LANDSCAPE AGRICULTURE:

LANDSCAPE DESIGN LESSONS LEARNED FROM

THE FARMING COMMUNITIES OF RURAL APPALACHIA

By

SARAH ELLIS COLLINS

(Under the Direction of Katherine Melcher)

ABSTRACT

The region of southern Appalachia has a rich cultural history that once included widespread self-sufficient farming. There are some farmers who are still using traditional methods of crop and livestock production. Landscape designers could learn important methods for production in the unique ecologies of rural Appalachia from the traditional and innovative farmers of the region. Through the process of literature research and primary source interviews, this thesis determines the current status of farming in rural Appalachia and makes recommendations of what practices are important for landscape designers to learn and incorporate into their own work.. Interviews were completed with traditional, self-sufficient farmers, with innovative farmers, and with landscape architects involved in agricultural projects. The results of the case studies provide insight into the potential role of agriculture in design and led to the creation of a site-specific design.

INDEX WORDS: Appalachia, Rural Appalachia, Highland County, Farming, Agriculture, Virginia, Subsistence Agriculture, Landscape Architecture, Permaculture

LANDSCAPE AGRICULTURE:

LANDSCAPE DESIGN LESSONS LEARNED FROM

THE FARMING COMMUNITIES OF RURAL APPALACHIA

By

SARAH ELLIS COLLINS

B.S. Arch, The University of Virginia, 2009

A Thesis Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

MASTER OF LANDSCAPE ARCHITECTURE

ATHENS, GEORGIA

2012

.

LANDSCAPE AGRICULTURE:

LANDSCAPE DESIGN LESSONS LEARNED FROM

THE FARMING COMMUNITIES OF RURAL APPALACHIA

By

SARAH ELLIS COLLINS

Major Professor:	Katherine Melcher
Committee:	Shelley Cannady Daniel Nadenicek Craig Page

Electronic Version Approved:

Maureen Grasso
Dean of the Graduate School
The University of Georgia
August 2012

DEDICATION

This thesis is dedicated to my parents.

They taught me what I know about producing food and instilled in me a love for the land.

This thesis is also dedicated to the mountains of Appalachia and their people.

ACKNOWLEDGEMENT

Firstly, I would like to thank Katherine Melcher for her time and patience and for guiding me through this process.

I would also like to thank Josh Simmons and Coriena Reynolds for tolerating my many long and nearly sleepless nights and for providing a shoulder to rest my head on as I stole opportunities to close my eyes. They provided much needed support and encouragement throughout the writing process, and were there to remind me to take a deep breath now and then along the way. Without their love, this would have been much less fun.

I could not have been as successful in this endeavor this without the help and support of Theresa Cullen. She provided shelter, nourishment, laughter, and encouragement whenever I needed it most.

There are others, who are too many to name, who have supported me throughout this process of writing this thesis. To the sounding boards, editors, and guides, thank you.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION TO LANDSCAPE AGRICULTURE

The Future of Agriculture in Appalachia

The words ‘landscape architecture’ do not typically evoke an image of farming or agriculture, but the two ideas are not as disparate as one may initially think. At the root of both agriculture and landscape architecture is an intention for cultivation. While farmers work for food production, landscape architects have historically been oriented toward the design and production of decorative landscapes, with ornamental plants. After living in a rural area of Virginia and working on a teaching farm, the author began to explore the concept of using agriculture to guide design. Furthermore, the author was interested in discerning the role of design in the local foods movement and what designers could learn from farmers. It is possible for landscape architecture and agriculture to be brought together in an academic setting for the benefit of design professionals. By using traditional agricultural practices to inform design principles, landscape architects will be able to both better understand a region’s culture and create designed landscape that includes food production.

The question becomes in what context can these two disciplines—agriculture and design—be brought together so that designers can learn from traditional farming methods and be able to implement those concepts in design? Additionally, in order to provide certain limitations for the scale of the research, another question is what is the agricultural history of a specific region? In this case the region is southern Appalachia.

Because southern Appalachia is a region with unique ecologies and sometimes challenging topography, it provides a good context for landscape designers to learn from farmers who have been cultivating the land successfully for generations. The region is also home to the author. The author chose to use the rural, farming community of Highland County, Virginia for the context of traditional farming in southern Appalachia because of a familiarity with the area and knowledge of the fact that many older farmers do still use traditional methods (fig. 1.1). Additionally, the author interviewed farmers who are in the Appalachian Mountains of central Virginia and are using innovative farming techniques that incorporate design into their work. Finally, in order to fully tie landscape design to agricultural practices, it is important to investigate how landscape design has begun to incorporate food production into designed spaces. Through literature research and case studies, this thesis analyses these concepts for integrating food production into designed landscapes and specifically in the designed landscapes of southern Appalachia and the context of the regions modern culture.

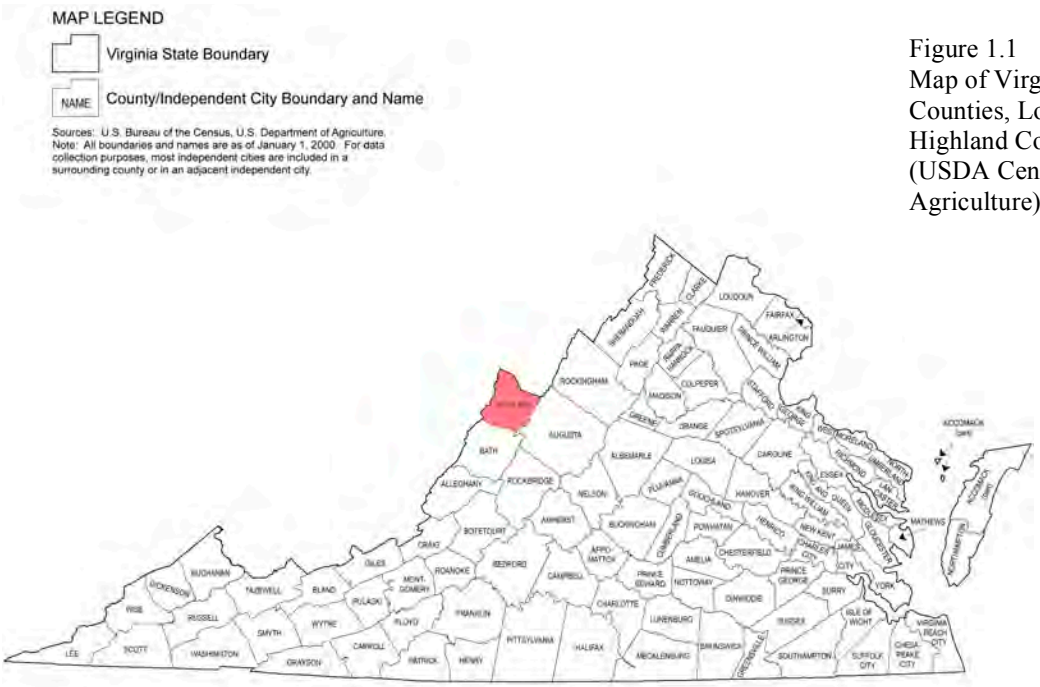


Figure 1.1
Map of Virginia Counties, Locating Highland County (USDA Census of Agriculture)

The area that comprises southern Appalachia is a region where the developed landscape was once defined by subsistence agriculture and the small farms that made up the rural communities of the region (fig. 1.2). Farmers in this area continued, through the last century, to practice a form of agriculture that was reminiscent of the methods used by indigenous peoples and early settlers in the region. The self-sufficient culture is being lost and therefore the opportunities for landscape designers to learn from the traditional farming methods and farmers of southern Appalachia are quickly decreasing.

Figure 1.2
Appalachian Mountain Farm
(Hart 149)

By investigating the farming history of rural Appalachia and focusing on the southern part of the region, and by researching the precedents of bringing together landscape architecture and agriculture, the author—in chapter two—aims to define a set of historic precedents that can be used to better understand the future of the regional landscape and farming in Appalachia, which will then help to guide the process of the case studies. In order to begin to understand the context for this thesis, the first subject researched was the history of farming in Appalachia. The authors whose works focus on this region include information about the region's broader cultural and ecological history as they present the farming precedents. The other important subject was the integration of

agriculture and landscape design; there are a number of authors who have contributed to the literature in this field. Some authors reference the ephemeral quality of farming landscapes, while others specifically speak to the concept of permaculture and where landscape architecture fits into this discipline. Through these written works, this author began to frame a process for using Appalachian history and farming to gain a new knowledge base for landscape designers.

In addition to the literary references, primary source case studies were completed that covered three separate perspectives on farming in Appalachia. In Chapter three, the case study process and interviewees are introduced to the reader. The first group studied was comprised of traditional farmers from Highland County, Virginia. The knowledge gained from this case study group, and the chapter compiling the results, answers the question about current practices of traditional farmers in southern Appalachia. In addition to these farmers, three innovative farmers from rural Appalachia were studied as well. Similarly to the traditional farmers, the results from these case study interviews were synthesized and chapter five presents the answers to the question of what methods are used by the innovative farmers of the region. Finally, three landscape architects were interviewed about their involvement in agricultural design projects in Appalachia and other mountainous, farming-oriented regions. In interviewing the landscape architects, the core research question—what can designers, specifically landscape architects, learn from the farmers of southern Appalachia and how can that information be incorporated into their designs—begins to be answered and the various aspects of the research begin to be tied together. These case studies directly aided the process of integrating the concepts of cultural landscape heritage, farming in Appalachia, and how landscape designers can

use that information in landscape design and creating edible landscapes. Chapters four, five, and six share the results of the interviews- divided by the case study groups, while chapters seven and eight present the discussion and conclusion of the information gathered throughout this process.

This author aims to generate a site-specific design that demonstrates using the knowledge gained from farmers, both traditional and innovative, to create a designed landscape in the southern Appalachia region. More explicitly, the thesis can be used to show that the profession of landscape architecture can learn from the agricultural history of this region. In order to do so, concepts from both landscape architectural literature and farming and design practice will be analyzed, synthesized, and presented in the document that follows.

List of Terms

Traditional Farming: farming with knowledge that has been passed down from generation to generation, through oral and practical means, and with limited use of technology and at a scale that can be managed by only a few people

Conventional Farming: mono-culture farming, typically at an industrial scale, with a dependence on machinery and technology and with the use of chemical soil amendments; with livestock, feeding animals large amounts of grain for the purpose of adding weight quickly and often keeping animals in small spaces with limited access to grass

Innovative Farming: using methods for crop and livestock production that include mimicking natural systems, methods that are counter to conventional means, working at various scales, and take ecology and sustainability into consideration

Subsistence Farming: a form of farming and food production that provides for the basic needs of a farmer and his/her family without the benefit of producing surpluses for marketing; farming that rarely brings any monetary profit, and typically only allowing for a marginal livelihood

CHAPTER 2

LITERATURE REVIEW: LANDSCAPE ARCHITECTURE, APPALACHIA, AND FARMING

Introduction to Design in Agriculture

Landscape architecture and landscape design have both directly and indirectly played a role in agriculture and food production throughout history. Currently, there is a move towards studying and understanding the historic agricultural landscape and to understand the greater culture in which they were originally generated. Additionally, practitioners are analyzing the current agricultural scene and taking part in its continued development. Permaculture, a new and specific area of landscape design, was generated in response to the desire to involve design in the reformed food movement. By definition, the culture of agriculture inadvertently takes design into account and therefore, it is a practical progression for the landscape architecture profession to learn from the culture of food production systems and in certain instances become involved in their design.

Introduction of the Authors

This author draws from the expertise of a number of different authors, from several fields, in order to compile comprehensive information on the history of farming practicing and culture in southern, and on Appalachia landscape architecture and design in agriculture. The first references presented are specifically about the history of farming and culture in Appalachia. In 1990, Mary Beth Pudup—then an assistant professor of Community Studies at UC Santa Cruz and a Fellow in the Division of Agriculture and

Natural Resources at the Smithsonian Institute—wrote about the relationship between agriculture and industry in central Appalachia in her article "The Limits of Subsistence." Another writer, John Solomon Otto, spoke to the changes in the agriculture systems of southern Appalachia in his 1983 article about the decline of forest farming. Colleagues David Propen and Daniels Kirk also discuss forest farming and the practice of slash-and-burn clearing but from a more modern and carbon conscious perspective, in their 2009 article: "Trust the Land: Land Management and Business Structures for the Future." While the work was published in 1977, John Hart's compiled research on land rotation in Appalachia is still important to understanding these systems in a historic context. Thomas Arcury, in his 1990 article in the journal *Human Ecology*, spoke more directly about ecology and agricultural diversity in Appalachian Kentucky between 1880 and 1910, but touched on some of the same issues referenced by other authors. Both Anne Chesky and Mary Lalone, in 2009 and 2008 respectively, published work on running and sustaining family farms in Appalachia and use specific case studies to support their work. Chesky wrote her article while pursuing a master's degree in Appalachian Studies and Development at Appalachian State University. Additionally, two authors wrote about poverty, landownership, and development, but the articles were written about fifteen years apart and therefore present slightly different perspectives. Eban Goodstein published his article "Landownership, Development, and Poverty in Southern Appalachia" in 1989, while Amy Glasmeier wrote "Poverty, Sustainability, and the Culture of Despair: Can Sustainable Development Strategies Support Poverty Alleviation in America's Most Environmentally Challenged Communities" in 2003. In his 2008 book *Uneven Ground: Appalachia since 1945*, Ron Eller—an Appalachia native and

historian—touched on many of these subjects. The book focuses on mining and development, but farming and landownership as well as historic land use are all important to the history of the region in the context of mining. Finally, In 2006, Jeremy Lake and Bob Edwards wrote an article, "Buildings and Place: Farmsteads and the Mapping of Change" which referenced farming communities in the United Kingdom, but some of their methods for research and designating relationships were useful in understanding the work being done in Appalachia. Through the work of these various authors, this author was able to gain a more complete understanding of the history of the region, specifically in the context of farming and self-sufficient lifestyles.

A number of authors wrote about agricultural landscapes and the cultural preservation of those areas. W. E. Boyd and J. E. Gardiner's 2005 article, from the School of Environmental Science and Management of Southern Cross University, NSW, Australia touches on the ephemeral versus the permanent qualities of agricultural landscapes. They present their work using the example of peanut farming in Australia, but the concepts are translatable to other regions and crops. Three faculty members from Lincoln University—Shelley Egoz, Jacky Bowring, and Harvey C. Perkins—wrote in 2006 about the landscapes of organic farming operations in comparison to traditional farmland in New Zealand; the authors also touch on some of the history behind the typical aesthetic of organic farms and about what modern rural landscapes are. In 2008, Joks Janssen and Luuk Knippenburg published about the landscape of the Dutch countryside and the cultural heritage of the area through the Netherlands Institute for Spatial Research. They discuss the conservation efforts directed at older, historic

landscapes, but also bring up the issue of modern rural landscapes and question how they relate to heritage protection and development.

In addition to studying the literature about the general agricultural landscape, this author researched the concept of permaculture as a valuable reference for this project. James Veteto and Joshua Lockyer are with the Department of Anthropology at the University of Georgia; they wrote, in 2008, about the history of permaculture and provided example of permaculture in practice in the ecovillage context. They look at permaculture through the lens of environmental anthropology, but their research is applicable to the design profession. From the Sustainability Center of Thailand, Brad McManus also wrote about permaculture and he presents it as a design approach system; his 2010 paper investigates the integral framework of the design system. Permaculture lends itself to the profession of landscape design and as a concept combines agriculture and design.

A Brief History of Farming in Appalachia, 1680s to 1900

> [Appalachia is] one of the oldest and most diverse forest ecosystems in the world, the Appalachian range contains the headwaters for most of the streams that drain the eastern United States. Blanketed by a forest that includes more species of deciduous trees, other plants, and wildlife than any other region of North America, the Appalachian woodlands functioned for thousands of years as a natural sponge that filtered and harnessed water resources and moderated runoff and soil erosion (Eller 248).

The region of Southern Appalachia includes the mountains of Virginia, West Virginia, North Carolina, Kentucky, Tennessee, and Georgia (fig. 2.1). Though the people who inhabit Appalachia were, and sometimes still are, often considered backward, poor, uneducated, and colorful—a polite, Southern term for odd—they were truly familiar with the land they lived on and they took care of it so that it would take care of

them. The people who make their homes in this region have historically lived off the land and some of that culture is being forgotten by the current generation. There were historic patterns for cultivating the land, some of the patterns have changed as technology has changed, but other traditions have remained intact. These patterns and traditions are central in understanding the self-sufficient farming culture of this region.

