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MAY 30 2018

PUC Ex. 33 200
A-2017-24410 ~~1110~~

PA PUBLIC UTILITY COMMISSION
Statement of Karen Benedict, 5413 Manheim Rd, Waynesboro, PA, before the PUC
Given at the Public Input Hearing for the Transource Independence Energy Project
SECRETARY'S BUREAU

5/22/18

Chambersburg
jav

Thank you, Judges Barnes and Calvelli, for allowing me the opportunity to speak my opinion today in opposition to the Transource proposed power line.

My name is Karen Benedict. I live, with my husband, assorted dogs, cats, chickens, and horses at 5413 Manheim Road, Waynesboro. The proposed route crosses over the northeast corner of our property, within 500 feet of our home. It passes over our horse pasture, and within 300 feet of a wet lands area and our spring, which is the source of our water. I have lived here most of my life, in my youth on what was our farm family, and now on what remains of that farm, on land that has been in my family since the 1850s.

When I opened that first mailing from Transource in June of last year, and realized the full implications of what it contained, I was heartsick. My friends, upon hearing what was happening, would extend condolences, "I am so sorry" they'd say, as if a beloved pet had died. I haven't made it past the second stage of grief. I seem to be stuck on anger. When I opened that notice and read its contents my world changed. There was my life before the notice, and my life after the notice. I was alternately angry and apprehensive. I composed much of this statement lying in bed during my many sleepless nights since then. I face the real possibility that something I hold dear and have come to count on in the course of my life, my home, my place of peace, is threatened. Not by death or disease, which are an inevitable part of life, not by a natural disaster like fire, flood or tornado, but by a corporation. A corporation that wants to take something from me, by force if need be, and leave in its place the unimaginable.

Transource wants to leave their unsightly industrial artifacts on the place where Native Americans gathered above our spring, to hunt, camp and make tools, the place where my forebearers built their log cabin over that spring and later, near it, the home that I now live in, where my father was born and died, and where I had hoped to live out my natural days in peace.

They want to leave a line of steel towers, strung with copper, carrying high voltage electricity, lines that will buzz and crackle in what was once the quiet mists which occur so often here. Each pole would be capped with a blinking warning light, punctuating the night sky, constantly broadcasting its presence. This row of steel giants would dominate the near eastern and northern sky until it disappeared over the northern horizon.

People might look at my property and say, "But you already have a power line on your property, what's the problem with one more?" I do indeed have a 128k line on my property, on wooden poles I estimate to be between 60- 70' tall. I have lived with it most of my life. This line supplies power to me and my neighbors up and down the line, I know it is a necessary part of modern life. It has been on the property for as long as I can remember. Why am I being asked to take on the burden of an additional, unsightly, much larger power line that will negatively

impact my quality of life and my property values? My husband and I are nearing retirement, and we are relying on the value of our property, which is our main investment, to help fund that retirement. Additionally, I am concerned about the effect this power line will have on my cell service. I have a land line, but often it becomes unusable after a prolonged rainy spell and I must rely on my cell phone for my communications, and sometimes even internet access.

I am not a Luddite. I'm not opposed to progress. I have a smart phone and a satellite dish. But I choose to live where I live, here in rural Franklin County, largely because of its "undeveloped" quality. Now I find that that lack of development has put a bullseye on my back, made me a target for a newly formed corporation looking to make money in a new venture, energy distribution. In my studied opinion this project does not represent progress. It represents the continuation of a failing energy policy perpetuated by entities like PJM, that either refuse to or cannot include in their forecasting models the impact of what is happening in the real world, in real time. Trends such as declining demand, the impact of conservation, distributed generation, solar, biomass, and industry building its own onsite generation to name a few. A failing energy policy that wants to believe and would have us believe, at the urging of its stakeholders, in this instance AEP Energy and Great Plains Energy, the companies behind Transource, wants everyone to believe that the answer to our energy problem is to string wires from here to kingdom come, whatever the cost to the people along the route. This project is the result of companies like AEP and Great Plains trying to move out of the unprofitable generation business and into the guaranteed income of the transmission business. And if this project is approved that profit will at my expense, and the expense of the residents of Franklin, York, Washington and Hartford Counties.

I am now forced to defend myself, through no fault of my own, against this assault on my mental and financial wellbeing. In addition to the money its costing me to defend myself and my community, it will devalue my property. The exact amount is hard to determine, and Transource deals with this by not addressing it. Are we, the landowners in question, supposed to trust that Transource, operating within the costly labyrinth of the legal system, is going to make this right for us? In addition, there are 73 (I counted them!) 73 homes along the proposed right of way where the power line passes within 200 to 500 feet of those homes, who will receive no compensation for their decreased property values, because the ROW does not touch their property. There is a stretch in the Mower Road area north of Rte. 30 in Chambersburg, where 44 homes are within 200 feet of the power line. In the published words of Transource, "There is no mechanism for compensation outside the corridor for adjacent landowners or other members of the community." Who is going to make it right for these people or are they just collateral damage?

This "market efficiency" project is being touted as the answer to grid congestion bringing economic relief to our neighbors to the south. When I want to reduce my electric bill, I don't expect my neighbors to put up a monstrous high voltage power line in their yard. I turn off

lights, lower the heat, turn down the ac, hang clothes outside to dry, winterize my home, and buy energy star appliances and LED light bulbs.

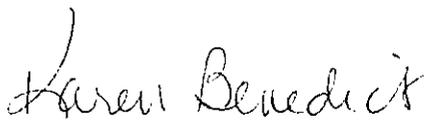
The project initially projected a savings of 622 million dollars over a fifteen-year period. This figure was mentioned in Transource's Sept 1, 2017 update and in earlier releases. That's about 41 million dollars per year. PJM serves a region of 65 million people. I don't know exactly how many customers are in the regions affected by this project, but by looking at the PJM map it could be as much as 60%. That would be 39 million and would amount to about \$1.05 per year, each, in savings. One dollar a year. That savings figure interestingly has been omitted from their later updates. The project started with a benefit/cost ratio of 2.64. A project must have a b/c ratio above 1.25 to be approved, and many PJM proposals have a b/c ratio of 10 or more, some even 100 or more. The benefit of this project was marginal from the start and has been continually declining. Its latest estimate (from 2/8/18) was at 1.32. That's .07 above a failing grade, and I would call that a D-minus, barely passing. Nowhere in the cost analysis does it account for the cost to the land, businesses and homeowners along the route. If it did, I wouldn't be standing here. If it did I wouldn't have found myself in the Franklin County Courthouse several weeks ago defending myself from a legal action by Transource to gain access to my property, and if it accounted for those very real costs I wouldn't have received a legal notice last week that Transource is petitioning the PUC for the right to use eminent domain proceedings to force me to relinquish part of my property to them. I think anyone could understand why the prospect of someone save \$1 a year on their utility bill in exchange for my being dragged to court and then having to either live with these power lines for the rest of my life, or try to sell my home and move, might upset me.

Let's talk about the region that might benefit from this market efficiency project, our neighbors to the south, who seem to need our help to underwrite their electric bills. Maryland and Virginia together have 10 counties listed in the top 25 in the country for median income in a 2016 US Census report. These ten counties have a median income average of more than \$116,000 a year. Franklin County has an annual median income of about \$55,800.

Transource has made my husband and I an offer for our right of way. It was an offer we might have considered reasonable if it had come from a neighbor who needed some ground to put in a driveway. But Transource isn't so much asking for something from us as forcing something unwanted upon us. They want to leave behind in perpetuity, on our land and in our view, a line of behemoth steel structures that will tower over our home and our landscape, and blight not just our property, but 28.8 miles of our surrounding countryside, and the farms and homes and vistas that make up that countryside. These steel structures and their wires will dominate our landscape, cross our roads and highways, pass by our school grounds, and hang over parking lots where we shop every day. They will be a permanent feature of our skyline. We won't be able to drive from Waynesboro to Shippensburg without having these towers and their wires in view much of the way.

The Pennsylvania Utility Commission has a mission statement. It can be found on their web site. I wish to quote the parts of this statement which apply to the proposal we are addressing today. "The PUC balances the needs of consumers and utilities", and the PUC "protects the public interest". Judge Barnes, and Judge Calvelli, I call upon you to heed your mission when deciding this case, to seriously consider the lasting harm this project will do to the citizens and the landscape of Franklin County and our counterparts in York, Washington and Hartford County, and weigh that against the minor benefit this project will have in the way of savings to utility customers.

I ask you to say no to the Independence Energy Connection Proposal.

A handwritten signature in cursive script that reads "Karen Benedict". The signature is written in black ink and is positioned above the printed name.

Karen Benedict

VIII The FCC (By Riley Hollingsworth, Special Counsel, Spectrum Enforcement Division, FCC Enforcement Bureau)

PUC-34(a)

A-2017-26470-200

5/22/18 Chamberlain

Jon

The FCC has the responsibility to require that utility companies rectify power-line related interference problems within a reasonable time if the interference is caused by faulty power utility equipment. Under FCC rules, most power-line and related equipment is classified as an "incidental radiator." This term is used to describe equipment that does not intentionally generate any radio-frequency energy, but that may create such energy as an incidental part of its intended operation.

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SECRETARY'S BUREAU

Commission rules specifically related to this topic are as follows.

Title 47, CFR Section 15.5 General conditions of operation.

(b) Operation of an intentional, unintentional, or incidental radiator is subject to the conditions that no harmful interference is caused and that interference must be accepted that may be caused by the operation of an authorized radio station, by another intentional or unintentional radiator, by industrial, scientific and medical (ISM) equipment, or by an incidental radiator.

(c) The operator of the radio frequency device shall be required to cease operating the device upon notification by a Commission representative that the device is causing harmful interference. Operation shall not resume until the condition causing the harmful interference has been corrected.

Title 47, CFR Section 15.13 Incidental radiators.

Manufacturers of these devices shall employ good engineering practices to minimize the risk of harmful interference.

Title 47, CFR Section 15.15 General technical requirements.

(c) Parties responsible for equipment compliance should note that the limits specified in this part will not prevent harmful interference under all circumstances. Since the operators of Part 15 devices are required to cease operation should harmful interference occur to authorized users of the radio frequency spectrum, the parties responsible for equipment compliance are encouraged to employ the minimum field strength necessary for communications, to provide greater attenuation of unwanted emissions than required by these regulations, and to advise the user as to how to resolve harmful interference problems (for example, see Sec. 15.105(b)).

If the complainant has attempted unsuccessfully to work through the power company complaint resolution process and has been unable to get the problem solved, the matter will be reviewed by the Enforcement Bureau. The FCC prefers that those responsible for the proper operation of power-lines assume their responsibilities fairly. This means that the utility company should locate the source of any interference caused by its equipment, or work with the complainant to establish that it is not power company hardware or equipment, and make necessary corrections within a reasonable time if the company's own hardware is the source of the interference.

While the FCC has confidence that most utility companies are able to resolve these issues voluntarily, it is important to be aware that unresolved problems may be a violation of FCC rules and could result in a monetary forfeiture for each occurrence. The FCC encourages the parties to resolve problems without FCC intervention, but if necessary to facilitate resolution, the FCC will investigate possible rules violations and address appropriate remedies.

We expect the utility company to advise the complainant what steps it is taking to correct interference problems reported to it. The FCC expects that most cases can be resolved within 60 days of the time they are first reported to the utility company. If a power company is unable to resolve such problems within 60 days after contact from the

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

{Date}

Utility Company

Attn: (Name)

Address

City, State, ZIP

Dear (Name):

The Federal Communications Commission has received complaints that equipment operated by your company is causing harmful radio interference to operators in the Amateur Radio Service. The complainant is:

Name, Callsign

Street Address

City, State ZIP

The FCC has the responsibility to require that utility companies rectify such problems within a reasonable time if the interference is caused by faulty power utility equipment. Under FCC rules, most power-line and related equipment is classified as an "incidental radiator." This term is used to describe equipment that does not intentionally generate any radio-frequency energy, but that may create such energy as an incidental part of its intended operation.

To help you better understand your responsibilities under FCC rules, here are the most important rules relating to radio and television interference from incidental radiators:

Title 47, CFR Section 15.5 General conditions of operation.

(c) The operator of the radio frequency device shall be required to cease operating the device upon notification by a Commission representative that the device is causing harmful interference. Operation shall not resume until the condition causing the harmful interference has been corrected.

Title 47, CFR Section 15.13 Incidental radiators:

Title 47, CFR Section 15.15 General technical requirements.

In the present, the complainant has attempted unsuccessfully to work through your usual complaint resolution process and as a result the matter has been referred to our office. The FCC prefers that those responsible for the proper operation of power lines assume their responsibilities fairly. This means that your utility company should locate the source of interference caused by its equipment and make necessary corrections within a reasonable time.

While the FCC has confidence that most utility companies are able to resolve these issues voluntarily, the FCC wants to make your office aware that this unresolved problem may be a violation of FCC rules and could result in a monetary forfeiture for each occurrence.

At this stage, the FCC encourages the parties to resolve this problem without FCC intervention; but if necessary to facilitate resolution, the FCC may investigate possible rules violations and address appropriate remedies.

The American Radio Relay League, a national organization of Amateur Radio operators, may be able to offer help and guidance about radio interference that involves Amateur Radio operators. You may wish to contact them at:

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SECRETARY'S BUREAU

PUC-34(b)

A-2017-2040200

5/22/18

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- FGC, it is expected to advise the Enforcement Bureau about the nature of the problem, the steps it is taking to resolve it and the estimated time in which those steps can be accomplished.

American Radio Relay League
Radio Frequency Interference Desk
225 Main Street
Newington, CT 06111
860-594-0200
Email: rfi@arrl.org

Please advise the complainant within 30 days of what steps your utility company is taking to correct this reported interference problem. The FCC expects that most cases can be resolved within 60 days of the time they are first reported to the utility company. If you are unable to resolve this within 60 days, please advise this office about the nature of the problem, the steps you are taking to resolve it and the estimated time in which those steps can be accomplished.

If you have any questions about this matter, please contact:

Laura L. Smith
Special Counsel
Enforcement Bureau, FCC

Thank you for your cooperation.

