work."

Her father embodied this state of independence achieved through hard work. She speaks as if it defined his American identity. Speaking of how he resolved to leave the Yankee family that had sponsored him, she characterizes the decisions in this way: "He decided to strike out on his own—he was an American." Helen says her father did not stress his Polish origins, even though there was a Polish community in some of the surrounding communities. "Father had a great love of this country. If you said anything against this country, he said you'd better go back to Poland." (1) "And god help you if you did not appreciate being an American." (2).

"He said, 'This is my land now,' and he meant it, too. " His wife Anna had come to the United States on a ship. When she said something he construed as

against the country, he used to tell her, "I'll put you on that ship back to Poland."

If the farm was her father's American dream, it was also where Helen learned values from her grandmother that Helen thinks of as quintessentially Polish . "In the old country, people learned to be effective, efficient, and productive. And that's what they taught us." Her grandmother was a model of these virtues. Helen speaks with pride, perhaps with a kind of reverence, of her grandmother's capacity for work. "She was unbelievable. She was no good over the stove, but she could milk the cows and work in the fields all day."

> "I remember how hard it was to get it going," Helen reflects on the farm. "I remember my family. On our fourth year on the farm, we had a farm event, a function sponsored by a farm group. It must have been the Farm Bureau. ,There were contests, mostly for the men. There was a contest with scythes, to see who could cut the fastest, but not too high or too low. It was a speed event, but it also called for precision. My grandmother got in the contest. She was an old hand at this, from back in the old country. She missed winning by six inches, but her precision was great. I was so proud of her. Some one from Vermont won. My grandmother must have been sixty-five, or even older.
>
> She was strong. I remember one day when she was in her eighties. She must have been eighty-four. She decided she wanted to break up a boulder out in the field, so she went out with a sledgehammer and she broke it up."

Helen admired her grandmother's strength, and her strength of character. She found the same strength of character in her mother and father as well, and feels the quality of their character was revealed in their philosophy of work. "My grandmother taught me what work was. They all taught me not to shrink or have other people do your work for you. If you have work to do, do it, and do it well."

Helen says her father was "the achiever," but her mother was "the matriarch." Helen describes her mother as the one who ran the family: "My mother was the matriarch. She ran the place indirectly, She ran the farm through the rest of the family." Her father sometimes refereed to his wife as "the big boss." Grandmother and mother together got the family into the dairy business, and their hard work and values sustained the family farm over the years.

Helen clearly feels she learned essential values from her parents, and from her experience of growing up on a farm. Some of these values have to do with "who you are" as a person—what we might call moral identity, a sense of self forged in a work ethic. Other values concern the stewardship of the land.

> "There is something valuable about growing up on a farm. It teaches you to accept things you have no control over. It teaches you responsibility and independence.

If Helen has derived an ethic of personal character from her experience and from the lessons of those close to her, she has also formulated an ethic of stewardship:

> "Land never really belongs to any one permanently. We have it only for a short while. We have to respect it, and take care of it. No one owns the land forever. You have to treat it with dignity, almost like a person. You have to nurture it. You can't neglect it. And then you have to pass it on. You have to pass it on to those you hope will do right by it."

Helen concluded this eloquent testimony to her feelings of stewardship by expressing her admiration for Native Americans, saying that she appreciates their connection to the earth. She sees a parallel between their connection to the earth and her connection to the earth. Whether we term this sense of connection an ethical or a spiritual value, it is clearly a value whose significance she feels deeply, even passionately.

Comment

What we have in this account is a story of a small farm in Concord, Massachusetts that tells a larger national story of how immigrants come to the United States with hopes and aspirations, of the challenges involved in realizing their aspirations, and of the hardships and joys of putting down roots. The values that farm life have for some are clear in this account.

FOUR

THE FARMERS

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Introduction

When first contacted about this project, I conjectured that farming at Minute Man would reflect the general conditions and historic trends in American farming. I felt I would encounter variations on basic social, economic, and technological patterns that I was familiar with in Wisconsin and Oregon. I also thought the farmers would embody the basic cultural patterns found in most American farming communities. I expected, too, that these farm operations would be quite small in scale and perhaps marginal as farm operations, compared to farms in the major farming regions of the United States.

What have I actually found? Research has confirmed my conjectures in part. The farm operations visited in Concord do embody many of the basic social and cultural, economic and technological patterns of American farming. Yet while acreage farmed is indeed less than in some parts of the United States, ranging from 5 to 500 acres for the farmers interviewed, I would not call all these farms marginal. In some ways they are thriving, not barely hanging on or struggling for survival. They have adapted their operations to farming in a quasi-urban and suburban context. Despite the profound changes the towns around them have undergone, the farms continue to have an integral place in the life of local towns as suppliers of locally grown produce and farm products.

In fact, these farms appear to have been innovative in their search for market niches and for farming strategies that would keep them going and allow them to make a living at farming. These are farms that have had to change and innovate

in order to remain viable. Describing area farmers as "the cream of the crop," one grower remarked that they had to be the best, in order to make it at all.

These farms are, of course, adapted to specific local conditions and have features that reflect the agricultural history and cultural traditions of the area. These are family farms, not agribusiness. They carry forward a farming tradition that stretches back three centuries, a tradition that successive waves of immigrants have joined and made their own—plowing what Howard Russell (1976) called "a long, deep furrow" in the history of New England.

What is distinctive about local farms and farming traditions cannot, of course, be neglected. However, I also want to point out some of the continuities that exist with larger scale national patterns, which reflect broad historic and economic trends and developments, in American agriculture that cut across regional and local farming systems. Local farms reflect these, as well as local circumstances.

Family Farms: Household and Kinship Roles

Salamon (1992:106) describes the farm family as "a kinship group that is also a productive unit." Concord farms are family farms, operated by farm families. The farming operation depends on the labor of family members. Husbands and wives have different roles, but each contributes to the farm enterprise, although men are seen as the chief farm operators. Being "the farmer" is perceived as a male role. Older women refer to their husbands as "the farmer" and tend to disclaim any knowledge of farming.

Women in fact have roles that contribute to the farm operation, but these are not seen as farming, because they do not involve tilling the land, raising crops, or tending livestock. Women monitor farm stands, grow flowers for sale, help prepare items for shipment or display, and keep financial records. "I've never done the books," said one farmer. "She does it all."

For the most part, men rather than women seem to handle relations with the Park. This does not mean women are not involved, but only that male members of the family more often represent the farm to the outside world in "official" contexts. It seems likely that women are often consulted about major decisions, and about actions by the Park that affect farming or living conditions at the Park.

In my observations this year, I did not see any women driving tractors or operating equipment. This is the role largely reserved for men, the one associated with being "the farmer." As the Nowalk history showed, some women did work in the fields in earlier years, or report that their mothers or grandmothers did.

In Concord, the kinship group involved in farming may often be wider than the nuclear family. Often, a single farm operation has more than one farmer: brothers or father-son pairs farm together in joint operations. Frank and Joe Palumbo were an example of two brothers who farmed jointly. In other cases, fathers and their adult sons farm together. Not all family farms are extended in

this way, however; several of the farm families traditionally associated with land now in the Park operated as nuclear family households, with the male head of household viewed as the single farmer for the farm operation. Whether any of the children of these families would have grown up to form a joint farm operation cannot be answered, since the Park's acquisition of the land occurred before inheritance and succession became issues for these families. Members of these families report simply that there "might have" been an interest in having one of the children take over the farm.

In addition to the labor of adults, family farms often depend on the labor of children and adolescents. In the past, children were involved in farming: "My girls grew up working. They drove the tractor and truck." In 1995, however, I did not observe the children of farm families engaged in farm work at Minute Man. I saw no adolescents operating equipment or working in the fields, a common pattern in many farming communities. This may reflect either the age structure of the current farming population (they're either too old or too young to have children who might work in the fields) or the drift of young people towards non-farming occupations. At Minute Man itself, the Park's acquisition of farms may have discouraged succession within farm families.

> "[My son] might have been interested. But it is harder now, with all the government rules and regulations."

Grown-up sons do work with their fathers on some Concord farms and will inherit these privately owned farms, but since farmland at the Park cannot be inherited, no such pattern exists among those who lease back land their families once owned, with the partial exception of one family which wishes to farm land until the expiration of the term reservation they have inherited as part of an estate. With this one exception, I discovered no one from a former farming family with the interest or the means to farm land at the Park. For the most part, with the death or retirement of the older generation of farmers who leased back land they or their families once owned, the Park will have to rely on farmers with no previous association to continue its agricultural leasing program.

What cultural and agricultural continuity exists at the Park—or can be preserved—derives from the farming community's continuing interest in farm land at the Park, not from the continuing presence of the farm families that once owned and worked land now in the Park. The old farming families are now largely gone, either dead or retired. The last active farmer in this category is in his late seventies.

Land Tenure

Most of the farmers interviewed can be classified as part owners. Part owners are farmers who own some of their land and rent the rest. None are full owners, who own all the land they farm—of course, by definition, any farmer who leases land at the Park is not a full owner. Technically, under US. Dept. of

Agriculture categories for types of land tenure, some who farm at the Park are tenant farmers, who rent all the land they farm (Salamon 1992:104): but the tenant status of these farmers was created by the acquisition of land these farmers or their families once owned. Agreements with some of these farmers permitted them to continue to farm the land their families had owned—the Palumbo brothers and Edward Nowalk are examples of this.

The tendency for area farmers to be part-owners is consistent with national statistics and with patterns of land tenure found in other agricultural communities in the US (Rogers 1985, Salamon 1992:104). Farmers in this group also lease private land and conservation land owned by towns. Farmers whose land was acquired by the Park are a special case, but in terms of how they operate, they seem similar to the part-owners. It does not seem to be unusual for local farmers to rent more land than they own.

Equipment and Workers

Farmers in Concord and Lincoln may not own as much land as farmers elsewhere in the country, but they must make investments in equipment. Like American farming generally, local farms are relatively capital intensive, highly mechanized operations. True, these farms may not involve the magnitude of capital investment or the degree of mechanization found in corporate agribusiness in California, but as the history of the Palumbo farm made apparent, they have followed a basic trend in American agriculture and become increasingly capital intensive and mechanized operations. Tractors and a variety of specialized equipment are used to plow, till, and plant. Greenhouses and warehouses are integral to farm operations. Irrigation is used to improve the quality of crops and protect crops from drought. Fertilizer and other soil amendments are used to maintain the fertility of fields and increase yields. Pesticides are applied to control pests. All these practices are relatively expensive, and financing them can produce a cash crunch. Farmers must have the financial resources to buy equipment and to fit it when it breaks down, must be able to pay workers, and must be able to pay seed companies and other suppliers. As part owners, they must be able to pay rent on land they lease. Farmers must have enough access to enough land and to the equipment to farm this land so that they can finance their operations, support themselves and families, and maintain a viable and sustainable farm operation under the rather rigorous conditions of modern agriculture. As the Palumbo history shows, these farmer operations reflect a basic "trendline" in American agriculture. This involves capital intensification and mechanization—substituting capital for labor, in the form of machinery.[1]

[1] A corollary is that sharing equipment is relatively more important than exchanging labor. Farmers associated with the Park do keep track of what each other has and make use of each others' equipment. This access to equipment seems quite important for some operations.

However, for a number of reasons, farms require more labor than farm households can supply. In part, this is because most farms in the area grow fresh produce for roadside stands and local markets. Produce must be picked and packed by hand, trimmed, sorted, washed and packed for retail and wholesale markets, loaded into trucks for delivery, delivered to stands or restaurants or wholesale markets, washed and put on display at farm stands, and so on. Much manual labor is involved in this process. The labor needs of most farm operations I observed cannot be met by the farm families themselves, especially since in some cases not all family members are directly involved in work in the fields, and the children of some of these farm households enter non-farm occupations. In other cases, even the principal farming figures are enaged in other, non-farm occupations. To meet their labor needs, these farms hire farm workers. Workers may be high-school students or residents of near-by towns who work the cash registers at farm stands. Field workers, on the other hand, at least in 1995, were immigrants to the US from other countries. They worked in the fields planting, weeding, and harvesting crops. They engaged primarily in manual labor, not the operation of farm equipment.

In the year of the study, agricultural workers from El Salvador and Cambodia worked for farms that lease land from the Park. The Cambodian workers came as family groups from Lowell, Massachusetts, with women working in the fields alongside the men. In the past, workers from Puerto Rico were employed at one of the farm. Non-immigrant workers operated tractors for at least one operation. At present, farms do not provide on-site housing for workers, although this was a practice at some local farms in the past.

Truck farming or market gardening involves a labor-intensive component, but in Concord and Lincoln even haying operations seem more labor-intensive than in other parts of the country, perhaps because many of the fields hayed are small and not ideally configured for the most efficient use of machinery. I was surprised to see bales dropped on the ground and then picked up by hand to be loaded on trucks on one Park field, but clearly the field was unsuited to using a baler and wagons in tandem, so there was no alternative. One local farmer has suggested that grazing would achieve greater efficiency than haying on many of these fields, even factoring in the cost of fencing.

The Dual Income Strategy

Most local farm households appear to combine farm and non-farm sources of income. Non-farm income flows into farm households in a number of ways. For example, some members of farm households may work at non-farm occupations or operate businesses. Even some of the men responsible for field operations may hold non-farm jobs. Non-farm sources of income include the sale of non-farm items at roadside stands, and the sale of agricultural produce not grown by the farmer, as well as outside jobs.

Farmers with non-farm incomes are sometimes called "part-time farmers," but I prefer to call this a dual-income strategy. To some, "part-time" suggests a hobby (Barlett 1986). It implies that farming is not a central focus of their work lives and that farming is a peripheral economic activity, when many part-time farmers may in fact be working at outside jobs in order to invest in farming, and may derive their occupational identity as much, or more, from farming than from their other work. To others, "part-time" farming may suggest that full-time farmers have been forced to seek non-farm work, that farmers seek non-farm jobs to save the farm and remain in agriculture. While this may true in some cases, other part-time farmers may be entering agriculture, or may have made a deliberate decision to combine farming and non-farm jobs (cf. Barlett 1986).

One finds this dual-income strategy—and the multiple occupational roles it involves— quite widely in the United States and worldwide (Barlett 1986:289, 291). I have observed such "worker-farmers" in Oregon and Wisconsin, and they are found in parts of Germany as well, where some farmers also work in factories.

Some Concord area farmers work outside the farm until they can shift into full-time farming; in one instance, a farmer has been expanding his operation since his retirement from a non-farm occupation. In some cases, interviews suggest, farmers view non-farm income as diversification that allows them to survive the ups and downs of agriculture.

Non-farm business activity may be related to agriculture, e.g. retailing or wholesaling produce they did not grow or selling selected non-farm items. "Non-farm" items include both agricutural produce grown by others, bought and then resold by the stand owner, and processed goods that one might also find in a convenience or grocery store, purchased from wholesalers. Farmers with stand may sell non-local produce when local produce is not available. The critical importance of roadside stands as a market means local farmers with stands must find ways to keep their stands supplied with key crops such as sweet corn, and this means they must buy and resell corn grown by others. This means the stands generate a market not only for produce grown by those who run them, but for other farmers who supply the needs of such stands.

Management Styles

A local farmer thinking of retiring spoke of younger farmers as less cautious. He noted that although spring temperatures were still cool, slowing down drying in hay, some of the "young guys" with haying operations, who he described as "eager to get going," had already cut hay, taking the chance that it would dry and they would get it baled before it rained. The older farmer, looking up at the clouds in the sky, noted the saying that it "takes three days to make hay."

As this commentary suggests, such factors as a farmer's age and stage in the life cycle, as well as other factors such as size of current operation, cultural val-

ues, perceived opportunities, may affect the way a farmer's outlook and the way he manages his farm operation. Concord and Lincoln farmers exhibit management styles found elsewhere in the United States (Barlett 1993, Bennett 1981). At the risk of oversimplifying somewhat, farmers associated with the Park fall into three basic categories or "types" in terms of management style: retirement-oriented, stability-oriented, and expansion-oriented.

None of these classifications applies to Codman Community Farm or to special use permits for grazing horses. They apply only to farms involved in commercial crop production. (An analytic chart of "types" of farmers classified by management "style" is found in Appendix B.)

Expansion-oriented farmers are actively seeking more land to farm, buying more equipment, attempting to intensify operations and expand their markets. Stability-oriented farmers have no or little interest in expansion, and express content with the present size and scope of their farm operations. Retirement-oriented farmers are those who are winding down their operations, or continue to farm on a reduced scale to supplement their income or because they continue to find farming interesting. Joe Palumbo now belongs to this category.

Expansion-oriented does not entail a lack of caution, although such farmers may generally be more willing to assume risk than stability-oriented farmers. However, in Concord, even expansion-oriented farmers seem to have a relatively cautious approach, and—at least in interviews—stress incremental expansion. What they say in interviews sometimes suggest a degree of management caution that may temper their expansion oriented management style: one remarked that farmers "who have to have the showiest operation often fail." They are, however, ready to pursue opportunities, including opportunities at the Park.

I would describe three operations associated with the Park as expansion-oriented or somewhat expansion-oriented. Palumbo is retirement-oriented, and his operations have contracted in the past couple years, although he is still active in farming. Another person with a special use permit is active, but speaks of planning to retire soon. Still another retired farmer works with another farmer to hay the land he leases. One operator who farms only a small parcel at the Park but has land of his own elsewhere I would tentatively place in the stability oriented category.

Local farmers have a strong interest in adapting their operations to local and regional market niches. These farms face economic competition, not only from local growers, but in the case of vegetable crops, from farms and agri-business in other states and nations. The prices at which local farmers can sell crops are determined in part by national and international markets, not by local conditions. While local growers can sometimes achieve a premium over prices for produce shipped in from other regions, what they can get for their produce is fundamentally linked to market prices they do not control. They do not have much flexibility when it comes to passing on costs or raising prices to compensate for poor

growing conditions, nor do they have significant bargaining power when dealing with wholesalers.

Support Systems

These are farms that have survived in an area where agriculture has declined or been displaced by urbanization and suburbanization. They are niche operations in an area that no longer possesses an underlying agricultural economy and is no longer truly rural in character. While some support systems remain—equipment dealers, farmers report, are still responsive to their needs—other support institutions are not specifically oriented to farming. Farmers do not expect banks to have any particular knowledge of farmers' financial needs, or loan programs for them. Some farmers feel marginalized. They say that local institutions and their non-farming neighbors do not understand farming. Some expressed the feeling that local communities and institutions were indifferent, even hostile, to agriculture. [2]

Trade shows, fairs, and meetings of farm group have some importance in the farming community. Local vegetable growers belong to the New England Vegetable Growers Association; one local farmer served as President of the Association.

The main support group farmers have is each other. As noted elsewhere in this report, there is what one grower described as "friendly" competition among farmes, but also a significant degree of mutual support, which may take the form of exchanging information or in some cases of sharing equipment. Information exchanges observed included discussions of who might have specialized equipment that could be borrowed or purchased, and the passing on of news about land that might be available for lease. Linkages between farmers and their operations vary, with some operations being quite closely linked, and others not.

Ethnicity

Farmers identify themselves by ethnic background, as Italian, Polish, and Norwegian. They express these identities in a variety of ways. They are made tangible in family rituals and family stories of origin, in language, in trips abroad, and in other ways. Food constitutes one of the most important ways of expressing a sense of ethnic identity and relatedness. The lefse of Norwegian Americans, Italian cooking for Italian-Americans, serves this purpose.

One farmer drives his tractor while wearing a baseball hat with the Polish eagle on it. He also wears a signet ringing with this emblem, and has it emblazoned prominently on his house. He said, with regret, that Polish community life was fading, saying that "kid didn't learn the language anymore." He noted

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[2] Some representatives of the towns characterized these communities as supportive of agriculture, noting the desire to maintain the rural character of the landscape.

that activities at Polish community Catholic churches were less important than they used to be. He uses his Polish on trips to Poland, where he reconnects with his ethnic heritage.

Italian-American farmers form perhaps the a numerous and important part of the farming community. The parents of one of the associated farmers, Joseph Palumbo, came to the United States from Palermo, Sicily, establishing a semi-subsistence farm in the 1920s. If the fields of this Italian-American farmer were not within the boundaries of Minute Man, it would still represent an important ethnographic and historic landscape—that of Italian-American farming in the Concord region.

Ideally, the ethnic histories of the area should be documented as part of a larger project of showing continuity and change in the agriculture of the area. A more extensive study would be needed to define the social fabric, if any, that goes along ethnic identifications. It seems clear that individuals do not form social networks exclusively on the basis of ethnic ties, nor do groups form ethnic enclaves. Farmers who assert the values and identities of an ethnic heritage also make repeated reference to symbols and values of a unified national identity as "American." The Park itself is an ethnographic resource for this process of self-identification, as the events the Park commemorates are often invoked in this regard. Just as they maintain a "dual" or "multiple" income strategy, a number of the "ethnic" farmers maintain a "dual" or "multiple" identity that allows them to generate a wide range of relationships.

A Note on Ethnicity and the Ethnographic Landscape

It follows that the landscape, too, has a kind of multiple identity. I believe that almost any academic observer would agree that one of the challenges—but also one of the special opportunities—for the Park is to document and interpret the multiple layers of American history and culture associated with this agricultural landscape. One can look out over and be invited to see the past: to contemplate these fields as reminders of the agricultural landscape of 1775, the countryside Thoreau walked, the world the Alcotts knew, and the lives of ethnic and immigrant farmers over two centuries.

As I stood in a field one day talking with a farmer, a black Mercedes first drove to the farmer's sheds, and then to where we stood. Two men got out, and asked after the farmer's name, which they had seen on a sign at the drive, explaining they had relatives in Italy with that name. One man explained how he came to the US from Italy more than twenty years ago, and always keeps a look out for people with this name. After discussing relatives and family history, the farmer and the men then talked about the greens the farmers was growing, describing ways to cook them with olive oil and garlic, waxing quite eloquent about how delicious they were cooked this way. One of the men waved his hand to take in the green farm field and said, "This is just like where I grew up in Italy."

In a sense, then, ethnicity and history are both part of the landscape. The key here is the continuity of the agricultural landscape. The crops grown make this continuity tangible: the sweet corn that grows today on market-garden plots that reminded this man of his native Italy can also evoke the corn that grew in 1775, and the corn that Native Americans grew in the region (Cronon 1983). The continuity of agriculture here makes the historic landscape palpable, helps bring it to life, in the way no diorama in a visitor's center ever can.. Given adequate interpretation, visitors can work this out in their own mind's eye, can see the past in the present, and the present in the past.. A field of corn waving in the wind at Minute Man National Historic Park can be a field of dreams indeed, evoking cultural memories central to the American experience.

A Sense of Community

Ethnicity, of course, is not the only basis for community and identity among those involved in agriculture. Farming itself forms a key basis for community. Farmers form a community in an ethnographic sense.

Farmers form a community by virtue of shared interests and values, common experience and knowledge. They share what anthropologists term a "world view." They have many of the same concerns, often face similar problems. These shared concerns form links, help connect those involved in agriculture in ways that sustain a sense of identity and community as farmers. Farmers in this region see themselves as set apart from other segments of society precisely because they are farmers, and mutually identify with each other, forming a "we" viewed in contrast to a "they"—non-farmers, suburbanites, Park staff.

Local farmers maintain face-to-face relationships that contribute significantly to their ability to make a living from farming. Farmers identify with each other and see each other as resources. Without this sense of community and the relationships forge as members of a community, farming might well not be less sustainable in the Concord-Lincoln area. An example of this is the local ethic that says that other farmers ought not to bid on land which comes up for lease if another farmer has a relationship to that parcel by virtue of family history or if the land is continguous or close to land currently farmerd by another farmer unless this farmer has no interest in leasing it. This ethic apparently retains some moral force, even if it is not always respected in practice. (Angry criticism may be directed at those who violate this convention.) When it works, this practice tends to minimize conflict among farmers and to rationalize their operations by allowing them to consolidate land they own and lease-holdings into the most efficient configurations possible under the circumstances.

At least three of the farmers who lease land from the park but did not formerly own the land became involved in the leasing program in large part because of their relationship with the people who did once own the land. Local farmers respect the relationship each has with the land, and would not normally bid on

land that another farmer had an established relationship with, either because they once owned it or because they have been farming it in recent years. (Note: this value is taken into account in the leasing programs of the surrounding towns of Concord and Lincoln, which both take the past ownership or relationship with land into account. While this respects a local value, it is also probably generally a good pragmatic strategy, since it would help keep those farmers who have the best working knowledge of the land farming it.)