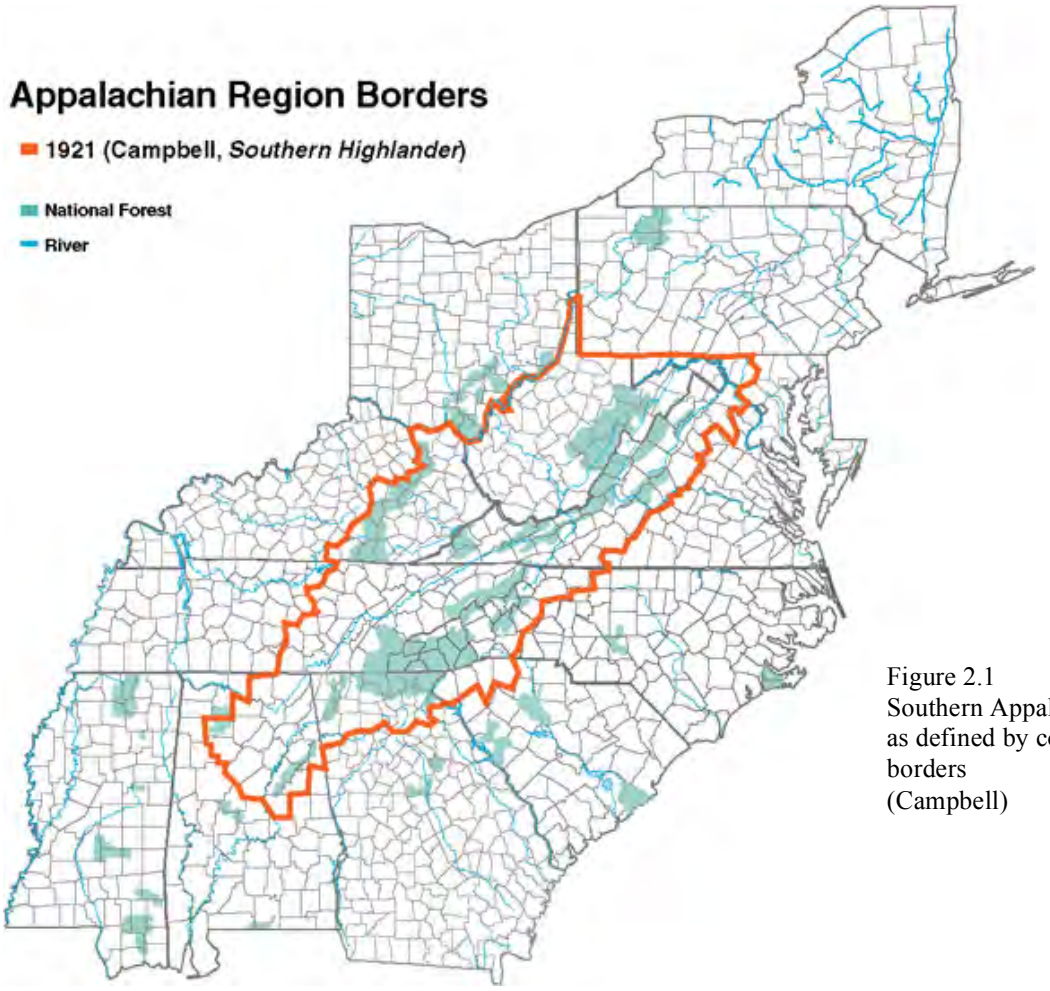


Figure 2.1
Southern Appalachia, as defined by county borders (Campbell)

European settlement began in Appalachia during the late seventeenth century as the bottomland that was closer to the coast was claimed. Many of the coves and hollows that make up the landscape of this region are still occupied by the descendants of those early settlers (Hart 164). The residents of Appalachia ran the gamut of society. There were the indigenous Cherokee Indians, African Americans who were former slaves,

subsistence farmers, entrepreneurs, laborers, representatives to the government, people of different classes, ethnicities and national origin (Goodstein 566). Until the mid-twentieth century, these residents of Appalachia lived on small farmsteads and worked within their immediate communities. Industrialization—beginning in the early 1900s—changed the landscape of the region and changed how people related to the land. Technology made it easier to extract resources from the mountains and that led to a decline in people's ability to live off the land. Appalachia became a region associated with poverty and ignorance; with the change in attitude came a change in the way the land was used. "The decline of farming… pushed families off the land across most of Appalachia" (Eller 28). There are far fewer people who live off of their land in Appalachia today than there were six decades ago and an even smaller number who practice self-sufficient farming within this region (table 2.1). This is also the case in Highland County, Virginia—the local case-study area; the number of farms and the amount of land being farmed had decreased by more than fifty percent between 1940 and the present (table 2.2 and 2.3).

Farms in Appalachia were typically small, self-sufficient, and family run. In fact, the small family farm was considered an icon of Appalachia (Chesky 87). The family as a unit most commonly managed the small farms; goods that were produced were used by family members or traded with neighbors for other commodities. Some of the earliest Appalachian farms were organized around commercial production, but by the 1850s most farming that took place in the region was subsistence-based (Pudup 63).

Table 2.1: Agricultural Census Data for the New River Valley
(combining census data for the four counties in the region) (LaLone 93)

Year	Number of Farms	Total Acreage	Average Farm Size (acres)
1935	7,488	691,618	92
1940	6,418	651,621	102
1945	5,947	603,433	102
1950	6,150	602,672	98
1954	5,474	564,980	103
1959	3,950	520,251	132
1964	3,329	479,593	144
1969	2,581	423,733	164
1974	2,207	394,477	179
1978	2,034	395,075	194
1982	2,227	389,181	175
1987	2,022	365,561	181
1992	1,993	360,324	181
1997	1,959	363,338	185

(Sources: U. S. Census of Agriculture 1992; 2002a, b; 2007)
Statistics by county can be found in LaLone, Wimmer, and Spence 2003.

Ron Eller writes about the decline of agriculture across Appalachia between 1880 and 1930, which occurred in part because by 1930 there were more off-the-farm jobs available to add into household strategies (Eller 1982, 229 - 30). Patricia Beaver indicates that the average size of farms across Appalachia declined from187 acres in the 1880s to seventy-six acres in 1930s (Beaver 1984, 87). The southwest Virginia region under study appears to have retained its agricultural base a little longer than the average. The NRV does not seem to have had as many off-the-farm work opportunities available until the construction of the Radford Arsenal in 1940, as discussed in a later section of this article, and the average farm size in the NRV was a little higher than the cross-Appalachian average, and even rose slightly in the 1940s (LaLone 93).

Table 2.2: Agricultural Census Data for Highland County, Virginia
The Number of Farms in Decline in the Last Eighty Years

		Year					
	Farm Size, in Acres	**1935**	**1940**	**1992**	**1997**	**2002**	**2007**
Number of Farms	<10 acres	35	30	17	10	3	0
	10 to 49 acres	114	99	25	21	28	36
	50 to 69 acres	84	81	19	22	22	15
	70 to 99 acres	100	85	31	18	26	16
	100 to 139 acres	57	63	28	28	23	32
	140 to 179 acres	7	2	29	34	33	26
	180 to 219 acres	55	54	19	19	23	8
	220 to 259 acres	44	32	12	17	22	9
	260 to 499 acres	109	107	55	66	62	53
	500 to 999 acres	54	48	52	34	34	30
	>1000 acres	24	22	11	14	17	14
Total		**683**	**623**	**298**	**283**	**293**	**239**

(Sources: U. S. Census of Agriculture 1940; 1997; 2002; 2007)

Table 2.3: Agricultural Census Data for Highland County, Virginia
The Size of Farms in Decline in the Last Eighty Years

		Year				
	Farm Size, in Acres	**1940**	**1992**	**1997**	**2002**	**2007**
Number of Acres in Farmland	smaller than 10 acres	161	34	22	10	
	10 to 49 acres	2,932	712	572	826	1,161
	50 to 69 acres	2,747	1,145	1,302	1,266	854
	70 to 99 acres	6,737	2,506	1,456	2,014	1,239
	100 to 139 acres	10,062	3,297	3,215	2,678	3,794
	140 to 179 acres	9,869	4,643	5,289	5,191	4,182
	180 to 219 acres	10,763	3,873	3,764	4,482	1,613
	220 to 259 acres	7,672	2,877	3,984	5,220	2,095
	260 to 499 acres	35,843	20,235	23,095	21,061	18,644
	500 to 999 acres	32,070	36,565	22,157	25,392	20,215
	larger than 1,000 acres	34,568	21,023	26,486	27,896	22,967
Total		**153,424**	**96,910**	**91,342**	**96,036**	**76,764**

(Sources: U. S. Census of Agriculture 1940; 1997; 2002; 2007)

The self-sufficient and subsistence lifestyles of southern Appalachia were based on both the necessity of economy and the necessity of geography (fig. 2.2). The natural topography of the mountains limited the access that farmers had to commercial centers. Much of the reasoning for subsistence-oriented agriculture was the lack of reliable transportation, including improved roads and rail systems (Otto 18). The combination of economy, geography and topography helped to define the southern Appalachian farm as one that was based on self-sufficient cultivation; the way farmers managed their land gave a distinct character to the mountainous region.

Figure 2.2
Mountain Farm
(Eller)

Because a scale of self-sufficiency defined the majority of Appalachian farms, they were small enough properties to be manageable for a single family. In the mid-twentieth century, the average farm in southern Appalachia was less than eighty-one acres; the farms in the more rugged areas, southern West Virginia through western North Carolina, were even smaller, typically less than fifty-five acres each (Eller 29). By 2002,

seventy-five percent of the farms in the New River Valley, in the heart of southern Appalachia, were less than one hundred and eighty acres, and in that region the average farm size was still only one hundred and sixty-four acres (LaLone 64). While the farms of Appalachia were modest by most standards, the amount of land that was actively being cultivated was even less. On a given farm there was typically less than fifteen acres of farmland under production as cropland at any given point in time (Eller 29). In order to keep the soils as fertile as possible, farmers frequently rotated cultivated land back to forests. "Southerners clung tenaciously to the land on which they had settled, and they quietly kept it in production by rotating it from cropland through apparent abandonment to woodland and then back to cropland once again" (Hart 164). The subsistence farms of rural Appalachia were small and carefully cultivated in order to preserve the fertility and productivity of the farmland.

Cropland occupied only a small portion of any given farm in mountainous Appalachia; through planning and foresight, farmers were able to rotate their open land to scrub and forest in order to maintain the arable soil. This system of field-to-forest-to-field rotation was not just a remnant of early settlement; Appalachian farmers mimicked, whether consciously or not, the Native Americans of the region in their traditional methods of field rotation in order to maintain soil depth and fertility (fig 2.3). Through the mid-twentieth century, the Appalachian region was host to one of the best remaining examples of what is considered forest farming, a form of slash-and-burn farming that is found in temperate forests and characterized a majority of Native American agriculture (Otto 18; 21). Because production areas were allowed to grow up into woodlots, the rotation cycle took much longer than the typical pattern of rotating crops within a field.

The cycle of land rotation extended over a generation, sometimes even longer, and it was very rare for one person to observe the complete cycle (Hart 151). In addition to taking longer than the more standard crop rotation pattern, the system had to be managed in a very different manner. One of the most common methods of land clearing was 'deadening,' in which trees were girdled and then crops were planted around the still standing, dead trees; this process helped to slow soil loss, but still the overall low soil quality and slope of the soil necessitated the regular abandonment of older fields and development of new ones (Arcury 107). This system of deadening also offered farmers an ability to cope with the unpredictable climate of Appalachia where frosts could occur most months of the year (Otto 22). Through planned field and forest rotation, farmers were able to systematically maintain soil fertility and crop yield and allow for the growth of woodlots without compromising their field acreage.

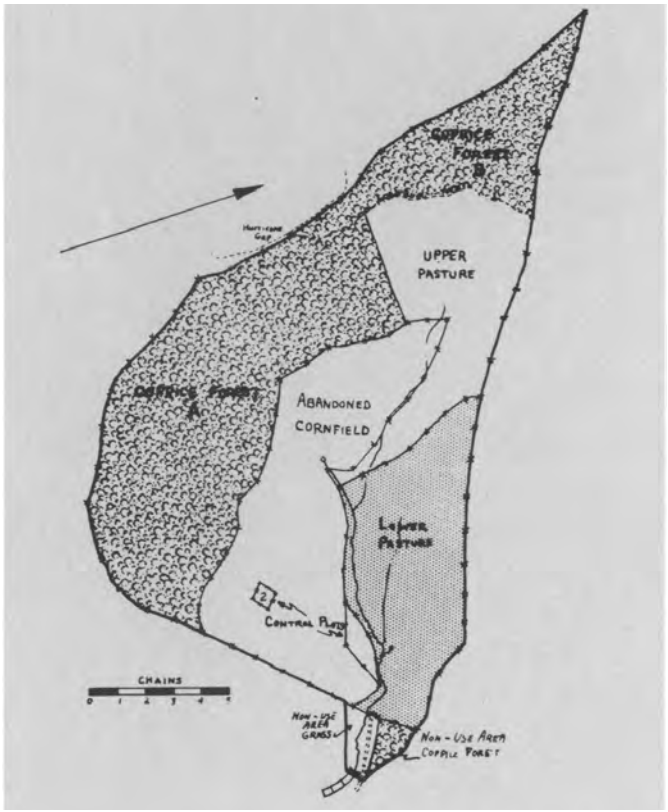


Figure 2.3
Diagram of Field to Forest to Field Rotation
(Otto 20)

Farmers grew a wide variety of crops and raised various types of livestock in the fields that they had cleared. Most farms had gardens and orchards, and families raised bees, cows—both dairy and beef cattle, – mules, sheep, and chickens; in their gardens, farmers grew beans, tomatoes, peas, lettuce, onions, and potatoes and what was extra they would put up for the winter in a cellar or by canning (Eller 29; LaLone 66). Through this diversification, families were able to live off of what they could produce on their farms and were often able to feed their livestock off of what was grown in the fields created by deadening (fig. 2.4, 2.5). Because of the subsistence and self-sufficient culture, farmers produced hay and silage crops for their livestock (LaLone 63). Farmers typically grew corn in their fields as well. Only a small fraction of the fields were planted in corn, however; and the crop was grown to be consumed by the farm family or used to help fatten livestock that were to be taken to market (Otto 20). The scale at which they produced those feed crops favored, at most, the use a small tractor (LaLone 63). As often as not—because of scale and topography—tractors were not used at all on the mountainous farms of central and southern Appalachia. The terrain was not conducive to the operation of modern farm machinery, including tractors, therefore only about a third of the farms employed the use of a tractor for cultivation (Eller 29). Most

Figure 2.4 Cattle Grazing in a Transitional Field
(Hart 149)

food that was grown on the farm was used for family and livestock consumption or for barter with friends and neighbors; there were, however, a few cash crops grown occasionally in small quantities throughout southern Appalachia. “Neither cotton nor tobacco, the traditional cash crops of the region, ever occupied any major fraction of the land even in the areas where it was most important. Both crops make heavy demands of the soil, and neither can be grown on the same ground for more than a few years unless it is heavily fertilized” (Hart 163). By producing much of what was consumed on the farm and occasionally producing cash crops, residents of Appalachia were able to carry out a self-sufficient lifestyle.

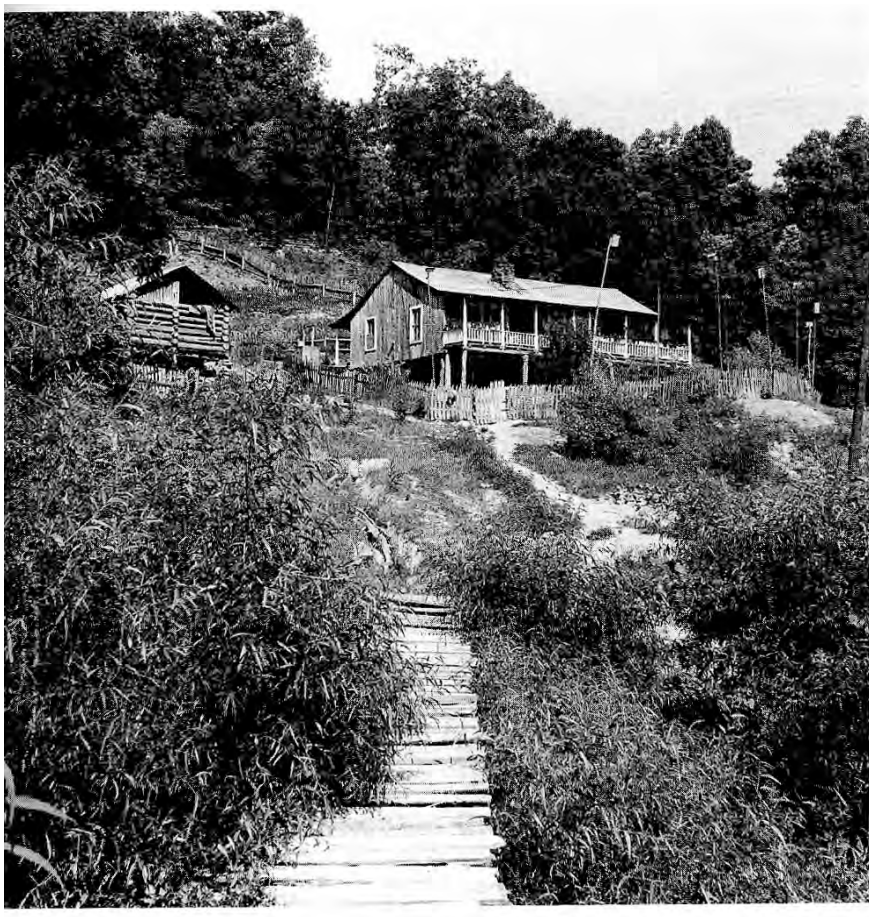


Figure 2.5
Hillside Farm, 1964
(Eller)

On the farm, it was important to manage work through the sharing of resources and diversifying the skill-set of family laborers. There were several distinct strategies that

were used to manage the farm and the labor force in Appalachia; they included diversification, pooling and the concept of reciprocity. A nuclear family would often collaborate with members of a more extended family to increase the labor force and the resources they had to work with (LaLone 64). Those arrangements with extended family would allow for the sharing of equipment, increase the ability to grow multiple silage crops and spread holdings over multiple locations, and raise a wider range of produce and livestock (LaLone 65-66). Pooling was a very similar strategy, but related more directly to skill and labor contributions of the people involved. Family members could contribute to the household by carrying out entrepreneurial activities, getting jobs off of the farm and supplementing the household earnings, and supply additional labor and abilities to help with the agricultural, mechanical and veterinary services (LaLone 67). Finally, reciprocity pertained to the trading and sharing systems that were established between farmers and their neighbors. The reciprocal relationships were often formed to trade labor for activities which required large-group labor efforts, and to share in communal activities such as apple-butter making and hog-killing (LaLone 69). One farmer from the New River Valley of Virginia made the distinction that '[they] didn't work for other people, [they] worked with other people, because everybody worked together to get all the work done' (LaLone 70). These family and community relationships allowed farmers to share resources and work together for betterment of all involved.

In order to have this subsistence lifestyle on their small parcels of land, the farmers of Appalachia often found it advantageous to carry out a wide range of activities including growing gardens, raising livestock, managing wood lots, and occasionally spending time working off of their farms. Mountain farmers were used to leaving their

farm for seasonal jobs in order to earn extra money (Eller 21). Some of the outside work that farmers or their family members participated in, however, competed for, and even threatened, the land on which they relied so heavily. By the twentieth century, farmers had to contend with the timber and mining industries for the ownership of land in Appalachia, all the while working seasonal jobs for the same industries (Otto 18; Eller 21). The farming families of this region were successful and self-sufficient because they were able to share skills and goods, but did occasionally find a need to work temporary jobs off of the farmstead.

Appalachian Industrialization, 1900 to 1980s

> Self-sufficiency in the form of producing everything for their table is no longer a primary goal for households operating in today's cash economy like it was for households in the 1930s (LaLone 81).