Consumer Information Bureau
Consumer Center
Federal Communications Commission
Gettysburg, Pennsylvania 17325

February 14, 2018

Et. PUC-34(c)

Rosemary Chiavetta, Secretary
PA Public Utility Commission
Commonwealth Keystone Bldg.
400 North Street
Harrisburg, PA 17120

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PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

A-2017-2640200

5/22/18

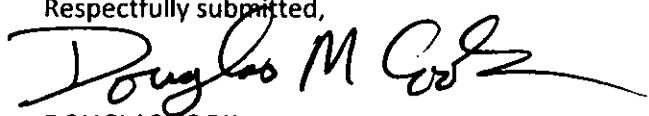
Harrisburg
jos

Re: Application of Transource Pennsylvania, LLC
Filed Pursuant to 52 Pa. Code Chapter 57, Subchapter G,
For Approval of the Siting and Construction of the 230 kV Transmission Line
Associated with the Independence Energy Connection – West Project
In Portions of Franklin County, Pennsylvania
Docket Number: A-2017-2640200

Dear Secretary Chiavetta:

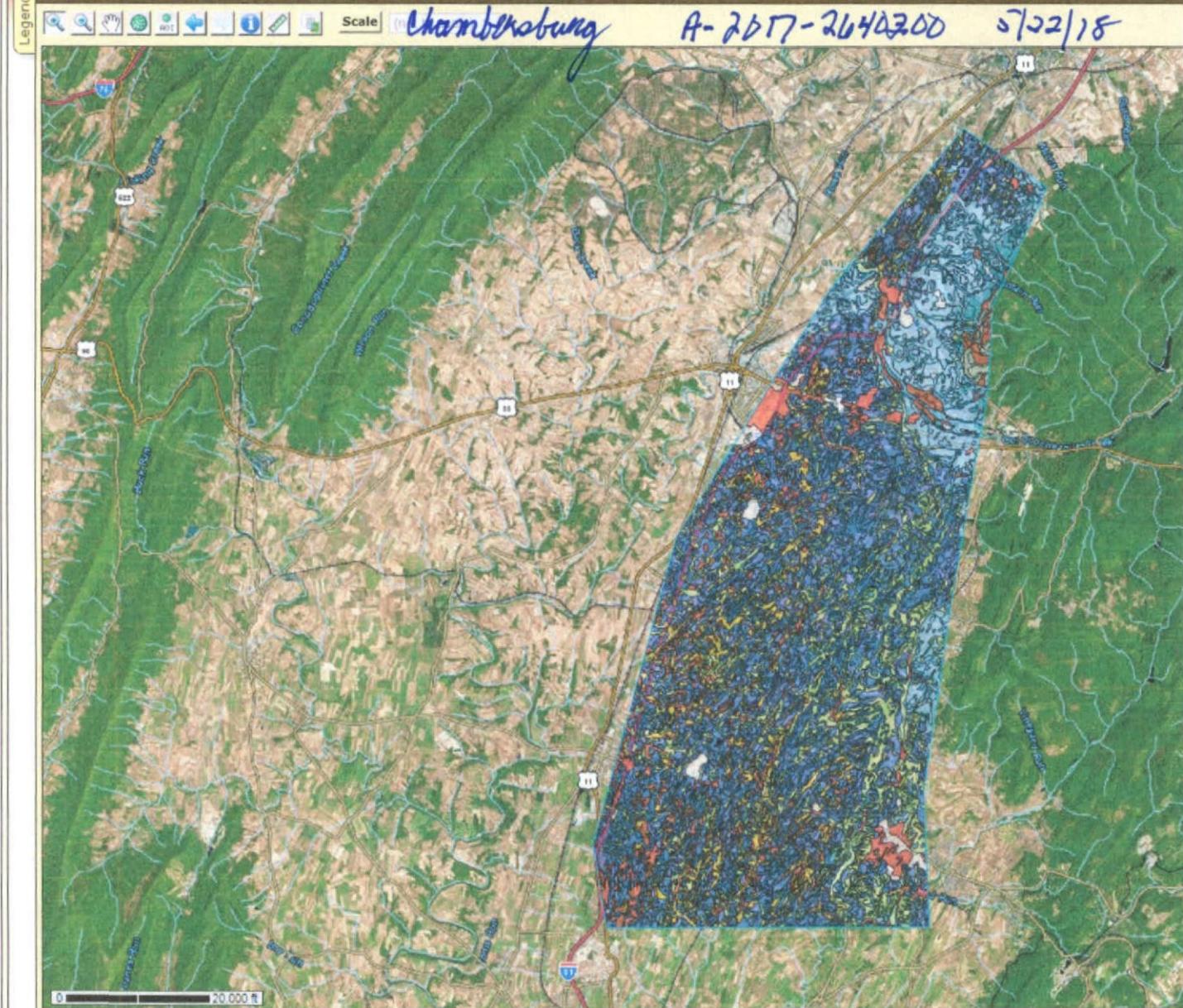
As a licensed Amateur Radio Station and Radio Operator, that provides Emergency Communications Services to our community, County, State and Nation. I hereby object to the proposed 230 kV Transmission Lines that will create Radio Reception Interference to Station KB3FTF. -

Respectfully submitted,



DOUGLAS COOK

7073 Augusta National
Fayetteville, PA 17222



11:11 AM

Search

Suitabilities and Limitations Ratings

Open All Close All

Building Site Development	?	?
Construction Materials	?	?
Disaster Recovery Planning	?	?
Land Classifications	?	?
Land Management	?	?
Military Operations	?	?
Recreational Development	?	?
Sanitary Facilities	?	?
Soil Health	?	?

Tables — Yields of Non-Irrigated Crops (Component): Alfalfa hay (Tons) — Summary By Map Unit

Summary by Map Unit — Franklin County, Pennsylvania (PA055)

Summary by Map Unit — Franklin County, Pennsylvania (PA055)

Map unit symbol	Map unit name	Rating	Acres in AOI	Perce of AO
AgB	Allegheny loam, 3 to 8 percent slopes	4.18	253.4	0.3
AnB	Andover gravelly loam, 3 to 8 percent slopes	0.53	56.9	0.1
As	Atkins silt loam	0.24	230.3	0.3
BaB	Bagtown cobbly loam, 3 to 8 percent slopes, very stony		0.6	0.0
Totals for Area of Interest			87,601.1	100.0

COMPARE QUALITY OF FRANKLIN & LANCASTER

Vegetative Productivity ⓘ ⓘ

- American Wine Grape Varieties Site Desirability (Medium) ⓘ
- Crop Productivity Index ⓘ
- Forest Productivity (Cubic Feet per Acre per Year) ⓘ
- Forest Productivity (Tree Site Index) ⓘ
- Hybrid Wine Grape Varieties Site Desirability (Medium) ⓘ
- Iowa Corn Suitability Rating CSR2 (IA) ⓘ
- Minnesota Crop Productivity Index ⓘ
- Range Production (Favorable Year) ⓘ
- Range Production (Normal Year) ⓘ
- Range Production (Unfavorable Year) ⓘ
- Yields of Irrigated Crops (Component) ⓘ
- Yields of Irrigated Crops (Map Unit) ⓘ
- Yields of Non-Irrigated Crops (Component)** ⓘ

[View Description](#) | [View Rating](#)

View Options ⓘ ⓘ

- Map
- Table
- Description of Rating
- Rating Options
- Detailed Description

Basic Options ⓘ

- Crop Alfalfa hay ▼
- Tons

Advanced Options ⓘ ⓘ

[View Description](#) | [View Rating](#)

- Yields of Non-Irrigated Crops (Map Unit) ⓘ
- Waste Management ⓘ ⓘ
- Water Management ⓘ ⓘ

Summary by Map Unit — Franklin County, Pennsylvania (PA055)

Map unit symbol	Map unit name	Rating	Acres in AOI	Perce of AO
BbB	Bagtown cobbly loam, 0 to 8 percent slopes, extremely stony	0.14	139.2	0.2
BbD	Bagtown cobbly loam, 8 to 25 percent slopes, extremely stony	0.09	199.1	0.2
BcE	Bagtown cobbly loam, 15 to 45 percent slopes, rubbly		73.6	0.1
BuB	Buchanan gravelly loam, 3 to 8 percent slopes	3.37	61.9	0.1
BuC	Buchanan gravelly loam, 8 to 15 percent slopes	3.34	1.7	0.0
CoB	Carbo silty clay loam, 3 to 8 percent slopes	4.10	32.0	0.0
CsA	Clarksburg silt loam, 0 to 3 percent slopes	3.66	3,771.7	4.3
CvA	Covegap cobbly sandy loam, 0 to 3 percent slopes	3.98	86.2	0.1
CvB	Covegap cobbly sandy loam, 3 to 8 percent slopes	4.40	1,708.7	2.0
CvC	Covegap cobbly sandy loam, 8 to 15 percent slopes	4.05	646.5	0.7
DbE	Dekalb-Bagtown complex, 25 to 65 percent slopes, extremely stony		11.7	0.0
DED	Dekalb and Hazleton soils, 3 to 25 percent slopes, rubbly		13.5	0.0
DEF	Dekalb-Hazleton cobbly sandy loams, 25 to 75 percent slopes, rubbly		34.1	0.0
Dm	Deposit gravelly loam, 0 to 8 percent slopes, very stony		31.9	0.0
DrB	Dryrun gravelly loam, 3 to 8 percent slopes	3.96	871.1	1.0
DsA	Duffield silt loam, 0 to 3 percent slopes	5.33	718.8	0.8
DsB	Duffield silt loam, 3 to 8 percent slopes	5.33	8,951.8	10.2
DsC	Duffield silt loam, 8 to 15 percent slopes	4.84	859.1	1.0
Du	Dunning silt loam	0.62	325.3	0.4
EdB	Edgemont channery loam, 0 to 8 percent slopes, very stony		12.0	0.0
Fa	Fairplay marl	1.18	595.1	0.7
Fu	Funkstown silt loam	5.40	3,550.3	4.1
HaA	Hagerstown silt loam, 0 to 3 percent slopes	5.20	2,437.2	2.8
HaB	Hagerstown silt loam, 3 to 8 percent slopes	5.36	9,413.7	10.7
HaC	Hagerstown silt loam, 8 to 15 percent slopes	4.79	270.2	0.3
HbB	Hagerstown-Carbo silty clay loams, 3 to 8 percent slopes	5.44	6,035.0	6.9
HbC	Hagerstown-Carbo silty clay loams, 8 to 15 percent slopes	5.00	2,729.8	3.1
HbD	Hagerstown-Carbo silty clay loams, 15 to 25 percent slopes	4.47	304.3	0.3
HcB	Hagerstown-Carbo silty clay loams, 3 to 8 percent slopes, very rocky	5.21	7,021.9	8.0
HcC	Hagerstown-Carbo silty clay loams, 8 to 15 percent slopes, very rocky	3.71	3,398.2	3.9
HkB	Hagerstown-Rock outcrop complex, 3 to 8 percent slopes	0.22	3,999.4	4.6
HkD	Hagerstown-Rock outcrop complex, 8 to 35 percent slopes	1.59	6,300.1	7.2
HRB	Hazleton-Dekalb complex, 0 to 8 percent slopes, extremely stony		15.6	0.0
Jg	Jugtown silt loam	3.68	1,463.7	1.7
Totals for Area of Interest			87,601.1	100.0

Summary by Map Unit — Franklin County, Pennsylvania (PA055)

Map unit symbol	Map unit name	Rating	Acres in AOI	Perce of AO
Ln	Lindside silt loam	4.18	184.1	0.2
Mb	Maurertown silt loam	0.45	71.2	0.1
Me	Melvin silt loam	0.38	766.2	0.9
MoB	Monongahela silt loam, 3 to 8 percent slopes	3.55	86.6	0.1
MrA	Murrill gravelly loam, 0 to 3 percent slopes	4.22	229.5	0.3
MrB	Murrill gravelly loam, 3 to 8 percent slopes	4.45	5,235.4	6.0
MrC	Murrill gravelly loam, 8 to 15 percent slopes	4.03	1,857.5	2.1
MuB	Murrill cobbly sandy loam, 3 to 8 percent slopes	4.43	48.7	0.1
MuC	Murrill cobbly sandy loam, 8 to 15 percent slopes	3.98	94.8	0.1
Pg	Penlaw silt loam, 0 to 3 percent slopes	2.80	588.0	0.7
Ph	Philo silt loam	4.01	585.1	0.7
Po	Pope silt loam	4.30	95.7	0.1
Pu	Purdy silty clay loam	0.17	7.1	0.0
Q	Quarries		277.3	0.3
RaB	Rohrersville silt loam, 3 to 8 percent slopes	0.18	3.5	0.0
RyB	Ryder-Nollville channery silt loams, 3 to 8 percent slopes	4.05	851.1	1.0
RyC	Ryder-Nollville channery silt loams, 8 to 15 percent slopes	3.55	5,342.4	6.1
RyD	Ryder-Nollville channery silt loams, 15 to 25 percent slopes	3.15	955.2	1.1
SrD	Sideling gravelly loam, 8 to 25 percent slopes, extremely stony		2.5	0.0
SwB	Swanpond-Edom complex, 0 to 8 percent slopes	4.34	6.6	0.0
TrB	Trego gravelly silt loam, 3 to 8 percent slopes	3.83	200.0	0.2
TrC	Trego gravelly silt loam, 8 to 15 percent slopes	3.40	34.2	0.0
TsB	Trego gravelly silt loam, 3 to 8 percent slopes, very stony		144.1	0.2
TsC	Trego gravelly silt loam, 8 to 15 percent slopes, very stony		26.9	0.0
Ty	Tyler silt loam, 0 to 3 percent slopes		53.6	0.1
UdB	Urban land-Duffield complex, 0 to 8 percent slopes	0.18	822.6	0.9
UdC	Urban land-Duffield complex, 8 to 15 percent slopes	0.18	113.5	0.1
UhB	Urban land-Hagerstown complex, 0 to 8 percent slopes	0.40	826.6	0.9
Uu	Urban land-Udorthents complex, 0 to 25 percent slopes		1,087.4	1.2
VaD	Vanderlip cobbly loamy sand, 0 to 25 percent slopes		163.9	0.2
VaE	Vanderlip cobbly loamy sand, 25 to 50 percent slopes		151.0	0.2
W	Water		49.6	0.1
WuB	Wurno-Nollville channery silt loams, 3 to 8 percent slopes	3.35	6.8	0.0
WuC	Wurno-Nollville channery silt loams, 8 to 15 percent slopes	3.15	7.5	0.0
Totals for Area of Interest			87,601.1	100.0

Description — Yields of Non-Irrigated Crops (Component)

These are the estimated average yields per acre that can be expected of selected nonirrigated crops under high level of management. In any given year, yields may be higher or lower than those indicated because of variations in rainfall and other climatic factors.

In the database, some states maintain crop yield data by individual map unit component and others maintain the data at the map unit level. Attributes are included in this application for both, although only one or the other is likely to contain data for any given geographic area. This attribute uses data maintained at the map unit component level.