On farmer leases fields that he leased from a former owner, before the Park acquired the property. In another case, a younger farmer got his start working for a farmer who until his death recently worked land that the Park acquired from him. In another case, a farmer leasing land from the Park relies on the advice and help of a semi-retired associated farmer.

Degree and Nature of Traditional Association

Life history and oral history interviews were the basis for the "farm histories" of the Palumbo and Nowalk farms. This material suggests what the degree and nature of the association of farm families, the former owners, with land now in the Park.

Clearly, the degree of traditional association is very high for members of some of these farm families. Joe Palumbo has worked the same piece of land for more than sixty years, since he and his father cleared these fields in the late 1920s. His entire life is associated with the fields that he helped farm as a boy with his parents. In the Nowalk history, we see the same kind of personal and cultural meaning attached to Maplewood farm. In essence, the farms represent a life-history and a way of life. The farms themselves have a central place in the life-story of persons who grew up on them. Former residents speak of the farms and homes that they once owned as having shaped their lives. They speak of what were for them defining experiences, of challenges and life-struggles, of kinship and hardship. At the same time, they speak of farms as representing a way of life associated with core cultural values. If one phrase could define the nature of their association it might be this: family farms, farm families formed the core of their cultural and personal experience.

There is a significant degree of anger and resentment at the Park's previous land acquisition policies, which are seen as having disrupted this way of life. There is also palpable evidence of the grief former occupants of this land feel for what they have lost: several broke into tears as they spoke of these farms. This suggests the depth and intensity of their sentiments. Barlett (1993) documents some psychological reactions to farm loss during the farm crisis of the 1970s and 80s. Contacts with farmers and former farmers here suggest similar kinds of grief and mourning among some former farmers and their families. This is complicated by the feeling that they did not really want to sell, but felt they had no choice, that "the taking of the land" was in some cases an injustice. Some of the strong

feeling that the Park "has not done much" with the land it acquired may in part reflect the pain of loss and a sense that this loss should mean something.

Family and the land itself have been identified as the key to their association. People speak of their parents' lives on the land, on their own childhood and its memories, and of their own efforts to make a life on land now part of the Park as the basis of their felt association with it. Some mention a closeness to nature as part of their feelings for the land and for farming [3]

"It was a good life but hard. My husband loved it. I don't think [he] could have worked inside. It was a gamble, no doubt about it."

"He loved it. He liked working the land."

"To be a farmer, I don't know how you could do it and not like it—it's such long hours and hard work, and it is a gamble. There's satisfaction. Putting seeds in—seeing [the crops] grow. The love of working the land."

Why They Farm: Subsistence and the Values of a Way of Life

When California was poised on the edge of the era of agribusiness, a farmer there told anthropologist Walter Goldschmidt, "There is one thing I want you to put in your book. Farming in this country is a business, it's not a way of life."[4] This suggests what I believe may be a central tension in the culture of American farming, and one that I suspect farmers associated with the Park struggle with in various ways. For farmers associated with the Park, farming is both a business and a way of life—but there are quandaries involved in reconciling the way farming is at once a business and a way of life, and predicaments involved in affirming that farming is one and not the other, in believing or acting as if farming is not a business, or not a way of life.[5]

Local farmers value farming as a way of life. They derive satisfaction from their work. They feel it allows them to experience nature, to work outdoors, to be independent, to carry on a tradition. They also stress that it is a business, that they must make money at it in order to survive as farmers. If they do not treat it as a business, it ceases to be a way of life. This tension between farming

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[3] Some farmers would agree with the park worker who reported that the agricultural landscape of rolling fields, hedge rows and stone walls has "That feeling"—her words summing up a psychologically significant experience of the landscape, in which the individual elements of the landscape combine to create a total, and felt, gestalt. This "feeling" of course is part of what gives value to the landscape, and it is surely an experience the Park wants visitors and users of the trail through the farmed sections of the park to share.

[4] Goldschmidt, 1947 *As You Sow*. New York: Hartcourt, Brace.

[5] Salamon's work suggests that an entrepreneurial approach to farming may in fact represent a set of cultural values associated more with some ethnic groups than others, in the mid-western farming communities she studies.

as a way of life and farming as an economic enterprise finds expression in some of the concerns of farmers. The feeling that farming is too hard or not viable finds expression in the sentiment expressed by some that their children are better off not being farmers. The desire to provide for family may push farmers to intensify their operations, to stress the way farming is a business. For those who have been involve in farming for most of their life, farming is not only a way of life, it is their life.

The testimony of local farmers suggests that for them, unlike the California grower quoted, farming is both business and valued way of life. Farmers make trade-offs between the business needs and the non-monetary values of farming as a way of life.

For some, family circumstances may require a relatively aggressive and bottom-line approach to farming, an emphasis on the business aspects of farming that support a livelihood, savings, and the ability to buy things for the family. One farmer said that now that's he's married and has a child, he has to think of the future. He said he cannot afford to spend a dollar to make a dollar and five cents. He says he used to be satisfied with that, and that others may still feel that way, but now he has to be concerned with making enough money to keep his operation going and to secure a living and a future for his family.

Farming is of course a business, a difficult one to be successful in, and the Park needs to understand the nature and realities of the business of farming, in order to make informed decisions that affect farming. Westmacott (1994, draft), questions the assumption that "management of farmland [on the park] needs to be an economically viable enterprise," suggesting that this "need not necessarily be the case, as there on many who indulge in agriculture with little expectation of making a profit" (3:6).[6] This needs clarification and qualification. While profit may not be the only motive for farming, the costs of even hobby farming may be great enough that the operation has to be economically viable, that is, permit the operator to recover costs and set aside funds for future costs. Moreover, we may not be justified in assuming that the profit motive plays no role in farming done out of a love of farming. While some part-time, dual-income farmers may not have a high expectation of profit, we cannot assume they farm with the expectation of losing money consistently and for extended periods of time. Nonetheless, non-economic motives are important among people who farm or want to farm, and they are often willing to work at non-farm jobs to help support their farming. This is true of the general American farming population, and seems to be true of some farmers associated with Minute Man.

It is true that making a living is often not the only motive farmers have. In many instances, individuals engaged in farming could make as much or more money in other full-time occupations or part-time pursuits. Non-economic mo-

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[6] Westmacott. 1994 (draft)`Managing Culturally Significant Landscapes in the National Park System: Summary Report for Minute Man

tives may include having grown up on a farm, or the value placed on growing things, or the relationship with the land, and others (Barlett 1987). Such values may importantly influence management style (Bennett 1980, Barlett 1993). This does not mean that farm operations can afford to ignore the realities of markets and finances—not if they want to stay in business. Only if they achieve economic viability can they realize the other values that motivate them to be farmers. It appears that the farmers capable of farming in the way the Park requires want to make money, and need to make money. For them farming is subsistence, their means of support. The livelihood they derive in part from farming enables them to support themselves and their families, but it also allows them to support a way of life.

FIVE

FARMING PRACTICES

Sections

Introduction
Basics of Farming Practice
Cultivation
Soils
Water
Crop Hazards
Confronting and Managing Uncertainties
Critical Crops
Farm Stands

Introduction

The purpose of this chapter is to describe the farming practices associated with agriculture in Concord and Lincoln and to explain how these integral to the process of growing crops. Farmers who farm at Minute Man all report that normal farming practices are impeded in some way at the Park. Although this has not prevented them from farming land leased from the Park, they find these restrictions burdensome and question their necessity. These restrictions do not make it impossible for them to farm Park land, but make it harder to do so. In brief, these restrictions cost them time and money. Some farmers who do not farm at the Park state they would be unwilling to do so because of these restrictions.

The discussion here of the nature of ordinary farm practices will put farmers' concerns into perspective by showing how fundamental to farming these practices are.

Basics of Farm Practice

In essence, agriculture is the process of converting the nutrients of the soil into crops (Dasmann 1976, 110). Farm operations as economic enterprises seeks to achieve this conversion, and then convert crops into cash and a livelihood for farmers. Farming as a way of life reflects and contributes to this process of producing crops and livelihood by working the soil and managing the conditions of crop growth. Specific farm practices need to be understood for the role they

play in this process. Interference with these practices, where no alternatives exist, may mean farmers cannot produce crops or a livelihood.

What farmers do with crops and animals, with water and soil—their farming practices—all contribute to the process of using plants to convert natural resources into cultural and economic resources. To understand fully some of the ethnographic data and analysis presented in this report, it helps to have a basic working understanding of agriculture. A simple definition may help sensitize us to the importance to farmers of the practices that can be affected by management policies and actions: agriculture is the process of using plants to convert natural resources (soil, water, air and sunlight) into cultural and economic resources. Even animal husbandry relies on plants; it uses livestock to convert plants into milk, meat, eggs, and other animal products.

By the process of photosynthesis, plants are able to harvest sunlight and use it for their growth and biological processes. Plants also possess the capacity to convert the nutrients of the soil into forms that become food, fiber, and forage (Dasmann 1976, 110). Quite simply, then, agriculture is involves managing the growth cycle or growing environment of plants. For example, humans intervene in plant growth and its environment by preparing the soil through tilling, by storing and then planting seed, by removing competing plants, by providing water and nutrients or otherwise improving growing conditions, and by breeding plants to adapt them to human needs and natural conditions. Technology is central to this process of managing the conditions of crop plant growth: the plow, whether pulled by the oxen of the colonial era or by modern tractors, prepares the soil for planting and crop growth; pesticides are used to control insects that damage crops and weeds that compete with crop plants; drainage and irrigation systems regulate the supply of water to crops.

In the case of plant growth in synthetic or artificial environments, such as in hydroponic greenhouses, agriculture may dispense with natural soil and sunlight, supplying an synthetic medium for roots and providing artificial lights for photosynthesis. In such a setting, agriculture becomes the management of plants in an artificial environment constructed and regulated by human beings, rather than in a natural environment modified by human beings. But for most of human history, and for most crop production today, agriculture is the systematic management of plants in modified natural environments. For the most part, agriculture remains the process of using plants and managing nature to convert soil, sunlight, the atmosphere and water into biological structures that human beings can use: fruits and vegetables, seeds and grains, wood and fiber.

Cultivation

Cultivation, for example, contributes to the process of turning soil nutrients into food crops. While no-till or low-tillage systems of agriculture exist, farming in Concord relies on cultivation, first turning the soil with plows and then

ducing a fine-textured seed bed by harrowing.[1] Speaking of this system, Raymond Dasmann notes that "through generations of experience, farmers have found the best soil structure for the production of most crops is one in which the soil is worked into relatively small crumbs, and easily penetrated by water and plant roots. Cultivation aims at producing this condition" (1976:110).

By plowing and harrowing, the farmer prepares the soil for the growth of crop plants. The use of plow and harrow opens up the soil surface, buries vegetation and debris, breaks down larger clods of soil, and creates a soil texture suitable for seeding. In these ways, plowing and harrowing create conditions that facilitate the growth of crops, enabling germinating seedlings and growing plants to find the air, water, and nutrients they need. Through cultivation, the farmer also removes undesired vegetation which competes with crop plants, seeking to ensure that the resources of the soil reach the crops, not the weeds (Dasmann 1976: 110).

If you visualize a farmer plowing a furrow across a field, you can easily understand the nature of mechanical cultivation. Whether with the plow is mounted on a modern tractor, where it is raised and lowered by hydraulic lifts, or hitched behind a team of horses, mules, or oxen, the basic act of plowing remains the same: pulling a heavy, sculpted piece of metal through the ground by brute force. With this in mind, you can also visualize one of the problems of plow agriculture in New England—the plow encounters the stones of the land.

Historically, farmers responded to the abundant stones of New England's glacial terrain by clearing the fields of stones to make cultivation easier, digging up and moving stones to build stone walls (Russell 1976, 106). [2] Such stone walls still mark the boundaries of many fields in the Park, and New England stones still bruise the plows of New England farmers. Local farmers point out that some fields at the Park are "bony" fields. Visits to fields confirm this. Individual rocks peek through the soil and grass, often with scratches and paint flecks from where farm equipment has scraped them. In some places, spines of stone stick out at odd intervals, forcing farmers to swerve out of their way as they work the fields.

> "Every one of the rocks in that field has red paint scraped off on it, because the mower-conditioner is painted red."

Like their predecessors, farmers today would like to move stones out of their way to make cultivation easier. Hitting stones damages equipment. Repairs can be expensive not only in dollars, but in time lost. Even avoiding stones when you

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[1] Minimum till methods take different forms. Since post-planting cultivation mainly controls weeds, but may have adverse affects on crop yields by pruning roots, herbicides may be used to control weeds.

[2] The need to keep livestock out of cultivated areas was another incentive for building fences and walls (Russell, 1976, 103).

know where they are costs time and effort, and prevents farmers from cultivating in the most practical and efficient manner. Removing stones makes cultivation easier, avoiding damage to equipment and lost time spend repairing farm implements.

Naturally , farmers do try avoid obstacles they can see, even though avoidance maneuvers may be difficult and disrupt optimal patterns of plowing, harrowing, mowing or baling. "[Its] hard to keep an eye on your equipment and on an obstacle ahead of you." When the flow of machinery across the fields is impeded, the flow of time and effort is disrupted, too. Farmers dislike anything that disrupts the smooth flow of their operations (time is money), and seek to configure and maintain fields to come as close as possible to the ideal pattern for the safe, optimal use of their time and equipment.

Often, too, farmers do not know where the stones are until they hit them, since they can be hidden by vegetation or just under the surface. When they develop an intimate knowledge of the fields (which may take years of cultivating the same field to develop), they can avoid some obstacles of this sort, but years of repairs and lost hours does not seem the ideal way to deal with this problem. Farmers would prefer to receive timely permission to remove stones, or to have them removed in a timely fashion. As one said, "a day's work with a back hoe" will save enough in repair bills and delays to justify the expense and time.

Another farmer said he wanted to remove several large stones from a field, using a back hoe, but were told they could not. He said he hit these rocks, which he described as just flush with the ground, with the plow and other farm implements, and that these collisions damage equipment. He pointed out that he might hit each of these stones six or more times a year, while plowing, harrowing, and cultivating.

Not only stones, but fallen limbs, brush, and holes are hazards and obstacles to the safe and efficient use of equipment. On one field "they did an archeological study, and left a big hole." The farmer pointed out that this represented a hazard.

The fields on the parcel surrounding Noah Brooks house, for example, were described by one farmer as a "horror show." Not only are there many large stones and boulders on the parcel, but the presence of trees and the irregular and uneven configuration of the fields make it difficult to use farm equipment: the farmer looking ahead to avoid a tree or make a turn is likely enough to scrape his rig on rocks. Another farmer said he did not think he would want to put a plow down in this field because of the rocks.

In cases where permission to remove a stone or brush, or deadfalls, or a tree, cannot be given, because of a compelling interest or obligation that the Park has, the decision should be given promptly, and the reasons made clear, so that the Park's partners in multiple use are not left with any lingering sense that decisions are arbitrary or muddled in terms of their justification and rationale. At present, farmers do not understand why some decisions are made.

Perplexity at the Park's actions—or inaction—stands out as a recurrent theme in discussions with farmers. For example, one farmer reports that he was allowed to pull out a stump, but not use a back hoe. He said he did not understand the rationale for this decision. From a practical point of view, it seemed to make no difference, except that the back hoe would have been easier and more efficient.

Farmers expressed respect for Park goals that they could understand, such as maintaining the integrity of stone walls, or preserving archaeological sites. They do not believe that removing some obstacles from these fields would impact the Park's proper goals and management tasks.

Damage to equipment from hazards in fields, such as stones or holes, costs the farmer in three ways. First, they have to repair the parts damaged. Second, the need to stop and repair equipment loses them time. Third, not only does it cost them the hours it takes to get parts or to get a mechanic do the work, but it may lose them the window of opportunity they have to plant or harvest a field. While waiting for repairs, the weather may change, preventing them from doing what they have to do to prepare a field for planting, to plant, or to get their crops in before they are damaged by rain or lose their market value.

Soils

Soil is not "just dirt." The kind of earth removed from a building site may look like soil to the non-farmer, but it may not be suitable for plant growth. For a farmer, soil is what plants grow in. Ideally, it will be fertile and well drained, free of stones and other obstructions. It is "that part of the earth's crust in which the roots of plants grow" and from which roots extract nutrients and growth factors.[3]

In order for plants to grow, soil must have a number of vital characteristics: "For the purposes of crop production, soil must be considered to be a delicate balance of interwoven and interacting systems: (1) inorganic minerals, (2) organic matter, (3) soil organisms, (4) soil atmosphere, and (5) soil water" (Janick, Schery, Woods, and Ruttan 1974).

As practical agriculturists, farmers tend to see soil in terms of crop growth. They develop an intimate knowledge of the texture and structure of the soil of particular fields that they farm. For example, the farmers working one parcel at the Park pointed out a transition from one kind of soil to another (from a lighter soil to a heavier), and discussed the implications of this for growing crops. When showing me fields, farmers typically make fine distinctions between parts of the fields, and would often note the very specific soil characteristics found in specific areas—such as a spot that stays wet in the spring and after it rains, or a dry spot that does not retain rainfall or irrigation water.

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[3] Janick, Schery, Woods, and Ruttan 1974

Whereas the Park has apparently based its inventory of land suitable for agriculture on the classification of soil types, independent of their actual suitability for crop production, these farmers and others evaluate soils in terms of the practical needs of crop production. They evaluate the soil in relation to the crops they grow, and to the cultivation practices they use. They made judgments about particular crops and how they would do on the soils of particular fields. They also saw soils in relation to other resources that make crop production possible—sources of irrigation water and drainage ditches in particular. Some farmers grow crops on as many as twenty different kinds of soils. Farmers say they test soils frequently and follow the recommendations of the soil testing labs they use.[4]

Water

The drought of the summer of 1995 made it clear that irrigation is often a necessity not only for farms in the arid desert and semi-desert regions of the West, but even for farms in the supposedly humid and temperate East. It should not be thought that farmers need irrigation only in drought years, however. In reality, irrigation is an integral part of many area farming operations even during years of normal rainfall, because it permits farmers to increase production and improve the quality of their crops. This is crucial for many local growers because they participate in a market for premium fresh produce.

Often, the produce sold at local farm stands is not cheaper than produce brought in from other states, but rather must be sold as fresher and better qual-

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[4]Farming in Concord and Lincoln reflects a system of agriculture that developed on forest soils. While not highly fertile, such soils are often well suited to farming. They respond well to the farming practices of diversified general farming, as the system of agriculture that characterizes farming on once forested land in temperate, humid regions of Europe and North America has been called (Janick, Schery, Woods, and Ruttan 1974, Dasmann 1976). However, such soils degrade if poor farming practices are used.

As far as I can make out from the literature, agriculture in Concord and Lincoln has always generally involved diversified general farming, although individual farms may specialize, and particular crops emerge as particularly important at certain times (e.g. asparagus). The local farm economy have never been dominated by one crop in the way that cotton once did in parts of the South, or wheat in . With the disappearance of the dairy industry in the area, farms are perhaps less diversified, but between orchards and trucks farms, haying and livestock operations, an overall pattern of diversified agriculture continues, even though individual farms do not combine livestock and food crop production.

ity. Irrigation may be critical to getting the quality of produce needed for local markets.

Consistent with this, I observed extensive use of irrigation at the Park and its environs 1995. Some farmers said irrigation was necessary in two of the last three years. I observed drip and sprinkler irrigation in the area, but only sprinkler systems based on moveable pipe at the Park. One farmer expressed a desire to use drip irrigation at the Park.

Some farmers said they would like to use existing irrigation ponds built by previous generations of farmers at or near fields at the Park. The desire to use or enhance water sources reflects the importance irrigation has assumed in local farming, and the Park should be prepared to assess the potential and appropriateness of water sources for agricultural use.

Too much rain can be almost as much of a problem as too little. It can, for example, cause tomatoes to split or spot, reducing the marketability of this relatively high value crop. Fields may also stay to wet to till or plant in years of heavy rain. Proper drainage, promoted by drainage ditches or other measures, allows earlier planting and better crops. Some farmers said they would like to clear drainage ditches associated with certain fields, which have become partly overgrown and filled in.

The historic trend in agriculture is towards farmers exercising ever-greater control over the environment. Where 18th and 19th century farmers removed stones from fields to permit greater ease of tilling, built fences for livestock, dug and maintained drainage ditches, and spread manure to maintain soil fertility, their modern successors need to do take equivalent measures, but also need to maintain irrigation systems to bring water to their fields. Where it does not conflict with the Park's mission, the Park may wish to permit or help farmers drain and irrigate the land, engage in soil development and conservation programs, and so on. The Park should identify sources of irrigation water that farmers can use and allow farmers to construct or maintain drainage ditches associated with their fields. It should eliminate any uncertainties about the availability of these resources before offering parcels for long-term leases.

Natural sources or irrigation ponds are the preferred source of water for irrigation, because of costs involved with the use of municipal water supplies. All the farmers that I observed used irrigation ponds or streams and rivers as their source of irrigation water.

Crop Hazards

Crop hazards include everything that injures crops, thereby threatening the livelihood of farmers. Crops are threatened by many different sources. Substituting deer, raccoons, crows and other local threats to crops for those listed in the following quote gives a certain sense of what it is like to be a farmer even today:

> Worms have destroyed half the wheat, and the hippopotami have eaten the rest; there are swarms of rats in the fields, the grasshoppers alight there, the cattle devour, the little birds pilfer; and if the farmer loses sight for an instant of what remains on the ground, it is carried off by robbers....(From an ancient Egyptian scribe; quoted in Janick et al 1974).

Other crop hazards include drought and heat, frost and flood, hail and wind damage. The problem of pests such as weeds, insects, and disease-causing fungi—all hazards that farmers may attempt to control with pesticides—are discussed in chapter 9. In this section I will discuss other kinds of threats to crops, including the threat of having crops carried off by robbers.

Some local farmers identified deer and raccoon as major threats to crops on certain fields at the Park and elsewhere in the area. I observed damage from deer. One field in particular at the Park (Cook's Field) sustained heavy damage from deer to pea and beans grown there. Reports indicate that other crops sustain quite heavy damage from deer in the area. Birds are a problem in fields of sweet corn, but apparently are seen as one that can be managed—deer were seen as a more serious threat. In fact, deer may threaten the ability of farmers to grow crops on certain fields. Farmers identify the damage to crops caused by deer as one of the more urgent problems facing them on these fields. Farmers and Park managment (and perhaps local towns) will need to work together to find ways to manage this problem.

Crop theft and vandalism were concerns for some local farmers. Every vegetable farmer and former farmer interviewed has experience with theft of crops from fields or stands.

> "We had pumpkins in [a field in] back—and the kids caught some fellas, some college kids [taking pumpkins]... it was some kind of initiation thing, they had to get so many pumpkins." [Member of a former farming family]

Farmers reported the theft of items from farm stands, including pumpkins and Christmas trees left out at night, and apples and other items from displays.

Brooks (1987) reports that farmers in his research described several types of serious problems associated with trespass (on private farm property): theft, vandalism of crops and equipment, driving vehicles on farm land, horseback riding on farm land, hunting, using farms as shortcuts, failure to control domestic animals (dogs running loose), littering and dumping. Any Park with an agricutlural program may encounter some of these problems. They are all concerns or potential concerns for farmers at Minute Man.

At present, not all the rangers who patrol the Park seem to know all the farmers. This invites two kinds of potential error: on the one hand, cases of theft or vandalism may be ignored because it is assumed the persons in the fields are farmers with legitimate business there; on the other, farmers may be stopped and confronted for being in the fields because rangers don't know who they are and want to determine if they have legitimate reasons for being there. While recognizing that farmers and rangers are busy, it may be worthwhile to have those rangers who patrol the Park make the effort to meet local farmers when schedules permit.

Managing Risks and Uncertainties

One member of a former farming family characterized farming as a gamble. "It's a gamble. No doubt about it."

As the discussion of crop hazards suggests, farmer face a variety of uncertainties. Not only are there risks and uncertainties associated with nature—the weather, pests, soil conditions—but also risks and uncertainties associated with the social and economic aspects of farming. Farmers assume financial risks by investing in equipment that has to be maintained. They may assume debt for the purpose of farming production and must sell enough produce to service this debt. There are market risks and uncertainties generated by consumer behavior and by government regulation. Managing these multiple uncertainties is perhaps the ultimate challenge of farming.