As industry became more prevalent in the mountains, the lifestyles of many Appalachian farmers changed. The culture of mountain agriculture has languished since the beginning of the twentieth century, when industrialization changed many land use patterns and the local economy; after World War II, farming declined at an even more rapid pace and by the 1960s, half of the farmers in Appalachia had abandoned their lands (Eller 28-29). Industrialization invaded the mountains of Appalachia in the form of timber companies, coal mining operations, and the expansion of highways and retail centers (fig. 2.6). "Moreover, even allowing for the presence of the mining industry, rural Appalachia has experienced an economic development pattern markedly different from the rest of the rural South" (Goodstein 519). At the start of the industrial expansion, miners who worked in the West Virginia coal mines were able to hold on to their family farms in Virginia and North Carolina and therefore had a place to go in the event of a cut

in wages or a mine shutdown; essentially, they would use 'coal as a cash crop' in order to maintain their hold on the family farm (Glasmeier and Farrigan 320). Many families were eventually forced to sell their land, however. Land that been handed down through families for generations was sold because farms were no longer viable and the descendants were forced to sell off their family farm (Chesky 87). By giving up the family land, the people of Appalachia nearly gave up a way of life as well; the full consequences of the situation are only just being realized.

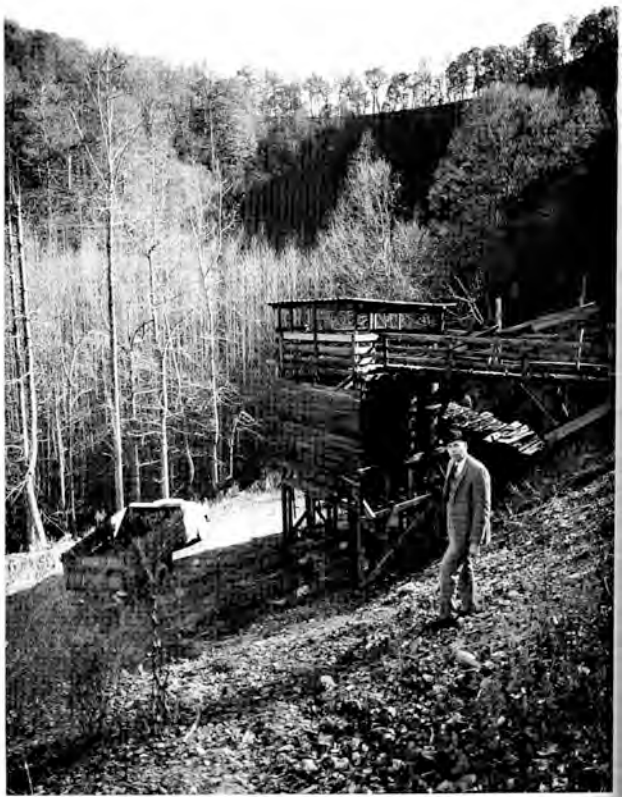


Figure 2.6
Small Truck Mine, for coal
(Eller)

Modern Appalachia: The Farming Methods and Practices, 1980s to Present

> As one drives through the national forests, it is difficult to realize that only fifty years ago much of this land was still being farmed. As late as the 1930s, cultivated fields straggled up the slopes of hills, ridges, and mountains throughout Southern Appalachia (Otto 18).

Long-standing agrarian customs of Appalachia were threatened as industry moved into the region. The economy of the region needed to be lifted up, but the challenge was to improve the economy without disrupting the existing culture or threatening the productive land. Some farms were able to remain solvent throughout the process of industrialization and the farmers worked together to support one another within

immediate families and within larger communities. As younger generations began to help run the farms, they helped to modernize their family's operations in order to compete in the again changing economy. As Appalachia modernized, the farming scene of the region changed; how individual farmers responded to the changes helped to determine whether or not an individual farm was able to remain a part of the active economy.

There was once a strong tradition of farming and of a self-sufficient lifestyle in Appalachia; as development spread like kudzu vines into the mountains, the culture changed from one of independence to one organized around a reliance on industry and a cash economy. "On the one hand, Appalachia needed jobs and economic expansion to lift its mines and mills, encourage tourism and second-home development, and attract branch manufacturing plants that could increase the local tax base and provide revenue for schools and roads. On the other hand, economic development should not destroy the landscape, exploit the people, or threaten traditional values" (Eller 195). Unfortunately, the landscape was drastically altered by the mining and timber industry and the of ethic self-sufficiency was nearly gone, having been lost between one generation and the next (fig. 2.7, 2.8). The once independent farming families were, all too often, reduced to surviving off of food handouts and what little they still grew in their hillside gardens (Eller 64). Many people in Appalachia had a difficult time, because of pride and a residual sense of self-sufficiency, applying for or actively participating in welfare programs. The lack of availability made it difficult to access many of the social services for those who even wanted to participate (Goodstein 519-20). Economic growth gave the outside world more access to the mountains, but made it more difficult for many people to live off of the land the way their families had for generations.

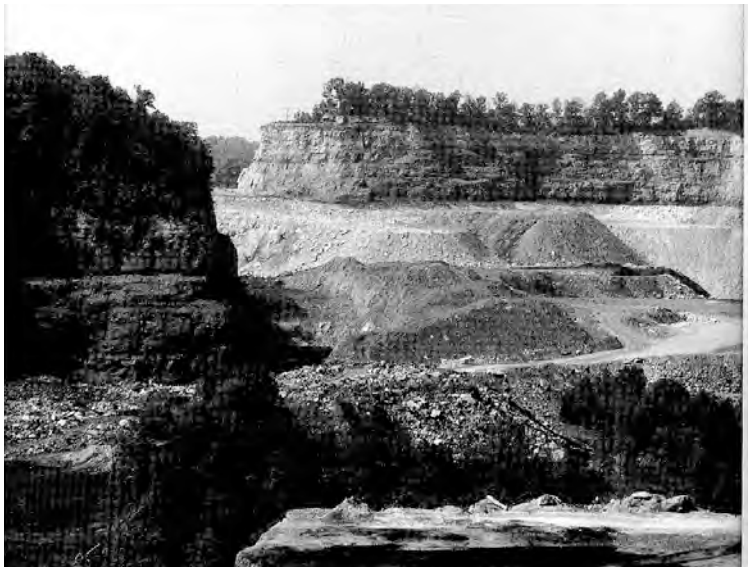


Figure 2.7 (*top*)
Surface Mine- New Home for Walmart: Grundy, Virginia
(Eller)

Figure 2.8 (*left*)
Surface Mine, 1985
(Eller)

There were a few farmers and families that were holdouts against the changing economy, and were able and willing to continue to farm their land; those people came together to keep their lifestyle solvent. By the late twentieth century, there was heavy pressure on agricultural land as suburbia spread and the increased taxes that came with population growth burdened the farms because they had 'empty' land locked in agricultural production (LaLone 78; 79).

As of 2002, farmers in the region continue to practice the principles of diversification in order to keep their farms financially afloat; inadvertently, through these

practices, farmers have maintained their self-sufficient culture. The families that still farm continue to carry out a mix of cropping, gardening, and raising of livestock; most grow silage crops, cut hay, have small gardens, and raise beef or other animals (LaLone 81). Reciprocity has become less commonplace than it once was, but farmers still work together and provide services that help one another. Now that farm equipment plays a larger role in the methods of production, the sharing and trading equipment has become as important as helping one another directly through the provision of labor (LaLone 86). Pooling within the family, on the other hand, has become even more important. By taking off-the-farm employment, individuals are able to supplement the family income; this measure has become crucial to farm family livelihood (LaLone 87). Pooling has now reached beyond the immediate family; some farmers will pool resources with neighbors in order to co-purchase and share ownership of farm equipment (LaLone 89). Through some of the traditional community and family practices of mountain living, the farmers of this region have been able to take part in and modernize with the changing economy.

Changes are on the horizon for southern Appalachia; while the changes are necessary to maintain solvency, the culture of the region should be documented and better understood through the process of transition. Within the families who still farm, the members of the younger generation who have come back to help on or run the farm, have begun to discuss and sometimes employ alternative methods of production. They are considering changes in the use of fertilizers, herbicides and pesticides, and shifting to no-till cultivation; these discussions and changes are generated by a want to keep the family ventures viable and stay competitive in the shifting market (LaLone 82). There is also a need to reclaim the land that was stripped through timbering and mining, to make some

of that land accessible and viable for production. Through the use of mineralization, soil fertility can be increased and biodiversity can be improved by encouraging natural ecological succession (Propen and Kirk 11). Modern Appalachia is different from the Appalachia of one hundred years ago, but the cultural history has not been entirely stripped from the mountains or the people, self-sufficient living can be preserved and revitalized, especially the farming culture that remains such an important part of the rich history of the region.

The modernization of Appalachia changed the agricultural landscape of the region. Development spread, threatening the farmland and changing the culture of the area. Farms that were able to survive the economy and societal changes clung to the traditions that had been passed from generation to generation with the farmland. Young farmers began to look for means of remaining competitive in a changing market and found that elements of design and science could aid in the future of the farms.

Landscape Design in Agriculture

> [An agricultural landscape is] an ephemeral landscape; that is, a landscape whose character is strongly influenced by cyclical ephemeral qualities(Boyd and Gardiner 195).

By actively studying and gaining a greater understanding of the agricultural landscape in a historic context, it is then possible for the landscape designer to learn from those histories and from the current methods used by farmers. Through cultural context and by learning from the farmers of a region, a designer can better design for a specific site within a regional context and will create designs that are realistic, feasible, and are well informed. Agricultural land is productive land, seasonally and constantly changing, it is important to recognize the significance of the agricultural landscape when designing

within it. As land use patterns are documented for site and regional studies, it is possible to recognize historic farmsteads for what they are, land which can be used to define models of farming methods and form the fabric of the area's history (Lake and Edwards 33). While agriculture is not glamorous, agrarian patterns help define a regional or national identity (fig. 2.9). Farmlands can play relatively temporary roles in the development of a region, but are still a fundamental aspect of the settler society and remain part of the history of an area (Boyd and Gardiner 213). When considering more modern landscapes, culture and economy can be used to inform the context in which the land developed to its present condition.

Too often, modern landscapes are dismissed with regards to their history, especially agricultural lands; agrarian changes which took place in the twentieth century are only considered significant because of the loss of 'traditional' rural landscapes (Janssen and Knippenberg 2). In fact, some of the greatest changes in the farming landscapes took place following major historical events, allowing historians to cross-reference the pattern changes. For example, in many places, post-war policies aimed to increase agricultural productivity while lowering the cost of the products; the changes in food production visibly and drastically changed the agrarian landscape because of the recent changes in technology that were then available to farmers (Janssen and Knippenberg 10).

Figure 2.9
Stooking the Peanuts, agrarian patterns that are part of a regional identity
(Boyd and Gardiner 202)

In the profession of landscape architecture and in academia, the study and design of productive landscapes is not yet commonplace, but the discussion has been taking place in scholarly writings and the professional practice for the past several decades. One of the most explicit conversations taking place is one of the ephemera of croplands and the fact that seasonality is even more marked in productive landscapes. There is a unique aesthetic in agricultural landscapes and while the cycle is predictable, it is predicated on the transitory nature of the system; therefore agricultural landscape design must consider both the annual—or even more often—cyclical phenomenon and also the cycles that takes place on a much longer time scale (Boyd and Gardiner 196). One must also consider the product and production method when approaching the design of an agrarian system; for example, there is a distinct difference in the nature of conventional and organic agriculture. Conventional farms aesthetically represent the desire to control the surrounding landscape, while organic farming is more commonly represented by weedy landscapes with a more naturalistic appearance (Egoz, Bowring and Perkins 55).

Agricultural landscapes cannot, however, be analyzed regarding solely their aesthetics. There is value beyond the visual effect of wind rippling a field of grain, the

image of fruit growing ripe on the tree in an orchard, or the bright green of new seedlings transitioning through the season to dark green summer foliage. While the aesthetics are what draw attention to these farmlands as cultural landscapes, it is difficult to justify preservation or design based only on the visual value of a productive landscape (Boyd and Gardiner 213). With all of the academic exploration of agrarian sites, there remains a gap between investigation and implementation. As Boyd and Gardiner stated, their study of ephemeral agricultural landscapes of Australia drew attention to the nexus between the conceptual study of landscape and the actualities of land use planning and design (Boyd and Gardiner 217). The academic study is important for understanding the history of farmsteads and the culture surrounding agricultural lands, but it is also imperative that the profession takes the next step and be involved in the design and preservation of these spaces, including protecting their ecological and social values.

One group of designers and farmers developed a system for the involvement of design in the agrarian landscape: permaculture. "The term Permaculture, [a term coined in the 1970s,] refers to permanent agriculture and permanent culture" (McManus 162). It is holistic and draws influence from the natural environment, traditional agricultural knowledge, and modern science; it is a system which embodies an ideology of grassroots education and positive action and aims to reconnect people to their food and within their communities (Veteto and Lockyer 48). While permaculture is not born out of the academic landscape architecture tradition, it references many concepts that are core to landscape design and how landscape architecture approaches site design. Several of the principles of permaculture closely mirror the design basics of landscape architecture,

including the concepts of: observe and interact, design from patterns to details, and integrate rather than segregate.

In permaculture, the site is observed for an extended period of time and the various flows of energy—including wind, solar, and water—are documented as part of the site analysis process (Veteto and Lockyer 51). In an agricultural landscape this site documentation plays an important role in discerning the precise location of growing spaces. By developing broader scale patterns and using the patterns to determine individual moments in the design, site designs using permaculture principles have a consistent language throughout the site (Veteto and Lockyer 52). The consistency generates coherency and ties areas, or sectors, of an agricultural landscape together. Finally, in permaculture, integration of food production and food happens on various scales from inter-planting within a garden bed to manage pests to the creation of 'forest gardens' where food crops are planted within existing, managed forests (Veteto and Lockyer 52). Integration allows for very efficiently managed space and is a natural method for pest management in the agrarian setting. By considering these principles throughout the design process, productive landscapes can be thoughtfully planned. Permaculture draws on landscape architecture to inform the principles, which then guide the design of the agriculture-specific landscapes; reciprocally, now that permaculture design has become established, landscape architects may find it necessary to refer to permaculture's food system-specific concepts in their own work.

To summarize, landscape design has played a part in agriculture for some time now, but that role has varied over time. Presently, scholars of landscape history are informing current designers by studying historic agrarian landscapes and translating that

information into tangible design principles. It may also be necessary for landscape architects to draw on the established principles of permaculture because that design cohort has been directly involved with agriculture since it was formed. By using the literature review as the guide for further research, how can a greater understanding of agriculture in Appalachia—generated through case studies, primary source interviews, and personal observation—be used to inform design?

CHAPTER 3

METHODOLOGY: INQUIRY INTO FARMING AND DESIGN THROUGH CASE STUDY

Approach to Investigation

This author is investigating the role that cultural history can play in the future of landscape design and what the discipline can learn from current farming practices; the author is specifically looking at the cultural history of farming communities in rural Appalachia to guide the research. Through researching traditional farming precedents as well as looking into current, more innovative farming methods, this author aims to create a site specific design that demonstrates a means of combining these traditional and innovative methods as well as demonstrates what landscape designers can learn from agricultural production in southern Appalachia. In order to best answer these questions about farming in Appalachia and agriculture playing a role in landscape design, primary source interviews were conducted and then analyzed as case studies. Because it is still possible to talk to people in Appalachia who—typically with their families—are farming and living off of the land, speaking to these farmers directly was the most effective way of understanding their lifestyles, how the area used to be farmed earlier in the twentieth century, and their thoughts on the future of agriculture in Appalachia. Likewise, farmers who are using innovative methods for production in the mountainous region were interviewed about their farming practices and perspective on landscape design in agriculture. In addition to interviewing farmers, the author sought out landscape

architects who have been involved in agriculture design projects. The projects that these designers have worked on are presented as case studies that provide insight into the actual process of design in farming and agricultural systems.

The farmers and designers were each chosen for their established status as experts in their fields, and for their relationship with Appalachia. Farmers were identified by word of mouth and community connections; they were chosen because of their experiences with farming. Members of one group have been farming for their entire lives; they use very traditional methods, and farm in the mountains of Appalachia—specifically in Highland County. The innovative farmers also have farms within the region of Appalachia and they are experimenting with and implementing innovative methods for production—including land conservation measures, soil regeneration practices, the free grazing of livestock, and others. The landscape architects who were interviewed were identified by word of mouth and prior knowledge, and are actively doing design work for agricultural lands in Appalachia and similar regions.

Introduction to the Individuals

The three groups of individuals provided valuable information about personal experiences around farming in Appalachia, though each had a very different story to tell. The first group was comprised of farmers from Highland County, Virginia. Highland County lies on the border with West Virginia and is a very rural and mountainous area; many families still have gardens, and livestock and logging are primary sources of income for many. Bard Warner, a farmer and former logger who has lived in Highland County since he was in his twenties, spoke about his wife's family—who have been here for generations—and about his own experience raising a family and livestock, and

growing a garden in the area. Warner also shared stories about the history of the community as well because he is very interested in local history. Another farmer, Conley Colaw, has lived in Highland County his entire life and still lives on the property where his family has been since the 1850s. He spoke of raising sheep, cutting hay, and about the garden that he grows with his wife and which has been in the same location since 1856.

The second group who provided information was the innovative farmers who are moving away from the current standards surrounding the farming lifestyle. One of the farmers, Joel Salatin, has become a leader in the pasture raised meat and intensive grazing movement and describes himself as a "Christian-libertarian-environmentalist-capitalist-lunatic" farmer (Cobb 220). His farm is in the Shenandoah Valley of Virginia; and like the historic farms in the area, Salatin and his family manage the farm full-time. The other two farmers who were interviewed as innovative farmers are a husband and wife couple, Dave and Lee O'Neill, who run Radical Roots Community Farm, a small farm outside of Harrisonburg, Virginia. In addition to providing for themselves on their own land, they have created a successful produce business based on permaculture principles and which makes use of every square foot of the five-acre farm where they also live. All three of these farmers have drawn inspiration from historic precedents that reflect more integrated and intensive systems.

Finally, the third group that was interviewed was comprised of landscape architects who are involved in agriculture and farming design projects. Ben Falk—the principle designer and developer of Whole Systems Design out of Mad River Valley, Vermont—was interviewed about the projects he has worked on as well about his view on cultural perseveration of farming communities. While his firm is in Vermont, the

cultural history and geography are very similar to that of southern Appalachia—the Green Mountains are part of the Appalachian Mountain Chain—and therefore his perspective on the matter is very relevant and relatable. Two practitioners from the landscape architecture firm Nelson Byrd Woltz were interviewed as well; one of the firm's principals, Thomas Woltz, was instrumental in establishing the Conservation Agriculture Studio within the office, and is very dedicated to sustainable agriculture and including design in agriculture. Jeremy Jordan also works at Nelson Byrd Woltz and is very involved in the Conservation Agriculture Studio; he has participated in several farm projects in central Virginia including a preservation and restoration project with Monticello. The practitioners, interviewed for this thesis, were chosen for their involvement in agriculture, and because they are also passionate about the projects which they have participated in.