The yields are actually recorded as three separate values in the database. A low value and a high value indicate the range for the soil component. A "representative" value indicates the expected value for the component. For these yields, only the representative value is used.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby areas and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper plant and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for the selected crop. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Rating Options — Yields of Non-Irrigated Crops (Component): Alfalfa hay (Tons)

Crop: Alfalfa hay
Yield Units: Tons
Aggregation Method: Weighted Average
Component Percent Cutoff: None Specified
Tie-break Rule: Higher
Interpret Nulls as Zero: Yes

Search

Suitabilities and Limitations Ratings

Open All Close All

- Building Site Development
- Construction Materials
- Disaster Recovery Planning
- Land Classifications
- Land Management
- Military Operations
- Recreational Development
- Sanitary Facilities
- Soil Health

Vegetative Productivity

- American Wine Grape Varieties Site Desirability (Medium)
- Crop Productivity Index
- Forest Productivity (Cubic Feet per Acre per Year)
- Forest Productivity (Tree Site Index)
- Hybrid Wine Grape Varieties Site Desirability (Medium)
- Iowa Corn Suitability Rating CSR2 (IA)
- Minnesota Crop Productivity Index
- Range Production (Favorable Year)
- Range Production (Normal Year)
- Range Production (Unfavorable Year)
- Yields of Irrigated Crops (Component)
- Yields of Irrigated Crops (Map Unit)

Yields of Non-Irrigated Crops (Component)

View Description View Rating

View Options

Map

Table

Description of Rating

Rating Options Detailed Description

Basic Options

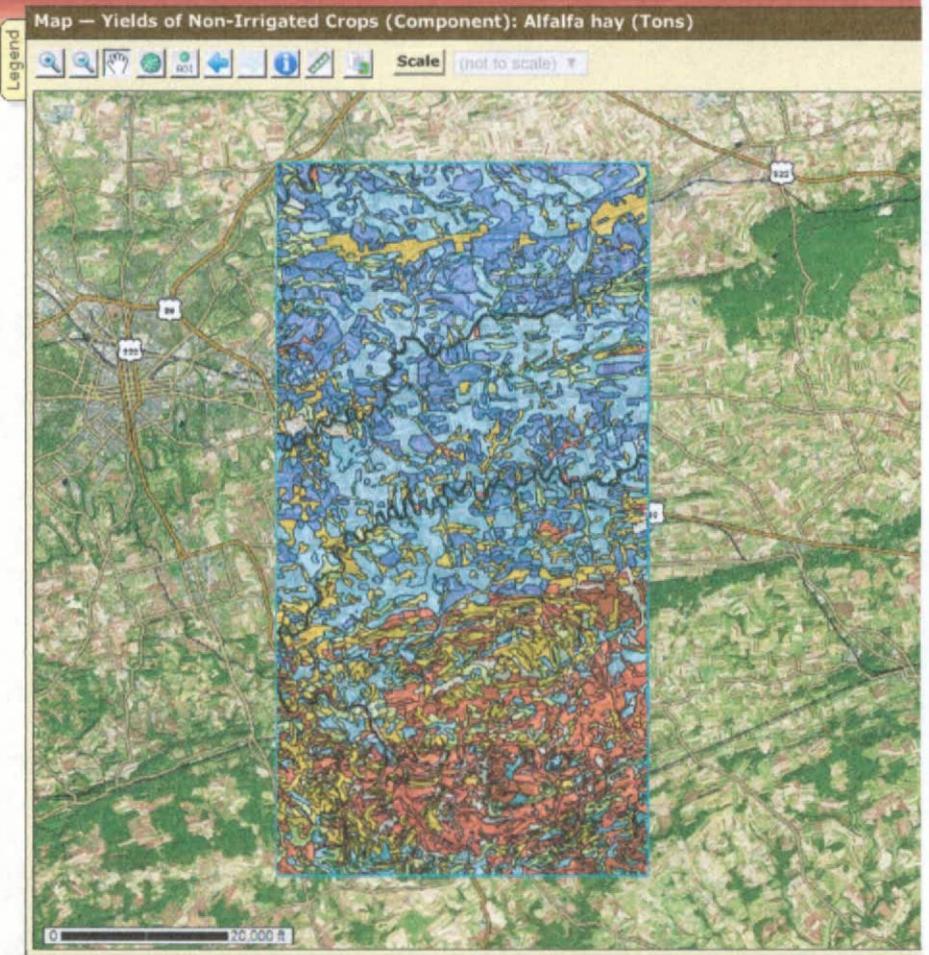
Crop: Alfalfa hay Tons

Advanced Options

View Description View Rating

Yields of Non-Irrigated Crops (Map Unit)

- Waste Management
- Water Management



Tables — Yields of Non-Irrigated Crops (Component): Alfalfa hay (Tons) — Summary By Map Unit

Summary by Map Unit — Lancaster County, Pennsylvania (PA071)

Summary by Map Unit — Lancaster County, Pennsylvania (PA071)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent AOI
Ba	Baile silt loam	0.61	470.0	0.5
BdA	Bedington silt loam, 0 to 3 percent slopes	4.81	12.6	0.0
BdB	Bedington silt loam, 3 to 8 percent slopes	4.30	171.3	0.2
BdC	Bedington silt loam, 8 to 15 percent slopes	3.88	170.1	0.2
BeD	Bedington channery silt loam, 15 to 25 percent slopes	3.80	116.6	0.1
CbA	Chester silt loam, 0 to 3 percent slopes	0.53	775.4	0.9
CbB	Chester silt loam, 3 to 8 percent slopes	0.70	6,335.1	7.3
CbC	Chester silt loam, 8 to 15 percent slopes	0.65	1,151.7	1.3
CkA	Clarksburg silt loam, 0 to 5 percent slopes	3.33	3,364.8	3.9
CIB	Clymer very stony loam, 3 to 8 percent slopes	0.50	172.6	0.2
CID	Clymer very stony loam, 8 to 25 percent slopes	0.46	127.0	0.1
Totals for Area of Interest			87,062.7	100.0

Summary by Map Unit — Lancaster County, Pennsylvania (PA071)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent AOI
CIF	Clymer very stony loam, 25 to 50 percent slopes	0.47	13.2	0.0
Cm	Comus silt loam	4.95	130.1	0.1
CnA	Conestoga silt loam, 0 to 3 percent slopes	5.34	629.2	0.7
CnB	Conestoga silt loam, 3 to 8 percent slopes	5.34	2,732.8	3.1
CnC	Conestoga silt loam, 8 to 15 percent slopes	4.91	48.8	0.1
DbA	Duffield silt loam, 0 to 3 percent slopes	5.22	5,748.9	6.6
DbB	Duffield silt loam, 3 to 8 percent slopes	4.96	15,002.2	17.2
EcA	Elk silt loam, 0 to 3 percent slopes	0.65	16.3	0.0
EcB	Elk silt loam, 3 to 8 percent slopes	0.59	97.3	0.1
GbB	Glenelg silt loam, 3 to 8 percent slopes	4.68	2,219.8	2.5
GbC	Glenelg silt loam, 8 to 15 percent slopes	4.33	2,988.1	3.4
GbD	Glenelg silt loam, 15 to 25 percent slopes	4.40	637.9	0.7
GdB	Glenville silt loam, 3 to 8 percent slopes		3,087.9	3.5
HaA	Hagerstown silt loam, 0 to 3 percent slopes	5.46	1,682.8	1.9
HaB	Hagerstown silt loam, 3 to 8 percent slopes	5.83	5,592.0	6.4
HbC	Hagerstown silty clay loam, 8 to 15 percent slopes	4.48	1,565.3	1.8
HbD	Hagerstown silty clay loam, 15 to 30 percent slopes	4.03	174.9	0.2
Hc	Hagerstown-Urban land complex	3.45	1,418.3	1.6
HfA	Hollinger silt loam, 0 to 3 percent slopes	4.45	18.7	0.0
HfB	Hollinger silt loam, 3 to 8 percent slopes	4.45	206.6	0.2
HfC	Hollinger silt loam, 8 to 15 percent slopes	4.00	254.3	0.3
HfD	Hollinger silt loam, 15 to 25 percent slopes	3.55	61.7	0.1
Hg	Holly silt loam	0.20	241.6	0.3
LaB	Lansdale loam, 3 to 8 percent slopes	4.84	501.8	0.6
LaC	Lansdale loam, 8 to 15 percent slopes	3.92	65.8	0.1
LaD	Lansdale loam, 15 to 25 percent slopes	3.46	24.2	0.0
LbB	Lehigh silt loam, 3 to 8 percent slopes	3.28	32.5	0.0
LbC	Lehigh silt loam, 8 to 15 percent slopes	2.76	23.6	0.0
LdA	Letort silt loam, 0 to 3 percent slopes	4.90	636.9	0.7
LdB	Letort silt loam, 3 to 8 percent slopes	4.90	7,891.5	9.1
LdC	Letort silt loam, 8 to 15 percent slopes	4.45	1,240.1	1.4
Lg	Linden silt loam	4.37	64.0	0.1
Ln	Lindside silt loam	3.88	2,097.6	2.4
MaB	Manor silt loam, 3 to 8 percent slopes	3.54	2,081.5	2.4
MaC	Manor silt loam, 8 to 15 percent slopes	3.15	2,819.8	3.2
MaD	Manor silt loam, 15 to 25 percent slopes	3.15	3,130.5	3.6
MbB	Manor very stony silt loam, 3 to 8 percent slopes	0.41	251.7	0.3
MbD	Manor very stony silt loam, 8 to 25 percent slopes	0.45	568.8	0.7
MbF	Manor very stony silt loam, 25 to 60 percent slopes	0.51	1,557.9	1.8
Nc	Newark silt loam		1,066.8	1.2
Nd	Newark silt loam, schist substratum	0.09	1,271.4	1.5
Ne	Nolin silt loam	4.87	801.7	0.9
Pa	Penlaw silt loam	3.27	413.7	0.5
Totals for Area of Interest			87,062.7	100.0

Summary by Map Unit — Lancaster County, Pennsylvania (PA071)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent AOI
PeC	Pequea silt loam, 8 to 15 percent slopes	3.52	992.7	1.1
PeD	Pequea silt loam, 15 to 25 percent slopes	3.03	1,215.6	1.4
PeE	Pequea silt loam, 25 to 50 percent slopes	0.33	87.7	0.1
Qu	Pits, quarry		148.7	0.2
Uc	Urban land		250.2	0.3
W	Water		389.9	0.4
Totals for Area of Interest			87,062.7	100.0

Description — Yields of Non-Irrigated Crops (Component)

These are the estimated average yields per acre that can be expected of selected nonirrigated crops under high level of management. In any given year, yields may be higher or lower than those indicated because of variations in rainfall and other climatic factors.

In the database, some states maintain crop yield data by individual map unit component and others maintain the data at the map unit level. Attributes are included in this application for both, although only one or the other is likely to contain data for any given geographic area. This attribute uses data maintained at the map unit component level.

The yields are actually recorded as three separate values in the database. A low value and a high value indicate the range for the soil component. A "representative" value indicates the expected value for the component. For these yields, only the representative value is used.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby areas and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper plant and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for the selected crop. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

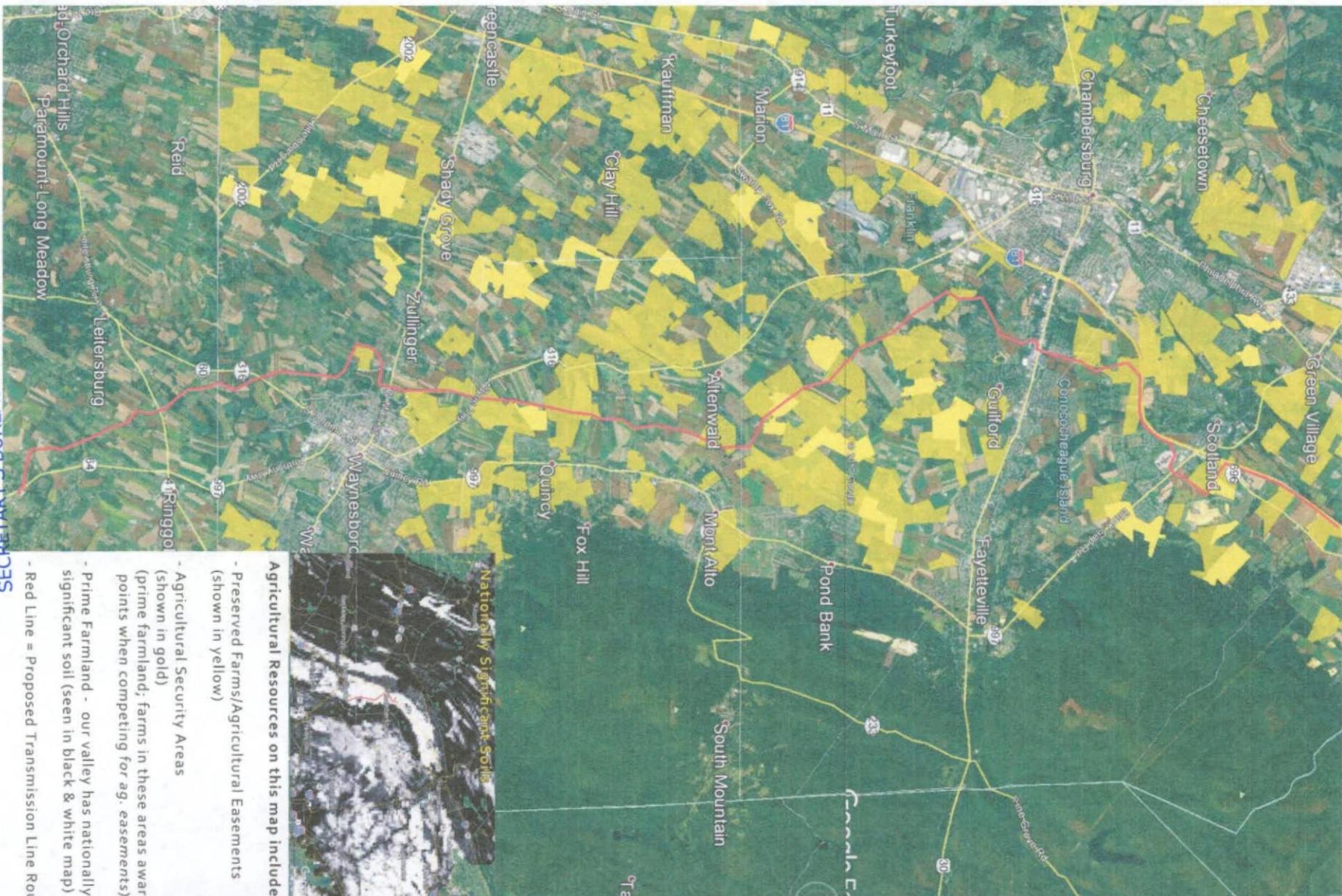
Rating Options — Yields of Non-Irrigated Crops (Component): Alfalfa hay (Tons)

Crop: Alfalfa hay
Yield Units: Tons
Aggregation Method: Weighted Average
Component Percent Cutoff: None Specified
Tie-break Rule: Higher
Interpret Nulls as Zero: Yes

A-2017-2640200
5/22/18
1 P.M.
Chambersburg Joo

Independence Energy Connection (west) - Final Proposed Route
Franklin County, PA & Washington County, MD
Project identified & implemented by PJM, Transource (American Electric + Great Plains Energy),
& Dominion Energy

Agricultural Resources Affected
by the PJM/Transource Project



- Agricultural Resources on this map include
- Preserved Farms/Agricultural Easements (shown in yellow)
 - Agricultural Security Areas (shown in gold)
(prime farmland; farms in these areas award points when competing for ag. easements)
 - Prime Farmland - our valley has nationally significant soil (seen in black & white map)
- Red Line = Proposed Transmission Line Route

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SECRETARY'S BUREAU

PUC Exhibit

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Chambersburg
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FRANKLIN COUNTY VISITORS BUREAU INC.