Many of the uncertainties are integral to agriculture. Farming practices modify nature, seeking to control events and processes that affect the growth of food and forage plants. This control is always uncertain, however, and the success farmers have in creating optimal conditions for plant growth always vary from year to year. The history of farming is the story of seeking and gaining greater control over the environment of crop production, but agriculture has not achieved total control. Growing conditions shift in and out of the control of farmers. The incomes of farmers are likely to vary correspondingly. Growing conditions are determined by a variety of factors—the vagaries of weather, the ecological relations of plants, insects, fungi, and other biological organisms. Not even of the most sophisticated and well-equipped farmers can absolutely determine how crops will turn out in a particular year. Cultivation and planting on well-drained fields can occur in late March or early April one year, making possible early crops, leading perhaps to higher yields or premium prices—but be delayed by rains and cold weather the next. Such uncertainties are endemic to agriculture.

Concord farmers, like farmers elsewhere in the US, talk of "good years" and "bad years." The judgments are not always global, although often it comes down to the bottom line: either the farmer made money, or they lost money. But farmers will speak of a good or bad year for particular aspects of crop produc-

tion, particular aspects of agro-ecology. The drought of the summer of 1995 made it a "bad year" overall for many farmers, but it was a "good year" for some farmers, for some crops, and for some aspects of crop production. For example, one farmer noted that it was a "good year" in terms of corn-ear worms. They did not show up early or in great numbers.

The other side of the coin is the way farming responds to changing social and economic conditions. Society as much as nature is a source of uncertainties for farmers. Here too farmers have only some control. A farmer may have a "good year" in terms of growing conditions for key crops, but still face a "bad year" in terms of market conditions. I think the dual uncertainties of growing conditions and market conditions help explain the restlessness of farmers when it comes to facing a third source of uncertainty—government policy and bureaucratic practices that regulate the use of land. Local farmers feel that the regulatory or administrative environment can undermine or hinder their ability to control the natural environment so that they can survive in the market environment.

Part of this has to do with timeliness. Timeliness is essential for farmers; delays can mean they miss windows of opportunity for planting or harvesting. One local farmer with no connection to the Park recounted leasing land from a town. The town wanted him to farm the parcel, but delayed the paperwork until late in the spring. As a result, the farmer was late planting these fields, and the summer turned dry. The crop he planted did not get established before the dry spell began. The farmer was not happy with the results of his work, and blamed the delays for the less than satisfactory outcome. In his opinion, governmental entities do not understand how important timeliness is for farmers. Farmers in general, and those associated with the Park, agree strongly with this evaluation.

Farmers have a number of stories they tell about crops being lost because of slow responses by government bodies from which land is leased. In one case, a farmer requested permission to irrigate a crop from a natural source. At first, they were denied permission. Later, they were told they could irrigate from this source, but the crop had been lost by the time they were given permission.

Obviously, situations such as this should be avoided if at all possible. The Park may wish to inventory agricultural resources associated with particular parcels, and make decisions in advance about whether and under what conditions farmers will have access to these resources. Water sources, in particular, appear critical in this regard, and crucial to the Park's agricultural program: vegetable crops and livestock require water. Uncertainty over water supplies should be eliminated in advance of leasing if possible.

The Park's leasing program generates uncertainty about the long-term availibility of land. This will be discussed in chapter 6.

Types of Crops Grown

In 1995, food crops for human consumption, forage crops for livestock consumption, and ornamental crops were grown at Minute Man. Ornamental crops included flowers, waxed gourds used for decorative display, corn stalks harvested for sale for seasonal decoration, and giant Halloween pumpkins. Forage crops included grass hay and pasture. Local growers raise and market a wide range of food crops in the environs of the Park, but not all of these were grown at the Park. Local farmers grow apples, asparagus beets, carrots, squash, strawberries, turnips, tomatoes, zucchini and many other crops. In 1995, crops grown on the Park in 1995 included sweet corn, green peppers, pumpkins and squash. Sweet corn was the most important crop, and the most acreage was devoted to it, followed by pumpkins and peppers. On a smaller scale, local farmers produced a variety of other produce on Park agricultural land. They grew leeks, Swiss chard, spinach, lettuce, string beans, shell beans, Broccoli rabe, and melons. While tomatoes were not grown commercially on any of the fields rented on special use permits, they were grown on the Inferrar farm.

Crops notable by their absence on Park land included potatoes and strawberries, and perennials such as asparagus and berries. Local farmers do grow these crops on land outside the Park.

Food crop production at the Park reflects the market niche of local farmers. The three crops usually listed as the most important are sweet corn, tomatoes, and pumpkins. These are also the three crops that are essential to roadside farm stand sales. Corn, tomatoes, and pumpkins are popular items that people will visit a stand to buy. As one farmer put it, these crops "draw customers." When customers come in to buy these crops, they may also buy other items. Of these three, farmers and stand owners rate sweet corn as the single most important crop.

The Most Critical Crop: Sweet Corn

From sugar to starch, and from field to stand

As soon as an ear of corn gets picked, a sort of biological clock starts ticking, and the sugar in the kernels of corn start turning into starch. Growing premium sweet corn is a kind of race, a race in which the farmer tries to get the corn to market faster than the sugar content of the sweet corn changes into tasteless starch. The demands of this race shape the organization of farm operations: plantings are staggered so that fresh corn will continue to ripen throughout the season. Crews must be mobilized to pick the corn and trucks line up to deliver it to roadside stands.

If we juxtapose the tempo and rhythm of activity imposed on farms that grow corn with the pace of change in agriculture, driven by social and economic factors, we find that sweet corn's biological sprint from sugar to starch has

helped preserve local farming, to slow the pace of change so that local farms could survive. Sweet corn buffers local agriculture from changes even more severe than it has faced. Why? Because sweet corn does not ship well. And because it does not ship well, local demand for fresh, local corn exists. This local demand sustains local farmers. Thus the farmer's race against biological time—can he get the corn to the customer while it is still sweet and delicious?—has in a manner of speaking slowed another kind of time in Concord. Corn's place in the repertoire of crops marketed by local farmers means the pace of agricultural change has not proceeded as swiftly or disruptively as it might otherwise have. Corn has been good for local farmers.

For some of them, it is the most essential crop, the crop their livelihood depends on. It is also the centerpiece of the farm stand system on which local agriculture depends.

The preference for locally grown, vine-ripened tomatoes means that growers can compete against tomatoes shipped in from other states, although the advantage here may not be as great. High yield per acre and a relatively long local season makes tomato a good crop for stand sales.

Roadside Farm Stands

As the two farm histories showed, farm stands are a tradition in the area. They constitute a key resource for family farms and farm families. They are also significant resource for the people of local communities who buy produce at the stands.

While crucial to the subsistence of local farm families, these farms stands also represent a cultural tradition. Farmers and non-farmers alike see farm stands as part of the heritage of the area. The farm stands directly link agriculture with the wider community. Farm stands and the farmers who operate them are regularly reported on in local newspapers. Visits to stands show that farmers are proud of their stands, and that the stands are seen as expressing values of hard work and independent entrepreneurial farming.

Farm stands are the critical market for local growers of fruits and vegetables. Some of the larger farm stands in the area stay open all year, but others are seasonal, opening in the spring and closing in the fall or winter. One farmer said there was no profit in staying open over the winter, but that it allowed the farm stand to retain employees who would otherwise be out of work. A local farmer considering staying open all year was going to evaluate customer demand to see if it justified staying open. The two farm stands currently operating in the Park both close during the winter.

Whether or not they close for the winter, the pace of activity quickens in the spring. For farmers with farm stands, the selling season may begin even before crops can be planted in fields. Most farm stands begin the season selling bedding plants and flowers started in greenhouses. Local farmers start a large vari-

ety of flowers and vegetables for people preparing their lawns and gardens, who buy items to transplant in their gardens or flower beds. Home gardeners buy vegetable starts for such transplantable garden staples as cabbage, peppers, or tomatoes.

The kinds of items that draw customers to the stands vary with the seasons. In May and June, fresh strawberries are a draw. Others crops—peas, zucchini, beans, lettuce, potatoes, tomatoes—come in succession, culminating with sweet corn and finally pumpkins for Halloween. Some local stands close in November, but many stay open to sell Christmas trees.

One farmer expressed the concern that many customers no longer understand the seasonal cycle of crops, so do not know when to come to get fresh local produce. For example, he thinks many don't know when strawberries are "in season." Some effort is made to educate customers and to mark the seasons for them, for example, by sponsoring events associated with particular crops. The Park might be able to work with farmers on such events, focused perhaps on crops that were of historic importance, such as corn or apples.

Farms stands have changed in certain ways over the years, reflecting changes in local communities. One former farmer describes what customers were like in the 1950s:

> "Back then, people did not eat out like they do now. People would buy 50 lb.. of potatoes, bushels of apples, to keep for the winter. They bought in bulk for big families. Mothers were at home....Stands are different today. Not just farm stuff [is sold]. We just had fruits and vegetables, later Christmas trees."

Farm stands are allowed to sell a certain amount of non-agricultural items, and they do so. Given the nature of their market, they must also often buy produce from other farmers to make sure they have a wide variety of crops and a continuous supply of the most critical crops, such as sweet corn.

The wife of a former farmer describes this: "[We] just sold what we raised" in the early 1950s. "Later he would buy at market—usually from local farmers—small items you don't need to have a big crop of." She notes that her husband would take surplus crops into the Boston market. Sweet corn was an important crop, and they needed to have it available at the stand every day. "He'd plant corn every 7-10 days, and hope they mature continuously, but if it did not, he'd buy to fill the gap until his own came in."

This practice continues today. As we saw in the farm history, the Palumbo brothers specialized in growing corn for stands and they supplied other farmers when there was a gap in their supply of sweet corn.

This concern with supply reflects demand. Farmers don't want to miss out on sales. They also feel that if a stand does not have corn, people won't come back. Farmers say there is a very strong market for locally grown sweet corn.

Local growers say some local customers "take their sweet corn very seriously" and will visit several different stands to find the sweet corn they like best.

Many residents clearly value local farms, and not only because farms maintain a highly valued agricultural landscape. Many local inhabitants patronize farm stands regularly. I believe they value the experience of going to these farm stands as well as the produce they purchase there. Patrons seem to enjoy interacting with growers and workers at the stand, asking questions about produce on display and about varieties they might grow in their gardens at home.

Farm stands and the experiences they offer are significant ethnographic resources. I want to stress that it is not just the produce, but also the experience that is valued by community members. For some, going out to buy sweet corn for dinner is one of the rituals of summer. In October, family groups go with their children to the stands to buy pumpkins. At one local farm, hay rides are offered during on weekends leading up to Halloween. These family outings are clearly enjoyed and valued. Another stand in Concord has a strawberry festival in June to encourage people to come out. In August, they might hold a sweet corn feast, where people can compare the taste of different varieties of locally grown corn. Whether they visit farm stands for such events, or to buy a dozen ears of corn or a Jack O' Lantern pumpkin, farm stands put people in touch with local agriculture and the heritage it represents. This should be seen as one of the values associated with farm stands, in addition to the subsistence value such stands have for individual farmers and the role that farm stands play in sustaining farming in the area.

SIX

AGRICULTURAL LEASES

Sections

Terms and conditions
Coordinating Farming Practices: IPM and Crop Isolation.
The Question of Tenure
Interest in Leasing Land
Field Size and Configuration
A Long-Term Objective: Consolidation

Terms and Conditions

What should the criteria be for formulating and granting agricultural leases at Minute Man National Park? This chapter will address this question, drawing on data from interviews and observation to suggest what the nature of farming practices and the organization of farm operations imply for the Park's agricultural leasing program.

A lease structures and constrains what a farmer can do, through the clauses stipulating conditions and requirements, and through the tenure on the land it gives farmers. Local farmers make it clear they believe multi-year leases would be better than annual leases. They also feel leases should allow them to engage in normal farming practices, without undue restrictions that would encumber and impede their operations. They feel leases should impose as few restrictions as possible on normal farming practices. They make the case that longer term leases would allow them the time to make investments in the land and to realize a return on these investments.

The type of agricultural uses permitted will be restricted. Not all forms of agriculture are compatible with the Park's mission. Agricultural uses such as growing nursery crops or Christmas trees, greenhouse or hydroponics operations, or the siting of large-scale storage facilities and warehouses for farm operations, would alter the character of the landscape and be incompatible with the patterns of agriculture found here from the 1700s to the present. Fortunately, local farmers likely to be interested in leasing land engage in forms of farming consistent with the Park's objective of preserving the historic appearance of the landscape: they grow vegetable and hay, raise cattle, horses and sheep. These are the modern equivalents of the farming practiced in the era the Park commemorates.

I believe that once having decided on the kinds of farming that are consistent with its directives and goals, the Park should not try to micro-manage farm op-

erations. Interviews make it clear that farmers will reject such efforts; there is already much talk about how difficult the Park's regulations make it to farm, and some farmers who say they have no interest in leasing land from the Park note this as a reason.

The Park may need technical assistance to distinguish between reasonable terms and conditions and those that would unnecessarily and unreasonably impede normal farm operations. In general, the more conditions imposed on agriculture use, the more likely it becomes that some of conditions will interfere significantly with normal farming practices, and so become a burden on farmers. The Park should seek technical assistance to make sure that a condition that seems reasonable and innocent from the point of view of Park management does not in fact impede farm operations in ways that make farming difficult or impossible. For example, if farmers need to plow to a depth of 8-9 inches, and have been doing so for decades on fields in the area, including those in the Park, then stipulating in leases that they cannot plow deeper than 6 inches might prevent those fields from being farmed at all.

Should such a situation occur—in a kind of regulatory "melt-down" of the Park's agricultural program—the farmers and the Park would both lose. The farmers would lose access to land that can help sustain farming in the area, while the Park would lose the help farmers provide in preserving the agricultural character of the landscape.

The Park will need to weigh monetary bidding for the land against other kinds of criteria for formulating and granting leases. The monetary value, or rent, should be only one factor considered in granting leases. The farming background and experience of farmers should also be taken into account: so of course must the technical merit and appropriateness for a particular site of what the farmer proposes to do with the land, and its compatibility with the Park's mission.

The farmers consulted in this study—both those with an interest in leasing land at the Park and those who reported no interest in doing so— stressed the importance of having a farming background and farming expertise. They expressed skepticism about non-farmers who want to farm, and questioned whether "gentlemen farmers" and "hobby farmers" with no farm background would be able to manage and maintain farmland properly. Some made the point that poor farming practices can damage fields. Not only can the soil be exhausted, but the "farmability" of fields can deteriorate if they are improperly cultivated. One made this point by telling of how he used to farm a privately owned field, but had lost the lease to some one who offered to pay more to the owner. The owner later contacted him, asking if he would "take back the land." The farmer looked at the field and then declined, saying that the way the land had been used by the higher-paying tenant made it harder to farm, and that its agriculture values had declined. I heard other complaints about farmers who

misused leased land: who "used the land pretty hard," or used it more as a storage site than as land to farm.[1]

Adjoining communities—notably the town of Lincoln—take into account such community criteria as the past association of a farmer with the land, the wishes of former owners, and the feelings of neighbors. Such criteria reflect the cultural values of the community, not monetary values alone. A cultural criteria in the farming community is reflected in the practice of not bidding against someone with a relationship to a piece of land, and giving farmers who live closest to a piece of land the first chance to purchase or lease it when it becomes available. The Park will need to decide how to weigh such cultural criteria against other criteria.

The Question of Tenure

With one exception, all farmers interviewed thought leases should be for a term of ten years. Five year leases, although less than optimal, would be better than the present one year leases. This consensus judgment has a firm foundation in the realities of agriculture, which involves multi-year investments, not only in equipment but in the soil. The best farming—in terms of farmers' long-term economic viability and agro-ecological conservation— also involves multi-year planning. Long-term leases allow farmers to make investments needed to build up the soil, to practice proper crop rotation, to plant perennial crops, to plan for the long term. [2]

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[1]While there is not enough data to make a definitive judgment, there is a suggestion in the data that farmers from out of the local area may be more inclined to "mine the soil," or use leased land as much as a storage site as for actual farming. Local farmers have their own storage facilities close by.

[2] As Rogers (1985:212) says, "A relatively long planning horizon is generally considered to be crucial to the optimal management of farm resources. At the least, the operator needs to have a reasonably accurate estimate of the size of his operation over a period of years." In many communities part-owners achieve security of tenure on rented land because they lease from kin or from neighbors, who are bound by kinship ties or community values not to withdraw the land from the farmer's use, thus giving the farmer a long-term planning and investment horizon. Rogers notes that where monetary values erode security of tenure, "It will then become very difficult for farm operators, unsure of the size of their operations from one year to the next, to make the kinds of medium- and long-run plans required for good management" (1985:213). She notes the case of a farmer who bought a new combine—a costly investment—in the hopes of acquiring "a bit more rental land." This farmer instead lost rental land he already farmed when it was sold to a new owner, who rented to some one else: "The original tenant...found himself with new equipment now much too large for the farm and little hope of building his holdings back up to the original size in the near future."

Only one farmer said long-term leases were not important to him and that he was satisfied with the present system of one-year special use permits. However, even the logic and behavior of this apparently exceptional case, when put into context, turns out to be consistent with the value other farmers put on multi-year leases. His logic was that he thought Park staff were reasonable people, and he trusted them to make reasonable judgments, and so counted on the one year permits being renewed. In effect, then, he was acting as if the one year permits would provide multi-year tenure. Furthermore, the primary crop he grows at the Park is hay. Hay production is less capital and labor intensive than vegetable production; it involves less investment of time, resources, and capital. Thus, less is at stake if a one year lease is not renewed. Even so, this farmer remarked that he would not be happy if he "was into a field for several hundred dollars" and a lease was not renewed. Moreover, his endorsement of year-to-year leasing applied only to hay. He said he would need a long term lease if he was to invest in fencing for livestock.

In general, long term leases provide incentives for the highest quality farming. Long-term leases encourage farmers to make investments in the land and in their farming operations. It is important to keep in mind the long-term nature of this. The value of crops grown in a single year, or even in five, may not cover the costs of equipment or facilities that must be purchased to farm at all. Under long-term leases, farmers can recoup the costs of farming, and so are more willing to commit the resources that it takes to maintain land in prime condition. With long-term leases, farmers know they will profit from the investments they make in the land. Long-term leases allow farmers to develop long-term farming strategies. Long-term leases provide farmers with the reasonable certainty of tenure on the land that they need for planning purposes, for developing cropping systems for particular parcels, for learning the detailed topography and agro-ecological conditions and hazards of the fields they lease. Long-term leases make it possible for farmers to realize a return (or at least recover) on long-term investments in the fertility of fields, in equipment and facilities required for farming, and in agricultural infrastructure such as fences and irrigation systems.

For example, few farmers would be willing to purchase an new tractor for $60,000 —or even a used one for $3,000—in order to expand their operation to farm additional land, if they knew they would only be able to farm a parcel of land for one year.[3] They would need to have some assurance that they can recover the costs of the investments they make. While they may be able to justify

[3] If they already have excess capacity in equipment, they might of course be willing to work a parcel for one year as a way of maximizing the use of their equipment, and thus of their investment. But interviews suggest they would not add to their capacity with a time horizon of less than five years. A lease structure that encourages farmers to "stretch" resources and capacity rather than commit resources and invest in additional capacity may not result in the best farming.

major expenditures in equipment and soil improvements over a multi-year lease, it is hard to justify those investments if they actually believed they would only farm it for one year.

At present, the one year special use permits put farmers in an equivocal position: they expect leases to be renewed, and tend to plan on that basis, but they can never be sure from one year to the next that they will be. I suspect this leads to a hedging strategy, although I cannot at present demonstrate this. By hedging, I mean that they make larger inputs into the land than they would if they were certain it was a one year lease, but not inputs as large as they might if they were certain they would be farming the land for five or ten years. That is, on the one hand most of them act as if the permits will be renewed and base their inputs on this; but at the same time, since they feel the permits might conceivably not be renewed, they do not make investments at quite the same level they do on their own property or on land on long term leases. While this may be difficult to document empirically, I think it is consistent with the short-term structure of the present leases. There is some suggestive data.

For example, one farmer has put off applying a soil supplement to a field because he does not know whether he will farm it next year. The benefit from this soil supplement would be achieved only in the next two to three years, and without the reasonable certainty that he will benefit from his own inputs, he is unwilling to invest the time, money and effort to do what he thinks is the right thing for the long-term fertility and conditioning of the soil.

Other farmers in the study have put off investments in irrigation equipment and other capital equipment. The following from a local farmer illustrates how the farmers in general assessed the relationship between leases and investment:

> "If they want to build fences, then they can throw me out whenever they want to. But if I pay for the fence, I don't want some guy to bid a few dollars more than me, and get the fences I put in. Fences are a 20 year investment. For me to make fences pay, you are talking five or more years even to break even."

Short term leases are not compatible with these fundamentals of farming. Short-term leases produce uncertainty that lead to a lower level of investment in farm operations and in fields. They may tempt some farmers to take shortcuts. Short-term leases may focus farmers on realizing short-term gains. Such gains may be offered by short-sighted farming practices that are hard on the soil. Short-term leases may invite an extractive approach—a kind of mining of the soil—rather than a sense of stewardship and a commitment to sustainable agriculture.

Even where farmers try to be conscientious (as are the present farmers at Minute Man) short-term leases put them in an difficult position. The very fact that farmers anticipate but cannot be certain these short-term leases will be renewed creates a dilemma for them: either they must choose to minimize their investments in the land, guarding themselves against the possibility that their leases will not be renewed but not treating the land in the way they might wish, or else they rely on the leases being renewed and risk overextending themselves if they are not.

Longer term lease may also better serve management goals than do short-term leases. For example, long-term leases on parcels of sufficient size permits the kind of diversified agriculture and crop rotations that might help provide desirable habitat. An IPM program can only be fully implemented over multi-year periods (and also requires larger parcel sizes be leased), so that long-term crop rotations can be implemented. Long term leases would justify the long-term investment in fencing that would permit grazing, allowing the reintroduction of cattle.

Local farmers say leases should not be allowed "to run down to zero." That is, they should be evaluated for renewal or termination before the final year of the lease. Farmers argue that this would allow for continuous long-term planning. If leases are renewed, farmers can continue with their long-term plans and management activities. If leases are not renewed, this allows for an orderly withdrawal and transition.

Interest in Leasing Land

If current levels of interest are any guide, the Parks should have no trouble leasing most of the land currently farmed. It is mostly desirable land and farmers are eager to farm it.

While a number of farmers do currently express a rather strong interest in leasing the Park's best agricultural land, I want to note that this may change, as local conditions change.[4] The demand is not fueled by very many farms. Thus, if one local farm should go out of business (and farms do fail), interest in leasing land might fall off, at least for a year or two. Even if the current interest in land were channeled into competitive monetary bidding, this might not bring in a significantly higher total income from leasing for the Park. It may bring in somewhat higher fees, I am not sure it is realistic to expect greatly increased fees. Moreover, even if fees per acre double, this will not represent a large aggregate sum.

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[4] Other farmers indicate they have little or no interest in leasing land from the Park, often citing the restrictions on farming at the Park and uncertainty about the continuity of Park policies. Others have no interest because they have as much land as they desire to farm.

It should be kept in mind that adjacent communities have leasing programs which do not involve competitive monetary bidding. Farmers also believe that additional land may be available in the future from the state and other public agencies. If this turns out to be true, this might depress the demand for land at the Park, although interest in farmland at the Park is currently substantial.

A danger here is that less qualified farmers will bid more than highly qualified farmers. The highest bidder may not be the best farmer—not for the land, and not for the Park. If I understand the Park's goals, it would seem that the primary consideration in granting leasing should not be getting the highest bid, but rather the ability of a farmer to be the kind of steward of the land who will ensure its long-term conservation and the retention of the landscape characteristics vital to the Park's mission, thereby enhancing visitor experience. The same principle of seeking the best farmers applies if the desired ends are long-term farm viability and sustainable agriculture. It seems reasonable to ask for a statement of qualifications and experience as part of the proposal that bidders submit.

Field Size and Configuration: The Issue of Fragmentation

Currently at Minute Man National Park, roughly 130 to 140 acres of land are leased to farmers for hay or vegetable production or farmed on occupancy reservations. This acreage is farmed by 10 farmers (excluding Inferrar). Leased parcels are relatively small, ranging from about 4 to 37.5, for an average size of 13 to 14 acres. Parcels used for vegetables range in size from 4 acres to almost 23 acres. Fields, however, are smaller than total land rented to a single grower. Moreover, in reality the areas that can actually be farmed are often even smaller, since the parcels leased contain areas of brush, trees, rocks, and other features that impede or prevent farm operations.