The Questions

This author used case studies to frame the research questions and the approach to primary source investigations. As stated by Mark Francis, case studies can be used to answer important questions regarding the design, especially for culturally sensitive studies and design (Francis). Interviews were determined to be the primary method for data collection for this thesis. Interviews allow for open-ended discussion and generate descriptive data. Discussion can provide relevant and specific data that might not have been asked about with the basic questionnaires. Interviews also allowed for the establishment of a personal rapport with each of the interviewees. These interview questions were developed to shed light on the current state of farming in Appalachia and the transfer of knowledge between agriculture and landscape design (Appendix 1). This

author was able to gather primary source information and therefore gain a better understanding of the problems and potential solutions. Additionally, the interviews began to demonstrate connections between agriculture and design through interviews with farmers and landscape architects.

The farmers from Highland County were asked about their farms and they discussed the practices they employ. The first question was about what is produced on the farm—both for personal consumption and for commercial production—and then what methods are used to produce the goods on the farm. Conversation then moved to water management and water use on the farm. Farmers were asked if they would change anything about how they farm and if so, why. One of the most significant questions was about what farming techniques the farmers of Highland County thought would be important to pass on to younger generations of farmers. They were also asked about which of their farming practices they are proud of and would want to share. The interviews with the Highland Farmers gave insight into their practices and their perspectives on the future of farming.

Interviews with the innovative farmers began similarly to that of the traditional farmers, but then moved to questions comparing traditional and innovative farming methods. After discussing what is produced and how, the interviewees were asked about what traditional methods are employed on the farm. The farmers were also asked if they had considered the inclusion of a landscape designer or engineer in the development of their farm. That question followed with a query about how they saw a landscape architect aiding in the future landplaning that might take place on the farm. Finally, the innovative farmers who were interviewed were asked what they saw as the role of landscape

architects in the preservation of Appalachia and the farming culture of the area. These questions helped to develop connections between farming and design from the perspective of farmers, as well as look at traditional farming methods from an outside or different perspective.

With both the traditional and innovative farmers, the author was able to visit the farms and observe the farmers practices in addition to interviewing the individuals. Different activities were observed on the various farms and while the visits to the innovative farms were as a part of an official tour, it was possible to understand the day-to-day activities that typically take place. Highland County farmers were visited when they were bailing and putting away hay, and during lambing season. As previously stated, the innovative farms were seen as part of a tour group; however, even as a member of a group, the visits were informative and the guides demonstrated specific practices used to run the farming operations. Observation of the farms improved the author's understanding of interviewees' descriptions of their farming methods.

Several questions were asked of the landscape architects and the questions led to more in depth dialogue regarding work that has been done in their office. The questions began with the discussion of current projects in the agriculture that the office is involved in. The conversation then moved to the individual landscape architect's view on the role of landscape architecture in agriculture. Additionally, cultural preservation in rural Appalachia and how landscape architecture can participate in that process was discussed as part of the conversation. Finally, the landscape architects were asked about what they saw as the most important aspects of agriculture that can be incorporated into landscape

architecture projects; in a sense, they were asked to relate the two subjects from a different perspective.

System of Analysis

The information gathered through the interview process and subsequent research was analyzed in the form of individual case studies. Following the presentation of the individual case studies, the connections between the different sites were then extrapolated in order to establish a method for the design and development of self-sufficient farms in southern Appalachia. The development system was then used to guide the design of a specific site in Highland County.

After the completion of each interview, the digital recordings were transcribed into text documents. Once the interviews were transcribed, they were studied for common themes and repeating ideas. The information gathered through site observation and research was considered with a similar approach and the consistent ideas were pulled out of that material as well. These themes were then analyzed to create a narrative that described the potential systems for design of self-sufficient farm sites in southern Appalachia and parameters were established for the involvement of landscape architects in the design process. Through the literature review, primary source interviews, site observation, and site research, a guided and site-specific design was developed that can be used as an example demonstrating the involvement of landscape architecture in self-sufficient farming of southern Appalachia.

CHAPTER 4

RESULTS: HEARING FROM TRADITIONAL FARMERS IN HIGHLAND COUNTY

The Farmers' Stories

Two farmers from Highland County were interviewed as part of the research completed for this thesis. Additionally, their farms were observed by the author as part of the case studies of local, traditional farmers. Bard Warner moved to Highland County when he was in his early twenties, while Conley Colaw's family has been there for several generations (fig 4.1). Both men have lived off of the land and farmed, as well as held additional jobs in order to support their families. Warner was a logger and spent time working for the nearby hydroelectric dam; Colaw worked for the Virginia Department of Transportation or VDOT, but now both are full-time farmers in their retirement. Warner even shared stories of local history and farming in a historical context in addition to his experience as a farmer. Mr. Colaw spoke very modestly of his own work; though, after having helped him fill a hay barn, it is fair to say that he remains able to put in a long, hard day's work and he is a significant figure in the local farming community.

Mr. Warner began the interview by speaking more generally about some of the changes in farming and rural lifestyle that he has experienced and seen during his lifetime. Most people in Highland County had at least a garden and raised some livestock (fig. 4.2). They would have had a horse or two, raised hogs and butchered them, and would have had chickens and collected eggs. During the interview, Mr. Colaw talked about how his family used to run their family farm using horses. They got the first tractor

Figure 4.1
Colaw Family
Farm
(Google Earth,
38° 31’ 13.5”N
79° 32’ 27.75”W)

in 1955 but before that they would plow with a horse and hillside plow, and would cut hay with horses. Both men discussed the gardens that their families grew and how their mothers and grandmothers would store and preserve a fair amount of what they grew. Warner referenced his wife’s mother’s pattern of working “relentlessly” to put food up; she had a cellar full of canned food including apples, pickles, peaches, pears, plums, and cherries, and she would put everything else she could gather in the cellar as well. Conley Colaw spoke about his family’s garden and the fact that they grew almost everything they ate and would, again, can food and store it in the cellar. Bard Warner also said that the older generations would grow all of their own grains such as corn and wheat, and that everybody had a buckwheat patch. Not only did people grow buckwheat, there were the old water-powered grist mills to grind it, too; nobody had to go out of the county to get a bushel of wheat (Warner). Both Colaw and Warner spoke about the general farming history of the area and then spoke about the specifics of their own lives.

Figure 4.2
Blue Grass Valley, Highland County, Virginia (photo by author)

Both men have raised gardens and livestock, and have successfully raised families on their land. Mr. Warner said that he raised his family off of the land like the historic farmers of Highland County; they had a milk cow, raised hogs, and had chickens in order to supplement the $37 that Mr. Warner made per week working on the sawmill when his children were growing up. The Warners always had potatoes, corn, beans, tomatoes, and cucumbers in their garden and often Mrs. Warner grew other vegetables as well; she would then put up any of the excess they produced, and would always make dill pickles. Mr. Colaw has a very similar assortment of produce in their garden every year; they grow potatoes, tomatoes, beets, lettuce, green beans, carrots, onions, peppers, and cucumbers and he and his wife work together in the summers to can and put up the excess. In addition to produce, Warner and Colaw raise livestock and the Warmers have raised different poultry at various points in time. Conley Colaw raises sheep on his own farm and also cuts hay for his sheep on a nearby farm that also has sheep on it. Mr. Warner currently raises cattle and sheep; he and his wife have raised chickens and turkeys at their

house, as well. Both of these men have spent their lives farming and supplementing their incomes with what they were able to raise on their farms.

Bard Warner also shared information about how he raises livestock on his farms. He does not fertilize with anything other than manure and does not spray herbicides but said that he has very healthy fields and garden. He said that he felt that one of the things which is most destructive to land is to overgraze it but a farmer also must take care to keep enough stock on it to keep the brush down. The situation is the same with over-cropping or farming an area; with a hay crop, the best thing to do is feed the hay back to the ground—feed the stock on the same land where hay is cut—or the crop yield will decrease over several years (fig. 4.3). Mr. Warner also said that he used to cut his best hay off of the land where his sheep bedded down at night. Common sense would suggest that cattle and sheep cut the ground and tear it up when they are fed hay out in the fields. However, Warner's experience contradicts that: he feeds his cattle in the winter on the field where he cuts hay in the summer and when he moves the cows off before the ground thaws completely in the spring and then is able to cut very good hay in the summer. He relates this practice to tilling with a hoe in the garden; it "puts some nitrogen in the ground". He tries to think of the whole system and to use closed loops when he farms and gardens; he said that he continues to get high yields without fertilizers because he has learned to help the land take care of itself and that he always gives back to the land.

Figure 4.3 Bard Warner and His Grandson, Jonathan, Collecting Waste Hay for Compost (photo by author)

Observations of the Farms

Having resided in Highland County for a little over a year now, it has been possible to observe and interact with a number of farmers in different settings and seasons. Between seeing Mr. Warner at the annual Highland County Maple Festival and around the county, and visiting his farm several times, it has been possible to gain perspective and insight to Mr. Warner's methods for farming, sharing his knowledge and skills, and how he assists others within the community. Similarly, Mr. Colaw was at the Highland County Fair at the end of the summer last year, helps community members on their farms and runs his own farm. Both of these men are important figures in the community and have knowledge about growing up and farming in the area; they will share what they know if you can keep up with them as they work.

After observing local farmers for the past year, there is rarely a time when these farmers—including Warner and Colaw—are not actively working. Spring is a very busy

time for a farmer, especially in this area where there are several major events taking place between February and April or May. The sugar maples, or as they are typically referred to locally—sugar trees, begin to run in February and farmers, including Colaw and his family, tap the trees to boil the sap down into maple syrup. In addition to maple syrup production, rising animals consumes a significant amount of time for local farmers. Livestock—cattle, sheep, and poultry—represents over ninety-eight percent of the profit-earning agriculture in the county (National Agricultural Statistics Services). Because livestock is so important in this area, spring is an important season; February starts the busy lambing and calving season for farmers here. The local, traditional farmers also begin to plan their gardens as the snow decreases in frequency and the weather begins to warm. Summer remains busy as farmers care for their livestock, crops, and gardens. Animals must be moved during the summer so that they are on fresh grass and are located where they have access to water when the weather is dry. Hay and silage represent a majority of production scale crops in the area and farmer begin to cut hay towards the end of the summer, and farmers have their personal gardens that must be cared for as well. Through the fall, local farmers make hay for winter storage and the sale of spring lambs takes place. Winter provides local farmers a little bit of respite, but in the snow and especially cold weather, livestock needs special care to get out of the weather and needs access to the hay that made during the summer. There are also fences to mend when the weather is mild and gardens to plan when the weather is bad. Spring begins the cycle again.

Bard Warner has begun to involve his grandson in some of the more labor-intensive efforts on his farm and to teach him about raising animals and a garden by

including him in decision-making and important activities. This year, Warner made a point to have Jonathan, his twenty-eight year old grandson, present during the lambing season. He would ask Jonathan to make decisions about managing the lambing barn. If Mr. Warner disagreed, he would express his own opinion, but otherwise he would follow through with Jonathan's decision. Jonathan has been helping his grandfather for a number of years, but only recently has he been included in the decision-making. It is Bard Warner's subtle way of teaching his grandson how to raise livestock and learn from the older generation. Jonathan has also been included in hay-making and some management of the cattle for a number of years. Mr. Warner may include Jonathan more actively in making decision on the family farm this summer based on Jonathan's greater involvement this spring.

When Mr. Warner is not working on his own farm, he helps other community members and neighbors. In addition to preparing his own garden in the spring, he uses his tractor to plow and disc garden spaces for several other families. Additionally, Mr. Warner owns a small sawmill; because he used to work as a logger and for a logging mill, therefore he is very competent at running his own mill. He mills lumber for his own needs and for community members, especially local builders. His work is reciprocated in the form of work trades and monetary payment, similar to the historic reciprocation systems in southern Appalachia.

Similarly, Conley Colaw works for the benefit of others in a number of his farming efforts. The act that is most easily recognizable as aiding other community members is his making hay. Rather than cutting hay on his own farm where he actively sheep and cattle, he cuts is at the home and farm of another community member, Betty

Mitchell. He cuts her hay, fills her barn with what her sheep need—a mix of first and second cutting hay—and then uses what is left to feed his livestock in the winter. He does a service for Ms. Mitchell and rather than being paid monetarily, he receives something tangible.

Their Perspective on the Future in Appalachia

During the interviews, Bard Warner and Conley Colaw were asked about what farming techniques they used and which they thought should be passed on to younger generations. They also discussed how some of that information might be shared. Additionally, Mr. Warner spoke about some of the changes that he sees as necessary for the future of farming. In the end, both men felt that young people need to learn about farming before farming becomes something society needs to worry about because the knowledge is lost.

When asked about the status and the future of farming, Mr. Warner responded that "For the next two or three generations, it's gonna get nasty." The younger generation needs to become involved in farming, food production, and land preservation in order to improve the societal outlook for the future. The best way for young people to learn is to actually get outside on farms, work along-side older farmers, and to listen when the older people tell how they grew up and how they grow food (Colaw). According to Mr. Colaw, one must know the land, and—especially if they have never gardened before—they should get someone to show them how to run everything, what to buy, what to plant, when to plant it and then what to do with it. Like Mr. Colaw, Mr. Warner was worried about even the generalities of farming in Appalachia being lost in the near future, but he was maybe even more concerned with some of the specific skills that have already begun

to be lost during his lifetime. He said that because fuel is going to be too expensive or not even available, people need to know how to work without machinery again; "[young people need to] learn how to run a hillside plow run by a horse." He also saw food preservation as something very important for people to know and a skill that is quickly being lost. Transfer of knowledge to the younger generation is something that both of these men think about.

Bard Warner is interested in some of the farming and regulatory changes that are taking place currently. The Environmental Protection Agency is concerned about the Chesapeake Bay and has been putting pressure on the farmers who live and work in the headwaters of the Potomac River for some time; it is now looking at the headwaters of the James River and farmers along that waterway will need to fence their livestock out and protect the banks of the creeks (Warner). Both of those rivers begin as smaller creeks in Highland County, and most farms fall within the watershed of one or the other of these two rivers. In an area where springs are sometimes seasonally ephemeral, wells can be cost prohibitive, and much of the agriculture is centered on livestock, fencing animals out of waterways can be a difficult but necessary decision. However, there is a government conservation program designed to help farmers take care of the streams on their property by paying for the land that is fenced to protect the waterway from livestock (Warner). Warner said that several farmers in Highland County have taken measures to protect the surface waterways on their property (fig. 4.4). One farmer fenced several acres of bottomland and put that land in the government program, planting trees, softwoods and oaks, to protect the waterways. The difficulties arise when water levels are low and farmers must carry water to their livestock during prolonged dry spells (Warner). Bard

Warner reflected on the changes which are taking place in Highland County and on the role these and similar changes will have on the future of Appalachia. Water and access to it will continue to play a large role in agriculture of this region.

Figure 4.4
Water Source Fenced Off and Protected from Livestock and Planted with Saplings
(photo by author)

Many of the practices that came up during the interviews, such as diversification and rotational land use, mirrored those mentioned in the literature about farming practices in rural Appalachia. The farmers of Highland County also saw land conservation as a significant part of preserving their heritage. Through the process of the interviews, however, it became clear that one of the greatest challenges to preserving the culture of traditional farming in the region is getting younger generations involved in farming. In addition to preserving the land itself, it is very important to educate those young people about traditional and sustainable farming practices that are part of the cultural history of Appalachia.

CHAPTER 5

RESULTS: INNOVATIVE FARM CASE STUDIES

Understanding Innovation in Farming from the Farmers' Perspectives

Because several of the innovative farmers in this region have incorporated design into the development of their farms, the farms make good case studies researching the possibilities for an exchange of knowledge between farmers and designers. By looking at Polyface Farms and Radical Roots farm—two farms in Central Virginia that have made efforts to design the systems on their sites—the author began to see, in practice, what designers could learn from farmers. Additionally, these case studies demonstrate what landscape designers can bring to the table from their academic background. Joel Salatin of Polyface Farms and Dave and Lee O'Neill of Radical Roots Farms each share insight of their practices and how they developed their farms, as well as their views on the future of farming in Appalachia.

The Many Facets of Polyface Farms

Polyface Farms, run by Joel Salatin—the self-proclaimed lunatic farmer—and his family, is a farm that is a little bit different from the majority of the livestock farms in the region (fig. 5.1). Salatin said, "[they] produce salad bar beef, pigaerator pork, pastured poultry--eggs, broilers, turkeys, forage-based rabbits, vegetables, and lumber." The goal behind Polyface Farms is to mimic nature in order to create a productive and healthy system. According to Salatin, a farmer should provide plants and animals with habitat that suits their needs and that allows them to express their physiological distinctiveness;

for example, respecting and honoring the "pigness of the pig" can help to form a basic foundation for societal health (Polyface Inc.). They use nature's template as the pattern for their commercial domestic production model (Salatin). The primary lesson that Salatin has learned from the world surrounding his farm is that everything in nature moves. "In nature, animals don't stay in the same place. Fire alters landscapes and plant species dramatically and routinely." In response to that knowledge, Salatin has developed systems to contain animals in small areas and then move them daily or nearly daily. By imitating nature, Salatin eliminates many of the problems that traditional agriculture must face such as how to maximize grazing acreage.

Figure 5.1
Joel Salatin on his farm
(www.polyfacefarms.com)

These methods used by the Salatins are far from conventional; for the past half century, their farm has avoided conventional methods of production and, as previously stated, he has designed alternatives that mimic natural systems. Rather than spreading

chemical fertilizer on the fields, Salatin relies on what he calls “mob stocking herbivorous solar conversion lignified carbon sequestration fertilization with the cattle” or more simply, cattle eating grass and creating nutrient-rich waste (Polyface Inc.). Chickens then follow the cattle in order to incorporate the natural fertilizer and accelerate the composting process (Gabor). He does this rather than using a plow or disc (Polyface Inc.). Similarly, he uses pigs as a disturbance factor in forests to mimic the pattern of fire. Additionally, because the pigs create more disturbance, Salatin has refined that system so that no paddock is occupied more than once a year, which allows the forest to regenerate between visits by the pigs (Gabor). These systems were designed by Salatin and have been gradually refined to a point of efficiency; many other farmers are beginning to use Salatin’s system as a model.