37 South Main, Suite 100
Chambersburg, PA 17201
717-552-2977 866.646.8060

PA PUBLIC UTILITY COMMISSION
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1 P.M.

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October 5, 2017

Transource
P.O. Box 573
Harrisburg, PA 17108-0573

RE: Pennsylvania Portion Transource Independence Energy Connection Project

Dear Transource Representatives,

By mission, the Franklin County Visitors Bureau promotes, advertises, and educates the public on the natural, historic, recreational, cultural, and hospitality value of Franklin County. The natural, agricultural, and recreational components of Franklin County tourism play a major role in the \$326.7 million in traveler spending annually. The Pennsylvania portion of the Transource Independence Energy Connection Project concerns the Franklin County Visitors Bureau because it will have long-term effects on view shed and agriculture, which will negatively impact tourism and our local economy.

Franklin County is known for its peaches and apples at roadside stands, farmers' markets, and orchards as well as ice cream from creameries and dairies. The county is second in Pennsylvania production of all three of these ag products—apples, peaches, and milk. Franklin County's total cash revenue, across all agricultural products, is \$414 million, ranking fourth among 67 counties in PA.

Pairing tourism and agriculture yields a variety of visitor experiences. Agriculture festivals with pumpkin-picking, hayrides, apple-desserts, and corn mazes are the backbone of Franklin County's fall tourism market. Beginning the last week of September and running through the first weekend of November, each weekend features multiple festivals, mazes, and pumpkin patches. Along with the family fun, the county supports locally sourced wines and ciders. In the Commonwealth, tourism and agriculture are consistently top-ranking industries. Together, the industries bring over \$740 million to Franklin County.

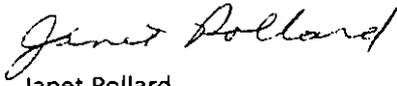
Franklin County is prime hiking country and includes land in four state parks and two state forests. In fact, the two oldest parks in Pennsylvania—Mont Alto and Caledonia—are part of the county. Both the Appalachian Trail and the Tuscarora Trail cross the county. The open space of Franklin County is an unrennewable asset, vital to the stability of the tourism industry. Central to the natural and recreational tourism is Franklin County's view shed. It is beautiful vistas of state forestland, farmland, and four-seasons of recreation.

Preserving the view shed and the desirability of recreational and natural space enjoyment are essential elements of the Franklin County tourism industry. The 2015 PA tourism study, completed by Longwood Associates corroborates visitors' attraction to scenic outdoor spaces and freshly grown foods. The study ranks scenic drives as #2 and farmers markets/farmstands as #3 in a percentage ranking of "Things Seen and Experienced in PA." Visiting a state or national park ranked #5. These three categories comprised 39% of a total 100% of visitor identified things to do.

The Pennsylvania portion of the Transource Independence Energy Connection Project impacts view shed and agriculture. The Franklin County view shed is at the center of the scenic Cumberland Valley. The proposed chain of metal, high-voltage power line towers is distinctly uninviting and counter to what attracts visitors to the beauty of the county. In addition, the impacts of power lines on dairy production could negatively impact Franklin County's considerable milk production and impact agricultural tourism.

The specific cost in a present-day action for Transource to develop the electric transmission line project is identified as a \$320 million investment, per the June 2017 Fact Sheet of the Transource Independence Energy Connection Project. Siting the Transource Independence Energy Connection Project through virgin view shed and agricultural production land will have a long-term and far-reaching negative impact on the entire tourism industry of Franklin County for perpetuity.

Sincerely,



Janet Pollard
Executive Director

cc: Pennsylvania Utility Commission
County of Franklin and County Municipalities
Franklin County State Representatives and Senators
Franklin County Area Development Corporation
Hagerstown-Washington County Visitors Bureau
South Mountain Partnership
Franklin County Chambers of Commerce



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF AGRICULTURE

PUC Ex.

35(d)

A-2017-2440200

5/22/18

Chambersburg

for

1 P.M.

November 29, 2017

Ms. Laurie Spears
Transource®
Senior Siting Specialist
8500 Smith Mill Road
New Albany, OH 43054

Dear Ms. Spears:

RE: The Independent Energy Connection project and potential impacts to farmland.

It has come to my attention that Transource® is developing the Independence Energy Connection (IEC) project, to include a new overhead electric transmission project. I understand that the project will be built in two segments, East and West, and will include land primarily in Franklin and York counties in Pennsylvania, land that is some of the richest and most productive agricultural land in the world. This is of concern to me as agriculture is a leading economic endeavor in Pennsylvania. The agriculture industry contributes over \$75 billion to our economy statewide. Products grown and processed here provide food for our nation, support jobs and a diverse economy.

In addition, Pennsylvania leads the nation in farmland preservation through the purchase of permanent agricultural conservation easements and both York and Franklin counties have two of the most robust programs in the state with more than 58,807 acres preserved. In fact, over \$107 million in public funds have been invested in preserving farmland in these two counties alone.

Farm owners have given up the right to use their properties for other uses in support of maintaining a thriving agricultural industry in this region. Many are now questioning how the Independent Energy Connection project will impact their farming operations and why there are no additional protections or considerations for preserved farms. Since farmland is open and cleared it is often viewed as path of least resistance by comparison to other impacted resources. However, it cannot be overstated that farmland is valuable to both the farm owners whose livelihood depends on it and to the taxpayers who have made significant investments in preserving it.

In summary, as Transource® prepares to file with the Public Utility Commission later this year, I urge you to be mindful of agriculture and particularly preserved farms in planning and siting of this project. Please feel free to contact Doug Wolfgang, Director of Farmland Preservation, at (717) 783-3167 if there are questions or you would like further discussion.

Sincerely,

Russell C. Redding
Secretary

PA PUBLIC UTILITY COMMISSION
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SOUTH MOUNTAIN PARTNERSHIP



CULTURAL LANDSCAPE ASSESSMENT
FOR
MICHAX STATE FOREST
ADAMS, CUMBERLAND, FRANKLIN, & YORK COUNTIES, PENNSYLVANIA

PUC Ex 35(e)

DECEMBER 2017

A - 2017-2640200
Chambersburg

5/22/18
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1 P.M.



**Cover photograph: Pine Grove Furnace and Michaux State Forest seen from the south, circa late 1930s.
From the personal collection of Michael J. Rish, used with permission.**

CULTURAL LANDSCAPE ASSESSMENT
FOR
MICHAUX STATE FOREST
Adams, Franklin, Cumberland and York Counties,
Pennsylvania

Prepared for the
Appalachian Trail Conservancy
Boiling Springs, Pennsylvania

On behalf of the
South Mountain Partnership

Prepared by
Heritage Strategies, LLC
In association with
Liz Sargent HLA
Margaret B. Parker, Historian
James Ciarrocca, GIS Specialist

December 2017

This Cultural Landscape Assessment has been funded through a grant from the Keystone Historic Preservation Project Grant Program of the Pennsylvania Historical and Museum Commission with matching funds from the Department of Conservation and Natural Resources through its Conservation Landscape Initiative.

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ACKNOWLEDGEMENTS

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CHAPTER 1 – INTRODUCTION AND OVERVIEW

The South Mountain Partnership is a group of organizations and individuals working to protect, preserve, and enhance the landscape and communities in the South Mountain region of Pennsylvania. The Partnership was formed in 2006 as a Cultural Landscape Initiative of the Pennsylvania Department of Conservation and Natural Resources (DCNR) with the goal of identifying values at a landscape scale, revitalizing communities, and engaging local and regional partners in conservation and economic development. The South Mountain Partnership has over fifty member organizations representing government agencies, municipalities, non-profit organizations, academic institutions, and private businesses.

In 2012, partners met to consider development of a South Mountain Cultural Heritage Project documenting historic and cultural resources at a landscape level throughout the region. This Cultural Landscape Assessment for the Michaux State Forest is a pilot project and initial phase of the larger South Mountain Cultural Heritage Plan focusing on a distinctive core landscape of the Partnership.

The Cultural Landscape Assessment for Michaux State Forest establishes a context and provides a model for the documentation and assessment of other South Mountain landscapes. It outlines historic contexts for the landscape; describes how the landscape has changed over time; identifies important landscapes and associated types of building, site, and landscape resources; and considers appropriate future management and treatment and recommendations. While intended to focus specifically on Michaux State Forest, the Cultural Landscape Assessment addresses the landscape of South Mountain as a whole and its relationship to the broader landscapes of the adjacent valleys.

Chapter 1 provides an introduction to the landscape assessment, outlining its background, context, and purpose. It focuses on portraying the mission and programs associated with the South Mountain Partnership and Michaux State Forest. A separate condensed version of the Cultural Landscape Assessment has been prepared to serve as an executive summary for the study.

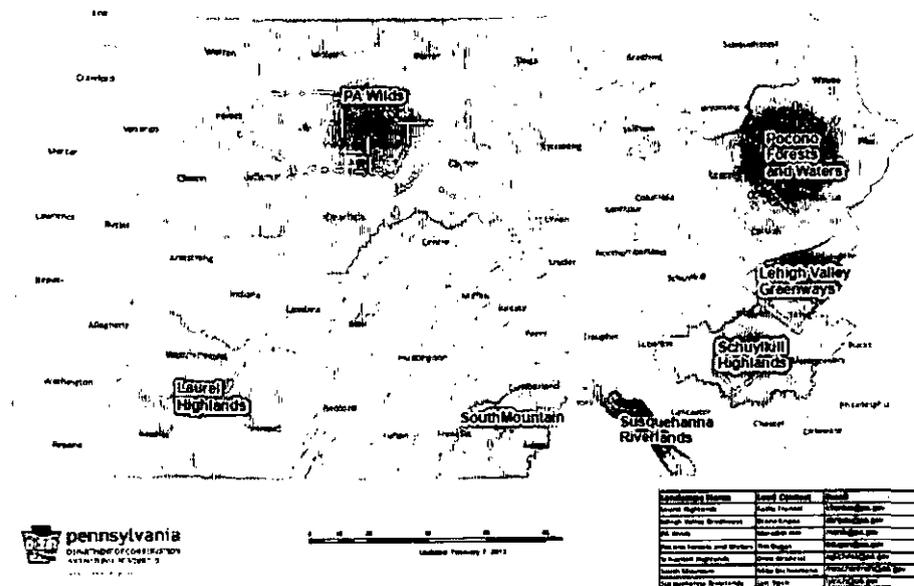
THE SOUTH MOUNTAIN PARTNERSHIP

The South Mountain Partnership is a regional, landscape-scale conservation initiative in south-central Pennsylvania created to guide efforts within the South Mountain Conservation Landscape, one of seven Conservation Landscapes identified by the Pennsylvania Department of Conservation and Natural Resources (DCNR) throughout the state.

Conservation Landscape Initiative

DCNR's Conservation Landscape Initiative was established in 2006 as an approach to large-scale landscape conservation while promoting sustainable economic development. The initiative is focused on areas of high conservation importance, including several areas of high forest fragmentation pressure, such as the Poconos region, South Mountain in the south-central region, and the Schuylkill Highlands in urbanizing southeast (DCNR 2010:4A-16).

Conservation Landscapes



DCNR's seven Conservation Landscape Initiatives (DCNR)

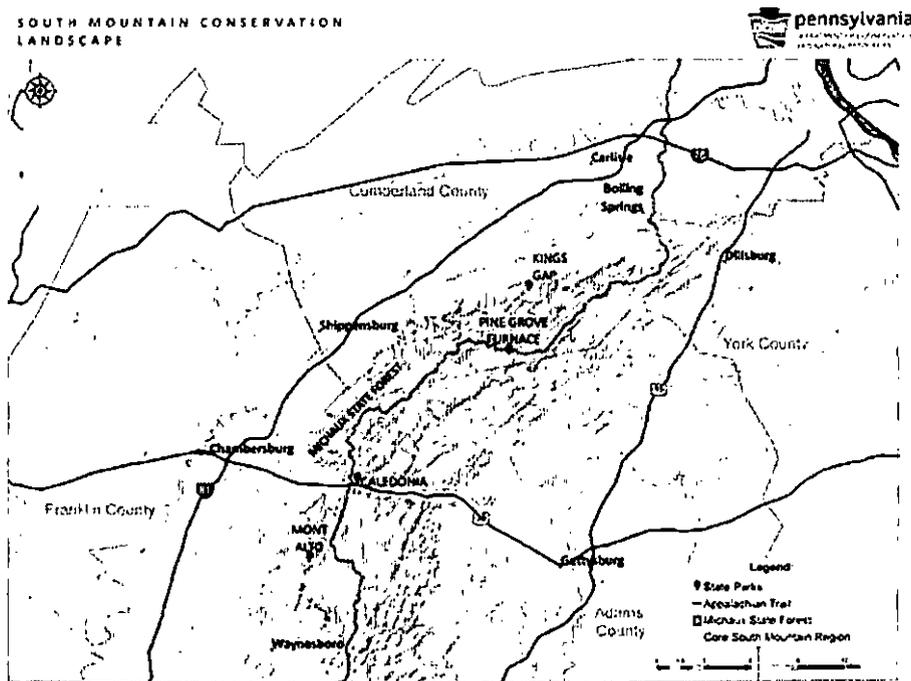
Seven regional areas have been identified by DCNR for participation in the program based upon conditions and their capacity to work together to drive strategic investments and actions around sustainability, conservation, community revitalization, and recreational projects. Each of these seven regional areas has strong natural assets, local readiness and buy-in, and the potential for significant state-level investment and support around conservation interests. Criteria for designation of the Conservation Landscapes included:

- **Presence of DCNR-owned lands** – large blocks of state parks and forests provide the foundation for the landscapes and a staffing presence that can help guide the initiative;

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- **Sense of Place** – regions with a sense of place and identity, in many cases based on landscape character not political boundaries;
- **Readiness** – made more ready by opportunity or threats, such as changes in the economic base, depopulation, or development and sprawl;
- **Engagement** – civic engagement potential to bring people of the region together to identify common values and concerns;
- **Strategic Investments** – the potential for state agencies and other statewide and regional partners to provide high-level leadership, financial support, and technical assistance to local partners in building better communities, conserving identified values, and investing in sustainable economic development.