These figures indicate that field size and total acreage per farmer are less than optimal. Moreover, the pattern of leasing fragments ideal natural farming units (contiguous fields with complementary tillage and drainage characteristics and topographies). In one case, the present leasing pattern also fragments the farm units that existed when the Park was established (at the Jones/Stowe Farm, or Maplewood Farm). Besides being inconvenient and inefficient, this fragmentation impedes crop diversification and rotation. It is not ideal for the farmers, and not good for the land.

A Long-Term Objective: Consolidation

In general, the Park should have the long-term objective of consolidating farm land into larger parcels, leased to fewer farmers than at present. Most farmers interviewed share the view that larger parcels are better from a farming point of view. Small, scattered fields require equipment to be moved more often. Time spend commuting between fields is time lost for tilling, planting, and harvesting.

Not only are small production units not as efficient for farmers, they also make it hard for them to engage in the patterns of crop diversification and crop rotation that the Park might like to see. Moreover, some of the smaller parcels presently leased seem too small to be treated as truly integral to farmers' operations (an effect compounded by short-term leases). While land associated with the Park is generally well farmed, larger parcels are likely to attract more of farmers' time, attention, and resources, because they will represent a larger part of their total operations, rather than a marginal piece. Farmers often mention fields or parcels of 20-30 acres as desirable. It will probably not be possible in most cases to create larger fields, since the network of stone walls means fields cannot be consolidated, but at least larger parcels can, and should, be leased in the future.

It should be understood that the "parcels" the Park leases are not the same as "the fields" that farmers actually farm. Parcels often include land that cannot be farmed, because of soil conditions or because of trees or scrub brush. The 20 to 30 acre size here means "farmable acres" organized into the most efficient possible configuration given the topography, presence of stone walls, and so on, even if not into one unified field. At this point in my research, it seems to me that he Park should, over the long run, attempt to offer for lease parcels in the range of at least 20-50 acres, centered on the largest farmable fields available, with "satellite" fields as close to the core unit as possible.[5]

Fragmentation of the Park's agricultural land into small units has the effect of impeding efficient management, from the farmers' point of view and, I believe, from the perspective of the Park goals. [6] The farmer has to haul equipment to a small field, work the field, and then move the equipment again, back and forth on busy roads. When only a few acres are leased to a farmer, and on a short-term lease, it is not reasonable to expect crop diversification and rotation.

Coordinating Farming Practices: IPM and Crop Isolation.

Leasing adjacent parcels to several different farmers also creates the need for farmers to coordinate some of their farm practices: at best, this might simply be another chore, but it failure to coordinate actions could lead to problems. When there are several abutting farmers, they will have to coordinate their pest

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[5] This would seem workable for the area where the most intensive farming goes on. An alternative pattern, already used, would be for a "strip" of fields to be leased to one grower, who can start the day at one piece, and end it at another. This is most suitable for haying operations.

[6] Leasing smaller parcels to more farmers must, I imagine, almost always constitute a drain on management resources than leasing larger parcels to fewer farmers. Leasing fewer, larger parcels to fewer farmers would ease the burden of the agricultural leasing program.

control and IPM procedures. The more farmers there are, the harder his becomes. For example, a farmer will need to know his neighbors spray schedule. Spraying could kill beneficial insects that have been released. Bees needed for crop pollination could be killed.

Some varieties of crops need to be isolated in order to avoid cross-pollination. Some local farmers, for example, grow varieties of sweet corn that need to be isolated from other varieties grown in the area.

Another predictable consequence of leasing small parcels—especially where they could easily be consolidated with other parcels, as in the core area of farming in the Park—is that pressure to acquire more land builds up among farmers, potentially straining neighborly relations among farmers. This is a serious issue, since farming here depends very much on close, cooperative ties with other farmers. While what one grower called "friendly competition" exists between farm operators, structural conflict does not. The Park should be wary of creating and prolonging a situation of structural conflict among farmers who would otherwise cooperate and support each other. Perhaps the only way to resolve this will be to move forward with a new leasing program, based on a more formal bidding procedure.

One exception to this long-term objective of consolidation would be small scale operations involved in agricultural reintroduction, such as grazing on selected sites where the primary consideration is making use of small parcels not currently farmed. Even here, although several "ranchers" might be involved, it might be simpler to work with one or two livestock operations that would place animals at two or three locations.

Where small fields are unavoidable, adjacent fields or a series of fields close to each other, should be leased to the same grower whenever possible, so that equipment can be utilized efficiently.

How far can consolidation go? How many farmers does the Park need? One farmer could in principle handle the prime agricultural land at the Park, but in practice local farmers are fairly specialized, either growing vegetables or specialized for haying and livestock, not both. This means the Park would need at least one farmer who specializes in hay, and at least one (but more probably two) who specializes in vegetable crops, if it wishes to maintain a diversified farming program that maintains both livestock and historic crops on the land.

Also, with one farmer, the Park's ability to achieve its goals through an agricultural leasing program are dependent on the fortunes of one farmer. Given that farming is a enterprise with risks, it would be better to diversify somewhat and maintain a working relationship with two or three farmers.

More farmers are superfluous unless more land can be reintroduced to agricultural use. Of course, the Park may have goals that are met by having more than the minimum number of farmers needed. For example, it may wish to have horses at a particular location. But from a strictly agricultural point of view, ten

farmers are too many. Unless a particular Park goal is met by leasing to additional farmers, it is hard to see any value in having more than three, or at most four, farmers, assuming the land available for farming does not increase dramatically. More farmers means each will have less land to farm. The less land they have, the harder it will be for them to survive and make a living. The more farmers, the greater the demands on management time and effort will be. Smaller units reduce every one's management flexibility (e.g., in cooperating on conservation measures, on IPM measures).

Since with more farmers the amount of land leased to each would be less, there might be significant pressure to acquire more land, leading to tensions with the Park or other farmers.

As farmers retire or withdraw from the Park leasing program, it would make sense to consolidate land under fewer farmers. No purpose would be served by recruiting more farmers than those already involved in the Park's agricultural program, except in the special context of the agricultural reintroduction program, where it might be necessary to recruit some one who is willing to clear land.

SEVEN

THE QUESTION OF HOUSING

Sections

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The Nature of Farm Households
Housing for Farmers
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Farmers' Evaluation of Proposed Housing
The Importance of Outbuildings
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Introduction

The Park has housing it could make available to farmers as part of its agricultural leasing program. This chapter reports on what farmers had to say about on-site housing, and assesses the problems and potential of offering housing to farmers. The research suggests that while offering housing at the Park could be of value in some circumstances, providing housing does not at present appear to be a necessary condition for supporting agriculture at the Park, at least for land currently farmed.

Moreover, the proposal to offer on-site housing raises a number of questions. What are the implications of linking housing and land leases? How would this be done? Does the housing meet the needs and requirements of farms households? Would farmers who do not need housing be excluded from the leasing program?

As these questions suggest, linking housing and land leases could fundamentally alter the Park's agricultural program. There is some indication in farmers' evaluation of the proposal that offering on-site housing could evolve into a management problem.

Making housing a prerequisite for participation in the agricultural leasing program seems counter-productive in terms of matching up land with the most highly qualified farmers. What the data and the analysis of farm operations suggests is that housing might usefully be offered as an option, but not as a prerequisite, for land currently in agricultural use at Minute Man. It may be that the best use of housing for farmers would be as a way of supporting the agricultural reintroduction program.

With each unit identified as possible housing for farmers, a question that needs to be addressed is this: is the housing compatible with the needs and pref-

erences of farmers? Ethnographic research suggests some definite answers to this question.

The Nature of Farm Households

Farmers in the United States live in a variety of circumstances: from modest mobile homes to large and luxurious farm houses. No doubt a few could be found who live in residential areas and commute to their farms. Some may even live in apartments.

But these would be exceptional cases. Despite this diversity, I think there would be some agreement that the ideal living situation for an American family farmer consists of a single family house surrounded by land farmed by this family, with equipment sheds, barns, and other structures clustered around or near the house. If their land is scattered, farmers prefer to have their home surrounded by at least some core portion of their farm.

Such living arrangements represent a cultural value. This ideal is realized in many communities, although often the fields farmed are not contiguous, but lie some distance apart. As a result, the farmer must spend some time in what one Oregon farmer termed "road farming"—driving from field to field over public highways. In Concord and Lincoln, this basic pattern holds: the farmer's house overlooks some land, while other fields farmed lie some distance away.

While I would not want to generalize too far, even about local communities—since variation is found in every farm community—the nuclear family household is the primary residential unit, that is, the family group that lives together. With marriage, new households form and set up separate households. It is this desire to form separate households that generates a need for housing, and it is this need that generates what interest established farm families have in housing at the Park.

Extended families may farm together more often than they live together. In some cases, however, extended families that farm jointly may live together in a single housing unit, as we saw in the account of the Palumbo farm, where two brothers and their families lived on separate floors of the same house. Even here, however, the independence of the nuclear family households was maintained by the fact they lived on different floors, with different kitchens and amenities.

Even where the residential group is a nuclear family, relations with relatives can be very important. The family and kinship patterns of farmers are not uniform—they vary by ethnicity and by type of farm (Salamon 1992). Such family and kinship patterns may fundamentally shape farm operations, and contribute to their viability. Nuclear family households with relatives—parents, siblings, cousins—living nearby who cooperate but do not farm jointly is another common pattern. This web of kinship may be vital to farm operations.

Housing for Farmers

The Park's ability to offer housing to farmers constitutes an important potential management tool for supporting agriculture at the park. I stress potential: realizing the potential may require not only a well-thought out management strategy, but also a certain amount of luck. The major question here is, "How do you match up housing with highly qualified farmers?"

The significance of this question may be clearer if we think of it in negative terms: how do you avoid leasing housing to individuals who are unprepared for the business of farming? Many people think they can farm, but upon trying find that it is harder than they believed. Local farmers, certainly, do not believe the Park will have much luck by in effect subsidizing start-up farmers, at least not if it undertakes this on a large scale.

The most likely candidates for renting a house from the Park would be a recently married son who is forming his own household, but continues to farm in cooperation with parents or siblings. Renting a house would be an option they might consider because they have reached the point in the life cycle of farm families where they wish to set up their own household, and because the housing market in Concord and Lincoln make it difficult for farmers to buy homes in the area.

In the wider context of American farm families in general, I think it would be unusual for farmers to rent homes for long periods of time if they could purchase or build their own. However, Concord and Lincoln can hardly be considered typical farming communities; nor do they contain a large stock of affordable housing, whether for purchase or rental. (Other communities in the area, however, may be more affordable.) It may be that under the circumstances farmers would forgo buying a home and be satisfied to rent. There is precedent in patterns of land ownership. Some farmers operate as tenants, without buying land, for most or much of their careers (Salamon 1992:104-105). Some may be willing to live as tenants as well. I do not think this can be predicted, because too many factors come into play, including the plans that farm families make for succession and inheritance.

What the ethnography of American farm families nation-wide, and the local scene suggests, is that leasing single family houses on-site at the Park might be attractive under some circumstances, depending on the rent, and on costs such as heating. Affordability would help farmers' from being driven out of the area by the high cost of housing in the area. Houses with barns and outbuildings may be very attractive, since such facilities are essential to farm operations.

Some farmers expressed some interest in single family housing. While it lacks a barn and outbuilding, even the Burke house (a house proposed for such use), for example, seems to be of some interest. If it can be offered for lease at a moment when a local farmer wants it, the Park may manage to link housing and

land in a way that enhances, rather than disrupts, the goals of the agricultural leasing program.

If however, the Park lets housing drive the leasing program, there seems no certainty that housing can be filled with the best farmers. The Park needs to be very clear about the what the goals of its leasing program are. If the primary goal driving the leasing program is to fill houses, that entails a different set of priorities and decisions than if the primary goal is finding the most qualified farmers for the land available.

If the Park wants to fill houses with farmers (with keeping land farmed a secondary consideration), the pool of potential farmers seems small. The most qualified farmers may have the least interest in housing, unless the Park is fortunate enough to catch local farm families at a moment when these families experience a need to seek additional housing. If the Park wants farmers to work the land, housing can be an incentive, but only if farm families currently experience a need for housing. The Park will need to decide whether it is going to lease houses with land on a take it or leave it basis, or whether it will offer land with the opportunity to leases housing in connection with the land. These are drastically different options. I rather think the Park may not want to gear its leasing program to houses plus land, for the reasons I have given here and others, but may want to consider a land plus housing option, where housing would be available, but taking the housing would not be a prerequisite.

Houses or Land?

At the risk of redundancy, a brief summary analysis of the options for structuring the agricultural leases seems warranted. We need to keep in mind that housing cannot be considered in isolation from other aspects of the Park's agricultural program, any more than it can be considered apart from the nature of farm operations. Decisions about the basic structure of leases will, after all, have very definite consequences. Since the Park has both lands and houses to lease as part of its agricultural program, the Park can in principle structure its leases in a number of ways.

1) The Park can offer a house with land. Leases could be structured so that farmers only gain access to land by leasing housing. We might term this the "no house, no land option"--the phrasing suggests the problem it might pose. If farmers did not need the house, they could not lease the land. This complicates farmers' decision-making because they must assess their needs for housing in relationship to their needs for agricultural land, not on the merits of housing or land considered separately. If farmers are fully qualified AND want the land AND want the housing, structuring agricultural leases in this way is not a problem. But if this linkage rules out all or most qualified farmers (because they don't want the housing) and so forces the Park to lease to less or least qualified farmers, it would be a problem.

2) The Park might offer land with an option to lease a house. The farmer would bid on the land, and take the house only if they actually desired it. This might be a more flexible approach. It reduces the chances that the houses will be rented to farmers, but does allow a match between highly qualified farmers and houses if such a match is possible at all.

3) The Park can lease land without bringing in houses at all and seek alternative uses for the structures it had thought to use for housing for farmers.

What contacts with local farmers suggest is that there might be some interest in houses that the Park has identified as potentially leasable to farmers. However, there is no way of knowing how firm such interest is until the prospect of leasing a house becomes more tangible. In fact, only by going through with a bidding process can the degree of interest in housing be settled with any absolute finality.

In sum, the Park may wish to think the implications of linking houses and land in its agricultural leasing program. It may be desirable to map out some fail-safe or fall-back positions, to ensure that any complications that arise do not unduly disrupt farming operations.

Apartments

Leasing apartments, on the other hand, seem inconsistent with the established cultural patterns of American farmers. The one exception is that "family" (siblings, or parents and grown-up children) might live in apartments carved out of a house and farm together. The only local anecdote I heard regarding a farmer living in an apartment suggested this was an emergency and temporary measure.

What do farmers say about apartments? Most comments were critical, and articulate a number of reasons why farmers do not typically live in apartments, such as interpersonal conflict and inappropriateness for farmers and farm operations.

> "I can't see two farmers living together. (Laughs.)
>
> "Even family doesn't always get along. There'd be problems."
>
> "Insane."
>
> "I'll rent them for my hired hands, but it's a bad idea. I'm against it."
>
> "Where would you put your equipment? You want to be almost as close to your tractor as your wife."

Local farmers doubt that unrelated farmers would want to inhabit the same structure. Some say that it is unlikely that "real farmers would live in apartments" (again with the exception of relatives).

Farmers and a few park personnel I queried have said they would be reluctant to inhabit a building with members of the other group. Each worries about incompatible schedules, lifestyles, and uses of the building. "A farmer might go to bed by 9:30, get up by 5 in the morning," remarked one farmer, asking whether this schedule, which might involve starting up trucks or tractors at five or six in the morning, would be acceptable to non-farmers.

One farmer said that if the Park was going to rent a house divided into apartments, they should lease the whole house to the farmer and let him decide who else lives there.

Farmers' Evaluation of Proposed Housing

And what do farmers say in general about the Park's proposal to provide housing for farmers? They have mixed feelings about it. The intent is often seen as commendable, but skepticism expressed about how it will work in practice.

> "If you give a guy a house and eight acres, he's not going to make it, and it'll be a mess. He'll have equipment sitting around that he can't afford to repair."

> "The Park has fine ideas, they want to help, I can see that, but I don't know...not very practical...good intentions are not enough."

> "Hard to get started in farming these days. Anything might help. Would have to keep rents low. You need money for equipment, for supplies."

One farmer who might have an interest in one of the single-family houses that the Park might offer to farmers says he thought it would be a good idea if there was a farmer "on the land." He thought a farmer residing on the land could watch out for vandalism and monitor crops and crop hazards more closely.

If one concern was that the housing would be leased to marginal operators who would "make a mess of it," another concern expressed was that the Park would lease the housing to people who did not need to make a living at farming, who would "put in a garden." One person expressed the view that the Park would subsidize "gentlemen farmers" at the expense of "real farmers"—the terms used draw a sharp distinction between those who farm as a hobby, to en-

hance a lifestyle, and those who farm for subsistence, as a necessary means of support. I was asked why the Park was proposing to give housing to new farmers when it had moved the old farmers off the land and when there were still members of the local farming community available to farm land at the Park.

The Importance of Barns and Outbuildings

Housing needs to be evaluated in terms of patterns of use, not just in terms of the house where a farm family might live. Around most farm households in Americas you will find outbuildings, sheds or barns where equipment and animals are kept. Farmers often focus on these before they do the residences. Outbuildings should be considered a potentially critical resource in a Park's agricultural program.

The house being converted into apartments at Minute Man lacks such outbuildings. If farmers were established in these apartments, where would they keep their equipment? Would each apartment dweller get to park his tractors (and most farmers own several) at the house divided into apartments?

Would they be permitted to build a shed to shelter equipment from the weather? (One local farmer who has to keep some of his equipment outside year around estimated that this costs him more than $1,000 in repair and extra maintenance. He plans to build a shed for the equipment.

Even a 10 acre farm--even one farmed for a hobby or to supplement an income--requires machinery and equipment such as tractors, rototillers, irrigation equipment, harrows, seeders, planters, manure spreaders, and many other items. Trucks are needed to haul produce to market and pick up supplies. A farm also requires space to store supplies, and space to store crops before they are transported to market. (Some older houses in the area had built in cold rooms for storage). If apartment were rented to farmers, where would all of the necessary accouterments and paraphernalia associated with farming be stored and parked when not in use? How will the Park accommodate these requirements, which from the farmers point of view are reasonable and integral to farming?

Although the Park has identified some buildings that might be suitable for storing equipment, I wonder if the Park appreciates the sheer quantity of equipment and material required for even a small farming operation. In fact, local farms appear to own more equipment relative to their size than many farms in other parts of the country. For example, some local farms own seven to eight tractors, as well as several trucks, plows, harrows, seeders, irrigation pumps and pipe, along with many other farming implements. Farmers also need space to store produce that is waiting to be marketed. Squash and pumpkin, for example, are important crops today, as they were historically. Storing them, however, takes space. Some local growers have warehouses where crates of pumpkins and squash are stacked for storage, then moved with hydraulic lifts onto large trucks

to take them to market. Where would such activities occur on farms leased by the Park?

All things considered, there appears to be few reasons why working farmers who are not related by bonds of kinship would want to live in apartments, and many reasons why farmers mostly do not choose to live in apartments. I know of no precedent for this kind of housing arrangement for farmers from my own experience, and I have yet to find reported cases of it. In most farm areas in the US, even a farmer who rented rather than owned a house might be seen as a bit of an exception, perhaps as less than a success, as not independent: but a farmer who rented an apartment would be truly unusual. This does not mean that renting apartments to farmers is impossible, but it does suggest that there might be certain cultural barriers. Clearly, we would be dealing not with the typical case, but with special cases. I cannot even imagine what kinds of social tensions and psychological conflict might arise among farmers living under these conditions. The Park should ask itself whether it wants to engage in this kind of social experimentation. Furthermore, should complications arise, would they drain management resources, eat up the time and energy of staff?

It seems to me inevitable that farmers leasing land from the Park will have operations and facilities off the Park, unless the Park intends to permit them to do everything on park property that they would do off it, on privately owned farms. Given the Park's special circumstances, this seems unlikely. If I am correct, then it seems just as well to lease to existing farm operations and recognize that the land and buildings leased to them will serve primarily as an annex or addition to off-park operations. This will remove some of the pressure to use Park land and structures in ways the Park may deem incompatible with its mission, and will perhaps help minimize conflict over use of leased land and facilities.

In sum, conflict could occur if farmers feel they are being unreasonably denied the ability to use and store material and equipment needed for farming. One strategy for avoiding this might be to lease primarily to farms with property elsewhere, so that land and buildings leased to farmers are not the only place where equipment and supplies can be stored. The storage issue should be discussed in advance of leasing, obviously, and reasonable limits applied.

But what about the apartments? Who might live in apartments? Farm hands and hired workers sometimes live in apartments or quarter provided by growers.[1] Hired farmers or farm managers may live in quarters provided by the farms they work for. People wanting to get started farming may be willing to live in apartments. Farmers under economic duress may be forced to consider living in farmers. Niche or hobby farmers—people who grow flowers or herbs or keep

[1]In many farm regions, rentals and apartments carry a stigma, precisely because of their association with hired workers, sharecropping, or tenant farmers (i.e., with individuals considered less successful that independent farmers).

in apartments. Farmers under economic duress may be forced to consider living in farmers. Niche or hobby farmers—people who grow flowers or herbs or keep animals as a hobby or income supplement, for example—might be willing to rent an apartment as part of a lifestyle choice.

Given these exceptions to the rule, what the vast majority of American farmers do, the kinds of households they live in, and the living arrangements they prefer, does not then absolutely preclude finding farmers, or quasi-farmers, to rent apartments.

It is not clear, however, than niche or hobby farmers would be able to do a good job if given responsibility for large parcels, or that they would remain interested in the long run. Nor can small parcels be considered viable units in terms of livelihood. If the Park leases to people who want to get started in farming, they will soon want more land to farm. Moreover, if the present body of prime agricultural land, which is already divided into rather small leasing units, is carved up further into even smaller parcel, this further fragmentation not only would keeps units below the threshold of viability, they would interfere with farm conservation practices, and increase demand on Park management resources. As a general rule, I would suggest, small leases should only occur with isolated parcels or where there is a compelling interest in establishing a specific use. Small scale leasing—an house or apartment and six, seven, or eight acres—should not be the default option, but a carefully considered special case.

As I understand it, three apartments are available in one building, in addition to one, perhaps two, single family residences. This means the Park could house four or five farmers. I see no evidence, however, that the Park needs four or five farmers with the present agricultural land base.

Housing and the Question of Qualifications

There is the potential that the offer of housing itself would draw out people who either primarily want the housing, or, if they want to farm, may not be qualified to do so. In terms of its agricultural leasing program, farming should be considered a skilled occupation, and the Park should be looking for the best-qualified farmers. The best predictor of success is likely to be past experience. The individuals that are entrusted with the Park's important agricultural land should be actual farmers, not people who want to be farmers but lack any substantial farm background.

I am not saying the Park should absolutely rule out working with a start-up farmer. Some individuals have a farm background, grew up or worked on farms, have the required knowledge and experience, but have not been able to engage in farming as an occupation because they do not have access to land, equipment, and everything else needed to get a farm going. Giving some one like this access to land and to affordable housing could help such a individual get started. It might even be appropriate to help nurture such an operation, as a way of ensur-

ing the long-term viability of farming at the Park and bringing land not now farmed back into agricultural use. But I would recommend doing so only with careful qualification. The Park needs to appreciate the risks and problems involved; it should not attempt anything of this nature on a wholesale basis. It should most certainly not put its prime agricultural land into the hands of growers who have nothing but aspirations: who have no experience, who are undercapitalized, who have no marketing plan, who will almost certainly not be able to do justice to the land for several years, if they survive at all.

The most likely area for working with a relatively untested part-time farmer would be in the area of agricultural reintroduction. At present, based on what area farmers tell me, and my own observations, it would increase the chances of success to offer at least one piece of "good land"—a cleared, tillable parcel where a cash crop can be grown—to a start-up farmer along with access to land that could, with effort, be put into production. Housing could greatly increase the chance of a start-up farm succeeding but would not be the only factor.

EIGHT

AGRICULTURAL REINTRODUCTION

Sections

Agricultural Reintroduction and Leases
The Agricultural Reintroduction Program
Farmers' Reactions to the Agricultural Reintroduction Idea
Land Available for Agricultural Reintroduction
The Grazing and Livestock Option
Obstacles to the Haying and Truck Farm Option
Berry Production and Orcharding.