The Salatins are also very conscious of the seasonality of the Appalachian region and practice seasonality within their farm work. They only raise meat chickens in the summer because it is the only time the birds can be pastured full time (Polyface Inc.). Mr. Salatin and his family also manage a woodlot on the farm and they work in the woods in the winter. In winter, the sap is down therefore making the wood better to harvest, and, Salatin notes, the rattlesnakes aren’t around (Polyface Inc.). The seasonality allows for the design of systems on a larger scale, an annual scale, not unlike that seasonal farming that was traditionally practiced in the region. Additionally, the fluctuating demands of farming this way makes the job more enjoyable for the farmer (Polyface Inc.). The pattern is very different from conventional and industrial farming that currently takes place on many farms in this area.

During a recent—in the fall of 2011—tour of Polyface Farms, Joel Salatin took a group of visitors to see the different livestock systems on his farm. There was an opportunity to see the animals as well as the infrastructure that travels with them as they move around the farm. Along with seeing animals who appeared to fit in their habitats, one noticeable attribute of Salatin's system is the lack of smell around the animal herds and flocks. The animals were clean and the areas where they were pinned had an earthy smell as opposed to a smell of fecal matter. Additionally, the livestock seemed rather indifferent to the presence of a crowd; they were busy grazing in the fresh pasture rather than expecting grain or feed from a group of people. It was also possible to understand how any one of these systems can exist independently, and on a smaller scale, but that they work very well together; they have a symbiotic relationship with one another.

All of these systems and relationships, however, do generate their own challenges that are not present in traditional agriculture. Because animals are being moved frequently, the infrastructure must be designed to move with the livestock. Therefore, the infrastructure, especially shelter, is designed to be portable; instead of building "monolithic concentrated animal feeding operations," the Salatins have designed lightweight and "gentle-foot printed" structures which can be moved easily from paddock to paddock. His farm creates a completely different system for animal-based agriculture (fig. 5.3, 5.4, 5.5, 5.6). "[It] allows outdoor livestock in an ecologically and sanitation-enhancing [manner]." Salatin has carefully experimented and improved his structures that are used out in the fields of Polyface Farms; by working with nature and mimicking it, he has been able to create a unique and functioning system.

The Seeds of Thought Behind Radical Roots Farm

Like Joel Salatin, Dave and Lee O'Neill have made an effort to fully understand the natural systems on their farm in order to work with nature and create relationships within the planted communities of their farm. They have a small-scale, intensive farm where they have annual and perennial produce; all of which is grown with permaculture principles guiding their process. "[They have ended up with] a mixed cropping scenario where [they] have water catchment swales with perennials with berries and fruit trees interspersed about forty to fifty feet apart and eight rows of vegetables, annual vegetables, in between those" (fig. 5.6). They also grow vegetable transplants for sale, have an area where they have been growing herbs, and they raise chickens for eggs (fig. 5.7). There is an abundance of food grown on the five acres that comprises Radical Roots Farm.

Figure 5.2 Echinacea: a medicinal flower (www.radicalrootsfarm.com)

The O'Neills are able to raise a significant amount of produce on their small farm because of their unique production system and because of the care that they took in planning their land use. Lee O'Neill said the farm started as essentially nothing but rocks and a slope; the couple spent a season observing the place and completed a full contour map of their farm before they began any construction or land manipulation.

Figure 5.3 (*top*) Turkeys being pastured in the Gobbledygo (www.polyfacefarms.com)

Figure 5.4 (*second*) Pastured Broilers, following the cows (www.polyfacefarms.com

Figure 5.5 (*third*) Salad bar beef (www.polyfacefarms.com)

Figure 5.6 (*bottom*) Pigaerator pork (www.polyfacefarms.com)

Figure 5.7 Arial Photograph of Radical Roots farm after significant establishment of crops (www.radicalrootsfarm.com)

Whereas buildings tend to be placed almost haphazardly on traditional farms because they are constructed as they are needed rather than being planned in advance, the O'Neills designed the entire building compound for flow, proportion, and functionality (L. O'Neill). Dave O'Neill said that they took care and made sure that it is no more than four hundred feet between the center of the farm and any other point and that each of the building is no more than fifty feet apart.

Figure 5.8 Aerial Photograph of Radical Roots during Initial Earthwork
(www.radicalrootsfarm.com)

As they developed the building plans, the O'Neills also began to plan for managing water on the site. "Water shapes the human climate and we can shape the cultivated ecosystem with water and water catchment" said Dave O'Neill. There is a small pond which is used to capture water on site and the swales, because they are on contour, also help to catch water and allowing it to infiltrate; instead of allowing water to

wash down the slope, they hold the water in the soil where the plants are grown (fig. 5.8) (D. O'Neill; L. O'Neill). Their water management system also became a means of access throughout the site. Access radiates out from the center of the site along the contours following the swales, and the driveway into the farm was created by the damn for small pond (D. O'Neill). Through the initial planning, the owners of Radical Roots Farm were able to maximize the productivity of their five-acre farm site.

When visiting Radical Roots Farm, it is possible to see these processes that are the basis for the everyday function of the farm. The O'Neills have also developed systems for experimenting with and testing methods of production and they demonstrate these systems to the farm visitors. Additionally, it was very interesting to see the three different garden bed types used by Radical Roots—permanent-no-till-raised beds, perennial production berms, and more conventional tilled and succession planted straight rows (fig. 5.9). Furthermore, while the O'Neills are practicing farming on a scale of commercial production, it is possible to see how many of these practices can be scaled down for personal production. Radical Roots does not claim to get it right every time and they continue to refine their systems, learning from their experiments as they go.

In addition to their initial planning, the O'Neills continue to follow a process that integrates design into the everyday operations of the farm. Lee O'Neill said that one of the most important aspects of their process is that it has allowed them to actually make money and remain solvent as they got their farm off of the ground. They proceed to develop the land through incremental design; there is a final master plan that they hope to achieve, but in order to do that they occasionally go back and refine their intentions, and Dave O'Neill likened their process to working in layers. While they themselves are

permaculture designers, the O'Neills have invited their peers to consult on the design of the farm because it can be difficult to think outside of the box in one's home environment. All of these elements, when brought together, have allowed the O'Neills to farm on a self-sufficient and market scale in an area which historically sustained people on family farms; these methods have the potential to aid in the cultural preservation of this region.

Figure 5.9 Dave O'Neill Demonstrating the Succession Beds of Lettuce (photo by author)

Integrating Design and Agricultural Preservation

Joel Salatin and Dave and Lee O'Neill have good ideas accompanied by personal experience about how to integrate landscape design into the farming practices of Appalachia. While Polyface Farms focuses on meat production and Radical Roots Farm bases their business on vegetables and fruit, both farms were developed with forethought and with landscape design. Additionally, Dave O'Neill is a permaculture designer and therefore has had firsthand experience designing productive landscapes in the

Appalachian region (fig. 5.9). Through their own experiences, Salatin and the O'Neills were able to provide insight and ideas on the role of design in the future of the farming culture in Appalachia.

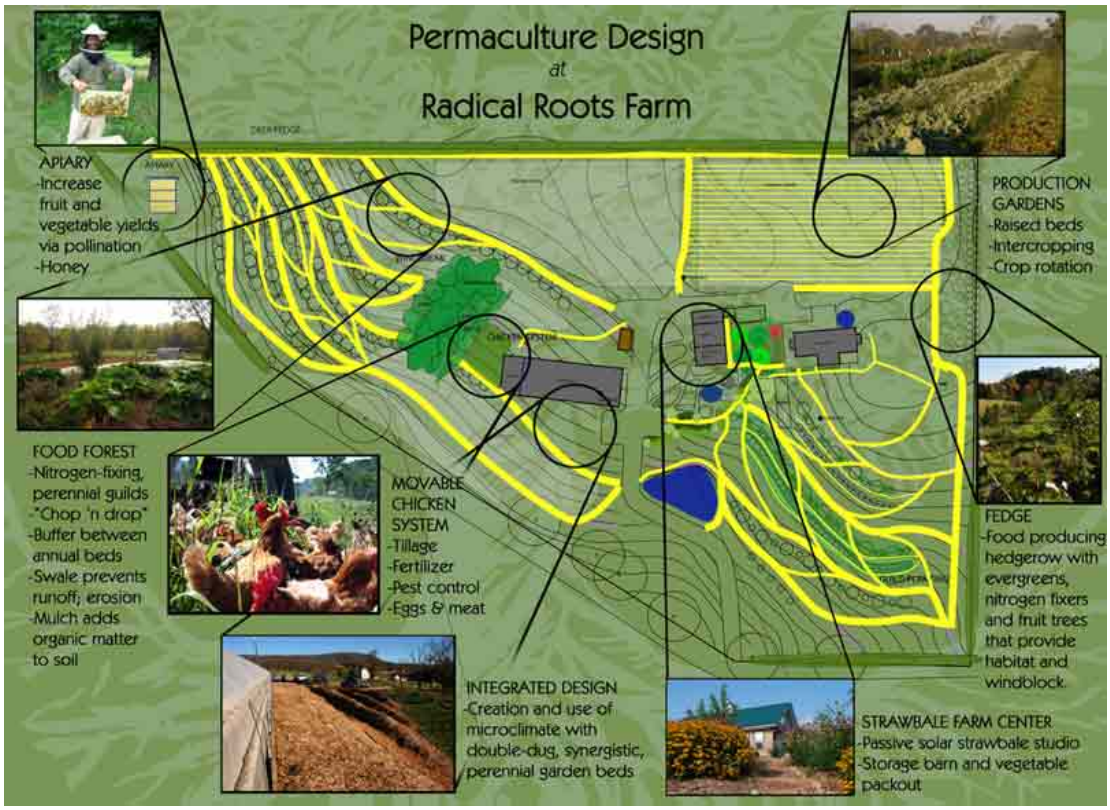


Figure 5.10 Permaculture Development of Radical Roots (www.radicalrootsfarm.com)

A primary aspect of the farm landscape that came up during the interviews was infrastructure. Dave O'Neill suggested that the current state of the rural landscape necessitates a retrofit of the farm, beginning with the infrastructure. In this case, infrastructure is defined as the physical structures on the site as well as the designed physical systems for water. He suggested that work could begin with the historic farmhouses themselves, and then moving to the infrastructure for capturing and storing water. After analyzing the water systems, it is important to assess the systems for nutrient retention—keeping soil nutrients on a site rather than allowing them to wash into

waterways. Salatin also referenced water and water storage during his interview. He would like to see more ponds created on farms but also said that landscape designers should continue to refine the 'basic pond concept.' Additionally, Salatin spoke specifically about fencing and said designers should consider methods for fencing and fencing systems when completing a design. Salatin states specifically that fences must not be just fences, but must be "crooked fences." Because everything moves in a landscape; fences should include various ecosystems within their boundaries and therefore cannot be straight. Salatin went on to speak about the particulars of the environments he considers when moving his animals and setting his fence-lines. The different ecosystems—valley, ridge, riparian, forest—all provide a mosaic of diversity "agronomically" which Salatin tries to leverage as he generates symbiotic relationships. "North slopes stay cooler and damper but are retarded in early spring green-up. South slopes are drier but jump earlier in spring and keep growing longer in fall. [He leverages] these nuances with topographically-appropriate fencing to move the animals to the best spot at the best time to massage the ecology into more biomass accumulation."

Once improved basic infrastructure is in place, systems can be generated which can improve farming and community to encompass the greater culture of the region. Lee O'Neill stated that people are beginning to recognize that mono-culture does not work and will not be able to last; it is time for farmers to think about their farming system—the inputs and outputs—and how to make the farm a more diversified place and business. She used the example of cattle farmers and the fact that they could have a business of selling compost as well as dairy or meat products. That would not only give a farmer an

additional resource, it references the whole-system-thinking of historic farmers of Appalachia. Using manure as compost in the fields and taking care to disturb the soil less used to be practiced in this region, and the O'Neills are bringing ideas like that back to the forefront. Additionally, Lee spoke about the need to remind people of the systems that have been in place for generations (fig. 5.10). Many traditional farmers knew to rotate crops and that one should not plant the same crop in the same place every year because plant deplete the soil of specific nutrients and that different plants require different soil nutrients. However, mono-culture crop production ignores this cultural knowledge and that is one the major problems with this practice. The O'Neills are also trying to generate a greater sense of community through their food production and introduction of permaculture to the area. Dave O'Neill said that the resilience of the region can be re-created through farming at nested scales. He made the point that if there are many farming communities each with a number of small farms, the region can become more self-contained and self-sufficient. Additionally, Salatin spoke specifically about permaculture and edible landscaping as way to bring back the culture that was once the standard here. He said that farmers and landowners should be converting lawns into edibles and ornamentals into edibles, and landscape architects can play a role in that process. By including edible plants in ornamental designs, designers can encourage this conversion process. Additionally, as more edible plants are used in designed spaces, they will increase in popularity and their use will increase. Through rebuilding community and farms, as these innovative farmers have started to do, landscape designers will have a precedent for the inclusion of food production space in site designs and can continue to learn from farmers growing food in rural Appalachia.

Fig. 5.10 Lee O'Neill Collecting Greens late in the season because of their season extension methods
(www.radicalrootsfarm.com)

A number of interesting points came out of the discussions with some of the innovative farmers of central Appalachia. During an interview, Joel Salatin of Polyface Farms spoke about the efforts he has made to mimic natural systems in his farming practices. He also discussed the role of design and landscape architecture in the future of agriculture. Dave and Lee O'Neill, owners of Radical Roots Farm, each described their farm's approach to fruit and vegetable production and spoke of the integration of permaculture into the organization and planning of their farm. Because they each have different backgrounds and bring separate strengths to the management of their farm, Mr. and Mrs. O'Neill each brought up complimentary but somewhat different aspects about the farm that were important and special to them individually. Through studying farmers who have incorporated design into the planning of their farms, the author was able to gain a better understanding of what designers should learn from farmers in order to work in agricultural landscapes.

CHAPTER 6

RESULTS: INQUIRY INTO FARMING WITH LANDSCAPE ARCHITECTS

Food Based Design Projects

Landscape architects have become involved in the various systems of agriculture. Three landscape architects were interviewed in order gain a better understanding of the process of landscape design in agriculture. Ben Falk, of Whole Systems Design, was interviewed and the discussion included an explanation about the direct integration of permaculture into the firm's design principles and it's potential for an increase in food production landscapes. Thomas Woltz established the Conservation Agriculture Studio within the Nelson Byrd Woltz office. Jeremy Jordan is also with Nelson Byrd Woltz and is part of the Conservation Agriculture Studio. These three practitioners from two different landscape architecture firms were able to provide perspective on the role of agriculture in landscape architecture through the specifics of their projects as well as through insight they have acquired through their food system-based work.

While the Whole Systems Design studio is in Vermont not southern Appalachia, the topography of the state is similar to that of the southern Appalachian region. There is also a farming culture in Vermont that is not unlike the culture of the mountainous Southeast. Falk stated that the design firm researches and works to develop diverse food systems which include the incorporations of rice, fruit and nut trees, and nutrient dense foods. In addition to simply designing food into planted landscapes, Whole Systems Design and Ben Falk include other aspects of permaculture and agriculture into their site investigations and designs.

The three landscape architects were interviewed about their projects within agriculture and the processes involved. While a majority of the projects that Whole Systems Design is part of are focused on agriculture and food production, several of their design projects are on smaller New England farms and are focused on preservation. The office of Nelson Byrd Woltz does not solely focus on agriculture projects, but the Conservation Agriculture Studio is seen as an important design team within the office. They have participated in projects all over the world including New Zealand, the West Coast, and Central Virginia. The project in New Zealand is not dissimilar to those in Central Virginia because of the geography of the land and the goals of the project.

Permaculture and Landscape Design in Agriculture: Whole Systems Design

Whole Systems Design has done significant design work focused on landscapes for food production and that also preserve the farming culture of Vermont. One of the projects, Teal Farm, is located in Huntington, Vermont, a small town about twenty-five miles south of Burlington. Teal Farm is a residence, farm, and ecological preserve (fig. 6.1, 6.2) (Whole Systems Design). The residents hired Whole Systems Design to help design prototype agricultural and energy systems that will aide in meeting regional food and energy needs (Whole Systems Design). Ben Falk and Whole Systems Design analyzed the site using permaculture assessment tools and then created a design that met the clients needs as well as the permaculture principles (fig. 6.3, table 6.1) (Whole Systems Design).

Table 6.1: The Twelve Permaculture Design Principles

1	Observe and Interact	By taking time to engage with nature we can design solutions that suit our particular situation.
2	Catch and Store Energy	By developing systems that collect resources at peak abundance, we can use them in times of need.
3	Obtain a Yield	Ensure that you are getting truly useful rewards as part of the work that you are doing.
4	Apply Self-regulation and Accept Feedback	We need to discourage inappropriate activity to ensure that systems can continue to function well.
5	Use and Value Renewable Resources and Service	Make the best use of nature's abundance to reduce our consumptive behavior and dependence on non-renewable resources.
6	Produce No Waste	By valuing and making use of all the resources that are available to us, nothing goes to waste.
7	Design from Pattern to Detail	By stepping back, we can observe patterns in nature and society. These can form the backbone of our designs, with the details filled in as we go.
8	Integrate Rather than Segregate	By putting the right things in the right place, relationships develop between those things and they work together to support each other.
9	Use Small and Slow Solutions	Small and slow systems are easier to maintain than big ones, making better use of local resources and producing more sustainable outcomes.
10	Use and Value Diversity	Diversity reduces vulnerability to a variety of threats and takes advantage of the unique nature of the environment in which it resides.
11	Use and Value the Marginal	The interface between things is where the most interesting events take place. These are often the most valuable, diverse and productive elements in the system.
12	Creatively Use and Respond to Change	We can have a positive impact on inevitable change by carefully observing, and then intervening at the right time.