Partnerships with state agencies and other statewide organizations are important in framing and incentivizing the Conservation Landscape process. Through regional collaboration, state, regional, and local organizations have worked together in each designated Conservation Landscape on a variety of strategic and regionally appropriate projects and initiatives. The Conservation Landscape approach is value-driven, place-based, and locally grounded (DCNR 2015).



Core area of the South Mountain Conservation Landscape in green (DCNR)

The South Mountain Conservation Landscape

The South Mountain Conservation Landscape encompasses the geographic area of South Mountain and adjacent valley lands in Franklin, Cumberland, York, and Adams Counties. A core area for the South Mountain Conservation Landscape has been identified that extends from beyond Interstate 81 on the west to beyond Route 15 on the east and includes approximately 1100 square miles. However, the Partnership's vision and activities embrace the entirety of the Cumberland

Valley on the west and the rolling agricultural lowlands to the east within the four counties.

The South Mountain Conservation Landscape encourages and promotes appreciation and protection of the intrinsic geographic, geologic, biologic, natural, agricultural, and heritage resources and values of the South Mountain landscape and the important connections these have to the quality of life and place in the region (DCNR 2015).

The South Mountain Partnership

The South Mountain Partnership was organized in 2006 in conjunction with DCNR's Conservation Landscape Initiative and operates as a public-private partnership under the leadership of DCNR and the Appalachian Trail Conservancy, which serves as the Partnership's administrative entity. Over the past nine years, the South Mountain Partnership has grown into an active alliance of citizens, businesses, non-profits, academic institutions, and local, state and federal government agencies and officials collaborating to envision and secure a sustainable future for the South Mountain landscape. The Partnership has over fifty member organizations.

The Partnership's mission involves:

Conserving Landscape Resources to enrich the quality of life and sense of place of the South Mountain region's citizens and communities.

The Partnership identifies three primary goals:

- **Conservation of Landscape Resources** – conserving and stewarding the natural, cultural, recreational, and agricultural resources that make the South Mountain landscape unique;
- **Promotion of Landscape Resources** – elevating public awareness of the natural, cultural, recreational, and agricultural resources;
- **Connections Across the Landscape** – creating a community of collaboration amongst a critical mass of public agencies, non-profit and community organizations, businesses, and citizens (SMP 2015).

Programs undertaken by the Partnership are illustrative of the means through which it has worked toward these goals since its inception. Programs include:

- Regular Partnership meetings (generally three per year) at which partners meet, exchange information, learn about initiatives, and discuss issues;
- The South Mountain Speakers Series, three to four presentations or talks each year for partners and the general public on topics of regional interest;
- Mini-Grants awarded competitively to local partners for initiatives advancing and implementing the Partnership's strategic concepts, including community engagement;
- Go Local for Health, an ongoing series of workshops on regional community wellness, agriculture, local foods, nutrition, recreation, and fitness;

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- South Mountain Science Forum, a proposed series of annual workshops bringing researchers and managers together around practical issues on the conservation and stewardship of the region's ecological and natural systems;
- Additional workshops and forums on topics of regional interest such as trails, land use, balancing nature and commerce, and reinventing the commercial corridor;
- Special projects such as this Cultural Landscape Assessment.

Where possible, partners collaborate on land conservation and protection, facilitating the acquisition or protection of threatened open space, promoting agricultural and landscape conservation initiatives, and facilitating community planning.

Fermata Report

In 2008, when the South Mountain Conservation Landscape was in its early stages and striving to coalesce around common ground in the interest of conserving the region, DCNR engaged Fermata, Inc. to assess opportunities and challenges present within the South Mountain landscape.

Fermata, a firm specializing in experiential tourism and outdoor recreation as sustainable approaches to community revitalization, prepared strategic assessments for five of DCNR's designated Conservation Landscapes. Their overview for South Mountain culminated in a report released in December of 2009: the *South Mountain Conservation Landscape Initiative Strategic Plan*, which was instrumental in shaping the strategic vision of the Partnership (SMP 2015).

The report recognizes the two primary thematic strengths of the South Mountain landscape – **agriculture** and **conservation** – and outlines ideas for a strategic approach to interpretation, engagement, protection, and enhancement.

The approach to agriculture highlights the unique landscape character of both the South Mountain Fruit Belt on the east side of the mountain and the Cumberland Valley on the west. The **South Mountain Fruit Belt** is recognized as unique and important—perhaps even world class. Its agricultural landscape has a distinctive sense of place and provides the public with scenic views, cultural attractions, recreational opportunities, nutritious fresh foods, wildlife habitat, and employment (Fermata 2009).

The report emphasizes the need for engaging both the agricultural industry and general public in a unified vision for the Fruit Belt that supports and strengthens its agricultural network. Ensuring that the Fruit Belt remains economically viable is central to any strategic approach.

The vision and approach must support both the industrial scale entities that are its economic base and small local initiatives that embody its character and provide the best opportunities for public engagement. Using experiential tourism to strengthen the local agricultural economy and underscore the need for unified community and landscape planning is at the core of a variety of coordinated supporting initiatives that may be employed.

Similarly, agriculture in the **Cumberland Valley** has unique attributes that can be specifically branded, promoted, and strengthened. Its remarkable landscape, many enterprises, appealing communities, and tourism infrastructure are clear strengths. *Opportunities for creating a fresh foods strategy through agri-tourism, culinary tourism, and emphasis of historic cultural identity are highlighted.*

The Fermata report strongly recommends using South Mountain's central role in the *early development of conservation and forestry in Pennsylvania* as the basis for experiential tourism and recreation around the theme **Cradle of Conservation**. The theme would introduce the story of conservation in America and directly connect that story to the South Mountain landscape.

Public engagement through these three thematic subjects – South Mountain Fruit Belt, Cumberland Valley, and Cradle of Conservation – is the key to the report's perspective. Development of a coordinated interpretive plan for experiential tourism using a heritage area and scenic byway landscape approach is recommended. Proactive and creative use of web-based technologies and media is emphasized, with the South Mountain Conservation Landscape initiative as its organizing entity. A variety of specific ideas and recommendations are suggested, demonstrating both a way of thinking and a series of concrete actions that might be taken.

The Fermata insights have provided the basis for development and evolution of the Partnership's ongoing programming. Specifically, the Speakers Series reflects the direction and impact of the historic Michaux Lecture that gave impetus to conservation in Pennsylvania. The various recommendations on agricultural heritage are reflected in programming such as the Go Local for Health forums and various projects supported through the Mini-Grant program. The Partnership's South Mountain Science Forum is inspired by several ideas and approaches included in the report, such as the development of a sustainability center within the Conservation Landscape.

Ideas and approaches outlined in the Fermata report will continue to inspire new ideas and initiatives and can be expected to form the nucleus around which a coordinated approach to interpretation, recreation, agriculture, and community and landscape conservation will coalesce. This approach is recognized in the organization and recommendations of this cultural landscape assessment.

2011-2016 Strategic Plan

The South Mountain Partnership acted regionally through working groups to consider a range of topical issues between 2006 to 2010 as part of the initial phase implementing the vision that had been articulated. This process was further informed in 2009 by the Fermata Report. In 2010, a concise Strategic Plan was developed to outline goals, strategies, objectives, and actions to guide activities from 2011 through 2016. Over the past five years, the Partnership has been active in implementing elements of this Strategic Plan.

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The Strategic Plan lists three goals, essentially the same as those listed above from the Partnership's recently updated website:

- Preserve, sustain, and develop critical natural and cultural assets of the region;
- Promote the region's natural and cultural assets and develop them into a major regional economic force;
- Build a critical mass of public and private organizations, non-profits, and citizens to support the Partnership's mission.

Based upon these goals, four strategies were outlined for their implementation:

- A. **Inventory and prioritize** natural and cultural assets so that they can be preserved, promoted, and developed;
- B. **Promote and advocate** for natural and heritage assets, agriculture, and recreation and showcase organizations and businesses that actively support them;
- C. **Collaborate with key communities** to preserve, promote, and develop natural and heritage assets, agriculture, and recreation;
- D. **Sustain current partners and develop program and activities** that will attract a broad demographic.

Under Strategy A on the inventory and prioritization of assets, objectives and actions are outlined for the prioritization of natural lands, agricultural lands, trail projects, and heritage resources. Lead and contributing partners are identified for each activity. Information is to be compiled into a regional atlas to provide a comprehensive view of its landscape assets.

Under Strategy B, promote and advocate, seven objectives and actions are outlined, including development of a regional outdoors festival, promotional pieces for agriculture and recreation, and development of a geo-trail. Additional objectives include branding the Fruit Belt, further developing the annual Speakers Series, and supporting businesses and non-profits related to recreation, agriculture, heritage, and natural assets.

In Strategy C, collaborating with communities, the Partnership works with interested and "ready" municipalities beginning with those adjacent to South Mountain in providing training and resources, seeking funding for land conservation, development of greenways and trails, and preservation and promotion of heritage assets. Place-based educational opportunities are stressed related to schools and teacher development.

Strategy D, sustaining partners and developing programs, emphasizes maintaining an organizational structure for the Partnership while implementing its Mini-Grant program, continuing partner development through quarterly meetings and outreach, and developing and implementing a communications strategy.

This Cultural Landscape Assessment for Michaux State Forest and its surrounding landscape relates primarily to Strategy A in the inventory and prioritization of

natural and cultural resources. However, it supports elements of the other strategies by defining the historic contexts through which the regional landscape is appreciated and viewed in a holistic and integrated manner. The plan assists in identifying themes and resources for interpretation, promotion, and protection.

South Mountain Cultural Heritage Plan

Following completion of the Strategic Plan, assigned partners considered how best to implement objectives related to Strategy A, the inventory and prioritization of natural and cultural assets. The result was development of a South Mountain Cultural Heritage Plan integrating the identification and appreciation of natural and cultural resources using a cultural landscape approach.

The South Mountain Cultural Heritage Plan is a long-range project to develop a *regional plan for defining, interpreting, and sharing the South Mountain landscape's major historical contexts or narratives*. Using a cultural landscape approach, the project is intended to:

- Greatly increasing the knowledge and understanding of the presence and importance of the cultural resources at a landscape level in the region;
- A repository for regional cultural resource information;
- Ensuring the preservation of important cultural resources while providing public access to them;
- Providing information about the cultural resources for tourism and education materials by telling the stories about the region's history;
- Streamlining the environmental review and permitting processes for proposed development and redevelopment in the region by providing *information about the presence, absence, and significance of cultural resources at a landscape level*, in lieu of project-by-project and site-by-site inventoring and analysis;
- Enhancing local and regional land use planning and zoning to protect and enhance important cultural resources and their settings;
- Enhancing Michaux State Forest cultural resource management through the identification of important cultural resources at the landscape level.

There is currently no standardized or coordinated Geographic Information System (GIS) mapping and database for all of the cultural resources of the region, and many historically-significant sites are not mapped on the PHMC's Cultural Resources GIS (CRGIS). Cultural resource maps are on a variety of paper and electronic media. Historic documents and artifacts are stored in a variety of local facilities without appropriate cataloging, access security and environmental controls.

While the Partnership has identified potential landscape-level historic and cultural themes in its work over the years, there are currently few historical contexts written to describe those themes at a landscape level into which the region's historic and cultural resources can be better appreciated. Currently, cultural resources are usually described on a site-specific basis with limited *context information*.

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Similarly, there is currently no comprehensive cultural resource management plan for the region, nor is there an organization with the responsibility to develop or implement one. The Heritage Area Program administered by the DCNR does not include the South Mountain region. There are no cultural heritage planning initiatives proposed or underway in the other Conservation Landscape Initiative areas. Proposed land development activities affecting known cultural resources are required to comply with the State History Code and the National Historic Preservation Act when state and federal funds or permits are required. Mitigation of impacts on cultural resources is typically required on a project-by-project, site-by-site basis and is usually not programmatic.

The identification of pre-historic and historic resources for the development of municipal comprehensive plans is not typically a robust effort. Secondary sources are typically used to identify well-known cultural resources and limited field research has been done to identify unknown resources.

Cultural Heritage Plan Approach and Pilot Project

The concept for the South Mountain Cultural Heritage Plan is to develop a regional plan that includes the type of content commonly found in cultural landscape assessments and heritage area management action plans, but expands on that model by incorporating the characteristics of a comprehensive plan. More specifically, the plan should define the area's historical contexts and set goals to interpret and promote its associated resources. It should also recommend land management and revitalization strategies designed to maintain and enhance the distinctive character of the region's communities and rural landscapes.

Cultural landscapes are distinctive landscapes that have been shaped by humans through the conscious or unconscious manipulation of natural systems. Cultural landscapes offer a lens through which to consider how people have adapted to and changed the landscapes upon which they live, and thus can reflect social and cultural attitudes of individuals and communities; a comprehensive understanding of such landscapes can be central to understanding how we have gotten to where we are today, both physically on the landscape and culturally within communities.

The Cultural Landscape Assessment for the Michaux State Forest is a pilot project and initial phase of the larger South Mountain Cultural Heritage Plan, focusing on a distinctive core landscape within the region. It will establish a context and provide a model for the documentation and assessment of other South Mountain landscapes. The project will assist State Forest staff in identifying and managing historic cultural landscape features and resources locally for public benefit and will guide communities and other partners in the recognition and treatment of cultural landscapes regionally.

MICHAUX STATE FOREST

Michaux State Forest is located along the ridgelines of the South Mountains in south-central Pennsylvania and is the central focus of the South Mountain Conservation Landscape. Encompassing approximately 85,500 acres, the state forest straddles the boundaries of Adams and York Counties on the east and Franklin and Cumberland Counties on the west. It is the heart of the Bureau of Forestry's Forest District 1 and is the largest area of conserved lands within the region.

Michaux State Forest is significant as Pennsylvania's first state forest. It is central to the early twentieth century story of conservation and forestry in Pennsylvania and is often referred to as the "cradle of forestry," although it shares this title with the Asheville region of North Carolina. The state forest is named in honor of Andre Michaux and his son, Francois Andre Michaux, the well-known French botanists (DCNR 2009).

Today, Michaux State Forest is a vital part of the regional landscape, providing recreational opportunities to the residents of surrounding communities and managing and preserving important natural resources. The state forest is a key member of the South Mountain Partnership.