Agricultural Reintroduction and Leases

When asked about agricultural reintroduction, some farmers report being skeptical about whether the Park can write appropriate leases for such a process. The leases, they argued, must be structured in ways that recognize the nature of the land involved, and the way such marginal land would have to be farmed. They could imagine identifying farmers who might do the job, so they could see how a farmer and a parcel for agricultural reintroduction might be matched up in some sort of open-ended, evolving relationship.

They were not sure how the Park could write a lease that validly reflects all the circumstances, needs and contingencies relating to farming relatively marginal land. The factors involved in agricultural decision-making and farm viability may be too complex and nuanced to be specified in a way that ensures the best farmer for the land (the one with the best plan for it and best able to manage it) gets the lease.

The Park will require technical assistance in setting up leases for agricultural reintroduction and assessing proposals. One way of utilizing technical assistance in the bidding process might be to have a technical review panel evaluate proposals, where the panel includes farmers or agricultural specialists who can take a disinterested, yet expert, view. The Park itself does not have an agricultural specialist, and may find it difficult to evaluate the relative value and viability of proposals submitted. Yet the viability of farm plans, as well as compatibility with Park's mission and goals, and not just the monetary dimension of bids, should be a primarily basis for making leasing decisions.

The Agricultural Reintroduction Program

At the risk of redundancy—which seems justified because these are critical issues— additional discussion of the agricultural reintroduction program seems in order in this interim report, since it will require extensive lead-time for developing leases for this.

To reiterate and elaborate--the Park's agricultural program has multiple goals. Leaving aside the prospect of interpretive farming, the agricultural leasing program at Minute Man involves 1) leasing land already farmed and 2) reintroduction of agriculture on land not currently farmed. The research I have conducted into farming practices at Minute Man and in surrounding communities suggests the following management principle: what works for land already farmed will not necessarily work for agricultural reintroduction, and vice versa.

I would argue that the Park in effect requires two distinct and separate agricultural leasing programs, not a single program with uniform criteria for all farmers who lease land from the Park. Thinking of these as separate programs may make it easier to see what each objective—managing for quality, conservation, and stability on the Park's core farm land, and managing for agricultural reintroduction on land not currently farmed—requires. I believe the goals and process used to achieve these different goals should not be confused or co-mingled in a single leasing structure. For example, where housing may be appropriate in the agricultural reintroduction program, it is unnecessary and perhaps counter-productive to offer housing in connection with the prime agricultural land already farmed. Leasing and management of land already farmed represents a fundamentally different process than leasing for agricultural reintroduction.

For example, the criteria for selecting farmers is different in each case: for managing the Park's prime agricultural land, farmers should be highly experienced with on-going operations, off-park facilities, existing market niches. For agricultural reintroduction, the Park may need to find ways to support farmers who are not established. The resources (such as housing) allocated to farmers, the nature and amount of land to be leased, performance criteria, and so on, all vary depending on which objective is being advanced, the maintenance of existing, developed agriculture or agricultural reintroduction.

In sum, the Park has two basic options for agricultural reintroduction. First, it can try to set up a leasing system that gets established farmers (those already taking part, or able to take part, in the agricultural leasing program for existing farmland) involved in the reintroduction process. While this should not be ruled out, this option clearly should not be pursued in a way that compromises the goal of managing the Park's existing farm land for stability and quality. The study so far does not indicate existing, well-established farmers have a strong interest in clearing land or farming marginal land. The Park's second option is to lease to individuals who not have existing farm operations or are less well established, but have the knowledge and experience to farm, some financial resources,

and a strong desire to farm. In this case, the Park would be dealing with a different sector of the farm community than it does currently with its present leasing program: it may involve working with I have elsewhere termed "blocked" or "limited" farmers, whose access to the resources needed for farming (land, capital, markets) are to some degree restricted or blocked, or with "hobby" farmers. (See Appendix B for a descriptions of these types of farmers).

Farmers' Reactions to the Agricultural Reintroduction Idea

What do farmers think about reintroducing agriculture on land within the Park?

Some of the farmers I have interviewed have pointed out areas of the park were in agricultural use in the past. They believe agriculture could be reintroduced in some of these areas, at least in theory. However, trees and brush have grown up on much of this land. While some established farmers expressed an interest in cleared land, none so far have indicated an interest in clearing the land. Interest in land reintroduced to agriculture varied considerably. On grower said, "Sure, I'd be willing to take a shovel and have a look at any [cleared] field." Pointing to several areas along Route 2A, another farmer said he'd sign a lease for haying these fields tomorrow if the land was cleared." He also expressed an interest in grazing cattle at several sites, but indicated that he would have to proceed more cautiously with cattle than with hay.

Other farmers think agriculture was waning on much of the land not currently farmed even before the coming of the Park, and do not think the prospects for agricultural reintroduction are good. They think the best option is to "run some livestock." In terms of food crops, they indicate, in effect, that what you see is what you've got: the land most suitable for vegetable crop production is already being farmed.

Land Available for Agricultural Reintroduction

The phrase "three to four hundred acres suitable for agricultural reintroduction" appears in the minutes of public meetings and in newspaper clippings I have reviewed. If we took these figures as meaning "in addition to land already farmed," and added the figure for the land farmed at the time that these figures were used (120 acres), then the total land available for farming would be between 420 and 520 acres, or between 40 and 50% of the Park's land holdings (using the figure of 1,000 acres for the Park current land base). If this were the case, we would have a mystery—where is all the land that could be put back into farming? It seems to be missing. Site visits strongly suggest that there are not 300-400 acres truly suitable for agricultural reintroduction, not if evaluated from the perspective of viable commercial farming. If we take "three to four hundred acres suitable for agricultural reintroduction" as including land already farmed, that would give us an estimate of 180 to 280 acres that could be put into agricul-

tural use. This still seems to overstate the area that could be "reintroduced" to agriculture. None of the farmers familiar with the Park think that independent, commercial farming can take place on anything like this scale.

Elsewhere a total area of 181.5 acres is defined as "suitable" or "most suitable" for agriculture (Gavrin et al 1993:77). This is close to the approximately 135 acres now being farmed. It leaves us with a figure for potential agricultural reintroduction of about 40-50 acres. This seems a more realistic estimate. Gavrin et al (1993) also identify another 114 acres as "least suitable" for agriculture, and suggest that the that these areas might be managed by the National Park Service for interpretive farming or other goals. If this "least suitable" land is added to land in the "most suitable" and suitable" it gives us a figure of 295.5, a figure close to the lower range of the 300-400 acres estimate.[1] I believe the component figures, however, for "most suitable" and ""suitable" give a more realistic sense of what is possible—something like 160-180 acres, possibly 200 acres, in agriculture. While the Park itself might "farm" some land, it seems possible that only about another 40-50 acres at most are likely to prove viable for farming by independent farmers, whether commercial growers, hobby or lifestyle farmers.

Moreover, much of this land may be viewed as more-or-less marginal by many independent farmers. Such parcels may only be attractive to people who want to get into farming, but lack the capital to buy farmland in the area (and have some reason to stay in the area rather than, say, move to Wisconsin or Oregon where getting established in farming might be easier). Several local farmers report that such individuals exist, and I think this anecdotal evidence should not be dismissed.

However, the Park should note that insofar as it exists, interest in this uncleared, possibly quite marginal land, does not appear to be structural demand, fueled by the farm economy and by the desire of current farmers to have more land into production. Rather, this would be demand generated by personal circumstances and lack of capital. It is contingent on particular individuals, their circumstances, and desires. It may be somewhat difficult to find a good fit between a potential farmer and the land in question, and difficult to assess the capacity of this class of potential farmers to survive and do a good job at farming. Such start-up farmers will probably need more support than established farmers (and it is here that housing can be helpful).

This does not mean the Park should abandon the quest for such farmers, and give up on the goal of agricultural reintroduction on the parcels that might be best reclaimed for farming. There is, however, little doubt that achieving this goal

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[1] The scope of work for this study states that "approximately 600 acres or 60% of the Park's current land holdings were in agricultural use prior to entering Federal stewardship." This seems inconsistent with farmers' accounts of farming at the Park in the postwar period.

may be more difficult than leasing land already farmed. Yet some interest clearly exists, and a bidding process for land designated for agricultural reintroduction could draw good proposals. However, it might also draw proposals that are unrealistic or technically unfeasible. The Park will need technical help in evaluating proposals.

An option, if the Park decides it is averse to the process of working with start-up farmers (the type I have identified as "blocked" from access to farming), would be to attempt to find a larger, more established livestock and haying operation set up at multiple sites in the Park. In this case, the Park may have to offer (relatively) cleared land if it wishes to attract bidders, or find other ways to make the land attractive for leasing.

Such issues as fencing, water supplies, and long term leases will be needed whichever way the Park decides to go.

Summary

It appears the Park does not have 300 or 400 acres of lands suitable for agricultural reintroduction. What the he Park has is some land that might be suitable for agricultural reintroduction if trees, brush, and shrubs were not growing on it. To make it possible to farm this land, the trees and brush must be cut and cleared. For vegetable production, stumps, roots, rocks, and other impediments to plowing must be removed. Since it might cost as much as $8,000/acre to do so, according to one estimate,[2] the phrase "suitable for agricultural reintroduction" must be understood as meaning suitable in terms of soil types, historic use, and compatibility with some of the Park's goals—not necessarily from a practical farming perspective. For most farmers interviewed, uncleared land is not suitable for agricultural reintroduction. "I don't think there's much land being cleared for pasture in the US today." "It wouldn't be worth it."

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[2] Farmers have expressed some skepticism about this estimate, which I got from a contractor. They may be right, that it could be done more cheaply, if less swiftly, by other means than a contractor would use. However, if the cost was half as much as this estimate--$4000/acre—or even a quarter as much—$2,000—it is stills represents a formidable amount for any farmer, especially when other, cleared land, might become available, as it apparent does from time to time. Waiting may be a better option for established local farmers. Moving to Wisconsin or Iowa might be cheaper than clearing land at even $2,000 per acre for persons wanting to get started in farming. The investments in fencing or irrigation needed to bring land "on-line" may tax the resources of either a start-up or established operator, without the additional cost of land-clearing. So the advice of several farmers t to fence the perimeters and run livestock on the land should be taken seriously. It may represent the most feasible option.

However, some farmers think livestock could be introduced incrementally, if fencing was build along the perimeters of parcels and some clearing done. Haying might be an option on a few parcels, if cleared.

While the Park does not have hundreds of additional acres on which farming is feasible, reintroducing agriculture even on 40-50 acres would be a positive development for farming in the area, since development has eroded the stock of farm land in adjoining communities of Lexington, Lincoln, and Concord. It also seems quite likely that reintroduction on this less ambitious, but more practical, scale would significantly enhance visitor experience, by opening up land along Route 2A and placing livestock and crops where they are visible reminders of historic uses.

The Grazing and Livestock Option

At present, the grazing of livestock plays only a minimal role in the Park's agricultural leasing program. According to several local farmers with livestock expertise, the potential exists for increasing the role of livestock. Some local farm and livestock operations would have an interest in grazing animals at the park, under certain conditions.

There is precedent in the National Park Service for a livestock program. For example, dairy operations and cattle ranching at Point Reyes National Seashore in California continue a historic agricultural tradition that began with the grazing at Point Reyes Peninsula of the longhorn cattle of the Spanish mission at San Rafael and the arrival of Mexican ranchers in the period between 1817-1836 (Livingston 1993).[3]

The provenance of cattle, sheep, oxen, horses and other animals in Concord and Lexington has even greater historic depth. Torres-Reyes (1969:46) writes that livestock were kept on all farms in this area during this period, and were used "for ploughing and hauling as well as to provide meat and dairy products." Concord supplied beef to the army during the Revolutionary War (Torrey-Reyes 1969:48).

Livestock would have been a visible presence on the agricultural landscape of the Concord and Lexington area at the time of the American Revolution..

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[3] The ranches at Point Reyes are operated under Reservations of Use and Occupancy, Leases, and Special Use Permits (Livingston 1993: v). Livingston (1993:75) writes that Point Reyes "contains 70,187 acres, of which 21, 649 acres are used for either dairy or beef operations. In addition, the Superintendent of Point Reyes National Seashore manages 10, 125 acres of the adjacent Golden Gate National Recreation Area, which is almost entirely in agricultural operations as beef and horse ranches." By comparison, even a greatly expanded livestock program at Minute Man would be very modest in scope. Even if all the land now planted in hay and vegetables was converted to grazing, this would only add up to some 140+ acres..

Having its agricultural program include livestock could contribute to the Park's interpretive program, since livestock grazed at the Park would clearly point out the historic significance of livestock and the continuity of agriculture in this area. The Park has initiated a livestock program that could be expanded. A few horses are grazed at the Park, and in 1995 two cows belonging to Codman Community Farms were kept in a small pasture adjacent to Hartwell Tavern.

The Park's experience at this site has some implication for placing livestock at other sites in the Park. The animals were introduced into an area of trees and brush. After it had been cleared of larger trees and growth, the cattle themselves consumed much of the leafy brush and other vegetation as forage. This suggests that complete clearing of the land is not necessary for grazing cattle, while it would be for vegetable production. The natural forage was supplemented with other feed. A water supply was furnished, and the remaining trees provided shade during the heat of the summer.

Brief interviews and observations at this site suggest the Park's efforts here are very promising. Visitors stopped and remarked on the cattle to each other, often spending some time watching them graze or feed. They would often take photos and sometimes videotape the cattle. In one episode observed, two boys spend several moments asking each other whether the animals were horses or cows, before their mother identified them, a little tentatively, as cows. While amusing, this episode suggests the educational potential of this program. The Park should be able to build on the interest in the animals its interpretive programs, offering historic context to satisfy the curiosity of the visitor.

One of the local farmers—not one involved in this program—said he thought this program ("like they're doing at Hartwell's) was quite worthwhile. He said he thought the program should be expanded, since it showed the agricultural heritage of the area, and educated people about agriculture.

A local commercial livestock operation expressed an interest in grazing more livestock on land leased from the Park. This suggests that mutually beneficial arrangements could be worked out. The farmers would benefit from having access to more land for grazing. Benefits to the Park include making livestock part of the contemporary landscape in ways that evoke the historic landscape. Another potential benefit is that grazing could keep land cleared that might otherwise have to be mowed by Park crews with tractors and mowers at considerable expense. It is also possible that livestock could help clear land currently covered with scrub brush and so help restore the historic appearances of the landscape.

Since a livestock program might have these benefits, and haying and grazing seem to represent the best option for restoring land currently not farmed to agricultural use, in the view of most farmers contacted, it is worth addressing the question of what this might involve in practical terms.

1. Grazing requires clearing, but not as much as hay or vegetable crops require. Not all stumps and roots need be removed. Cattle can clear some brush. They can find some forage in areas not totally cleared. They can graze under mature trees in a pasture, although they may damage or kill young trees.

2. Livestock requires drinking water. "Twenty, twenty-five cows use a lot of water on a hot summer day." No field can be leased for grazing without determining how a dependable source of water is going to be secured for the animals. Stagnant water is not acceptable.

3. Livestock requires shade in the summertime. If land was cleared for livestock, some trees should be left to provide shade. The law requires that animals have shade.

4. Under normal conditions, cattle do not require elaborate shelter in the winter (but a shed might be desirable). They are well adapted to withstand normal winter conditions. Since the public may not understand this, the Park should expect queries if animals are kept on the fields during winter months.

5. Livestock does require fences. As one farmer put it, fences are needed not only to keep the animals in, but to keep people out. Fences are a long-term investment, and as such require long-term leases. Farmers would not pay for them under short-term leases unless they knew they would be compensated if the lease was not renewed.

6. When livestock gets loose, it poses liability issues for the farmers should it damage property or persons. Farmers carry insurance for such risks. Visitors who entered pasture and disturbed the animals might get hurt. One farmer said he did not worry much about people getting in among his cows except during calving, when the cows are protective of their young. At other times of year, he thinks the cows will "just spook and run away a little ways, or ignore people." He said he might remove animals from pasture during the calving period if people showed signs of climbing the fences. In his experience, people tend to avoid climbing electric fences.

7. Grazing and pastures involve less pesticide use than vegetable production.

8. Ready access to the animals must be provided to the owners, so they can feed, monitor, and move their animals in and out of pasture. The public on the other hand, should not have ready access. One farmer who has livestock said he would not put his animals on conservation land in Lincoln or Concord, or on Park land, because he believed visitors would leave gates open. The siting of

gates would be important part of planning for livestock operations. Ideally, gates for pasture would not be along trails used by the public or commonly used parking areas. (Fields south of route 2A, which are separated by the road from the areas of most intensive visitor use, might be best targeted for agricultural reintroduction by commercial farmers, whereas interpretive farming sponsored by the park, either directly or through community initiatives, might be best located in areas of higher public use.

9. Livestock needs to be managed to prevent overgrazing.

10. Livestock must be kept away from sites designated as sensitive by the Park. Fences would have to be sited to separate livestock and resources livestock need to be kept away from. In general, farmers could see no reason why a well-managed grazing program would adversely affect Park resources.

The need for fencing ties together several of the above points. Fencing would have to be modern, according to the livestock people I have contacted. Perhaps modern fencing could be combined with or screened by historic fencing along roads or other sites where the Park wants to stress the historic character of the agricultural landscape..

With any form of agricultural reintroduction, sites that might be adversely affected should be identified in advance of leasing, and disclosed in advance of bidding, so that the farmer considering leasing the land for grazing (or any other agricultural use) can assess the field with full knowledge of any restrictions or potential conflict with other resource uses. Unless they are identified in advance, farmers will assume that they have the full use of the fields for agricultural use as customary in contemporary farming. Fencing can be used to separate livestock from natural or cultural resources the park wishes to protect, but only if such resources are identified so that fences can be properly sited.

What are the prospects for restoring vegetable production on land not currently used to grow food crops? Farmers interviewed were inclined to be skeptical. Farmers felt this option is not likely to succeed for two general reasons: first, they felt the economic costs of clearing land for vegetable production are too great for farmers to bear; and second, they thought that all or virtually all of the land suitable for commercial vegetable production at the Park was already in use. To sum up, the general consensus of established local growers appears to be that any land that might be cleared would be marginal as crop land, and did not think it would be worth the investment of resources to clear land even if was potentially prime agricultural land.

In the following section, I will discuss the prospects of restoring vegetable and hay production on land not currently used for this purpose, summarizing what farmers identified as some of the issues involved. Given the skepticism of

most farmers, who felt this was probably not a viable option, at least not for them, this section will focus on the obstacles to developing viable truck farming on land currently not farmed at the Park, on which vegetation, trees, and brush has grown up.

Obstacles to the Haying and Truck Farm Option.

While hay and vegetables are very different crops, and involve different cropping systems and management strategies, they both require the passage of tractors and equipment over fields. Thus these two otherwise quite different forms of crop production face similar obstacles on much of the land the Park has identified for possible reintroduction to agriculture.

1. Trees, brush, and stones pose an obstacle to haying and vegetable production on much of the land identified for possible agricultural reintroduction. At present, the fields cannot be plowed. They would need to be cleared and prepared for cultivation. This means not only cutting trees, and removing stones, but filling holes and ditches, leveling the ground, and removing stumps, roots and other obstacles to pulling a plow through the earth.

Haying requires less tillage, but fields are often plowed and harrowed when grass or other forage species are established in a field. But even if low-till or no-till planting techniques are used, haying requires several passages over the field with equipment. Stones and stumps can damage equipment. While large, visible stones or obstacles are a problem because tractors equipment must be maneuvered around them, they can at least be avoided. Stones or stumps that lie hidden in the grass pose an invisible threat to expensive machinery. Hay is cut within a few inches of the ground, so a stone that rises up even three, four or five inches represents a significant hazard. Since these are hidden by the hay, they cannot easily be avoided. Not only are repairs costly in dollar terms, they may be costly in time, losing farmers hours of valuable time and perhaps the window of opportunity needed to get hay in before the weather changes.

In clearing the land for plowing, cultivation, mowing and baling, back hoes or other equipment would have to be used to remove stones and stumps.

2. Another possible obstacle could be buried debris on former house or building sites. On some parcels, house foundations have been buried. Even if these are buried deep enough that farmers can plow over them, I do not know how these filled in sites will affect drainage characteristics, or if settling or sink-holes will be a problem. While these may not prove to be real problems, the possibility should be noted and disclosed should such sites ever be leased for farming.

3. As with established fields, deer and other animals pose significant hazards for vegetable production. A field near what appear to be the best locations for agri-

cultural reintroduction has suffered severe crop losses to deer and raccoons. The deer population creates a significant risk of crop loss, and this may be a problem wherever fields are reintroduced to food crops.

4. Irrigation is needed for vegetable crops, although not for hay crops. This is not only to provide protection from drought; as discussed in section [cross-reference], irrigation may be even more important as a means of producing premium quality crops. Market forces and competitive pressures drive farmers towards the use of irrigation: farmers who cannot irrigate may lose sales to others who can, or may not be able to get the best prices for their crops because they lack the premium quality that timely irrigation can help provide..

5. The soil will need to be rehabilitated. One farmer thought the pH of the soil would be "out of whack." The thin growth of grass on one field that the Park currently keeps cleared (where a building formerly stood) suggests that several years of rehabilitation—involving the addition of soil amendments, fertilizer, lime, organic matter in the form of manure or compost—may be necessary.

The Park might consider whether it could provide any help with composting or adding soil amendments on fields it would like to see restored to agricultural uses. It should at least consider whether the Park itself generates any material which could be used to condition or rehabilitate the soils at some sites.

Berry production and orcharding.

If the problems listed under hay and vegetable production are not insurmountable, berry planting and orchards could also be established. Longer leases may be required for orchards (up to twenty years in the opinion of one farmer) and provisions for compensating the grower for the value of fruit trees if leases are not renewed. The Park's IPM program would have to be reconciled with the use of pesticides required for apples and other fruit crops. Irrigation would be needed while establishing plantings.

The consensus judgment of farmers suggests that the Park should begin its agricultural reintroduction program not with truck farming, but with livestock grazing. At some sites, haying may be possible, if these sites can be cleared sufficiently to permit haying equipment to be used. Over time, other forms of agriculture might become possible, as soil and tillage conditions improve.

Conclusion

In sum, each of the Park's goals requires its own approach. Agricultural reintroduction may require working with quite different types of farmers than those who are best able to farm existing agricultural parcels, if, as the research sug-

gests, established farmers have a high degree of interest in land already farmed, but little interest in land not currently being used for agriculture. What is required to manage and sustain viable, progressive agriculture on existing farm land may not make sense for the goal of reintroducing farming on land not currently farmed or developing farming for interpretive purposes. Rather, each component program implies a different relationship with farmers and entails management actions that interact with farm operations in different ways.

NINE

THE INTEGRATED PEST MANAGEMENT PROGRAM

Sections

Overview

Farmers' General Assessment of the IPM Program

Criticism of the Park's IPM Program.

Overview

The Integrated Pest Management (IPM) Program at the Park monitors and regulates the use of pesticides by farmers The IPM program applies to agriculture at the Park, and all farmers are required to participate in the Park's IPM program. Non-agricultural uses of pesticides at the Park—such as the use of pesticide to control insects damaging one of the Park's historic buildings—are also subject to monitoring and regulation by the IPM program.

At present, a Park ranger serves as the Park IPM officer. The ranger who serves in this capacity does so in addition to her other roles at the Park; her responsibilities for the IPM program are in addition to many other responsibilities. As IPM officer, the ranger receives training in IPM. The IPM officer's duties include collecting and submitting data on pesticide use, and submitting requests for specific uses of pesticides the approval. The approval or disapproval of these requests occurs within a centralized administrative hierarchy devoted to regulating pesticide use within the National Park System.[1] The local IPM officer is the first tier in the process. In principle, there is a regional IPM officer, although this position was not staffed in 1995. As a third tier, there is an office located in Washington, DC. that reviews pesticide requests. Pesticide use must be approved by this office. When a specific pesticide is not approved, the office may recommend an alternative. The latitude or discretion the local Park IPM officer is limited. The local IPM officer can disapprove, but not approve, pesticide use.

The IPM officer deals with farmers in three main contexts. First, farmers submit requests for pre-approval of pesticides based on what they plan to plant in the next growing season. The IPM officer transmits these requests to the regional and Washington offices for review, approval or disapproval. Second, the IPM officer will by contacted by farmers when there is an outbreak of plant disease or an insect infestation and the farmer wishes to use a pesticide to control the problem. The IPM officer will transmit these requests for approval or disapproval. Third, farmers are asked to submit annual reports on their activities, and

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[1] The Park IPM program is described in chapter 2 of Guideline for Natural Resources Management, NPS-77..

to provide information in these reports about fertilizers and soil amendments used, actual as opposed to projected yields, the effectiveness of pesticides and pest management actions, and problems encountered.