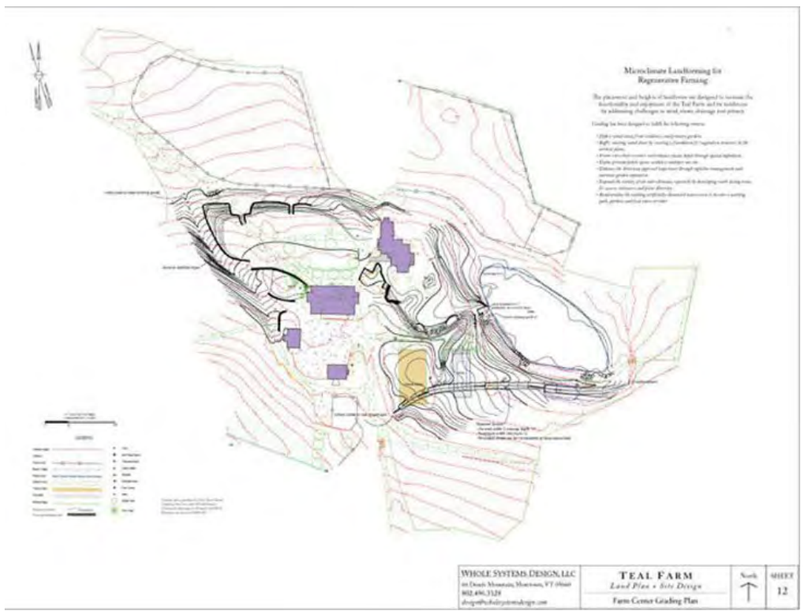


Figure 6.1 (*top left*) Arial View of Teal Farm (www.wholesystemsdesign.com)

Figure 6.2 (*above*) Sunken Perennial Bed with Stone Wall for Solar Gain (www.wholesystemsdesign.com)

Figure 6.3 (*bottom left*) Permaculture Plan for Regenerative Farming (www.wholesystemsdesign.com)

Figures 6.4, 6.5, 6.6 Pond Construction Sequence (www.wholesystemesdesign.com)

At Teal Farm, permaculture formed the basis for several site-specific goals that guided the design and continues to guide the work that takes place on the Farm. The grand, overarching concept that formed the framework for the project and practice goals is the concept of thinking of the farm as a "total organism" (Teal Farm). Design plays a very direct role in this framework through the master plan. Teal Farm includes food production areas, many of which are designed to be on contour, that are protected by windbreaks (Seidl). The design also includes the use of shelterbelts for protecting fruit trees, allowing the farm to cultivate fruit trees that are typically found in warmer climates (Seidl). In addition to the site master plan, the practitioners at Whole System Design designed systems for the farm so that the goal of acting as a total organism could be accomplished. These systems include possibilities for cycling nutrients on-site, reducing waste, and the on-site production of fertility enhancing materials (Teal Farm). Between the master plan and the design of specific systems, Whole Systems Design has worked with Teal Farm in order to bring design and food production together.

Another farm where Whole Systems Design brought agriculture and landscape design together was the Green Mountain Girls Farm (fig. 6.7). The small-scale and intensive farm is located in Northfield, Vermont; on the site, the farmers raise chickens, goats, pigs, and fish, and grow vegetables, fruit and nut trees, and wetland crops including watercress (Whole Systems Design). The team from Whole Systems Design collaborated with the farm owners to produce a master plan that included a pond design and construction, greenhouse design and construction, and plans for tree plantings (fig. 6.4, 6.5, 6.6) (Whole Systems Design). These projects by Whole Systems Design demonstrate one scale and style of landscape design involvement in agricultural sites.

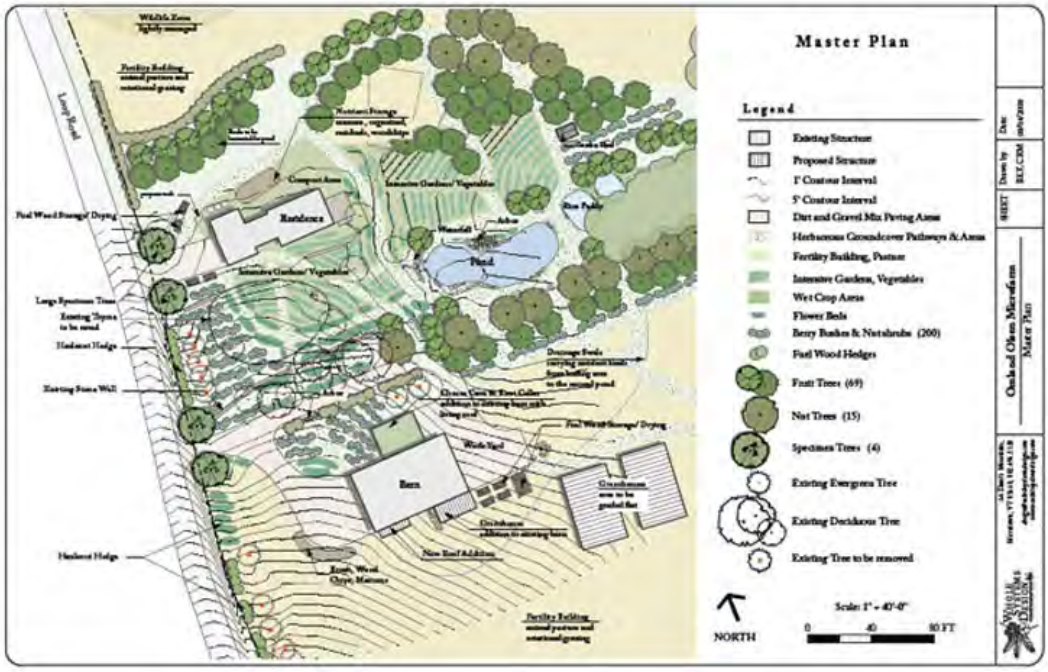


Fig. 6.7 Master Plan for Green Mountain Girls Farm
(www.wholesystemsdesign.com)

The design of Green Mountain Girls Farm, like Teal Farm, was based on permaculture principles and the farm continues to strive towards those same principles in their community supported agriculture endeavor. Whole Systems Design helped to create a master plan for bio-intensive gardens and orchards that allows for the site diversity to be used as an advantage and to grow a wide variety of both annuals and perennials (Green Mountain Girls Farm). Additionally, the farm is designed to support various types of livestock; the site includes pasture, woodlands, and "browse-scapes" so that the animals have access to the appropriate forage and can be moved to fresh forage on a regular basis (Green Mountain Girls Farm). These features of Green Mountain Girls Farm, created with the help of Whole Systems Design, allow the farmers to follow their guiding principles. Furthermore, The owners of Green Mountain Girls Farm see their role in the connections between farmers, the land, and the surrounding community as integral to their own success as well as to the health of the local area (Green Mountain Girls

Farm). From the community connections that are fostered by the work at Green Mountain Girls Farm to the relationships between the farmers, the livestock, the produce, and the land itself, the farm exemplifies the relationship between agriculture and design.

Conservation Agriculture: Nelson Byrd Woltz

Thomas Woltz and Jeremy Jordan, both of Nelson Byrd Woltz, have been involved in a number of agriculture design projects but one of the earliest projects for the Conservation Agriculture Studio was the master plan design for the Orongo Station, New Zealand conservation and restoration (fig. 6.9). The goal of this project was to demonstrate how design and planning could create an environment where best management practices and conservation projects can be combined for successful stock and cropping operations (fig. 6.10, 6.11, 6.12) (Nelson Byrd Woltz 6). Additionally, the designers sought to create a site that continues to respect local traditions and celebrate the Maori cultural landscape and integrate those concepts with the needs of a profitable agriculture operation (American Society of Landscape Architects). Furthermore, the designers were concerned with the sensitive ecological landscape that they were working within, including wetlands, marches, and steep slopes (Gibson). These conditions forced the design team and farm operators to think creatively in regards to management techniques so that profits would not drop (Gibson). The master plan created by Nelson Byrd Woltz is a comprehensive look at agriculture in a culturally sensitive region.

Agriculture continues to be an important part of the New Zealand industry and sheep and cattle ranching make up a significant part of the agricultural landscape (fig. 6.14, 6.15) (Nelson Byrd Woltz 66). When running a livestock operation, it is important to have and be able to maintain an efficient and organized work area; Nelson Byrd Woltz

was brought on to the conservation project at Orongo Station in order to design that workplace. The design team worked together to design and reorganize the woolshed and covered yard complex, the center of the sheep farming operation; this is where the sheep are brought to the farm, where they are shorn and where they are picked up when they are taken to market (Nelson Byrd Woltz 72). Cattle are also raised on Orongo Station and there is separate area that was designed for handling the cattle on the farm. The cattle station was developed as a system of circular yards that were designed to reduce stress for the cattle and their handlers and create a safe environment in which to work (fig. 6.13) (Nelson Byrd Woltz 71). The landscape architects at Nelson Byrd Woltz were able to conceptualize the entire systems of livestock agriculture that take place on Orongo Station and design functional, flowing infrastructure to match the needs of the farmers.

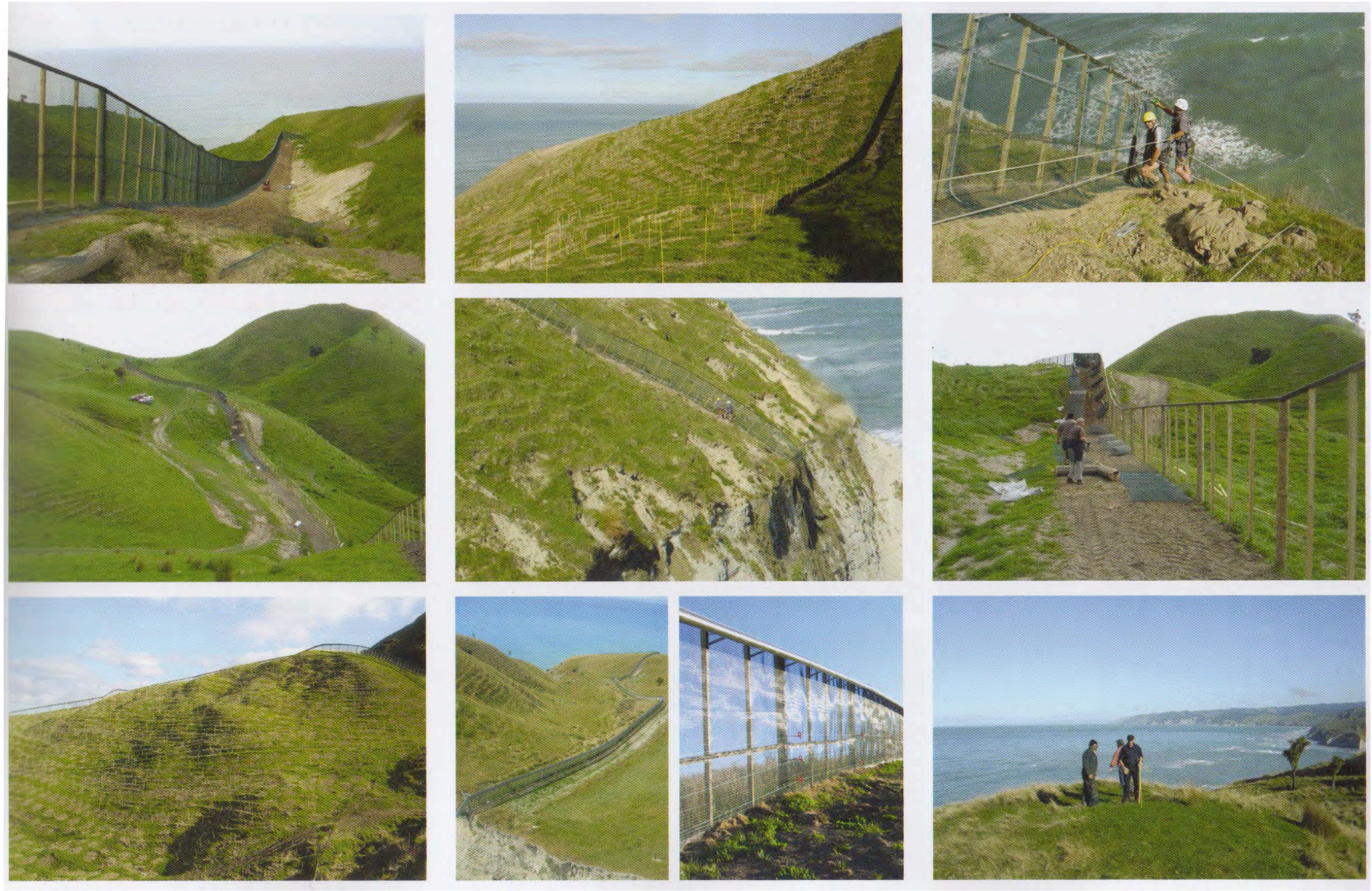
Fig. 6.8 The Endeavor Garden at the Homestead of Orongo Station, including plantings of New Zealand spinach and Cook's scurvy grass.
(virginiaarchitecture.org)

The culmination of the work at Orongo Station was the Homestead Garden. The series of gardens surrounding the historic house are a distillation of the efforts to knit together ecology, farming, and cultural history on the surrounding site (American Society of Landscape Architects). The seven gardens artfully connect the residence with the surrounding deforested, sculpted, and grazed land through interpretation of the landscape history of Orongo Station (Virginia Architecture). One of the gardens, while generally

ornamental, features edible plants that were staples for Captain Cook's crew as they explored New Zealand, including Cook's scurvy grass and New Zealand Spinach (fig. 6.8) (Virginia Architecture). The master plan for Orongo Station, completed by the Conservation Agriculture Studio of Nelson Byrd Woltz, brings together landscape design and agriculture in order to maintain a prosperous agricultural system while preserving the ecologically sensitive landscape.

The project at Oakencroft—an estate and vineyard in central Virginia—was similar in concept to the master plan design for Orongo Station. Jordan said that the goal was to have a functional livestock operation and vineyard, a meadow habitat, and a restorative wetland as well as a more private estate portion of the property (fig. 6.16). According to Jordan, the property had been host to a cattle operation that was run in a conventional manner and the fields were also used to cut hay. Additionally, the property had been a functional winery that was one of the pioneers of winemaking in Central Virginia (Richardson). Though they used some of the existing geometries from fences and hedgerows, he said that the design team worked to redesign the fields to create an environment for mob grazing—like the system used by Joel Salatin—and the new paddock system was designed for finishing beeves as well as for weaning paddocks (fig. 6.17). There were also improvements that were made to the vineyard and vegetable production area in the form of new varieties of grapes for the production of grape juice rather than wine, inter-planting within the vineyard, and terracing in the vegetable garden (fig. 6.18) (Jordan; Oakencroft Farm). The designers were able to preserve many of the functions previously performed at Oakencroft while also decreasing the ecological impact of the farming activities taking place on the estate.

Figure 6.9
Fence Installation for the Conservation and Restoration of Orongo Station (Nelson Byrd Woltz 31)



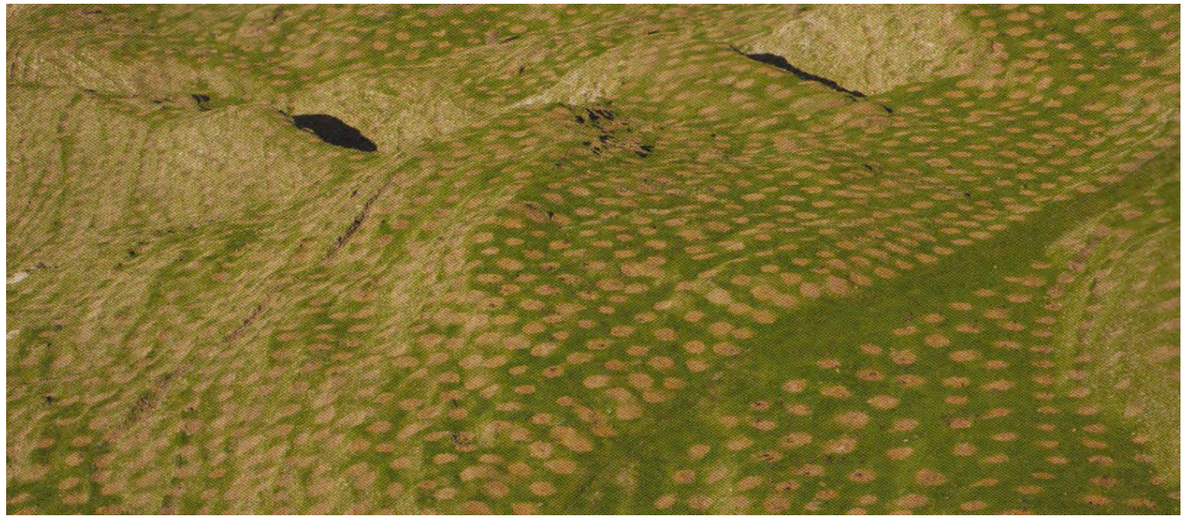


Figure 6.10 (*left*) Conservation Plan for Orongo Station (Nelson Byrd Woltz 38)
Figure 6.11 (*top right*) Preparing Ground to Transplant Trees on Orongo Station (Nelson Byrd Wolts 43)
Figure 6.12 (*bottom right*) Trees Planted as Part of the Restoration of Orongo Station (Nelson Byrd Woltz 39)

Figure 6.13 (*left*) Cattle Station Yards (Nelson Byrd Woltz 73)
Figure 6.14 (*top right*) Sheep Grazing, inset: Historic Terraces (Nelson Byrd Woltz 21)
Figure 6.15 (*top left*) Sheep Grazing in one of the Lower Fields (Nelson Byrd Woltz 70)

Figure 6.16 Master Plan for Oakencroft Vineyards and Estate
(Nelson Byrd Woltz Office)

Figure 6.17 Plan for Oakencroft Vineyards, Garden, and Finishing Paddocks
(Nelson Byrd Woltz Office)

In addition to being a site that supported very standard agriculture practices, many of the ecological systems were not functioning properly. The existing pond was shallow and very hot and a majority of the streams on the site were incised, said Jordan. He also stated that the design called for the improvement of the pond and redevelopment of the pond edge while the streams on the property were improved by increasing the meanders and the addition of a functioning wetland along one sections of a major stream. Additionally, the project had a goal of creating habitat for native wildlife. There were forest corridors that were preserved and a mixed meadow that was improved as habitat for wildlife through specific seed mixes and a planned maintenance regimen. For the Estate owners, Oakencroft represents the connection between community and agriculture, and they had taken on the property primarily for the purpose of responding to conservation issues (Richardson). Jordan said that the end goal of the master plan was to create a farm that would be entirely self-sustaining and would thrive on the resources—including manure/compost, vegetables and fruit, and meat—produced on site. The master plan that was created, and has begun to be executed, successfully met the goal of creating a self-sufficient system.