DCNR and the Bureau of Forestry

Article 1, Section 27 of the Pennsylvania Constitution states: "*Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people.*"

Pennsylvania Department of Conservation and Natural Resources (DCNR) is the lead agency in state government responsible for fulfilling this aspect of the Pennsylvania Constitution. Consequently, its mission states: *We conserve and sustain Pennsylvania's natural resources for present and future generations' use and enjoyment.*

DCNR is charged with maintaining and preserving Pennsylvania's 120 state parks; managing 2.2 million acres of state forest land; providing information on Pennsylvania's ecological and geologic resources; and establishing community conservation partnerships with grants and technical assistance to benefit rivers, trails, greenways, local parks and recreation, regional heritage parks, open space and natural areas (DCNR 2015 Fact Sheet).

In addition to four administrative and support entities, DCNR works through four programmatic bureaus responsible for managing resources and conducting a wide range of conservation, recreation, and education programs:

The **Bureau of State Parks** operates, maintains, and manages Pennsylvania's 120 state parks and 30,000 acres of park lands, providing outdoor recreation programs, nature interpretation, and environmental education activities for residents of the Commonwealth.

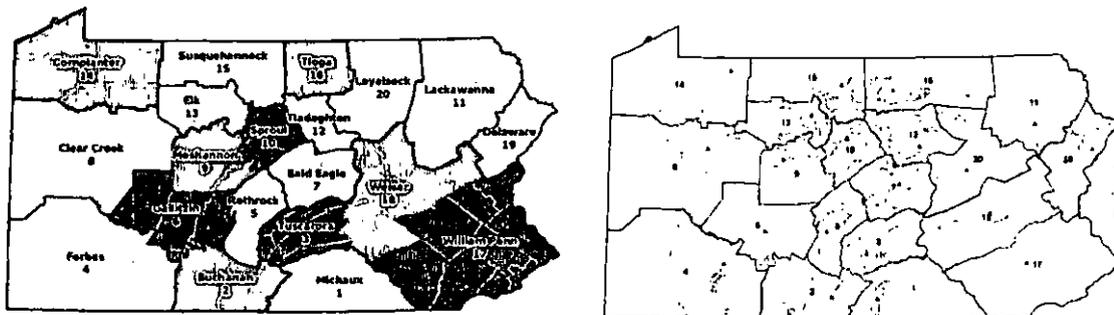
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The **Bureau of State Forests** manages Pennsylvania's state forest system and works to ensure the long-term health, viability and productivity of the Commonwealth's forests and ecosystems.

The **Bureau of Recreation & Conservation** provides technical and financial assistance for community parks, trails, recreational facilities, and regional programs in partnership with county and local governments; land trusts; and greenway, trail, river, and heritage organizations. This bureau manages DCNR's Conservation Landscape Initiative.

The **Bureau of Topographic and Geologic Survey** serves the citizens of Pennsylvania by collecting, preserving, and disseminating impartial information on the Commonwealth's geology, geologic resources, and topography to promote understanding, wise use, and conservation of Pennsylvania's lands and natural resources (DCNR 2015 Fact Sheet).

Michaux State Forest is part of DCNR's Bureau of Forestry and is headquarters and the primary resource within Forest District 1 (one of twenty state forest districts) which encompasses York and Adams Counties and eastern portions of Franklin and Cumberland Counties.

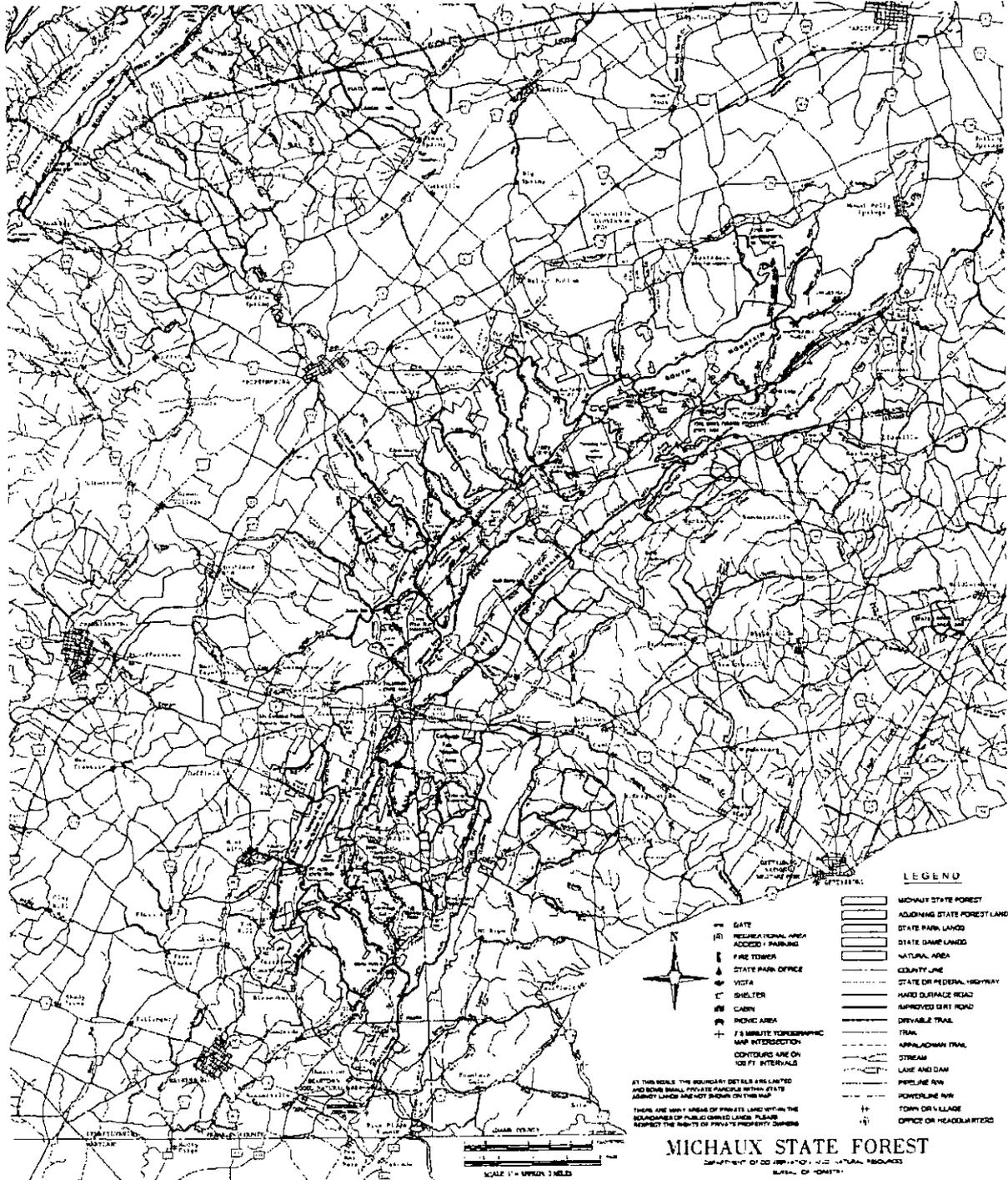


Pennsylvania's State Forest Districts (left) and State Forests (right) (DCNR)

The mission of the Bureau of Forestry is to ensure the long-term health, viability and productivity of the Commonwealth's forests and to conserve native wild plants.

The Bureau of Forestry fulfills this mission by:

- Managing state forests under sound ecosystem management, to retain their wild character and maintain biological diversity while providing pure water, opportunities for low-density recreation, habitats for forest plants and animals, sustained yields of quality timber, and environmentally sound utilization of mineral resources;
- Protecting forestlands, public and private, from damage and/or destruction by fires, insects, diseases and other agents;
- Promoting forestry and the knowledge of forestry by advising and assisting other government agencies, communities, landowners, forest industry, and the general public in the wise stewardship and utilization of forest resources;
- Protecting and managing native wild flora resources by determining status, classifying, and conserving native wild plants (DCNR 1995:32).



Official Public Use Map for Michaux State Forest



Roads and trails within Michaux State Forest (placeholder for roads/trails map)

Roughly parallel north-south roads follow the ridge tops and valleys of the state forest's landforms. Intersecting east-west crossroads follow mostly valleys and hollows that cut through the ridges. The state forest has a hierarchy of **roads and trails** that are managed for various uses, most of which were once used for logging. They include:

- Hard surface roads for public automobile travel;
- Improved dirt roads for sightseeing and forest automobile access;
- Drivable trails for off-road vehicles;
- Administrative roads for staff access and non-motorized recreational uses;
- Trails for hiking, horseback riding, and some recreational motorized uses;

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- Special trails for hiking that have received special designation, most prominently the nationally designated Appalachian Trail that follows a north-south course through the state forest (DCNR 2009).

Water is probably the most important single resource within Michaux State Forest. The need for a safe water supply was a primary reason that the state legislature was convinced to preserve the forest in the early twentieth century. Today, several adjacent communities still obtain all or part of their water supply from within forest lands. Until recently there have been four impoundments, five wells, and seven developed springs within Michaux providing water to local residents on the mountain and in the adjacent valleys below (DCNR 2009).

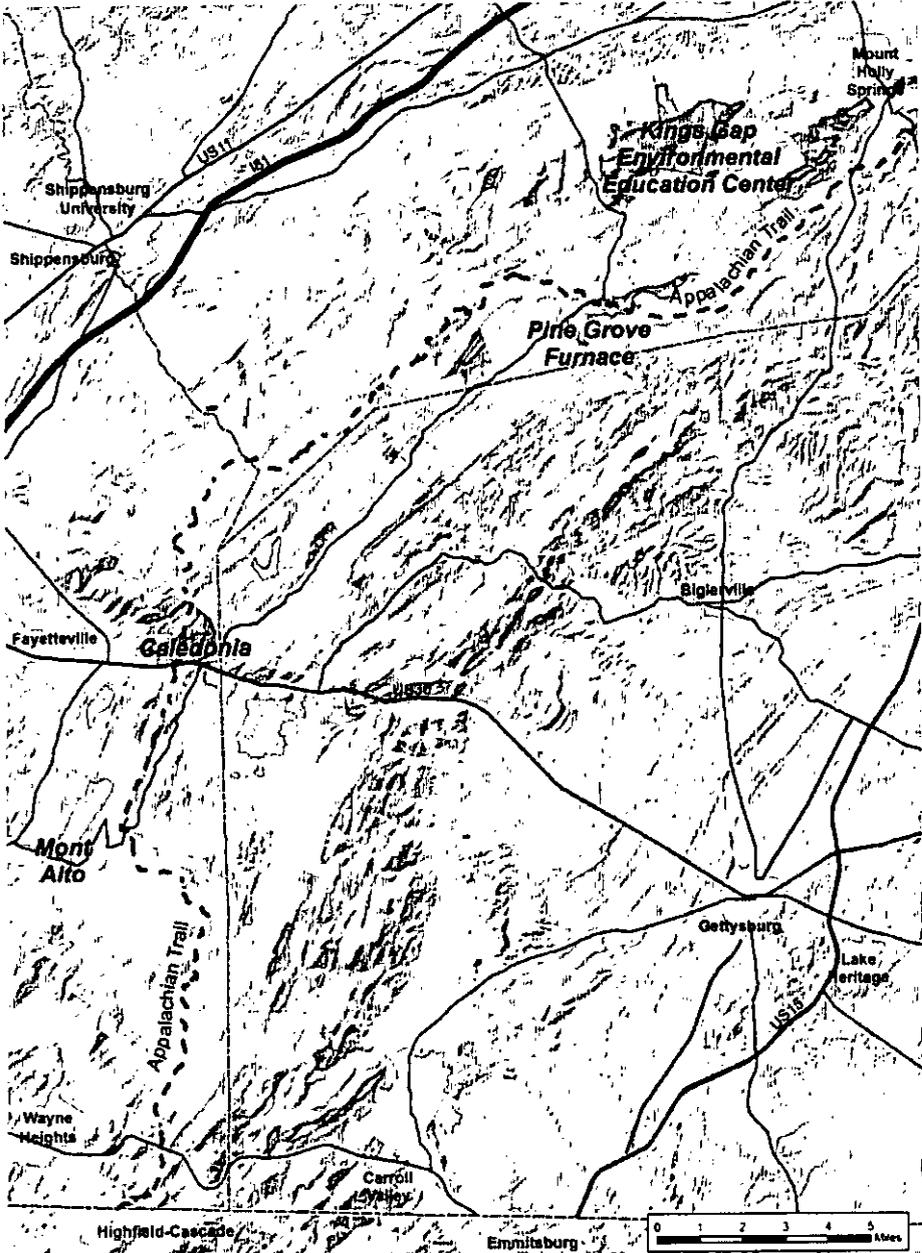
County surveys created over the past twenty years through the Pennsylvania **Natural Heritage Program** have identified a number of important ecological plant communities and locations within Michaux State Forest that warrant special notice and protection. These are discussed further in Chapter 2, and all are included in the state forest's management and protection program.

Several of these have been designated **Natural Areas**, a special management designation used by the Bureau of Forestry to protect unique or unusual biological, geological, scenic, and historic features. Natural areas are left alone to be managed by nature, and human intervention is limited. They provide places for scientific observation, protect special plant and animal communities, and conserve outstanding examples of natural beauty. Four designated Natural Areas are located within Michaux State Forest:

- **Meeting of the Pines Natural Area** – A 611-acre Natural Area located adjacent to the Mont Alto campus featuring five species of native pines growing together;
- **Carbaugh Run Natural Area** – A 780-acre area established to protect several unique archeological sites where Native Americans quarried stone and produced projectile points;
- **Mt. Cydonia Ponds Natural Area** – A 183-acre area on the lower western slopes established to protect the numerous seasonal ponds scattered throughout the area that provide critical breeding habitat for certain reptiles and amphibians;
- **Beartown Woods Natural Area** – A 27-acre area that is a relic northern hardwood forest type found in northern Pennsylvania, New York, and New England (DCNR 2009).

Special Wildlife Management Areas are another designation used for areas where improved habitat can be created to benefit threatened species. Michaux State Forest established and manages forty-three herbaceous wildlife openings across the forest as Special Wildlife Management Areas to provide improved brood-rearing habitat for wild turkey, whose population has severely declined here. Current efforts involve rejuvenating these areas to a diverse mix of native grass, wildflower, shrub, and tree species that provide year-round food and cover for game and non-game species (DCNR 2015 Management Activities).

Michaux State Forest is adjacent to four state parks with which it shares significant resources and has a close working relationship. They include Caledonia State Park, Pine Grove Furnace State park, Mont Alto State Park, and Kings Gap Environmental Education and Training Center.



Michaux State Forest in its regional landscape context

Programming

As a productive working forest, Michaux State Forest provides timber resources to the local economy while managing for ecosystem health and the natural character of the forest. Harvesting of **timber** in Michaux State Forest brings in about \$1 million per year in saw-timber and pulpwood sales to the private sector (DCNR 2009).