The present Park IPM officer has good rapport with local farmers. Even though farmers are quite critical of the IPM program as a whole, they express a positive opinion of the local IPM officer. They evaluate her as competent and hard-working, and say she is doing a good job in her role. They appreciate that she has other responsibilities, that she is not primarily an agricultural specialist, and do not expect her to have the knowledge of an entomologist or academic specialist in plant disease. Farmers say they have problems not with the local IPM officer's performance, but with the structure and operation of the IPM program. When they disagree with the decisions or policies of the Park IPM program, they say the local IPM officer is "doing her job." They direct their criticism at the IPM program as a whole.

Local Park staff has in fact attempted to improve the IPM program by investing in training and in a computer program to help process and track requests. Some farmers report that there has been improvement, saying the program works better now than it did in the recent past. However, they still criticize the program, while recognizing efforts made by the local IPM officer to stream-line and enhance the local functioning of the IPM program.

Farmers' General Assessment of the IPM Program

The brief description above of the Park IPM program suggests some of the problems farmers have with it. In essence, it is a reactive, not a proactive, program. It responds to requests for pesticide use but does not offer farmers useful technical assistance or aid in monitoring and managing pest populations. One farmer summed it up by saying that what the Park has is a pesticide restriction program, not an integrated pest management program.

The farmers do not appear to be opposed to integrated pest management in principle or practice. Some of them point out with apparent pride their own achievements in reducing levels of pesticide use in their operations. Most appear to have incorporated integrated pest management techniques in their operations. The farmers argue that their use of pesticides is safe and necessary to prevent the loss of crops. In contrast to the criticism they direct at the Park IPM program, they report that they value the state IPM program. They say it offers them valuable guidance and useful information.

Some farmers assert that the farming community has a better and more realistic grasp of pesticide use and integrated pest management than does the National Park Service. They point out that agricultural uses are regulated by the Commonwealth of Massachusetts, that they have to be licensed and certified to

use pesticides,[2] and that they access and utilize information from the University of Massachusetts Cooperative Extension System and other sources.

Before we proceed to discuss the specifics of the criticism farmers direct at the Park IPM program, it is worth reviewing some of the basic elements of an agricultural IPM program. This review will make help put into perspective the farmers comment that the Park has a pesticide restriction program, not an integrated pest management program.

First, what is a pest? The non-farming general public may be most concerned with pests in terms of damage to their homes—a termite is a pest. For farmers, a pest is not just something that eats their house; it is any organism that harms their crops. This includes insects and mites that eat crops, but it also includes pathogens such as viruses, bacteria, and fungi the cause plant diseases. Rodents and birds are pests if they cause damage to crops. Weeds are also "pests" insofar as they harm crop plants. Raccoons and deer are a threat to crops in Concord and Lincoln.

Since pests come in so many forms, and affect crops under so many varied conditions, there can be no single, simple response. The designation "integrated pest management program" implies that the program includes multiple measures and techniques that reduce the need to use chemical pesticides. The Park IPM program does not support such elements in practice; this is one basis for the comment that the Park only has a pesticide restriction program.

An IPM program for agriculture would involve the following basic features:

1) An IPM program must involve scouting to detect the presence of pests and the monitoring of pest populations and the damage they cause to crops. Environmental conditions (temperature, humidity, soil conditions, and so on) will also be monitored, since these may be correlated with the appearance of plant disease or predation.

Pest control measures are based on scouting and monitoring so that controls are used only when pests are a threat to crops.

2) An IPM program may involve the use of insects and organisms that can help to reduce pest levels.

3) Traditional agricultural practices such as plowing, crop rotation, the timing of planting, and the use of resistant crop varieties have a role in integrated pest management.

4) In integrated pest management, pesticides are applied only when needed, and only in the quantities needed to control pests damaging crops. The information about pest populations and environmental conditions from field monitoring will determine if and when pesticides are needed.

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[2] The state agency responsible for pesticide regulation is the Pesticide Bureau of the Dept. of Food and Agriculture.

From the farmers point of view, the Park IPM program only restricts pesticides: it does not offer technical assistance or support for the other components of integrated pest management. Note how essential the link between monitoring and pesticide use is. Since pesticides in agricultural IPM programs are administered on the basis of monitoring, it is critical to apply them as soon as the monitoring of conditions indicate. With insects, this may be when they have begun to cause significant damage. With plant disease, the decisions may be based on the monitoring of environmental conditions that are correlated with diseases, which in plants are often caused by fungi. The response the farmer makes will reflect the nature of the threat: diseases cause by pathogens such as fungi may call for an immediate response, since they can quickly kill the entire crop plant, while minor and intermittent damage cause by insect predation on plants may not threaten the loss of a crop. On the other hand, some insect predation may make crops unmarketable.

Criticism of the IPM program

The farmers criticize the IPM program for the following reasons:.

1) Lack of timeliness. NPS decision making is not timely. Farmers say that the processing of requests takes too long. Delays cause farmers time and money, and put their crops—and thus their livelihood—at risk.

2) Misinformation. The credibility of the IPM program has been eroded by errors in recommendations made.

3) Arbitrary decisions. Decisions about pesticide use made on the basis of insufficient information about circumstances. Farmers believe rules are applied arbitrarily, with little or no attention paid to applying guidelines to actual circumstances.

4) Inconsistencies with other regulatory bodies. NPS standards for pesticide use are inconsistent with state standards. Farmers maintain that operating under two separate standards is an undue burden.

These are the major criticisms of the IPM program, made repeatedly in interviews and in informal contacts by all the farmers who grow vegetable crops. In addition, one farmer objected to filling out forms and thought the paperwork required was excessive.

Each major point of criticism is based on experience, and on the perception that the Park's IPM process costs them money, wastes their time, and causes delays. Their comments portray the Park IPM program as ineffective and a burden. Farmers had virtually nothing positive to say about the Park IPM program, speaking of it almost exclusively as inefficient and redundant in ways that absorbs time, effort, and resources they would much rather apply elsewhere.

It is worth repeating that this does not mean they reject the principles or idea of integrated pest management. Rather their concerns grow out of their experi-

ence with the Park's IPM program. Moreover, they do not attribute the problems they perceive in the program to the local IPM officer—whom they like, respect, and see as "doing her job" even when they disagree with the decisions she communicates to them or have —but rather speak of these problems as properties of the organization of the program, with delays built into the process of forwarding request through the administrative hierarchy, and as resulting from the actions of regional and national staff, whom farmers feel are not fully qualified to make decisions about agricultural uses of pesticides. Again, this does not mean they find no value in integrated pest management. Some of them, clearly, do, even when they disagree on specific decisions made by the Park. But they have specific problems with the way the Park program operates. I will now discuss their major concerns in more detail, beginning with the timeliness issue.

1. Even with the use of telephones and computer systems, NPS processing of pesticide requests is judged by farmers not to be expeditious or timely enough for agriculture.

Where farmers associated with the Park can anticipate a disease or pest problem in their fields, they can request approval in advance. They acknowledged that pre-approval is better than in-season approval, but pointed out that a farmer cannot always know what pest control measures may become necessary during the year. Since that they plant a mix of crops, local farmers cannot even know with certainty what crops they will plant in a particular field; this decision depends in part on planting and growing conditions in that particular year. "How can you predict what you will plant where?—it depends on the weather." If a farmer does not always even know what they will be able to plant, they certainly cannot anticipate every pest problem that will arise in a given year. The complexities of crop-pest interactions with weather and growing conditions are simply too great for any farmer to know in advance what insects may appear to devour crops, or what blight or wilting disease afflict crops. There are unavoidable uncertainties in farming. Even the best laid plans must be adapted to weather and soil conditions, to conditions for seed germination and plant growth. Plans change with conditions. As conditions change, the types of pests and problems that must be dealt with change. When crops are substituted, the pesticides needed may change. Even when the farmer plants the crop he intended for a field, unexpected blights or insect problems may occur. And even when the problems the farmer anticipated appear, the measures taken in response to these problems may unexpectedly fail, making it necessary to take other measures. Thus, farmers may have to request that pesticides be approved for use after unforeseen problems appear. In these circumstances, farmers say hours may make a difference: the immediate use of a pesticide may bring a problem under control, while a day or two of delay may result in widespread damage or mean the problem cannot be brought under control, that crops will be destroyed.

Farmers need a rapid response to requests. Delay to them means crop loss, and a loss of income. It may also mean the problem has grown larger, and that more effort and resources must be utilized to control it. They report that the responses in such situations have not always been timely. They point to the need to transmit requests to the Washington office as a source of delays. They speculate that the staff responsible for their requests may be away from their desks, and that by the time they return, precious hours or days have been lost. The farmers report specific incidents with specific crops and problems to illustrate this concern.

The sequence of steps involved in the Park's three-tiered review of pesticide requests and decision-making may have the effect of breaking the essential timely link between monitoring and action. This puts crops at risk. In effect, the farmers are expressing their concern that the Park Service procedures undermine the most critical link in the integrated pest management process. Delays in getting approval prevent farmers from acting in a timely fashion on the data on pest populations and crop damage that monitoring supplies.

One farmer noted that in terms of time expended, "an IPM program is a wash." The time they used to spend on spraying they now spend on scouting fields and monitoring pest populations, but when they do not need to apply pesticides, they save money. Other farmers also pointed out the savings that could be achieved by reducing pesticide use as an incentive to practice integrated pest management. However, IPM in practice has a functional requirement: it requires rapid response when monitoring indicates that pests have reached damaging levels. When farmers do need to apply pesticides to protect their crops under an program of integrated pest management, they need to do this in a timely fashion—as soon as possible—because the pest populations have already built up to damaging levels. This is an integral and necessary element of the process of integrated pest management: taking control measures based on monitoring is perhaps the single most fundamental proposition of IPM. Timeliness is thus a basic and indispensable requirement for an IPM program. A delay in the application of pesticides when such use is necessary not only puts the crop at risk; from the farmer's point of view it wastes the time and effort he has put into scouting and monitoring. If he cannot act expeditiously on the monitoring that is integral to IPM to protect his crop, then an IPM program is a pointless exercise. Farmers maintain the Park pesticide review process sometimes causes such delays.

The NPS IPM program allows the processing of pesticide requests by telephone or computer. Even so, farmers are critical of response times. The technology does not speed up the process if the individuals who are responsible for these decisions are not available.

"The Park has to get on the phone to Washington—gotta chase down a bureaucrat. "

"In two days, you can lose a significant percentage of a crop."

Delays can also be caused when the park rejects a request and recommends an alternative, if the farmer believes the pesticide recommended is not effective or determines that it was not intended for the crops being grown. (The question of inaccuracy in Park recommendations will be taken up below.) Crops continue to be at risk while these issues are discussed, researched, and resolved—first between the local IPM officer and the farmer, then again with the regional or Washington office.

It is worth asking whether delays may not sometimes have the effect of increasing pesticide use after approval is finally granted, whether the requested pesticide was approved or an alternative was recommended. Assuming the crop is not a total loss by the time permission is granted, the extent of the problem may have increased in the interim. That is, the pest and damage could have spread over a wider geographic area, invading additional fields; or the pest population may have increased, meaning the magnitude of the problem has increased. This in turn might prompt farmers to intensify their efforts to control the problem, to take additional measures, perhaps including additional pesticide use. I have no data on this, but it seems like a possible scenario: delays in responding with control measures increase the magnitude of the problem, leading to an intensification of control efforts, resulting in more pesticide use than would have otherwise occurred. The NPS may wish to consider a study of such possible inadvertent effects of the structure and operation of its IPM program as part of a wider review of the on-the-ground functioning and actual consequences of its IPM program.

What comments by farmers associated with Minute Man suggest is that delays caused by the NPS pesticide review process may have the effect of undermining the integrated pest management process that the Park wishes to encourage as a matter of policy. Farmers' concerns may in part reflect the way practice contradicts policy.

2. Misinformation.

Farmers say they think the regional and Washington staff in the IPM program is not expert enough to make recommendations for agricultural uses of pesticides. They worry that recommended pesticides won't work, or that they are inappropriate for the crops for which they are recommended..

In one case, a farmer reports, he submitted a request, which was rejected, and an alternative recommended. When the farmer went to buy the pesticide recommended, his supplier told him that the pesticide recommended by the Park service was not meant for use on sweet corn. It was intended for field corn, or cow corn, a variety of corn intended for silage and consumption by livestock. The farmer said after this incident he wondered he could trust information and recommendations that came from the Park. It eroded the credibility of the Park IPM recommendations because it implied a fundamental lack of knowledge. The

farmer felt that no one with any claim to being an expert could confuse sweet corn meant for human consumption with field corn meant for livestock feed.

Farmers reported that pesticides recommended by the Park were not always effective on the pests they wished to control. One farmer reported being told that a particular pesticide worked on a particular pest, when in fact it does not. The farmer said the claim for the effectiveness of this pesticide on the pest in question flew in the face of expert opinion.

Dealing with misinformation or inappropriate recommendations takes time and may threatens to delay farm operations. "To go through [the process] is bad enough, but to go through it and get the wrong information....It's just a hassle you don't need," on farmer observed. He explained how a week before planting they had to go back to the local IPM officer to deal with an instance where the wrong pesticide was recommended.

The farmers' concern with misinformation reflects misgivings about the possibility of applying an ineffective or inappropriate pesticide on their crop. To avoid this, they evaluate Park recommendations. Their concern here also reflects the concern with delays discussed above: in the spring planting period, farmers worry that such delays could cause them to miss the window of opportunity for getting their crops in.

3. Arbitrary decisions.

If farmers worry that the pesticides recommended are ineffective or inappropriate, they also feel that are not being allowed to use pesticides that would work, are safe, and are used by farmers on non-Park land in Massachusetts. Farmers referred to decisions about pesticides as often arbitrary or excessively restricted, since these decisions prevented them from using pesticides used by other farmers in Massachusetts. In their view, the disapproval of a pesticide often seemed based on excessively narrow and limited readings of guidelines and restrictions, and failed to take into account the actual conditions of proposed use which they believed would justify the use under the guidelines and restrictions for a particular pesticide.

This was a general sentiment among the farmers interviewed. Perhaps the most egregious example of this "arbitrary" or "narrow" reading of guidelines stating the parameters within which pesticide use is permissible concerned a request to use a pesticide on one of the most isolated areas of the Park. It was reported that the grounds for disapproving this request were guidelines stating that the pesticide was not approved for use within an urbanized area or within a certain distance from a residential area. The request was disapproved because the field at the Park was technically within the boundaries of the town of Concord. In fact, in this case the designation as a "town" does not mean an urban or residential area, but an administrative unit; New England towns such as Concord

may contain quite extensive tracts of rural land in agricultural use, and the fields in question were in fact quite distant from any residences or built-up areas.

4. State and Park standards are inconsistent.

The Commonwealth of Massachusetts as well as the Park regulates pesticide use. The state licenses and certifies farmers to use pesticides. Farmers say Park standards are inconsistent with state standards and argue that the need to operate under two sets of inconsistent standards is a burden.

Farmers argue that pesticide use should be regulated under state rules so that growers do not have to deal with inconsistent standards. "What is good enough for the state should be good enough for the Park."

In sum, from the perspective of farmers the National Park Service IPM program cannot be considered a model program for agriculture, even if it is adequate and appropriate for the Park Service's internal needs. The scope of the IPM program of the NPS is wider than agriculture, and was never intended to be an agricultural IPM program. The NPS uses pesticides to manage pests in a variety of contexts, ranging from historic structures to museums to But agriculture faces special circumstances. A Park building can wait a few weeks, perhaps months, perhaps even years while a response is formulated and implemented. Farm crops cannot. The response to agricultural pests must be formulated and implemented within hours or days in order to protect the crop. A building with a pest problem does not wilt and die. It does not respond in the ways a living organism does to disease and predation. Crop plants do. Integrated Pest Management for agriculture requires flexibility, too, since the conditions of plant growth and pest-plant interactions are constantly changing.

At a minimum, the Park's review process needs to process requests rapidly and accurately. Crops represent livelihood. Since crop production is subsistence, farmers' concern with these issues reflects their need to make a living at farming. In effect, their concerns call attention to quality-control issues in the decision-making process of the IPM program, and underscore the consequences for farming and subsistence that decisions made at the regional and Washington levels can have.

At present, the IPM program restricts pesticides, but it does not prevent farmers from growing the crops that they need to grow. It would be helpful to smooth out problems in the review process and restore credibility to the Park IPM program. This is an area where a staff agricultural specialist could make a contribution, by actively assessing and double-checking the information provided farmers. Such a specialist could ensure a level of "quality control" on decisions that is currently lacking, perhaps preventing some of the errors that have made farmers skeptical. An agricultural specialist could help make the Park IPM pro-

gram one that works for agriculture, and make sure the program works as integrated pest management program in fact as well as in name.

TEN

CONCLUSION

Sections

The Goals of the Park's Agricultural Program
The Viability of Farming
Local Farmers: An Endangered Species?
The Adequacy of the Data Base, Study Findings, and Methodology
Recommendations for Further Research
The Need for Technical Support and An Agricultural Specialist

The Multiple Goals of the Park's Agricultural Program

For the Park, agriculture is a means to an end: the Park's overarching objective and highest priority in its agricultural program is to manage the land in ways that reinforce the historic character of the landscape. In practical terms, this means keeping as much of the land at the Park cleared and farmed as is feasible and consistent with other goals, priorities, and mandates. Agriculture has several roles to play in the Park's effort to maintain and restore the landscape to a meaningful semblance of what it was during the moment in history the Park commemorates. Not only can farmers help the Park maintain the agricultural character of the landscape by farming fields already under cultivation, but the Park would like farmers' help in restoring land not currently farm to agricultural uses, opening up land now covered with scrub-brush. It would also like to recreate aspects of the agricultural world of the Minute Men.

As this indicates, from the point of view of working with farmers the overarching objective of reinforcing the historic character of the landscape breaks-down into three specific, and distinct, goals:

1) The Park wants farmers to continue to farm land currently under cultivation—maintaining quality and stability is a priority.

2) It wishes to reintroduce farming to land not currently cultivated—building the "scaffolding" that will support the reintroduction process is the priority here.

3) It would like to integrate farming into its interpretive program—the emphasis here is on enhancing visitor experience by making tangible the agricultural world of the Minute Men.

Pursuing these goals require management strategies that are quite distinct in their structure and implementation: there cannot be one management strategy for farming at the Park because the goals of the Park require different kinds of farming. If different kinds of farming are required, the Park will need to work

with different kinds of farm operations—and so its management program will interact with different segments of the farming community. What must be done to support stable, quality farming on lands already farmed involves management actions that differ sharply from what is required for either interpretive farming or setting up farming on unfarmed, marginal land.

What the ethnography of local farming suggests is that the Park needs to develop a distinct management strategy for each goal that takes into account the nature of farming in the Concord and Lincoln area. The management of the agricultural program must take into account what farmers can actually do, based on the nature of their operations, their markets, their farming practices, and the nature of the land the Park can make available.

In pursuing the three parts of its agricultural program, the Park needs to be prepared to work in different ways with different kinds of farmers. Quite simply, what works for agriculture on Park land currently farmed may not work for land that needs clearing and rehabilitation before it is put back into agriculture use, and vice versa. The farmers who can help the Park with its goals on land already in agriculture may not be able to help the Park put land back into agriculture. Their operations may not be structured for it, and they may have little interest in reclaiming marginal land for agriculture.

Since each of the Park's goals requires a different approach to farming, each goal also implies a different management approach. Each goal requires a different relationship with farmers, and different types of management action. Moreover, the research suggests, establishing and sustaining these different types of farming will likely involve different kinds of farm operations, operated by different types of farmers. Well-established farmers, for example, have relatively little interest in reintroducing agriculture on marginal land covered with scrubbrush. Some one wishing to get into farming may be more interested—but the very fact they are not as well established may require a different management strategy on the part of the Park. Much more management "scaffolding" may be required for agricultural reintroduction, in the form of help with clearing, fencing, water, and housing.

Since achieving the Park's goals of managing land currently farmed for quality and conservation, reintroducing land to farming, and interpretive farming require different approaches to farming, and therefore imply different relationships with different kinds of farmers, the Park will need to develop a three-part agricultural management program to supplement and replace the current system of issuing special use permits.

Agricultural leases, for example, will need to reflect the Park's goals and the needs of the farmers who can help the Park meet these goals. The Park will need to develop somewhat different leasing arrangements for each of its specific goals: managing existing farm land for quality and conservation, proceeding with agricultural reintroduction, developing interpretive farming programs. Rather than taking "a one size fits all" approach, the Park may need to develop two to three

three different leasing "packages." Arguably, this would more realistically take account of the fact that the park has several goals, not a single goal, that these varied goals imply different relationships with farmers, and that, as the ethnography increasingly suggests, the farming community is not totally homogeneous.

Overview of the Component Programs

Let me proceed by defining the specific objectives and requirements of the component programs, indicating how they interact in different ways with the farming community. In brief, it appears the different parts of the Park's agricultural program may have to draw on different segments of the farming community, and be set up and managed in ways that reflects this.

1. First, the Park leases land that is already in agricultural use. The research to date suggests strongly that this part of the Park's agricultural program should be managed for stability and quality by leasing to established farmers, who as a group have a relatively strong interest in this land.[1] At present, only this component of the Park's total agricultural program is up and running at the Park, although mostly on short-term special use permits, rather than the long-term leases that farmers indicate make more sense for agriculture.

2. Second, the Park has the goal of reintroducing agriculture on some land not currently farmed. Contacts with farmers suggests that agricultural reintroduction will require a flexible and innovative management approach, and may involve working with less-established farmers. It is in this agricultural reintroduction program that some of the Park's innovative ideas, such as offering housing, may best be applied. For convenience and to distinguish it from the agricultural program for land already farmed, I will refer to this as "the agricultural reintroduction program."

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[1] Established farmers may or may not be associated with the Park by virtue of having once owned the land or being Park neighbors. "Established" here refers to a level of experience and resources embodied in an ongoing farm operation. However, in addition to this criteria, the National Park Service by local practice and (apparently) by policy (through notions of historic and traditional association) has criteria relating to the "relationships" of persons with Parks, as do neighboring communities. Historically, the Park, like neighboring towns, has given preference to persons with an existing relationship with the land, to those who once owned the land and their descendants, or to neighboring farms. There is also a local ethic, which still apparently has some moral force in the farming community, that says these relationships should be respected, and that other farmers ought not to bid on land to which another farmer has a relationship by history or by proximity to his or her core operations. I do not know how the Park or the Park Service intends this "association" criteria to modify the experience criteria.

Agricultural leases for the agricultural reintroduction program may have to be structured quite differently from leases in the agricultural leasing program for existing farm land.

3. Third, the Park has an interest in interpretive farming. Interpretive farming refers to farming—including horticultural techniques and forms of animal—husbandry that displays or demonstrates the historic agricultural practices associated with the period the Park commemorates. Of course, existing agriculture and agriculture reintroduced on the Park do help with the Park's interpretive mission: the land was agricultural, not grown up in forest and scrub brush in the historic era, and, moreover, contemporary farmers grow some of the historic crops by modern methods (corn, pumpkins and squash).

Yet while contemporary farming shows clearly the continuity of the area's agricultural heritage, it can not show in exact detail what agriculture was like at the beginning of the Revolutionary War. The Park's ideas for interpretive farming on a modest scale seem valuable on their own merits, but even more, in conjunction with the trail being developed, will allow visitors to see continuity and change in the agricultural landscape, as they move from historic plantings to modern farm fields.

Interpretive farming may not necessarily involve local farmers at all. It may be necessary for the Park to set up and manage an interpretive farming program, with the farm community being only an interested audience or involved as consultants. It is not feasible to expect local farmers who must make a living by farming to practice historic forms of agriculture. Not only would they not be able to make a living at it, but colonial agriculture was not sustainable agriculture—it involved destructive farming practices.

There may, however, be ways in which local farm operations can be involved (as suggested by the cattle kept pastured next to a historic building at the Park). The management goals here involve interpretation and education. If farmers participate—and there is no reason to think there cannot be some participation—the leasing arrangements and relationships with farmers would need to be fine-tuned to the needs of this interpretive farming program, even if farmers also participated in one of the other two components of the Park's total agricultural program.

In sum, local farmers may be involved in three different programs, existing or proposed, at the Park: an agricultural leasing program for existing farm land, an agricultural reintroduction program, and an interpretive farming program. Local farmers would interact in different ways with each component program--each program has different implications for farm operations.