Figure 6.18
Garden and Vineyard area of Oakencroft (Nelson Byrd Woltz Office)

Finally, Jordan spoke about the other major agriculture project that Nelson Byrd Woltz was involved in was at Monticello, Thomas Jefferson's historic home and farm. The design team worked on a master plan and landscape stewardship plan for Monticello through the re-introduction of historic fields along the East Ridge Road. Historically, these fields were managed using swidden—or slash-and-burn—agriculture; there was a progression down hill as more land was cleared for cultivation of tobacco and early fields were abandoned, the cycle was then repeated as the first field was cleared again. Fields that were developed later—further downhill and further down the road—were cultivated continuously and there are observable differences in the quality of the soil and forest between the two types of fields; though the fields have been abandoned for several generations, the lower field areas are still forested with only Virginia Pine and a few early-succession hardwood trees. One can walk the length of the East Ridge Road and see the differences between the higher and lower elevation fields and see the differences in the forest between the two sides of the road. Jordan pointedly said that, unfortunately, this scenario is not atypical in central and southern Appalachia. Once the historical survey was completed, the team from Nelson Byrd Woltz proposed a design that would preserve the historic function of the site and act as an educational tool. They proposed a regimen for clearing the fields again and working them in order to help the soil regenerate. This project with Monticello truly illustrates how landscape architecture can play a role in cultural preservation in this region. By gaining a thorough understanding of the site, the historical context and culture, and the preservation opportunities, the practitioners at Nelson Byrd Woltz were able to generate a comprehensive plan for the future of the historic fields at Monticello.

The agricultural design projects completed by these landscape architecture firms begin to demonstrate the possibilities for intellectual exchanges between traditional farmers and farming methods and the designers who can learn from them. Additionally, these projects can stand as examples for future projects involving other landscape architects and designers or work taken on by individual farmers and homeowners. Though most of these projects were located outside of Appalachia, they can still lend valuable information to these disciplines, especially with regards to recognizing the challenges of translating farming knowledge--from the mountains of Appalachia—into design methodologies.

Landscape Architecture in Appalachia

Landscape architects were also asked about their views on the future of farming in rural Appalachia. From learning from traditional farming methods to being directly involved with design projects on agricultural sites in Appalachia to leading by example through master plan designs, landscape architects have the potential to play a role in the farming culture of Appalachia while they are taking in new information. In some areas, there is even a need to reacquaint people with the regional history and their surroundings and these relationships can be established with the assistance of landscape design. Thomas Woltz and Jeremy Jordan—both of Nelson Byrd Woltz—and Ben Falk of Whole Systems Design were asked about the role that their profession could have in the future of farming in central and southern Appalachia.

Thomas Woltz began by relating the strengths that landscape architects can bring to designing the agriculture environment and then discussed the specifics of the Appalachian Region. While it can make for difficult situations sometimes, landscape

architects and farmers see the world differently. Landscape architects are trained to see, observe, and protect the landscape around them; they are taught to understand topography, natural systems, plant communities, wildlife connectivity, and the structures that form the land. Landscape architects are also trained to think about the movement of people and objects through spaces and to design those spaces for efficient flow. When it comes to designing systems such as loading dock systems or considering how to move livestock through a barn for inoculations, the over-arching concept is not wholly different from that of road design. On the agricultural lands, the design team from Nelson Byrd Woltz has been experimenting with the seed mixes for native warm season grass meadows, which the landscape architecture firm is using in their agriculture designs for habitat restoration and for grazing livestock. Finally, Woltz discussed what landscape architects are able to do on small farm- or backyard-scale projects; edible plants can be incorporated into or replace the ornamental plantings into perennial beds and gardens, and every client can be encouraged to compost which can be done easily on a small scale and can be integrated into a food system. While Thomas Woltz's ideas about landscape architects' involvement in agriculture are not specific to central and southern Appalachia, they can be incorporated into this region, especially when thorough site histories are completed as part of the design process.

While Jeremy Jordan has been working with Thomas Woltz in the Conservation Agriculture Studio, he has developed a number of his own ideas for the involvement of landscape architects in Appalachia. The office of Nelson Byrd Woltz typically works at a larger scale than the self-sufficient farm of Appalachia, but the large estates and public spaces can serve as examples and can help tell the story of design in agriculture to

generate systems that flow and are designed as a whole. Jordan also approached the subject of landscape architecture involvement in farming and Appalachia by discussing the necessity for continued education within the profession. Because people are also becoming more aware of local food—and are interested in where their food comes from—landscape architects can educate themselves about producing food locally and share that knowledge directly with farmers and with community advisors such as cooperative extension agents and farmers' market managers. Additionally, as designers continue to work in agriculture, it will become important to understand the cyclical nature of farming; landscape architects understand the cycles of plants and seasons but there are additional cycles and interactions in agriculture that are important to recognize and consider when working with farmers. As designers continue to educate themselves, they will be able to better work with farm- and landowners and will also be able to educate their clients as well.

Ben Falk of Whole Systems Design shared a few specific ideas that he feels are important to generating functional, small-scale agricultural communities. Like Thomas Woltz, Falk feels that it is very important to bring food and food production to places it has not been in recent history but once was—especially in Appalachia—such as public spaces and people's yards. Additionally, there is a need to implement systems for the production of resources rather than only consuming them, like most landscapes currently do, in order to build regenerative landscapes (Falk). Falk also stands by the need to generate community through food security and landscape designers can play an important role in creating those communities by designing food systems into any landscape (Whole

Systems Design). Areas such as rural Appalachia have a need to generate local food systems and Falk sees it as the role of landscape architects to create those communities.

Landscape designers can engage in the food movement through learning from traditional farmers of Appalachia and share the knowledge they gain with their clients in the unique, mountainous region. By using these established projects as case studies, the author began to gain a better perspective of how designers could both learn from farmers and share the knowledge that they have from their academic background. While these projects demonstrate the passion of members of both design firms, the case studies also show that passion is not the only driver for a successful endeavor. It is this exchange of knowledge that truly begins to bring the disciplines together and is what will make the relationship between farmers and designers effective in the future.

CHAPTER 7

RESULTS: SITE SPECIFIC DESIGN EXEMPLIFYING DESIGN METHODS LEARNED FROM APPALACHIAN FARMERS

By using the literature review and case study results for guidance, it is possible to generate a site-specific landscape design that incorporates the cultivation methods synthesized from the information gathered throughout the research process. There were a number of design interventions that came out of the literature research and case studies. There are a number of cultural concepts are not directly related to design but are an important aspect of the cultural history of rural, agricultural Appalachia. One of the themes that repeated several times throughout the process was involving family in the farming operations and the fact that family is very important to the culture of the region. In addition to family members working on the farm, it is often important for individuals to earn cash income by working jobs off of the farm. Another concept that is related—because it pertains to the people on the farms—is the idea of skill diversification, pooling and reciprocity; farms are able to be more self-sufficient if various members of the family specialize in different skillsets. Additionally, reaching beyond the immediate family members to the community, sharing time and skills as well as reciprocating work for one another. Yet another important cultural practice is the act of skill-sharing within a family and the greater community and therefore passing important skills on to others.

In addition to the themes relating to family and community member, the results of the research and case studies provided a number of interventions that are directly related

to design. One of the concepts that is applicable at almost any scale and is an important part of the Appalachian cultures is the creation of a vegetable garden on-site and in conjunction with growing food, designing for the storage of food. Many Appalachian families also raised livestock on their farms and continue to do so; livestock provided families with food as well as a source of income. Learning from the traditional farmers and understanding the use and need for livestock in this region is important for designers if they are working in the Appalachian landscape; especially if they are designing a system for managing livestock on a smaller-scale farm. In association with raising livestock in this area, another design intervention learned through the research and case study process is protecting waterways that run through and create the borders for farms. Furthermore, one other concept that came out of the literature research and case study interviews is the management of woodlots on a farm and, depending on the scale of the farm, designing a system for practicing the field-to-forest-to-field management system.

Finally, one other concept that came out of the case studies with landscape architects was a different approach to the idea of diversification. Diversification is, additionally, a concept for designers to consider within the plant communities on a farm. Thomas Woltz spoke to the concern of the diversity of native plant species during his interview. While it has not actively been a part of agricultural projects in the past, there is a need to work towards an increased and sustained biodiversity of native plants; taking plant populations into account and managing invasives is more than a farmer has time for, but it is something that landscape designers can consider in their design work and management plans for a site (Woltz). For example, designers can generate plans for the development and management of warm season native grass meadows, which includes

seeding plans, mowing plans, and plans for controlling invasive species within the meadow. It is also possible to use these farm sites as experimental fields to collect and share data for the study of the warm season native grasses. Nelson Byrd Woltz is doing just that, they are working on multiple farms and collecting data on their seed mixes and then are using the results to make adjustments in those mixes; they are also planning on sharing that data with other designers and groups like extension agents because while many farmers cannot afford to hire landscape architects, Thomas Woltz wants to share the results of their result with those who will benefit from it (Woltz). Landscape designers can also include plans for the initial removal of invasive species on a farm site and the planting of native species. Initially controlling the invasive plants on a farm improves the self-regulating native plant ecosystem and aids a farmer in their ability to manage field more systematically.

How these various interventions are used or if they can be used does depend on the scale of the farm in Appalachia. However, most of the concepts are able to work at different scales and designers can learn from these principles that have been employed by traditional farmers in Appalachia. In order to demonstrate the possibilities for designers to learn from traditional farming methods, a site-specific design was generated for a site in the case study area. The cultivation techniques that were incorporated into this design from the literature research and case study results include designing for the diversification of products, creating a system for season extension, a woodlot management system, a plan for the management of invasive species and a system for hillside production. Additionally, during the design process, the author considered the results of the interviews with traditional farmers with regards to what they grow in their

gardens and therefore the design includes produce that has been successfully grown in the area for generations.

Figure 7.1 Property Boundary for Site Including River-side Site and Hillside (Google Earth, 38° 29’ 29”N 79° 33’ 47”W)

The site is one that is familiar to the author; it has been explored in various seasons and its owners have shared their own understanding of the site. The property is located in Blue Grass, Virginia, in Highland County, and is owned by the Simmons family. The site contains both a flat, previously cultivated space and a hillside that is mostly wooded with a part that is cleared but steep (fig. 7.1). Because of the location and the site history, it is appropriate setting for site-specific agricultural design in rural Appalachia. Additionally, the site is fitting because of the connection—through location—to the case study research area of Highland County. The limitations of this design included working at the master plan scale and while the author was working with

extensive knowledge of the site, not having access to a detailed topographic survey of the site limited the level of detail that could be achieved in the drawings.

The lower part of the site is located along a tributary branch of the Potomac River, and therefore has fertile soil and a good water source that can be used as a resource for food production. This portion of the site also has several existing buildings, including the historic house, a small barn and a workshop. There are several existing productive fruit trees as well. Additionally, on the hillside, there are a number of wild blueberry bushes and there are several factors that serve as evidence for a dwelling, including the remnants of a small orchard. A spring is also located on the hillside property, though at one point livestock damaged it; the spring has begun to recover but is still not functioning as it once did. There are important resources available on both parts of the site.

Figure 7.2
Existing Conditions of the River-side Piece of the Site

The property owners have begun to plan for the further development of the hillside and have very recently started to cultivate the garden space again. The site design

includes plans for garden because the property owners have plans to include some raised beds in the future. Additionally, they are interested in increasing the number of fruit trees and bushes on both portions of the site. Development of the site will also require a change in the management of the woodlot on the hillside for the construction of an additional building, orchard space, and access to the site. The new building on the hillside is envisioned as a residence for one of the Simmons children who is planning on moving back to the area to start his own family. This management plan takes into account controlling the invasive species that were historically planted as ornamentals at the house-site. The site-specific design draws on the information gathered from farmers, landscape architects, the historic research of farming in the region, and research of design in agriculture.

Figure 7.3
River-side Site with Additional Fruit Trees and Blueberry Bushes

Beginning with the river-side site, the design includes an assessment of the existing conditions and plans for changes and additions to the food production systems of

the property. In addition to the existing buildings, there are three, healthy apple trees and one pear tree that is not in very good health (fig. 7.2). In order to maintain and even improve the opportunity for the diversification of food, the plans include various types of fruit trees and bushes, space for vegetable production, and an area for season extension and perennial vegetable and herb production. Two apple trees and three pears trees are included in the drawings in order to plan for replacement of the existing trees as they age and to take advantage of the open space that is currently available. As directed by permaculture principles, the fruit trees are planted in zone two and zone three of the existing house. In addition to the fruit trees that are planned, blueberry bushes are described as located in this same, small orchard space designed for food production for the household (fig. 7.3). In additional to being within an appropriate proximity to the existing residence, this site provides some shelter from frosts and strong west winds by being in the river valley and protected to the west by trees and a small ridge. The orchard is one component to the site design for the river-side portion of the property.

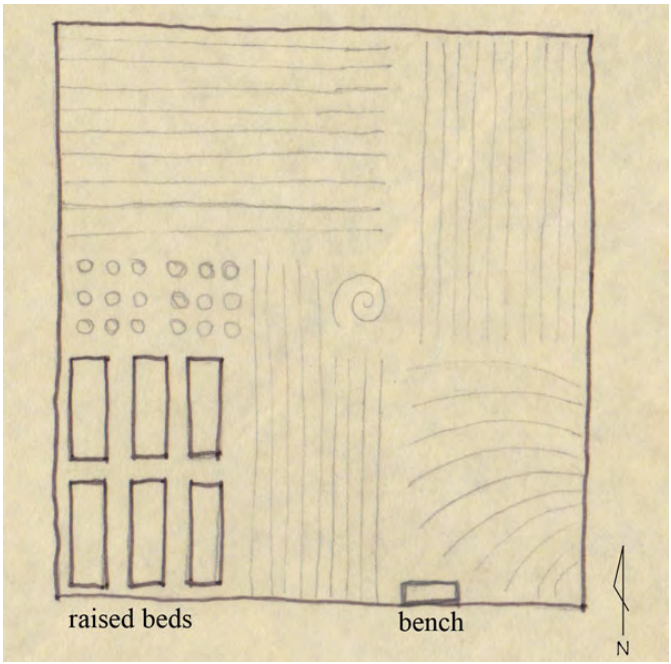


Figure 7.4
Garden with
Raised Bed
Additions

The other area of importance on the river-side portion of the site is the garden. The established garden site had been used for many years, but most recently it has been fallow for at least three years. The soil is very rich and because of the proximity of the river, the water table is high; these factors make this area good for producing food and therefore for maintaining the garden in its current location. The property owners do have a desire to make several changes in the space, however. One portion of the garden has not been cultivated as long and therefore is not as weed and rock free. The site design includes the placement of permanent raised beds in this area because cleaner topsoil can be moved into the beds once they are constructed (fig. 7.4). These raised beds are for the purpose of perennial herb and vegetable beds, and for the creation of beds that can be used to extend the growing season. The season extension can be achieved with the construction of a removable, low-tunnel hoop-system. The hoop tunnel is completely removable and also constructed so that during the season-extension period, it is attached with hinges for ease of use (fig. 7.5). The remainder of the garden space will continue to be used for vegetable production and rotated on an annual basis.

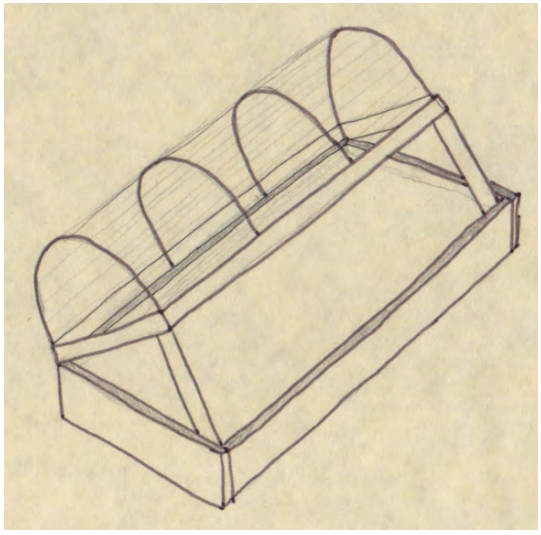


Figure 7.5
Hoop Tunnel for
Raised Bed Season
Extension

On the hillside portion of the property, the site design recognizes the fact that the majority of the site is steep sloped and the portion that is more level is wooded. Therefore the plans for this part of the site intend to create as little disturbance to the slope as possible. The new residence, proposed by the property owners, is placed at a flatter area near the top of the ridge and in an area that is rocky making it harder to use for food production (fig. 7.6). There is also evidence of a previous structure in this location based on the plants—including apple trees, barberries, multi-flora rose, and crabapples—that are well established in that area. In addition, part of the process for constructing the structure will include controlling and removing the invasive species and formulating a system for managing the woodlot on the hillside portion of the site. Control of invasive plants is an important aspect of management plans for farms and properties that border farms. In addition to simply controlling the invasive plant, management systems could include plans for keeping fence-lines clear, as split rail and four board fences of locust or chestnut will last forever as long as they are exposed to the sun (Goodall).

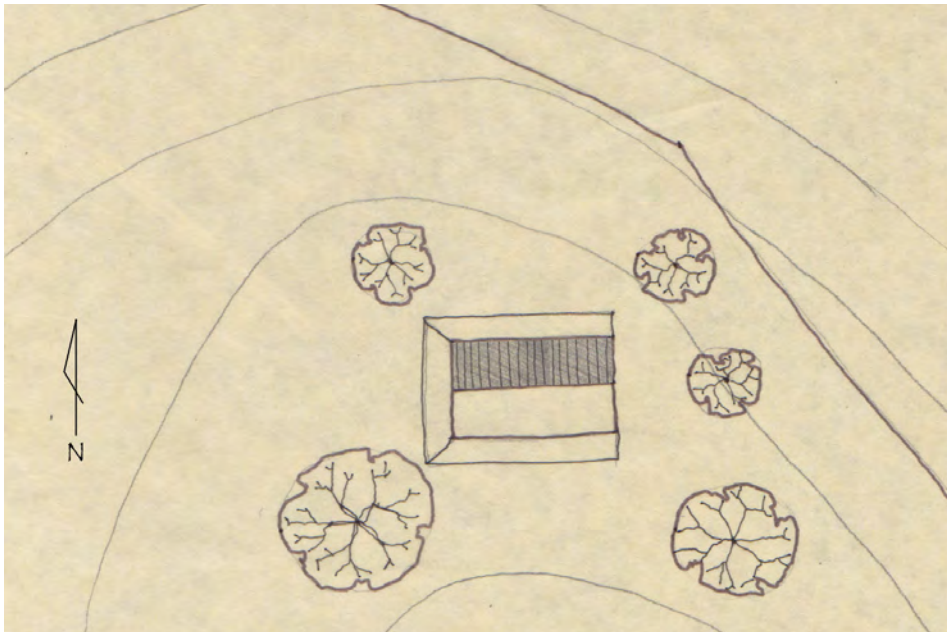


Figure 7.6
Building Site, at Top of Ridge, for Residence on Hillside Portion of Property

Because the woodlot on the hillside portion of the site is neither large enough to provide all of the wood necessary for heat or construction nor large enough to be able to rotate fields and forest, the management of the site cannot be the standard system used on larger farm properties in Appalachia. Therefore, the recommended management system does not drastically change the boundaries of the woodlot, and instead has a majority of the management that is taking place within the current wooded portion of the site. The wooded area is divided into four sections and each is visited on a rotating basis. Every section is cared for for a five-year period and then left to grow for fifteen years while each of the other three sections is cared for in rotation (fig. 7.7).