Timber sale contracts are normally executed with a two-year timeframe to complete the harvest. The 2015 work plan for Michaux lists nine active timber sales, five approved sales, and five tentative sales in progress (DCNR 2015 Management Activities).

Michaux State Forest provides a variety of active outdoor **recreational opportunities** for the general public and is the venue for a number of yearly events. The state park's recreational attraction is enhanced by the presence of four state parks, Mont Alto, Caledonia, Pine Grove Furnace, and Kings Gap, within or adjacent to it and the recreational programming they provide.

Michaux is one a few state forests in Pennsylvania experiencing extreme recreation use pressures, primarily due to its proximity to surrounding populations. However, the state forest receives very limited resources in support of the varied and important recreational opportunities the forest provides to residents of the surrounding communities and visitors.

Recreational opportunities include:

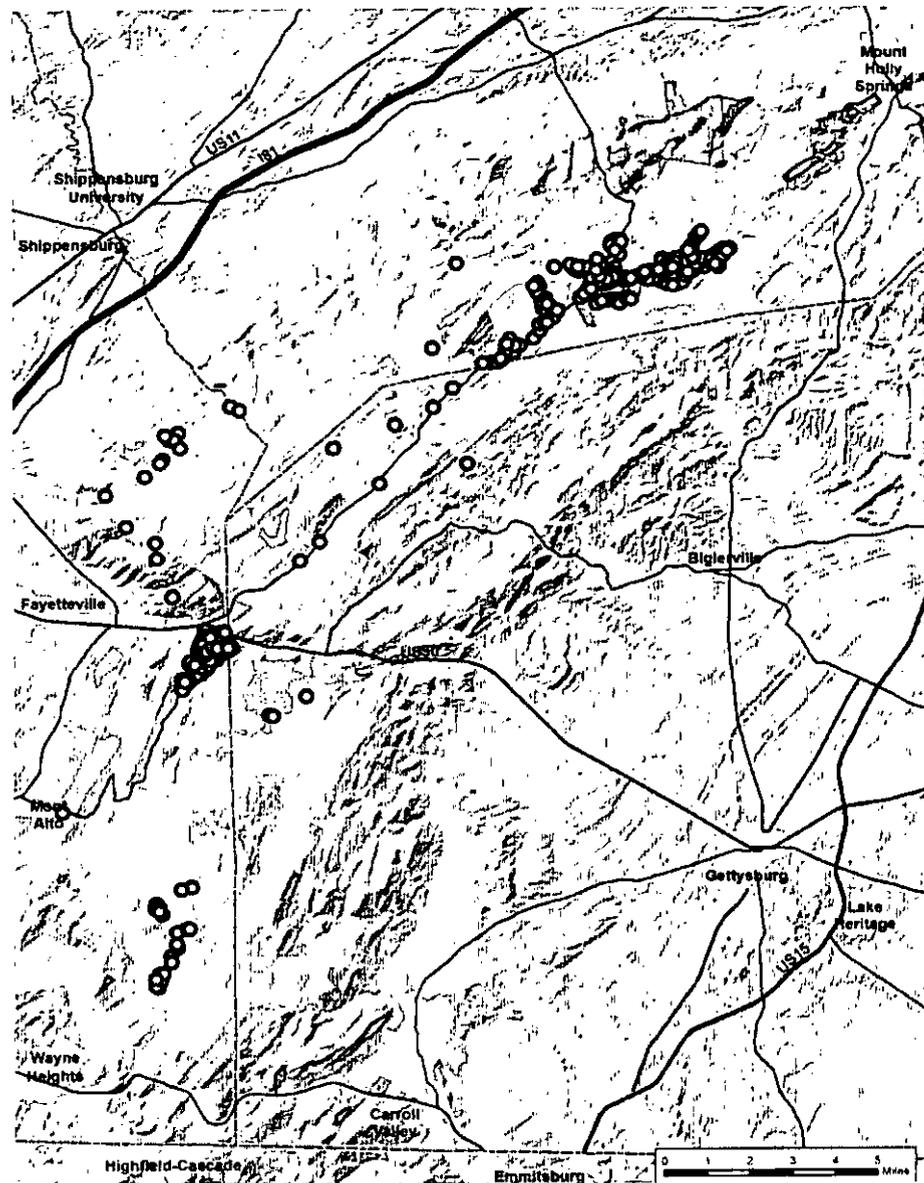
- Scenic or pleasure driving;
- Hiking;
- Picnicking;
- Camping;
- Fishing and boating;
- Hunting;
- Horseback riding;
- Cross-county skiing and snowshoeing;
- Mountain biking;
- Motorized trails (ATV and snowmobile).

Recreational use of Michaux State Forest is its most visible activity. Its economic impact on the local area approaches that provided by the forest's timber and water resources. Michaux State Forest and the state parks located within it provide a full range of recreational opportunities, including an eighteen-hole golf course managed by Caledonia State Park. Scenic driving is the single largest use of state forests; for many this is the sole purpose of their visit to state forest lands. Michaux has about 300 miles of trails, many of which are not blazed and follow the course of abandoned logging roads. Activities such as ATV riding, horseback riding, mountain biking, rock climbing, and primitive camping are becoming increasingly popular. (DCNR 2009; DCNR 2003:230).

Because of Michaux State Forest's striking character and its location in south-central Pennsylvania both as a prominent regional feature and within driving

distance of the major metropolitan areas of Philadelphia, Baltimore, and Washington, the state forest is heavily used as a recreational destination. Heavy recreational use places stress on the landscape and its resources and taxes the state forest's staff capabilities. Overuse can cause significant damage, such as graffiti at popular and accessible locations and erosion along motorized trails.

Michaux State Forest is also a popular location for **events**, many of which are large annual events sponsored by outside organizations. Occurring from April through October, they include running events, mountain biking events, horseback rides, treks, reenactments, and a motorcycle race. The 2015 list of management activities for Michaux includes 16 large events and is incomplete.



Leased sites with privately owned cabins within the state forest

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Public outreach and **engagement** is an important part of the state forest's responsibilities. State forest staff stays in touch with local partners, participates in local programs, and provides information at public and partner meetings on an ongoing basis. Informational meetings for the general public are conducted on issues within the state forest as well.

The state forest conducts trail work **volunteer** days approximately four times a year. State forest habitat tours are also provided about four times a year. The tours are designed to provide an overview of state forest goals and activities and provide both the general public and various stakeholder groups better understanding of the social and ecological goals that drive the state forest's management priorities and activities (DCNR 2015 Management Activities).

Finally, Michaux State Forest is host to over 400 **leased campsites** spread throughout the forest along primary roads. Private owners holding these leases have been permitted to build cabins, many of which have grown into full-scale residences over the years. The leases generally involve small parcels of land, usually about one-quarter-acre in size, with leases that are renewable for 10-year terms. Many leases have been handed down within families, generation to generation. In most cases existing leases may be transferred to new owners, provided the new lessees are Pennsylvania residents. Their use as permanent residences is prohibited.

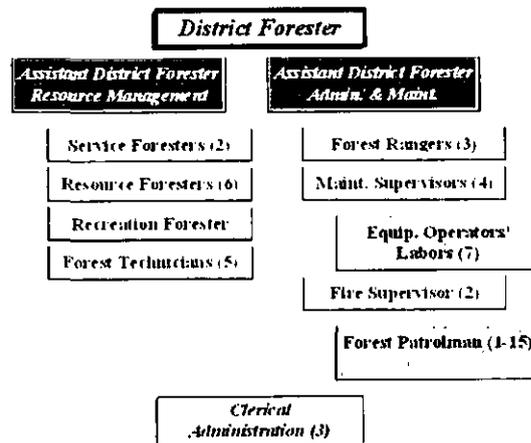
Sites were first leased on state forest lands in the first half of the 1900s, mostly to hunting groups. The introduction of long-term leases allowed owners to construct small cabins for recreational use on their sites. This program was started in 1913 and continued through 1970, when state forest land was closed to additional leased forest campsites.

Management of the forest surrounding leased forest campsites is intended to preserve and enhance their aesthetic value and generally involves maintaining a 150-foot uneven-age management buffer around existing buildings (DCNR 2003:226 & 235).

Forest Management

Michaux State Forest is managed by the staff of Forest District 1 based at its headquarters in the state forest on U.S. Route 30 near its intersection with PA Route 233. The District staff is comprised of thirty full-time staff members and ten seasonal employees.

The staff is led by a District Forester and two Assistant District Foresters. One Assistant District Forester with a crew of six foresters is responsible for forest resource management activities. The other Assistant District Forester oversees staff responsible for physical maintenance. They include two crews, one of which works predominately on road maintenance and the other which works predominately on building maintenance. This staff also includes four rangers, a mechanic, and the Fire Forester. The District has two full-time administrative staff members.



Typical District Office Organization Chart (DCNR 2003:13)

District staff manages Michaux State Forest in accordance with policies, goals, and objectives established in the 2003 State Forest Resource Management Plan and its 2007 Update. The State Plan, in turn, is based upon the Bureau of Forestry's strategic plan, *Penn's Woods - Sustaining Our Forests*.

When the State Plan was completed in 2003, its policies and goals were used to create individual Forest Resource Management Plans for each of the Bureau's twenty state forests. However, most of these individual plans, including the one for Michaux State Forest, were very general in nature and did not provide detailed management guidance with respect to conditions in the landscape. Michaux State Forest will be developing a new, detailed Forest Resource Management Plan in 2016. This Cultural Landscape Assessment is anticipated to serve as the cultural resource component of the 2016 plan.

2003 State Forest Resource Management Plan and 2007 Update

The story of the evolution of forest conservation and management can be told in the history of Michaux State Forest. The management of Pennsylvania's state forests has been an evolving process, beginning with the first purchase of land for Michaux State Forest in 1898. Early management efforts focused on the protection of forest resources and were characterized by restoration, reforestation, and land acquisition.

As Pennsylvania's forests recovered in the early and mid-1900s, management philosophies changed. During World War II, as well as in the post-war era, raw material extraction became the primary management objective with research and management efforts focused on single commodities or species. Intensive development of recreational facilities and timber management began a shift in resource management philosophy during the 1950s and 1960s.

By the 1960s, increasing demands by various forest users, as well as a renewed environmental awareness, resulted in the development of the management concept of multiple-use or multiple-resource management. Although certain resources were considered dominant, there was an effort to include a wider array of considerations into management strategies (DCNR 2003:7).

INTRODUCTION AND OVERVIEW

The initial management plans for state forests, written in 1955, focused primarily on timber management and watershed protection. Major revisions in the plans written in 1970 and 1985 incorporated new knowledge and reflected these changing management philosophies and cultural values.

In 1992, with increasing pressures on state forests, the Bureau of Forestry initiated a fourth generation of planning with a strategic planning effort to address the issue of long-term sustainability. In 1995, this effort resulted in the bureau's strategic plan, *Penn's Woods - Sustaining Our Forests*. As part of the strategic planning effort, the bureau adopted a mission statement, noted earlier in this section, which articulates the bureau's commitment to manage the state forest using the principles of ecosystem management. A new State Forest Resource Management Plan based on principles of ecosystem management was completed in 2003 and updated in 2007 (DCNR 2003:2).

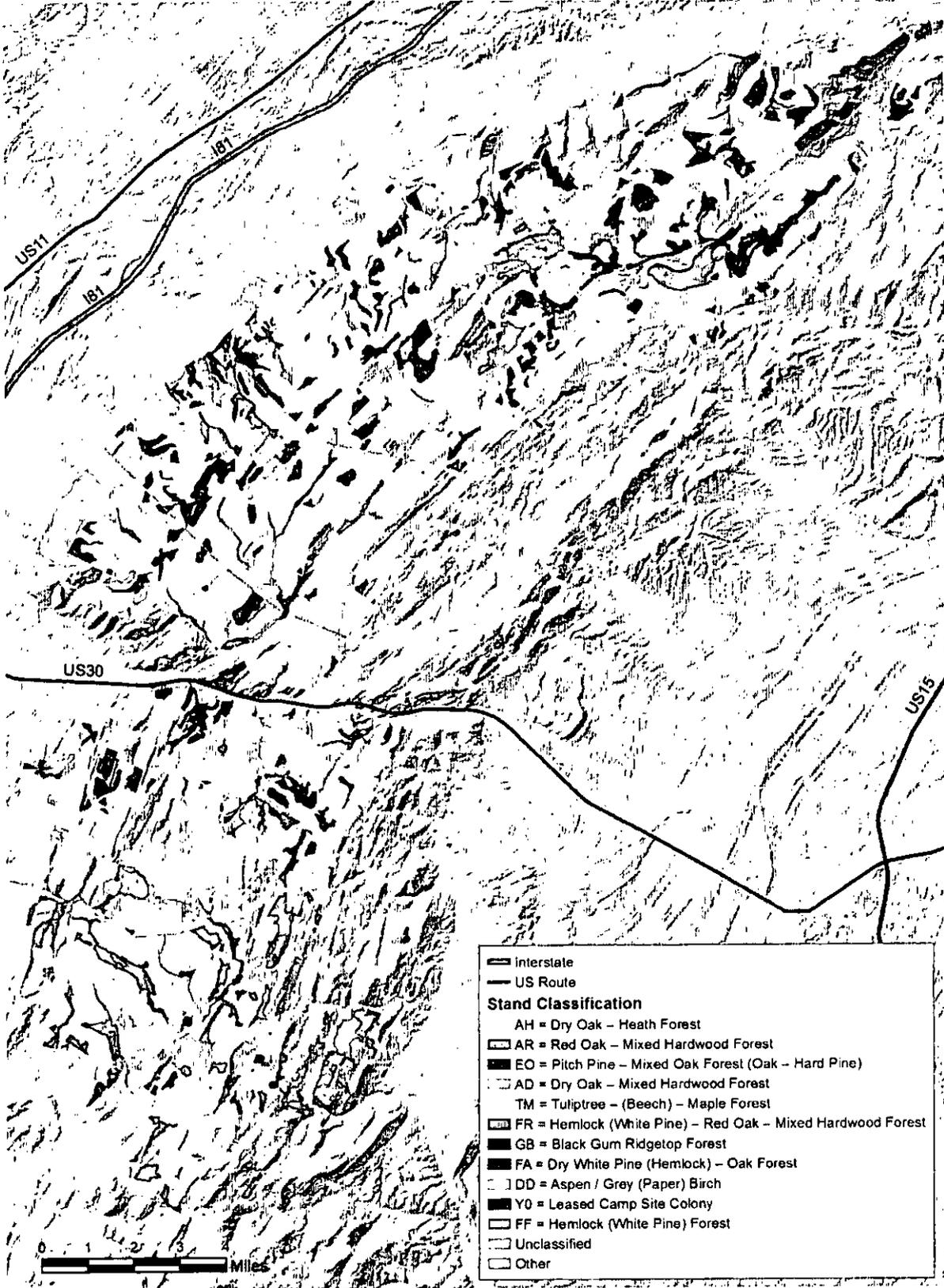
Ecosystem management seeks to conserve the natural patterns and processes of the forest while advancing long-term sustainability. It promotes the conservation of plant and animal communities and the landscapes and habitats that support them. It also accounts for needs and values of people and communities. This results in a holistic, integrated approach to managing forest resources (DCNR 2015 Michaux Website).