How distinct are these programs in terms of management actions and the ways farmers might interact with them? Let me try to give a sense of this by considering the Park's proposal to offer housing for farmers (discussed in section [cross-reference]). The research suggests there is no need for housing in the agricultural leasing program for existing farm land—this land can be leased whether

or not housing is offered. But housing for farmers may have an important role to play in the other programs: housing may be important or critical in the agricultural reintroduction program, and might be a useful resource in the interpretive farming program. If this is so, then potential housing for farmers should be evaluated in light of these programs, not in terms of leasing existing farm land. With this in mind, it becomes clear that the housing the Park has proposed for farmers is not ideally sited. The housing proposed for farmers is at the West end of the Battle Road unit of the Park, near existing farm land, which is leasable whether or not housing is offered. Yet what site visits with farmers suggest is that the best prospects for agricultural reintroduction appear to be parcels at the other end of the Park.

The point here is that resources should be defined, allocated, and managed NOT in terms of a global agricultural program, but in terms of the specific goals of managing for stability on prime farm land, for agricultural reintroduction, and for interpretive farming.

Certain issues cut across the programs. Pesticide use will be monitored and regulated by the Park's IPM (Integrated Pest Management) program. All agricultural activities at the Park must be consistent with visitor use, and visitor use has the potential to impact agricultural uses, just as it does the historic sites of the Park and the modern amenities the Park offers to visitors. Visitors may throw trash in the Hartwell Tavern garden or litter in farm fields; they may pick wildflowers or flowers grown for sale by a farmer; people may enter the Park and commit acts of vandalism. The Park and farmers have a common interest in guarding against such activities and educating the public in appropriate ways to use the Park.

Even with these common issues, however, uniform policies may have different implications: the Park's livelihood does not depend on nurturing crops to harvest in whatever interpretive farming program it may set up, while the livelihood of farmers does.

It follows that the Park may be able to tolerate losses or damages, however unwelcome, that farmers cannot. This goes to a question of perceptions: farmers may perceive Park decision-making and actions as slow and ponderous because they experience every hour of delay as a loss of income in a way Park personnel who receive hourly wages or a salary do not.

A Note on the Viability of Farming

Even farmers who are flourishing face all the challenges that go along with being a farmer in the United States, and with being a farmer in this part of Eastern Massachusetts. A distinction must be drawn between the success or failure, health or fragility of individual farm operations, and the viability of farming in the area. The viability of a single operation has to do in part with the

management ability, resources, experience, commitment—and luck—of individual farmers. It also has to do with factors extrinsic to the farm operation, over which the individual farmer may have little control, such as fluctuations in market prices or changes in consumer preferences.

So the viability of farming must be assessed not just in terms of individual operations, but in terms of structural conditions—the ups-and-downs of local and national markets, the suburbanization of the region, the actions of town, state, and national government—that impact farms in a variety of ways. Looked at in this way, the focus is not on individual operations, but on the effects of structural factors on the population of farm operations. In terms of this perspective—focusing on structural factors rather than individual farms, looking at farmers as a population rather than as individuals—I am less optimistic about the future of farming in Concord and Lexington than when I look at individual farms and farm operators.

Farmers: An Endangered Species?

One of the farmers interviewed for this study compared local farmers to an endangered species. This comment was echoed by a member of the Park staff. The analogy has some merit, although we are dealing with the social and economic survival of a local social population, a community of local farmers, not with a biological population. (Farmers generally are not "endangered," I would hazard to guess; but local populations of farmers may be at risk).

The focus of the metaphor is the social, cultural, and economic phenomena that impact specific local group of farmers, not biological or ecological processes. Still, some concepts from conservation biology regarding biological populations may also apply in some respects to social populations such as farmers. If the analogy is only an analogy, it is perhaps a useful one up to a point, because it can help make it clear why there is some reason to be concerned about the viability of farming in the area, even if some farm operations are flourishing, and give a sense of what the nature of the danger to farming is.

One facet of the analogy has to do with habitat destruction: the equivalent for farmers is the loss of farm land to development. Another concern has to do with the size of the population. Certainly, some of the infrastructure and social support needed for farmers disappears when the number of farms decrease in an area (e.g., financial institutions may no longer focus on their needs. But even more than this, when there are few farmers in an area, random events may cause farmers to go out of business or curtail their operations, leaving no farmers to work with parks or conservation districts. Here the analogy with principles of conservation biology does not seem very far-fetched: "the probability of the survival of a local population is a function of its size" (Soule 1984:41). Moreover, it seems possible that "below a certain population size...the probability of extinction from random demographic events increases steeply..." Farming is subject to

a variety of "random" events: the injury or death of the farmer-operator in an accident, market events, the lack of heirs interested in farming, a series of bad years caused by weather or pests or other exigencies, fires that engulf critical resources, and many others. While farm operations may be resilient enough to weather many of these, such events might also lead to the closing of a farm-operation. Although one might think the closing of one farm creates opportunities for others, and certainly farmers have an interest in farming land no longer tilled by others, it is also true that the closing of more and more farms prevents the cooperation and cycling of resources and knowledge that appears important to sustaining farming in this area.

It is not hard to imagine the relatively few farms in the area fluctuating down to zero. It is not so easy to imagine reviving farms in the area. While farmers might move in from elsewhere, or new farmers start farming, I suspect this is an easier process, and more likely to succeed, when there are existing farms in the area.

If random events in the context of the general surge of urban development in the region may threaten local farming, what sustains it? The diversification of farmers into local retail niches is not an accident. It is an adaptation, and one that makes use of the very processes that also threaten agriculture. The road side farm stands that proliferate through the region reflect the market that urbanization/suburbanization has created. Enough people want to buy fresh, locally grown produce that farmers have a niche; in short, suburbia sustains the farm stands. If this is so, then stability, not further decline, may characterize the immediate future (10-30 years). The argument here would be that the shake-out has already occurred, and that the suburban retail niche will support agriculture as long as random events do not extinguish the few remaining local farms, and as long as (some critical portion of) the remaining land is not given over to development.

The implication for the Park is that it may wish to support, in whatever ways it can, the retail efforts of leasing farmers. It may want to help the farmers let people know where they can buy produce grown on the Park. It may also want to organize farmers' markets, or continue to permit farm stands to exist on the Park, where these do not conflict with other priorities.

The Adequacy of the Data Base, Study Findings, and Methodology

If this were a study of farming in the region, the issue of whether the farmers contacted were representative would arise. The farmers were not contacted with the idea of generating a representative sample.. They were contacted because of their relationships with the Park, not as a sample that one could use as the basis of generalization about the farming population in region. However, as a study of farming linked to the Park, the issue is not whether they are representative or not of a larger population of farmers, but whether the ones who consented to be in-

terviewed are representative of farmers at the Park. Do farmer and former farmers who did not participate for a sub-group, distinct from farmers who participated, and if they do so, does this matter for the analysis of study issues?

Possibly the farmers who did not participate are more disenchanted with the Park than farmers who did participate, or perhaps they merely have less of an interest in agriculture at the Park. I was able to observe all farming that took place on the Park, and the farming practices I observed are consistent with those of other farmers, who did participate in interviews and show me their operations. I am fairly confident that the data and analysis of farming practices applies in large part to all operations at the Park. I cannot quite imagine that any farmer would say leases should be short-term, or that the Park does not restrict farmers enough, or that it would be better if there were more stones in the fields.

I do think it possible that there may be some variation in values or reasons for engaging in farming. Some of the farmers who did not participate may see farming less as a economic activity, more as a way of life, be more concerned with non-monetary values, and may feel that the Park has transgressed against this way of life by acquiring land from farmers. This is possible, at least in or two cases. However, there may simply be no connecting thread that unites those who did not participate, but a number of quite different reasons. Lack of interest, negative attitudes about the Park, illness, were reasons given for not participating.

In interviews, farmers' were asked to tell about their practices and experiences, and to extrapolate on the basis of their practices, experience, and knowledge about the possible effects of developments or management in the Park. Discussion of the trail (see Appendix D) draw on past experience, and apply it to the proposed construction of the Park. The discussion of agricultural reintroduction does the same. It should probably be stipulated that farmers reports about how management actions have affected them are more valid than inferences about what might happen under hypothetical circumstances. Farmers should be considered experts, and with the issue of agricultural reintroduction, the most important experts, but experts are not always right when asked to render opinions about what are for them more-or-less hypothetical circumstances. The data and findings of this study are strongest when it comes to farmers assessment of their own farming practices, or statements of their own preferences and attitudes, and are most tentative when it comes to extrapolations of what might be involved in agricultural reintroduction.

Given the consistency across interviewees regarding many key points—that leases should be long-term, that the IPM process is too cumbersome, and so on—it seems that interviews were able to tap a core of concerns and preferences that are widely shared and embedded in the practical exigencies of farming. All of the farmers who agreed to participate said leases should be long-term, and that red-tape and delays were concerns. Even some who did not wish to participate in longer interviews (because they lacked the time, or had no interest in the Park,

or other reasons) made these same points as I they listened to me explain the purpose of the research. Non-leasing farmers agreed with the principles expressed, and gave these as reasons they would not be interested in leasing land from the Park. The data here seems strong enough to serve as a basis for action; it is very unlikely farmers are going to seek shorter-term leases, more red-tape, delays in processing pesticide requests, or will suddenly prefer living stacked one on top of the other in apartments to living in farm houses with barns and equipment sheds. Given this level of informant agreement about this set of issues, where possible, such concerns should be addressed.

On the length of leases and the burden of restrictions, farmers has a strong shard consensus, but on agricultural reintroduction there was some disagreement, although skepticism seemed to outweigh enthusiasm. Still, the split seemed in part to be between established operators who did not think it would be worth their while, and farmers with some experience in land reclamation, who thought it could be done, if—and this seems like the most important point—the right person could be found to do it. No one was sure the Park could support this process in the way that would be necessary.

Recommendations for Further Research

In terms of the Park's needs and interests, research in two areas seems appropriate. First, a marketing study might be invaluable in finding ways to support agriculture. For example, restaurants might provide a market of the right scale for local farmers associated with the Park.

Second, the ethnography makes it clear that there were important links between farms now part of the Park and Faneuil Hall Market in Boston. It would be fascinating, and important, to know about the links between Concord and Boston. (For example, the Palumbo oral farm history showed the Palumbo family linked by kinship to a North End Italian wholesaler. Several farms delivered to the markets at Faneuil Hall.) This raises the question of defining a regional historical legacy in terms of rural-urban transactions. It is imaginable (but far beyond the scope of an ethnographic study to show) that the events of April 19, 1775 may have been a historic political expression of regional socioeconomic linkages that continued in different forms throughout the 19th and 20th centuries. I expect that agriculture in Concord was long shaped by Boston as a market. There may or may not be specific links between farm land at Minute Man and historical sites or settings in Boston, part of, or associated with, Boston Historical Park. However, it would be worth finding out. For interpretive purposes, such research might develop an understanding of Minute Man and the Boston Historical Park as respectively rural and urban expressions of American society in 18th, 19th, and 20th century incarnations.

The Need for Technical Support and An Agricultural Specialist

The Park will need technical assistance in restructuring leases (e.g. in assessing the agricultural soundness of proposals submitted as part of any competitive bidding process). It will need technical assistance in its agricultural reintroduction program.

The fact that agriculture affects and contributes to the Park's functioning and ability to accomplish its fundamental goals would seem to warrant having a staff agricultural specialist. Such a specialist would work on securing the greatest benefits at the least cost. He or she would manage the program for quality on currently farmed land, oversee the agricultural reintroduction process, and improve the IPM program.

A staff specialist could also develop an interpretive farming program on selected sites, and help with events where Revolutionary War era agriculture is interpreted. It is diagnostic of the capacity crunch at Minute Man that a popular "Harvest Festival" in which agriculture and its connection to the world of the Minute Men could be highlighted was not held during the year of this study, since staff time had to devoted to other efforts. A staff agricultural person could work on this program, and could act as a liaison with community members or groups that have an interest in agriculture.

For example, community members or groups might sponsor sections of "Minute Man" farm plots, the produce from which could then be harvested by the sponsors, or donated to charity. The specialist could work with gardeners and institutions with an interest in legacy or heirloom crops, historic varieties not currently used in agriculture or contemporary gardens, but which have historic importance. The connection between history and agriculture could be developed in a number of ways. Farming is so important to the Park as a practical, cost-saving measure, but it also offers an opportunity to educate the public, to tell them the story of agriculture in the historic era, and to show them the continuity of agriculture in Concord. Plows were as much part of the lives of the Minute Men as muskets and politics.

An agricultural specialist might also help set up farmers' markets that would not only provide an outlet for farmers, but could perhaps be integrated in various ways into interpretive programs. A staff person with primary responsibility for the agricultural program could help educate the public about farming at the Park, which is one of the measures needed to help manage possible visitor damage to farm crops. In principle, a staff agricultural specialist could also help support the Park's biological conservation and biodiversity efforts by working with farmers to generate nesting sites or habitat for particular species.

At present staffing levels, the Park does not have the capacity to support these activities, which raise from necessary for the health of the agricultural program to highly desirable. Attaching an agricultural specialist to Minute Man is strongly recommended.

Appendix A

Research Design and Methods

Who Participated in the Study

Eighteen persons associated with local farms or farm families were interviewed as part of this study, using an open-ended format structured in terms of a checklist of items. Fifteen of these individuals are, or were, associated with the Park, either because they currently farm land at the Park, are members of families who once owned land now part of the Park, or both. In addition, three farmers not associated with the Park were interviewed, including one farmer who used organic methods. In all, approximately 60 hours of interviews were conducted.

At the Park, the Chief Park Ranger and the Park IPM officer were interviewed, and discussions were held with a number of other Park employees. The Park was toured three times with the Chief Park Ranger, including two site-visits to the proposed trail (one involving a walk along the greater part of the proposed route of the trail). Two formal meetings were held with Park staff in which the project was discussed. Three state agricultural officials were contacted to discuss issues related to their areas of expertise, as were the Town Conservation Commission officials in charge of agriculture for the towns of Lincoln and Concord.

Four individuals associated with the Park declined to participate in the research. Two individuals with an association with the Park could not be contacted. The implications of this are discussed in the section of the Conclusion entitled "The Adequacy of the Data Base, Study Findings, and Methodology."

Overview and Justification of Methods

I did not use questionnaires or survey methods in this research, nor formal elicitation techniques such as domain or decision-tree analysis. Instead, I relied on the methods that form the foundation of qualitative ethnographic research: open-ended interviews on specific topics, observation and participant observation, anthropological life-history and oral history methods (in this case formulated as "farm histories). I based this choice of methods on a number of considerations. First of all, I believe that the measures excluded should follow, not precede, a period of basic ethnographic research. Surveys, questionnaires, and other measures formulated in a vacuum, without ethnographic data to guide their construction, may have little value and miss much that is of the most significance. (When I farmed, I was once interviewed by a researcher. I recall that I thought the questions were often irrelevant and formulated without a good understanding of farm realities, and reflected academic points of view rather removed from the socio-cultural-economic exigencies of real-life farming. I also thought the inter-

viewer was more interested in running through their list of questions than in listening to what I had to say or finding out what I knew or wanted to say.)

Since it is not the purpose of this study to convert ethnographic description into material for scholarly debate, but to gather information that would help farmers and Park staff work together, I have been careful not to let my academic interests bias the research. I have deliberately attempted not to focus the study narrowly on topics of current interest to some academics, which I believe would have rendered the research largely irrelevant to the practical needs of farmers and Park managers. I have not attempted to collect data or perform analysis relevant to specialized, rather esoteric, academic problem, but rather tried to collect and organize ethnographic material relevant to practical management problems from the point of view of a group of local farmers. I have proceeded in a discovery-oriented manner, rather than assuming that my academic interests and expertise or the theoretical constructs of current academic discourse define research problems meaningful to the decisions, practices, and circumstances of these farmers and Park staff.

A key advantage to a discovery-oriented approach for many projects is that it does not unduly privilege the preconceptions of academics about what is important or counts as relevant research, or for that matter unduly privilege the preconceptions of the sponsoring agency, but rather discovers what actual circumstances are, what actual people involved think and do, and bases data and description on a dialogue of the concerns of the parties involved in the research issue (in this case farmers and the Park). A discovery-oriented component in research cannot be dismissed as merely opportunistic, because it assesses what affects and concerns people, rather than merely elaborates on what academics or Park officials might believe is important.

While questionnaires and surveys have their essential place in social science research, given the kinds of issues the Park was interested in understanding, I judged that the most useful information would be generated by open-ended and focused but not rigidly prescribed discovery-oriented interviews, and by observation.

Another reason for choosing the methods of open-ended interviewing, observation, and oral history was that early contacts with local farmers suggested that they were extremely busy and pressed for time because of the nature of their work. Furthermore, my experience suggests that questionnaires and survey are not always well-received by farmers. In this case, I suspect some of farmers would have perceived them as "more government paperwork," and as a burden.

It should be noted that the number of farmers here is not large enough to form a sample, nor are other conditions for valid sampling present. While a separate ethnographic study of the social fabric and economic circumstances of regional farming would be valuable, it was not the purpose of this study. (Such a study would require a higher level of funding, and it is not clear what benefits would flow to the Park from such a study). While this means the findings of this

report cannot be generalized to farmers in the region, it was never the purpose of this study to do so. For the purpose of understanding the Park's agricultural program, it should be noted that all the main leasing farmers (in terms of land farmed and scope of operation), and two of the three farmers farming on reservation or in-holding, participated. See the discussion in the Conclusion on the "Adequacy of Method and Data" for more discussion of this point. I believe the data and analysis provides a reasonable basis for program development and management action—surely a better base than existed previously—precisely because it conveys what farmers have experienced and generates a better understanding of farming practices and of local agriculture's circumstances and requirements.

The use of technical formal methods for modeling decision-making processes (such as the Ethnographic Decision Tree Modeling [Gladwin 1989]) did not seem appropriate for this study, given its objectives. While such modeling of decision-making has important uses, and might well be called for in follow-up studies, they are labor intensive and employing them would mean less time and effort could be devoted to other methods. Moreover, while these methods of cognitive analysis have the merit of precision, by themselves they offer a rather narrow picture of how people make decisions and act on them. I believe the objectives of this study call for a broader, richer view of farm life and farming practices than such methods offer.

Given the goals of the project, and the budget for the project, it seemed better to proceed by using more open-ended ethnographic interviews and field observations. Decision-making in agriculture is so varied and complex that the demands of technical analysis would preclude the more holistic ethnographic analysis that seems called for in this case. I believe data and analysis from this broad ethnographic strategy will be more useful to the Park than what a narrow, technical study would have produced.

Interview Methods and Topics

Interviews were open-ended, and focused on specific topics such as the main crops grown by the farmer and the market for these items, the structure of leases, paperwork and restrictions on land leased from the Park, the IPM program, and so on. The list of topics discussed with all participating farmers included topics about local farming (e.g., farm stands) as well as topics related to farming associated with the Park (e.g., the duration of leases, concerns over the proposed trail).

General items covered which were not specific to the Park's agricultural program covered included:

- Land, soil, weather, pests and weeds. Climatic and ecological conditions, including microclimates and field-specific environmental conditions.

(Information about "bottom land," drainage conditions, "hot" fields, and so on, was derived from these interviews).

- Equipment and labor.
- Knowledge and expertise. (Forms of "human capital," whether acquired by formal training, by growing up on a farm, or other ways.)
- Type and scale of operation: mixed farming, haying, grazing, truck farm, u-pick.
- Agricultural methods and techniques: tillage, planting, cultivation, pest control, irrigation, harvesting, storage and transportation.
- Marketing. Planning, strategies, transport, nature of buyers.
- Decision-making: including perceptions of risks, opportunities, evaluation of goals and values.
- Tenancy and tenure patterns. The location of operations and the logistics of "roadfarming" (movement of equipment from field to field) this involves.

For those who lease land on special use permits or farm on occupancy reservations, interviews also focused on the relationship of farming to the Park. Farmers took a substantial interest in explaining their concerns and answering questions raised with them. Issues here included: How do specific park policies affect farm operations? How do they affect farmers' decision-making and actions?

Interview topics related to the Park's agricultural program included:

- Park requirements for different kinds of farm operations (haying, grazing, row crops). Land use restrictions, and farmers' evaluation of these..
- Tenure on the land and the terms of leases.
- Pesticide use and restrictions on pesticides. Organic farming alternatives.
- Integrated pest management.
- Problems experienced with the Park's agricultural program; grievances and assessment.
- Roadside farm stands.
- Interactions with the visitor population and park staff.
- Vandalism and crop loss attributed to visitors, if any.
- Opportunities and constraints, as perceived and evaluated by farmers.

Perceptions and evaluations of "what would help farming."

- These topics were covered with all farmers associated with the Park. The three farmers not associated with the Park were also asked about these matters, in terms of how they might affect farm operations; associated farmers were of course asked about their actual experience.

Observation, Monitoring, and Site-visits

Farm areas within the Park were monitored on a weekly basis (more often during periods when there is significant activities in the fields), observing what is being done. Photographs were taken of observed practices and the growth of crops. These observations helped in the formulation of specific questions about agricultural techniques and formed the basis for wide-ranging and detailed discussions of agricultural practices, of the problems farmers encounter in growing crops, and of crop selection, planting, cultivation, pest management, harvesting, and marketing.

Off-park operations were visited in the course of the study. Several farmers offered tours of their operations, off and on the Park. Observations were also conducted at eight farm stands.

Oral History and Life-history: The "Farm History"

The "scope of work" for the study asked for an assessment of what farming means to farmers. Obviously, farming constitutes a way of making money or supplementing other income: it has economic subsistence value. Yet farming also often has other kinds of meaning. Such values, attitudes, and meanings seemed best identified through the use of convergent ethnographic methods. Meeting and talking to farmers while residing at the Park created some opportunities for participant observation and for open-ended ethnographic interviews. Interviews followed up on what was learned by these means. Life-histories interviews structured into oral "farm histories" with several farmers proved useful way of finding out what farming means to them. (See Parish, in press, and Langness and Frank 1981, on the nature and limits of the ethnographic life-history). Oral histories of changes in farm life provided data on the felt meaning of farming, on perceptions of changes that have affected the farming community, and were used as a way to explore the nature and degree of traditional association of farmers and park lands.

In all, three "farm histories" were collected. Two of these are reported here as Chapter 2 and 3.. Only two are reported, since in the third case the party involved was unwilling to let his or her name be used. Because this person did not wish to be identified, and since the material, if presented as a farm history, would have revealed the identity of the interviewee, the third farm history could not be used. The two farm histories that are included in the final report cover much of the prime agricultural land that is currently under cultivation. The material from the third farm history tends to confirm what the two published histories suggest, but would have made clearer the importance of the road side farm stand. (At one point, there were four such stands on land now in the Park). The Palumbo farm eventually farmed for sale to roadside stands, without having its own stand; Maplewood farm had a farm stand, but it was also a dairy oper-

ation for many years. It would have been useful to have been able to show a farm focused to a greater and more direct extent on farm stand sales, but this could not be done without revealing the identity of the person who discussed this farm's history.

The methods of interviewing, observation, and oral history utilized were used to generate data in several areas relevant to farmer and Park concerns.

1. The nature of the farms and characteristics of the farmers associated with the Park

   Methods: Site visits to farms, interviews with farmers, observation of farming operations.

These methods generated data on farm practices, on the scale and nature of farm operations, on motives for farming, on management style, on the needs and circumstances of farming, and data on specific issues such as leases and experience with the IPM program. In interviews, farmers evaluated the prospects for agricultural reintroduction and the proposal to offer housing for farmers.

The distinction between data from interviews concerning past or current Park practices that farmers evaluate on the basis of specific actual experience (the IPM program, leasing under special use permits) and data from interviews asking them to think about proposed management actions about which they are interpreting or extrapolating based on their general knowledge and experience as farmers, should be kept in mind.

2. Farming practices, agricultural resources, crop selection and marketing.

   Methods: interviews, observation of farm practices, site visits to fields and farm stands.

These methods generated data on what farmers do, including such basic practices as tilling, pest control, and marketing. These have been interpreted in terms of the way they may form the basis of farmers' perceptions of Park policies and management actions. In analyzing data on farming practices—from cultivation to irrigation to pest control—I have stressed the functional role of these in farming, to help park staff understand why farmers do what they do, and how this shapes the way they respond to certain Park measures.

3. Farming as a way of life: values and meanings associated with farming and agricultural uses of park land.

   Methods: Participant observation, ethnographic interviews, life-histories with selected farmers, oral "farm" histories provided data on farming as "a way of life," and of the values and meanings associated with farming.