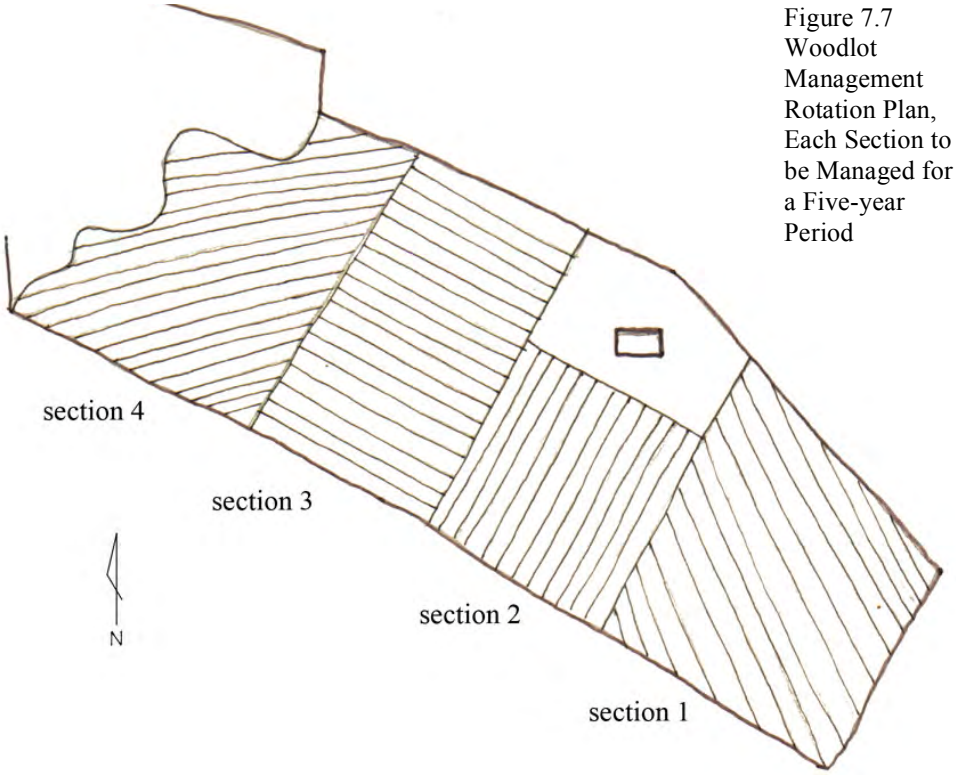


Figure 7.7
Woodlot Management Rotation Plan, Each Section to be Managed for a Five-year Period

In addition to the establishment of the new house and management system for the woodlot, the site design includes plans for the historic orchard; though there will be an orchard, it will not in the same location. In reestablishing an orchard, a new location is has been carefully selected, taking advantage of an already cleared, southwestern slope

that has a natural swale (fig. 7.9). The swale will be expanded and a berm created and used as a planting zone. As water runs off of the hillside, it will be caught in the swale and the fruit trees will be watered more thoroughly than if they were simply planted in the slope (fig. 7.8). The system can be expanded up hill, as well, to second natural swale if desired.

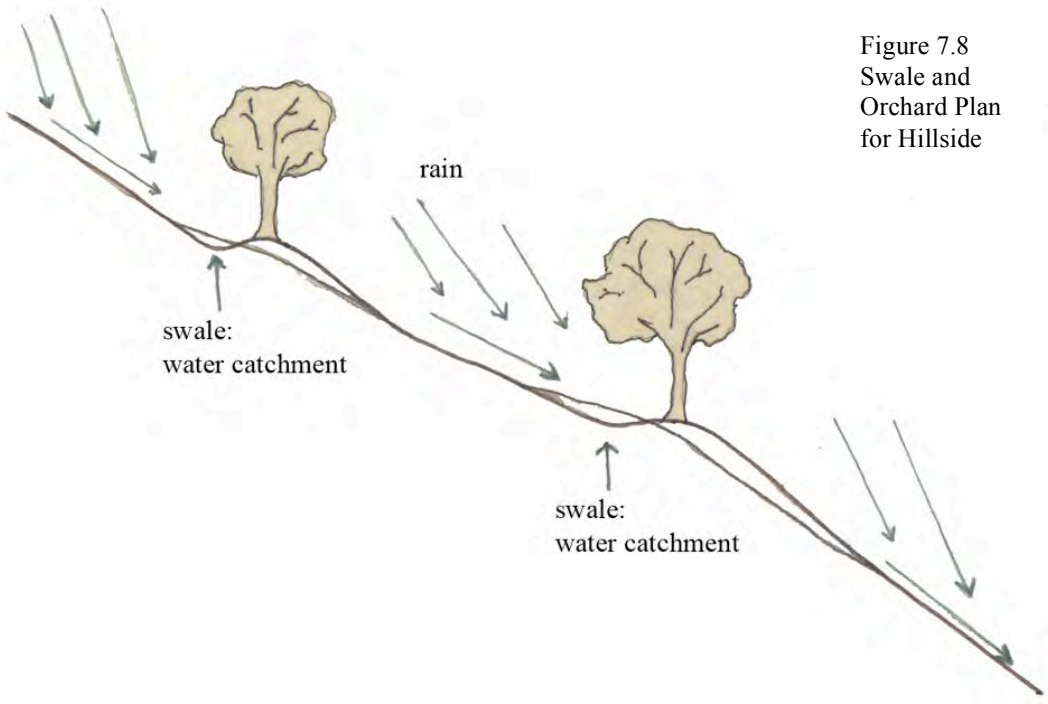


Figure 7.8
Swale and
Orchard Plan
for Hillside

The site-specific design for the property in the Blue Grass Valley of Virginia is able to take various types of landscapes into consideration and use a number of methods described by traditional farmers and landscape architects. Traditional methods employed on the site include diversification of products, woodlot management, making use of microenvironments. Landscape design precedents come into play with regards to permaculture principles, and the concept of design aesthetics. This site and the design was used to demonstrate how landscape design and agriculture can be brought together in

rural Appalachia and that landscape designers can learn from the traditional farming methods of the region.

Figure 7.9
Existing Natural Swale on Southwestern Slope of Hillside

CHAPTER 8

DISCUSSION AND CONCLUSION: DESIGN LESSONS LEARNED FROM THE FARMERS OF APPALACHIA AND THE CULTURAL HISTORY OF THE REGION

"Lying at the heart of the eastern United States, central Appalachia is a border region" (Pudup 62). Because it is a border region, there is a general blend of features from the surrounding areas. Therefore, there is a unique and historically important farming culture in the mountainous region of central Appalachia and it is a culture that has a lot to share with future generations. By learning from current traditional farmers and from the historic context of the region, landscape designers can play a role in the rural communities where they desire to work while also encouraging food production in the area. In order to respond to farming in both the historic context and the changing atmosphere of small-scale agriculture in central Appalachia, landscape designers must understand a site's history, the regional history, and maintain a dialogue with the innovative farmers of the region. A relationship between designers, innovative farmers, cooperative extension agents, community coordinators, traditional farmers, and other residents of Appalachia can be forged to promote the further edification of landscape designers working in Appalachia.

There was once a relationship to the land that should be reinstated. "Rural mountain residents had always been close to the land, although that closeness was reflected more in strong ties to family and place than to an ethic to preserve the land" (Eller 10). Bard Warner said that when he was growing up, it was the norm to farm or at

least garden, and people understood the land around them and took care of it (fig. 7.1). Though the reason behind the relationship with the land was not based on ethics, there was an ethical aspect to it. Through his work--especially with food landscapes—Thomas Woltz of Nelson Byrd Woltz hopes to reengage with his clients and their surrounding, natural environments. They try to encourage in their clients a feeling that they are stewards of the land rather than owners of it; they try to build a covenant between people and the land (Woltz). Landscape Designers can participate in this process of land conservation and food production—like members of the firm Nelson Byrd Woltz have done—through various means, but throughout the process should refer to the historic context and the traditional methods of cultivation in the region.

Figure 7.1
Bard Warner Contemplating His Life as a Farmer and Hoping to Keep His Grandson Involved (photo by author)

By learning from historic farming methods, landscape design firms can implement cultivation practices into the designs they produce, even when a projects main focus is not agriculture. Through studying precedents, working with current farmers, and integrating innovative techniques with traditional farming practices, designers can change

the standard approach to designed landscapes of Appalachia. Through interviews and research, the most common and important practices were found and through the site-specific design demonstrated how specific methods could be implemented. Traditionally, farming in the mountains of Appalachia was based on diversifying the range of agriculture activities that farmers participated in; this generated household self-sufficiency (LaLone 65). Specifically, farmers sometimes made use of various microenvironments on a farm in order to have a number of different crops and various small herds of livestock, and other times, a family chose to maintain several distinct locations where they produced goods in order to minimize the risk of loss from natural disasters (LaLone 66-67). When designers take these and similar historic practices into consideration, they are able to design systems and landscapes for practical purposes by studying the bigger picture and anticipating additional functions for any given zone within a farmstead.

Finally, one of the most important roles for a landscape designer is that of the observer. If landscape designers take the time to observe and listen to the traditional farmers of rural Appalachia, they can learn sustainable methods for farming in this unique region. Once designers understand these important, historic principles, they have the ability to integrate them with the innovative methods that are beginning to be used in the region as well. They can then incorporate a mix of the best practices into their own agricultural and residential designs.

The process began with a consideration of how landscape architecture can fit into the ever-increasing-in-popularity-food-movement. More specifically, through gaining a better understanding of how landscape architecture can participate in and bring the food

movement to rural Appalachia, the author hoped to make a difference in the mountainous region. Because the region is unique and holds a personal significance, it seemed to be an appropriate choice for investigation. Through this thesis, the parameters were defined and the author proceeded to conduct research and primary source interviews in order to assemble a thorough set of resources. With that information, results were established and they include a practical system for future agricultural development of central and southern Appalachia.

This author aims to learn from the farming landscape and culture of rural Appalachia and through this thesis share that information with fellow designers and practitioners. Now that a set of methodologies has been established, the next step necessitates sharing the system so that others—be they designers, extension agents, gardeners, community coordinators, or farmers—can continue to refine this process and implement it in practice. As farmers influence designers, designers may be able to simultaneously influence the practices of farming in Appalachia. The exchanges can take place by working with an individual traditional farmer and/or through leading by example, such as implementing these concepts on larger estates and turning those landscapes into agriculturally managed lands.

BIBLIOGRAPHY

American Society of Landscape Architects. "American Society of Landscape Architects Professional Awards: Orongo Station Conservation Masrer Plan". 2010. 26 May 2012. <http://www.asla.org/2010awards/205.html>.

Arcury, Thomas A. "Ecological Dimensions of Appalachian Agricultural Diversity, 1880-1910." *Human Ecology* 18.1 (1990): 105-30. Print.

Boyd, W. E., and J. E. Gardiner. "Stooking the Peanuts: Historical Agriculture and the Management of a Dying Seasonal Landscape, North-East New South Wales, Australia." *Landscape Research* 30.2 (2005): 193-220. Print.

Chesky, Anne. "Can Agritourism Save the Family Farm in Appalachia? A Study of Two Historic Family Farms in Valle Crucis, North Carolina." *Journal of Appalachian Studies* 15.1/2 (2009): 87-98. Print.

Cobb, Tanya Denckla. *Reclaiming Our Food: How the Grassroots Food Movement Is Changing the Way We Eat*. North Adams, MA: Storey Publishing, 2011. Print.

Colaw, Conley. "Personal Interview." 12 Nov. 2011. Print.

Egoz, Shelley, Jacky Bowring, and Harvey C. Perkins. "Making a 'Mess' in the Countryside: Organic Farming and the Threats to Sense of Place." *Landscape Journal* 25.1 (2006): 54-66. Print.

Eller, Ronald D. *Uneven Ground: Appalachia since 1945*. Lexington, Kentucky: The University Press of Kentucky, 2008. Print.

Falk, Ben. "Personal Interview." 18 Nov. 2011. Print.

Francis, Mark. "A Case Study Method for Landscape Architecture." *Landscape Journal* 20.1 (2001): 15-29. Print.

Gabor, Andrea. "Inside Polyface Farm, Mecca of Sustainable Architecture." *The Atlantic*. 25 July 2011. Print.

Gibson, Martin. "Transforming Nick's Head Station." *Gisborne Herald.* 26 February 2008. 2008. Print.

Glasmeier, Amy K., and Tracey L. Farrigan. "Poverty, Sustainability, and the Culture of Despair: Can Sustainable Development Strategies Support Poverty Alleviation in America's Most Environmentally Challenged Communities?" *Annals of the American Academy of Political and Social Science* 590.ArticleType: research-article / Issue Title: Rethinking Sustainable Development / Full publication date: Nov., 2003 / Copyright © 2003 American Academy of Political and Social Science (2003): 131-49. Print.

Goodall, Pendleton. "Personal Interview." 3 Mar. 2012. Print.

Goodstein, Eban. "Landownership, Development, and Poverty in Southern Appalachia." *The Journal of Developing Areas* 23.4 (1989): 519-34. Print.

Green Mountain Girls Farm. "Green Mountain Girls Farm". 2010. 26 May 2012. <http://eatstayfarm.com>.

Hart, John Fraser. "Land Rotation in Appalachia." *Geographical Review* 67.2 (1977): 148-66. Print.

Janssen, Joks, and Luuk Knippenberg. "The Heritage of the Productive Landscape: Landscape Design for Rural Areas in the Netherlands, 1954 - 1985." *Landscape Research* 33.1 (2008): 1-28. Print.
Jordan, Jeremy. "Personal Interview." 29 Dec. 2011. Print.
Lake, Jeremy, and Bob Edwards. "Buildings and Place: Farmsteads and the Mapping of Change." *Vernacular Architecture* 37.1 (2006): 33-49. Print.
LaLone, Mary B. "Running the Family Farm: Accommodation and Adaptation in an Appalachian Region." *Journal of Appalachian Studies* 14.1/2 (2008): 62-98. Print.
McManus, Brad. "An Integral Framework for Permaculture." *Journal of Sustainable Development* 3.3 (2010): 162-74. Print.
National Agricultural Statistics Services. "2007 Census of Agriculture, County Profile." Trans. USDA. 2007. Print.
Nelson Byrd Woltz. *Nick's Head Station, North Island, New Zealand/Te Ika-a-Maui, Aotearoa*. Charlottesville, VA: Nelson Byrd Woltz, 2010. Print.
O'Neill, Dave. "Personal Interview." 1 Dec. 2011. Print.
O'Neill, Lee. "Personal Interview." 1 Dec. 2011. Print.
Oakencroft Farm. "Oakencroft Farm". 2011. 26 May 2012. <http://www.oakencroft.com/approach>.
Otto, John Solomon. "The Decline of Forest Farming in Southern Appalachia." *Journal of Forest History* 27.1 (1983): 18-27. Print.
Polyface Inc. "Principles: Polyface, Inc.". 27 May 2012. <http://www.polyfacefarms.com/principles/>.
Propen, David, and Daniel Kirk. "Trust the Land: Land Management and Business Structures for the Future." *Annals of Earth* 27.1 (2009): 11-13. Print.
Pudup, Mary Beth. "The Limits of Subsistence: Agriculture and Industry in Central Appalachia." *Agricultural History* 64.1 (1990): 61-89. Print.
Richardson, Aaron. "From Wine to Juice: Oakencroft Pioneering Again." *The Daily Progress.* 14 January 2012. Print.
Salatin, Joel. "Personal Interview." 14 Oct. 2011. Print.
Seidl, Amy L. "Regenerative Design." *Orion.* September/October 2007. Print.
Teal Farm. "Teal Farm: Farm Evolution". 2012. 26 May 2012. <http://www.tealfarm.com/philosophy.html>.
Veteto, James R., and Joshua Lockyer. "Environmental Anthropology Engaging Permaculture: Moving Theory and Practice toward Sustainability." *Culture & Agriculture* 30.1/2 (2008): 47-58. Print.
Virginia Architecture. "Landscape Architecture: Award of Honor". 2010. 26 May 2012. <http://virginiaarchitecture.org/informonline/wp-content/uploads/2010/03/136-project.pdf>.
Warner, Bard. "Personal Interview." 10 Nov. 2011. Print.
Whole Systems Design. "Whole Systems Design - Selected Projects". 2011. 18 November 2011. <http://www.wholesystemsdesign.com/projects >.
Woltz, Thomas. "Personal Interview." 14 Dec. 2011. Print.

APPENDIX 1

INTERVIEW QUESTIONNAIRES

Traditional Farmers

1. What do you produce on your farm?
2. What methods do you use to produce the goods made on this farm?
3. How do you manage water and water use?
4. Is there anything you would like to change about your farming practices? If so, what?
5. What farming techniques do you think would be important to pass on to the younger generations?
6. What other farming practices are you proud of/would you like to share?

Innovative Farmers

1. What do you produce on your farm?
2. Can you describe your farming techniques/methods?
3. What traditional farming methods do you employ on your farm?
4. How have you considered landscape design/engineering in the development of your farm?
5. How do you see a landscape architect aiding in the design and future planning of your farm?
6. What do you see as the role of a landscape architect in the preservation of Appalachian and farming culture?

Landscape Architects

1. What agriculture projects are you/your office currently involved in?
2. How do you see the role of landscape architecture in agriculture?
3. Do you think that the profession can play a part in the cultural preservation of Appalachia?
4. What do you think are some of the most important aspects of agriculture that can be incorporated into landscape architecture projects?