The clearest sense of what farming means to people, of the value it has, is provided in the farm histories, which combine life-history data with interview data on changes in farm operations.

Collaboration and Consultation

Collaboration and consultation with the community involved were integral to the methods of this study. Names of individuals consulted in this study were not used unless their permission was obtained in writing. Information with names and identifying details removed was used only after those providing information signed consent forms. Farmers involved in the study were invited to comment on the draft report.

The agreement between Boston University and the National Park Service did not permit the use of audio tapes in interviews, since officials at the University felt it was not clear who owned or controlled these tapes (the researcher or the Park Service), and felt that identifying material could not be removed from the tapes. As a result, quotes in the text of the report are based on written notes. Data was recorded in field notes. While this disagreement hindered my ability to tape interviews and analyze transcript (as I do in most of my academic studies), it is unlikely in any event that all the interviews would have been taped and transcribed, given the limited budget for the project. Taking into consideration the limited aims of the study, it also seems rather unlikely that taping these interviews would have changed any overall conclusions, although it would surely have been desirable to have such tapes as a means of quality control and to give a richer sense of local dialect and discourse. Names were not recorded in any material provided to the National Park Service, except in the case of the farm histories where written permission to use names was obtained. The two farm histories used were read and corrected by the informants involved.

Note: those wishing a more detailed discussion of anthropological methods of qualitative research may wish to consult such basic works as Bernard (1994), Pelto and Pelto (1978), Spradley (1979), Langness and Frank (1981), and Briggs (1986).

Appendix B

Selected examples of types of American farmers/types of management style

Derived in part from Barlett (1987, 1993) and Bennett (1984).

Retired / retirement oriented farmers. Not expansion oriented.

- "Hanging on"—farmers approaching retirement or retired who need the income they get from farming.
- "Cushioning"—limited part-time farming enhances retirement earnings.
- "Traditional"—farming is valued as a way of life. Individuals in this category continue farming not out of economic necessity, but to express values or affirm their identity.

"Part -time" farmers (dual income farmers)

- Hobby / lifestyle farmers. Farming valued as a way of life, with variable relationship to local farming traditions.
- Income enhancers. Farm income supplements other income.
- "Limited" farmers. Farm part-time because of blocked access to full-time farming (insufficient land, capital, markets).
- Leaving full-time farming (voluntary or involuntary).

"Full-time" farmers.

- Established farmers.
  - Entrepreneurs: expansion oriented.
  - Stability-oriented: seek to maintain current income, low interest in expansion.

Start-up farmers / Newcomers

- "Bootstrappers"—low levels of resources (lands, capital, equipment) but sufficient experience and a desire to farm that motivates them to "bootstrap" themselves into farming.
- "Affluent newcomers" and "silver spoon" farmers. Newcomers to farming or members of established and prosperous family farms buying new farms with ample resources and capital to start out. Farm families may subsidize family members in farming, helping

them to buy land and equipment, mobilizing social networks to generate opportunities, and so on.

Prospective farmers (not currently farming or engaged in limited farming)

- "Blocked"—insufficient access to resources (land, capital, markets, other opportunity factors).

To flesh this out, a category of ethnic farmer is needed, since ethnicity may be associated with management style and farm type. The ethnic farmer category is based on my research in Concord and on Salamon (1992). Salamon found that ethnicity is pervasive in Mid-Western farm communities and strongly influences farm management styles and the values farmers bring to farming. I find that it is pervasive in Concord, and that interacts with the values and meaning of farming, but do not find that it is a strong direct influence on management style. The data does not permit any firm conclusions, but if I had to hypothesize, I'd say that generational differences may be more significant for management style than ethnicity.

Appendix C

ORGANIC FARMING

Concerns about pesticides have given rise to an interest in organic farming methods. Organic farming is agriculture that does not make use of chemical pesticides or fertilizers. In theory, organic farming would mean no pesticides would be applied to crop, since by definition this system of agriculture forgoes the use of such chemical remedies for crop pests. Thus, the appeal of organic farming seem clear—this form of agriculture seems to hold out the hope that the pesticide issue would simply disappear. In practice, there are a number of issues to consider. In the case of Minute Man, one practical obstacle is the lack of sufficient local resources for developing an organic farming program at the Park.

Even if there were, a number of issues would have to be assessed. Presumably, for example, pesticides would continue to be used by the NPS to protect buildings, to safeguard museum collections, to eliminate pests from housing, to protect endangered species, and so on—NPS documents suggest that the Park uses pesticides for orchard and ornamental protection, for roadside and trail maintenance, and for exotic plant control. Since the use of pesticides by the National Park Service might affect organic crops, the Park use of pesticides would have to be reconciled with organic farming. Organic farmers would be concerned about such uses and their potential for affecting their crops. Instead of the NPS being concerned abut the pesticides farmers use, the farmers would be concerned about the pesticides the Park uses. I observed a building being sprayed by NPS staff (I was inside it, and I did not receive any notice of the spraying), and such NPS use of pesticides might be an issue in some cases.

In general, organic farming should not be seen as a panacea. Organic farming methods will not solve all the problems associated with agriculture uses, and may pose new ones. Rather than thinking that organic farming methods will eliminate all headaches, Park managers should be prepared for organic farming to pose a different set of issues and problems. There may be trade-offs to be considered: while organic farming may reduce the levels of chemical used, organic farming practices may affect the Park and resources in other ways. For example, organic methods may use less processed chemical, but more manure and compost. This must be stored and handled properly. Questions about the chemical content, the health or biological hazards represented by, and the unpleasantness of such "organic" material may arise. Certainly, organic farms (and livestock operations) have to manage such material so that it does not prove a nuisance to neighbors. The Park would have to monitor the biological controls organic farmers might use to control pests (quote from document). In sum, if the NPS has a preference for organic farming methods, this should reflect a realistic assessment

of organic farming methods, their effects, and their limits, in the context of Park needs.

Wishful thinking should be avoided. A management preference for organic farming does not make organic farming viable. Unless it subsidizes organic farming, the NPS cannot by itself create the conditions that make organic farming viable in the face of economic and other constraints. It cannot dictate consumer behavior, nor compel wholesalers, retailers, and consumers to purchase organic produce. Organic farming cannot be created by management decree; while organic farming methods may represent an ideal, they may not always be practical. There may not be enough of a market for organic produce, or enough good farmers willing to stake their livelihood on organic methods.

Is organic farming—farming that avoids all use of chemical pesticides and fertilizers—an alternative that would be viable at Minute Man?

The fact that one farmer has been farming organically in Concord since 1975 suggests that organic farming at the Park is at least a possibility. However, there appear to be a number of practical difficulties involved in establishing organic agriculture at the Park. The consensus view of farmers interviewed, non-organic and organic alike, was that organic farming is riskier than conventional farming methods. This means that organic farm operations are harder to get going and more likely to fail. Organic methods require good management and farming skills, but not every one who proposes to farm by organic methods has these skills. While a market exists for organic produce, it is not clear how much demand there is, how successfully this demand could be tapped or developed, or how many organic farm operations the area could support. Organic produce may be more expensive, and many consumers may avoid blemished or insect-damaged produce, limiting the customer base for organic growers. At the same time, concerns about pesticides and the environment also generate a market for organic produce.

To be a viable alternative to farming that uses pesticides, there would need to be an established local grower who possessed experience with organic farming methods, who had access to markets for organic produce, who had the financial resources to deal with the special exigencies and uncertainties associated with organic agriculture and markets. In addition this farmer would have to want access to Park land and be motivated to develop a technical proposal for it. The one local grower with an established organic farm operation stated that he had no interest in leasing land from the Park.

The above considerations suggest that organic farming might be difficult to establish and manage as an alternative to conventional farming. If organic farming involves more risk, if it requires a excellent farming and management skills and special expertise in organic farming methods, and if there is not interest in land at the Park on the part of an established local organic grower—that is, a grower who has a demonstrated ability to manage the risks of this form of farm-

ing, who has a developed market for organic produce, and who has the proven expertise in organic farming methods—then it seems unlikely that organic farming is a practical alternative to conventional farming at the Park. If qualified organic growers can be found, organic farming may be an alternative, based on the merits of the proposals such growers submit and the evidence they can give of their qualifications. But the Park should be wary of granting leases on speculation, to unqualified individuals, because of a preference for organic farming methods.

The criteria applied to organic farmers should be as rigorous as the criteria applied to farmers generally. It seems likely that successful organic farmers would also be successful as conventional farmers: it takes as much, and perhaps more, knowledge and experience to be an organic grower. It certainly does not require less knowledge and experience.

If the Park has a preference for organic methods, it should not implement this preference by working with farmers who lack the resources and knowledge to farm successfully by this method. A concern for the health of land suggests Parks should be very wary of turning land over to people who are not qualified to farm it by any method, just because they propose to use organic methods. Ideally, they should be required to show that they have used organic methods successfully, or that they are successful conventional farmers who are converting to organic agriculture or diversifying their operations by adopting organic methods.

Given the risks of agriculture, one can imagine scenarios where the Park solicits organic farming, only to have such operations fail. It has been reported that this has happened in the past. Insisting on organic farming at the Park when the preconditions for successful organic agriculture do not exist could be counterproductive, wasteful of Park management resources, and potentially damaging to the land.

This is not to say that the Park should not consider proposals for organic farming; it should, if such proposals have merit, and if the organic farmer is well qualified.. It should not, however, lower the standards. Here again some kind of technical appraisal would be desirable.

If the Park wishes to encourage organic farming, it would be particularly helpful to find ways to assist with the development of markets.

Appendix D

THE TRAIL

The Park is preparing to build a bike trail through the Battle Road Unit. This trail will cross or run along the edges of some areas of agricultural use. Farmers varied in how they thought the trail might affect farm operation.

In general, most farmers thought the proposed siting of the trail was appropriate in terms of agricultural uses, and the trail seemed to conform to the criteria farmers listed as important. (This generalization refers only to siting proposed at the time fieldwork was conducted, in the summer of 1995, as it was shown to be on trail walks at the time.) Farmers thought the trail should not bisect or divide fields, but run along edges. One farmer advised that wherever possible the trail should run along the head of a field, where farmers turn around, or along existing farm roads, rather than running through parts of the field where crops are planted, eliminating rows for row crops.

Farmers said the trails need to allow them access. This includes vehicle and equipment access, but also access for irrigation equipment, where this is used. One farmer said that if the trial separates a field from a water supply, there should be a culvert to put irrigation pipes in, so that bikes don't hit the irrigation pipe. This was based on experience with trails on conservation land, where mountain bikes had dented pipes. Dents affect the transfer of water though the pipe.

The major concern was that the trail would increase theft and vandalism problems. This concern reflects experience with theft and vandalism the farmers have had in the past and at other locations. {See also section Crop Hazards}

One farmer reported to me that he had heard that the trail was going through, although he thought they would not begin building it for a while. He thought the Park had done a good job planning the trail, and that it would pose no problems for him. He did not feel it would impede farm operations. He reiterated this in a later conversation, again offering (basically positive) comments spontaneously. He was not concerned about bikers and hikers vandalizing his crops or disturbing his farm operations. He segued into accounts of problems that he had experienced in the past, with local residents. He was more concerned about people with cars than people with bikes: he did not foresee bikers biking away with bushels of fresh corn, but he had experience with people filling up their trunks with sweet corn.

Another farmer, however, reported that "kids used to come up" a bike path and "took backpacks" of corn from his fields.

One farmer contacted minimized the prospect of problems, He said he thought there would be relatively few problems. He thought people might walk down

into the fields and look. He would not mind that, he said, as long as they did not pick or damage crops. He liked to have people admire his crops. He wants people to see his fields. He is proud of their work.

However, another farmer had a very different view of the trail. He thought the trail would result in field invasion, theft, and damage to crops and equipment. "You can't tell me people won't come out here," he said, and cited examples of problems they'd had elsewhere, with people stealing pumpkins.

Neither of the above two farmers thought fences were a solution. The did not believe the Park would build chain link fences, and they thought people would simply go over or around other kinds of fences.

When a farmer with cattle heard about the trail, he said he felt people would avoid the electric fences. He said that cows can be dangerous when they calve. It is only during calving that he would worry about people getting in among his cows. He said he might remove animals during the calving period if a trail came up to where he had cows, and people showed they would climb the fence. He does not think climbing fences would be a problem, since they include an electric strand. He believes "Electric Fence" signs discourage people from this. .

The farmers could not think of any preventive measures they believed would be effective.

One farmer said you have to "look on the good side." Another shrugged and said expressed a pessimistic assessment of the situation. He said farmers "will have to lump it or leave it"—meaning either their losses will be acceptable or they will no longer be able to farm in these fields.

One of the most concerned farmers identified the isolation of the fields as conducive to theft and vandalism. "Who's going to know out here? You can't tell me people aren't going to go out in the fields."

One farmer reported groups of people entering fields during the Hanscom Air Show as a problem.

Farmers concern seem to reflect their experience elsewhere, transferred to what they see as the circumstances of the particular fields they farm at the Park. While there is no real way to predict whether experience elsewhere applies to this case, for planning purposes it may make sense to assume the rate of problems to be expected at the Park will conform roughly to the rate of problems under similar circumstances elsewhere in the area. Using this as a conceptual baseline, some assumptions might be made. First, to echo one local farmer, "there will be problems." There will be the same kind of problems farmers have experienced elsewhere and in the past. Second, if (and it is necessary to underscore the if) the problems encountered at the Park conform to the postulated "baseline" rate of problems experienced, elsewhere, these problems will probably fall below the threshold level at which farmers would have to stop farming these parcels, since they absorb such losses elsewhere and continue to farm. However, prob-

lems of theft and vandalism at the Park could be worse that the prevailing rate, since much of the theft and vandalism farmers report seems to have occurred in areas where either the farmers or neighbors are more likely to see problems, and the presence of houses serve as a psychological deterrent. As evidence of this, a number of cases of theft were reported to have occurred near farm houses or at farm stands. A possibility is that worse problems could occur in isolated areas screened from the view of roads or houses. Certainly, a body of research in the social sciences agrees with the intuitions of some of the farmers that crime tends to occur at higher rates in areas where individuals do not fear being detected.

Other Issues: Privacy, Quality of Life, and Security Concerns

One farmer was concerned with the fact that the trail would run in front of his residence. He did not want a fence built to separate his yard from the trail, saying he did not "want to live in a stockade." He wants shrubs to be planted rather than a fence.

Two other individuals--in the retired and former farmer category--expressed concern regarding the trail. In essence, they felt the trail would bring in people "they don't know." This seems to reflect their sense of isolation. I can't call out and expect my neighbors to hear, said one.

Appendix E

The Human Use of Plants and Animals at Minute Man National Historical Park

Non-Agricultural Uses

While this ethnographic study focuses on agricultural practices at Minute Man National Historical Park, I was asked to note any "ethnographic resources" or "subsistence resources" I observed. Moreover, a brief discussion of other food procurement activities observed or not observed will help place agricultural uses in context.

Anthropologists who have studied the ways human beings supply themselves with food have identified several basic patterns of food procurement. I will adopt the anthropological classification of subsistence and food production strategies to organize this discussion of human use of plants and animals at Minute Man.

1) gathering or foraging, the collection of uncultivated plants or other resources.

2) hunting

3) fishing

4) grazing and browsing animals on natural vegetation[1]

5) agriculture (the cultivation and management of domesticated plants, for consumption by human beings and domesticated animals).

In this classification system, agriculture may involve small scale production (horticulture) or large scale field production

All these strategies are found on federal lands—in one form or another. For example, hunting and fishing in national forests, grazing on rangeland managed by the Bureau of Land Management , small-scale horticulture and large-scale farming in certain National Parks. An example of small-scale horticulture would be community gardening, as found at Gateway.

The patterns that apply to food production or acquisition also apply to non-food uses of plants and animals. Plants used for fiber, basketry, decoration, or religious rituals may be gathered or cultivated.

Since human beings and their food-procurement strategies respond with great flexibility to need and opportunity, any of the basic kinds of resource-procurement activities I have listed may occur in a Park, some for subsistence pur-

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[1] Anthropologist define pastoralism as an economy based on maintaining herds of animals. In American society, herding is usually subordinate to farming, since animals are often fed a variety of cultivated crops, although grazing and browsing on natural or unmanaged vegetation does occur. In this study, I will consider livestock management a form of agriculture.

poses, some for other purposes. Depending on local circumstances, more than one subsistence or resource procurement activity could occur on a National Park. For example, at Minute Man National Park, people pick wild berries, a form of gathering, although on a small scale, and farming takes place under an agricultural leasing program. In fact, some of the basic types of food-procurement activities noted here occur even in urban parks (Dr. Rebecca, Joseph, personal communication).

Gathering. No extensive foraging for wild or uncultivated plants was observed. People were observed picking blackberries and grapes at the Park, but they did not carry off large quantities of either, and were not observed to come with containers for harvesting these. The use seemed incidental to other uses of the Park (taking a walk, walking dogs, jogging, visiting historic sites). Observations were not systematic, however, so planned harvests of berries or grapes may have been missed; moreover, this was a drought year, so blackberries and other items may have been less plentiful. Park staff reports that in other years they had observed people coming in with containers with the intent of picking berries.

People were observed to stop in their cars to pick bitter sweet. Branches of this plant are used for decorative purposes, and were observed at several local houses. Bitter sweet was also observed for sale in Concord. Evergreen boughs are collected for seasonal decoration.

People were heard discussing wild mushrooms, but were not seen taking any. People were reported to collect chestnuts at a farm near the Park.

No one was observed cutting trees or deal fall, but there is local demand for fire wood. Road side stands sell fire wood, and I was approached twice by people wanting to know if they could take wood they had observed being cut by Park staff or contractors working for the Park.

Since the apple trees in front of the residence where I stayed did not produce fruit, the fact that no one was observed harvesting apples does not mean anything. It seems likely that apples above a certain threshold of quality would attract people, but here is no data relating to such use from the present study. Unblemished apples are sold at road side stands in the Park, as are apple cider and apple pies.

A special case of plant collection involved ornamental plants left by former owners or residents of houses at the Park. A number of the houses the Park acquired were surrounded by plantings of various ornamental species. After the residents have left, people occasionally will come to the Park and remove some of these plants. The people who do so may be friends or relatives of former residents for whom these plants have personal associations, or people living near the Park who desire these plants for their own lawns and gardens. Rather than treating this as theft, the Park may wish to have rangers refer people to Park headquarters. Since these plants do not constitute a resource for the Park, it may be appropriate to permit former residents, relatives of former residents, and per-

haps people with a special relationship to former residents, to take such plants. It is unlikely that there is enough demand for these plants to be a burden on Park staff, or that any formal procedure needs to be put in place.

Hunting and trapping. Hunting is not allowed in the Park. An interest in deer hunting exists. Some local farmers have been approached. The area around the Park is developed, and hunting would not be safe. Some illegal hunting is said to occur. Some reports suggest that some trapping of small animals and birds occurs.

Fishing. Fishing occurs in and near the North Bridge Unit of the Park, along the Concord river, despite posted warnings.

Grazing. Currently, a small number of horses and cows are grazed in the Park. For the most part, animals graze on cultivated pastures, but in 1995 some browsing on natural vegetation occurred in a small area being reintroduced to agriculture. The natural forage provided a portion of the animal's diet. The ability of livestock (sheep and cattle) to browse on natural vegetation may be taken advantage of as the Park seeks to reintroduce some land, now grown up in scrub brush and trees, to agricultural uses.

Small-scale horticulture (gardening). "Kitchen" gardens of food plants and herbs (often interplanted with annual flowers) were grown at a number of sites on the Park, by inholders, term and life residents, and by Park staff. The economic value and subsistence status of these gardens are hard to evaluate, but no data collected suggests they are essential to subsistence or livelihood, although they may be supplements of some significance in at least a few cases. Such gardens have considerable personal significance and cultural value. For example, giving friends, relatives, neighbors, and co-workers garden produce is an important social activity. The aesthetic and culinary value of kitchen gardening may appear too obvious to seem worth noting by those who garden, but should be noted by those who do not.

Ornamental gardens and plantings are highly valued. This is not only for aesthetic reasons; the plantings may have personal associations. At one house, for example, a daughter gave her mother a rose to plant as a birthday present.

Gardening is for the most part an innocent pursuit, but one local crop can lead to jail. Park staff report that illegal marijuana cultivation has occurred in the Park.

Farming. Modern agricultural production of food and forage crops occurs, of course, under the Park's agricultural leasing program currently involving approximately 150 acres, as discussed in the main text of this report.

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Honey production. I am tempted to list this under "grazing" since bees forage for pollen in wild and domesticated flowering plants, including crops plants like squash and pumpkins, but I will instead note it as a special case. Bees are vital to crop production, and some hives are kept on the Park.

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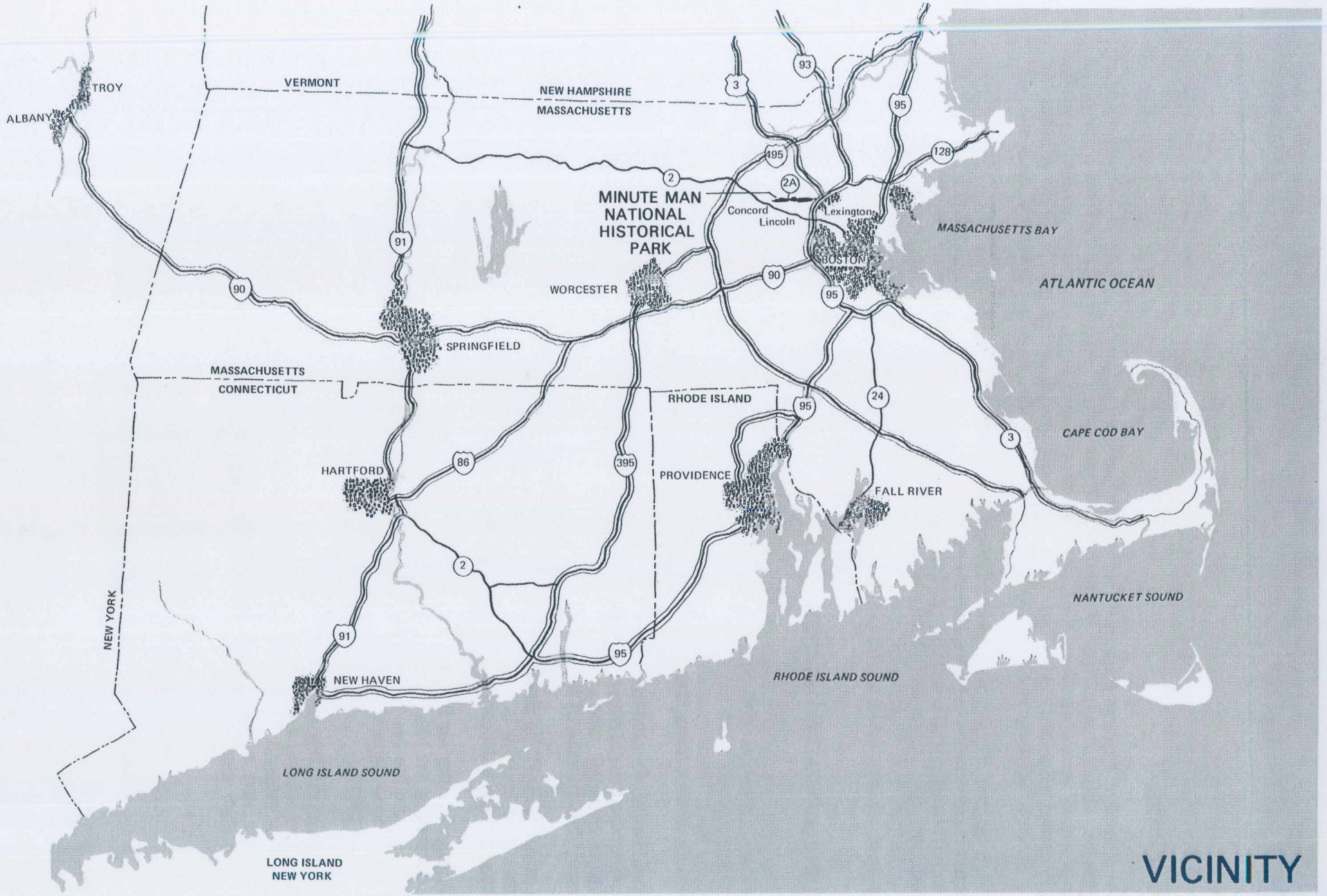

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