As summarized in the Bureau's strategic plan, ecosystem management can simply be defined as an ecological approach to resource management. All aspects of an ecosystem are considered important, and the interdependency of biological and non-biological systems and cycles is recognized as central to this holistic approach. Humans are part of the ecosystem and must be taken into consideration in the development of management strategies. Ecosystem management does not preclude resource use, including timber harvesting, hunting or other recreational activities.

The primary goal of ecosystem management is to keep the complex interdependencies of ecosystems intact and functioning well over long periods of time. The essence of maintaining ecosystem integrity is to retain the health and resilience of systems so they can accommodate short-term stresses and adapt to long-term changes. The key elements include the maintenance of a diversity of plants and animals and the properly functioning nutrient, water and energy cycles (DCNR 1995:8).

The State Forest Resource Management Plan is organized into twelve core sections, plus an Executive Summary and an Overview, to address the resources, uses, and values of the state forests:

1. Communications
2. Ecological Considerations
3. Forest Health Components
4. Geology/Minerals
5. Soil Resources
6. Water Resources
7. Fauna Resources
8. Flora Resources
9. Recreation
10. Silviculture/Timber Management
11. Non-timber Forest Products
12. Infrastructure



Plant Community Types within Michaux State Forest (DCNR data)

INTRODUCTION AND OVERVIEW

Each of the twelve core sections contains an introduction, history, inventory, policy statement, goals, objectives, guidelines or actions, monitoring indicators of sustainability, and critical research needs. This information provides a basic understanding of the directions the Bureau of Forestry intends to follow concerning the management of the state forests. In addition, operating manuals and other documents are referenced and attached via links on the Internet. Together, with its reference materials, the plan provides a comprehensive source of information and guidance on the management issues of the state forest for the Bureau of Forestry and the public (DCNR 2003:3).

The resource management policies and guidelines as outlined in the State Plan and applied to actual landscapes in the state forests will be an evolving process as more is learned about change in ecological systems. Through scientific study and field experience, the policies and management techniques that tend to yield the desired results will likely change over time. Even the idea of what is a desired result may change. Forest management involves a process of continuous observation, experimentation, and learning.

Land Classification and Management Zones

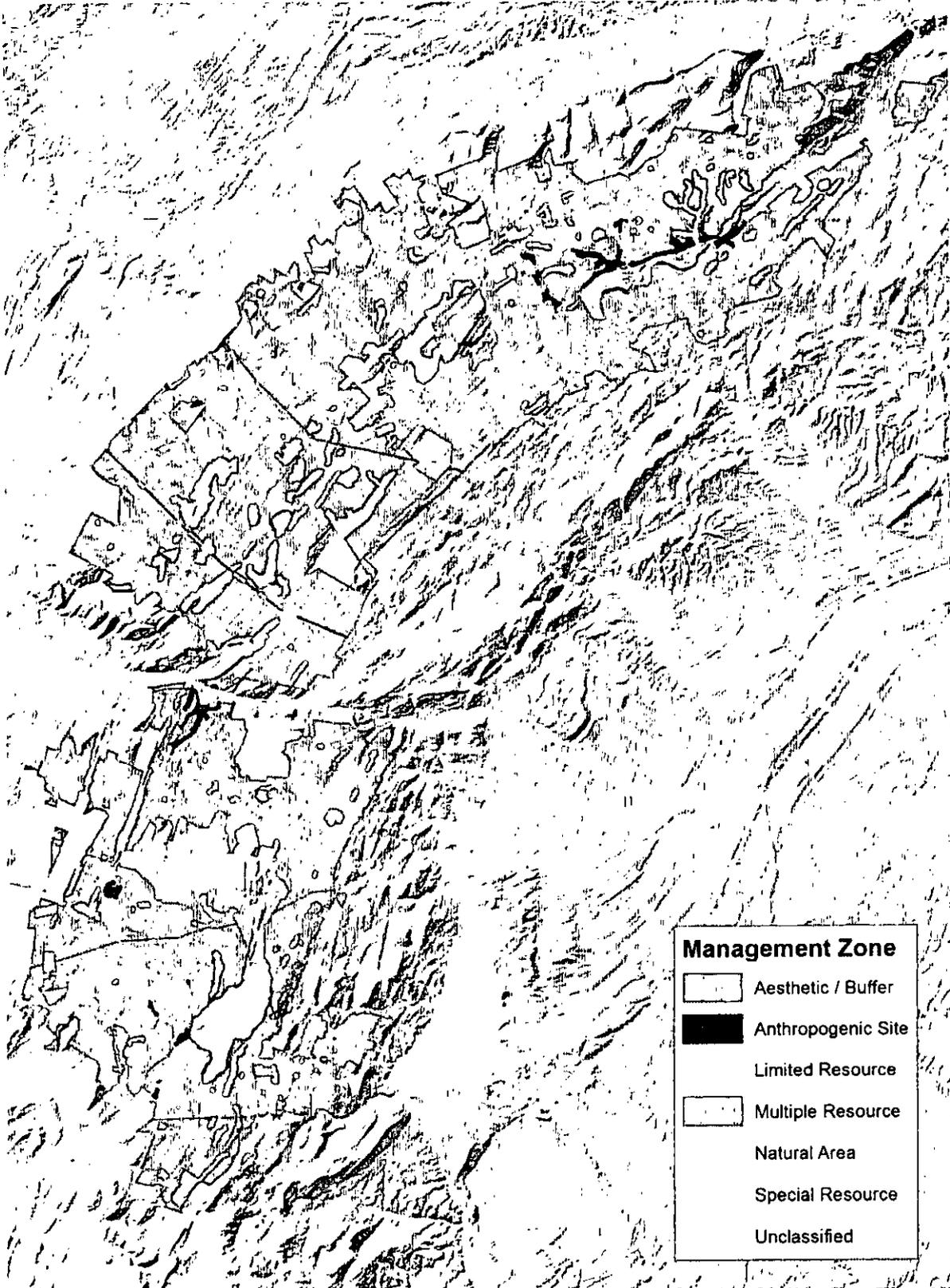
Conducting and maintaining accurate and current forest resource inventories and assessments is critical to implementing ecosystem management and achieving sustainable forestry. As part of its resource planning and management strategy, the Bureau of Forestry conducts and maintains many inventories. These inventories provide information on various levels, including statewide, eco-region, individual state forest, landscape, and finally, plant community type, or forest stand level.

The foundation of the Bureau's inventory and assessment process is the delineation of state forests into land classification and management zones. Through a combination of aerial photo interpretation and field reconnaissance, every acre of state forest has been delineated into land classification units based on the primary features of the dominant vegetation. This delineation is expressed through assignment of a Land Classification and Management Zone code to every acre of state forest land, providing information on:

- Management Zone;
- Plant Community Type;
- Site Class;
- Size and Stocking Class;
- Commercial Availability.



This information was documented on aerial photographs and then digitized to create a GIS coverage of approximately 70,000 land classification units of forest stands, each of which contains a code for the above attributes, along with district, acreage, and compartment number.



Management Zones within Michaux State Forest (DCNR data)

INTRODUCTION AND OVERVIEW

Using this information, various attributes of the forest landscape can be mapped for planning purposes. For example, the land classification unit code MAD24C denotes; M = Multiple Resource Management Zone; AD = Dry Oak-Mixed Hardwood Forest; 2 = Site Class 2; 4 = Size and Stocking Class 4; and C = Commercial land base (DCNR 2003:19-20).

Detailed information on the classification system and code is included in an *Inventory Manual of Procedure for the Fourth State Forest Management Plan*, also known as the Typing Manual (DCNR 1999). This classification system is used by Forest Districts in the management of forest lands on a year-to-year basis. The analysis of this information and the modification of classification units based on the analysis is a continuing process undertaken in ongoing management decisions and the development of State Forest Management Plans for each of the 20 State Forests. The results of some analyses are presented in various chapters of the State Forest Resource Management Plan.

Appendix 1A of the Typing Manual describes the 7 Management Zones currently used in the management of state forests. They include:

AESTHETICS / BUFFER MANAGEMENT ZONE (B) is applied to areas where connectivity, aesthetics and water quality conservation are the primary values. These areas encompass a wide array of lands and are associated with linear features such as roads, trails, and stream corridors or encompass significant features of State Forest lands. Appropriate forest community types within this zone are considered part of the commercial forest land base, however, timber harvest is excluded from certain areas. In addition to roads, trails, stream corridors, this management zone includes areas such as wetlands, park buffers, picnic areas, lease sites, and buffers around designated Natural Areas.

ANTHROPOGENIC SITE MANAGEMENT ZONE (H) applies to man-made structures or facilities such as roads, rights-of-ways, mineral sites, tower sites, leases, forest district buildings, and so forth. The primary value for this zone is human amenities.

LIMITED RESOURCE MANAGEMENT ZONE (L) is applied to areas of State Forest lands where management alternatives are limited due to site quality or topographic constraints. Recreation, aesthetics, water, and soil retention are the primary values. Site or topography are inhibiting factors that restrict or prohibit management practices on these areas (e.g. recreational facilities such as picnic areas, parking lots, restrooms, etc. would typically not be placed on these areas). This zone is typically not part of the commercial forest land base. Timber harvesting is usually not practical.

MULTIPLE RESOURCE MANAGEMENT ZONE (M) is applied to areas of State Forests where timber, water, recreation, fauna, flora and minerals are the major values. This is the majority of lands within the State Forest system and is the least restrictive, most encompassing management zone. Appropriate forest community types within this zone are considered part of the commercial forest land base.

NATURAL AREA MANAGEMENT ZONE (N) is applied to those areas that have been designated or are pending designation by the department as State Forest

Natural Areas. Natural Areas are defined as an area of unique scenic, historic, geologic or ecological value, which is maintained in a natural condition by allowing physical and biological processes to operate, usually without direct human intervention. These areas are set aside to provide locations for scientific observation of natural systems to protect examples of typical and unique plant and animal communities, and to protect outstanding examples of natural interest and beauty. The four designated Natural Areas within Michaux State Forest are listed earlier in the Landscape Context section of this chapter.

SPECIAL RESOURCE MANAGEMENT ZONE (S) is applied to areas of State Forest lands that are managed for specific values such as public plant sanctuaries, special wildlife management areas, certain recreation sites, vistas and reservoirs. These zones have specific management recommendations or plans; recommendations depend on the values that are being recognized. Forest community types within this zone are typically not part of the commercial forest land base, however timber harvesting is allowed if specific management recommendations recognize timber harvesting as an appropriate management tool. Michaux State Forest manages 43 designated Special Resource Management Areas across forest lands to provide improved habitat for the wild turkey population.

WILD AREA MANAGEMENT ZONE (W) is applied to those areas that have been designated or are pending designation by the department as State Forest Wild Areas. A Wild Area is defined as an extensive area which the general public is permitted to see, use and enjoy for such activities as hiking, hunting, fishing and the pursuit of peace and solitude. No development of a permanent nature is permitted so as to retain the undeveloped character of the area and conserve ecological resources. There are no designated Wild Areas within Michaux State Forest (DCNR 1999:13-17).

2010 Pennsylvania Forest Action Plan

The Bureau of Forestry receives funding from the US Forest Service for a variety of programs. As a requirement for receiving this funding, the 2008 Farm Bill required the bureau to undertake a five-year assessment documenting the condition of Pennsylvania's forests across all ownerships and establishing a framework for developing strategies to achieve long-term forest sustainability.

This evaluation and planning is known as the *Pennsylvania Forest Action Plan* (DCNR 2010 Action Plan). In addition to meeting these Federal requirements, the bureau utilized this process as an opportunity to undertake a holistic, long-term evaluation and strategic planning effort for Pennsylvania's forests. The completion of the Farm Bill requirements in June, 2010 was the first step of a longer-term, continuous endeavor, including updating the bureau's strategic plan: *Penn's Woods*, which was developed and adopted in 1995 (DCNR 2010 Assessment:1-1).

The Pennsylvania Forest Action Plan took an in-depth look at the state's forest resources and was organized into two parts. The first part, *The Pennsylvania Statewide Forest Resource Assessment*, was an assessment of current forest conditions and trends. The assessment identified priority issues, delineated important landscapes, and laid a foundation for the development of strategies and actions (DCNR 2010 Assessment). The second part, *Pennsylvania Forest*

INTRODUCTION AND OVERVIEW

Strategies, outlined long-term strategies for addressing identified issues and achieving sustainability in Pennsylvania's forests (DCNR 2010 Strategies).

The assessment of current conditions looked at eighteen detailed indicators of sustainable forestry organized under seven categories or criteria:

Criterion 1: Conservation of Biological Diversity

Criterion 2: Maintenance of Productive Capacity of Forest Ecosystems

Criterion 3: Maintenance of Forest Ecosystem Health and Vitality

Criterion 4: Conservation and Maintenance of Soil and Water Resources

Criterion 5: Maintenance of Forest Contribution to Global Carbon Cycles

Criterion 6: Maintenance and Enhancement of Long-Term Multiple Socioeconomic Benefits to Meet the Needs of Societies

Criterion 7: Legal, Institutional, and Economic Framework for Forest Conservation and Sustainable Management (DCNR 2010 Assessment:3-2)

Analysis of the eighteen indicators of sustainability revealed a cautionary sustainable conclusion, with many causes for concern. Some indicators, such as forest health, forest composition, and fragmentation and parcelization, rated low and represent major cause for concern. Other indicators, including overall amount of forestland, water quality, recreation opportunities, and species of concern, received more favorable ratings.

Overall, the assessment found that Pennsylvania's forests tend toward a sustainable condition, but with some areas of major concern. Based on the sustainability analysis and stakeholder input, eight priority issues were identified:

- Land Use;
- Forest Health;
- Forest Management;
- Climate Change;
- Communicating Natural Resource Values;
- Energy Development;
- Wildland Fire and Public Safety;
- Plant and Animal Habitat.

For each issue, the assessment described the situation, presented and discussed available data, and laid a foundation for developing long-term strategies and actions (DCNR 2010 Assessment:6-1).

Part two of the Action Plan outlined strategies for addressing the identified issues. An additional issue not included in the assessment, Recreation and Quality of Life, was added to the original seven.

For each issue, a short narrative was provided, along with a list of the specific strategies for addressing it. For some strategies an initial list of tasks or actions was provided. The details of each strategy were organized in a matrix format with the following columns:

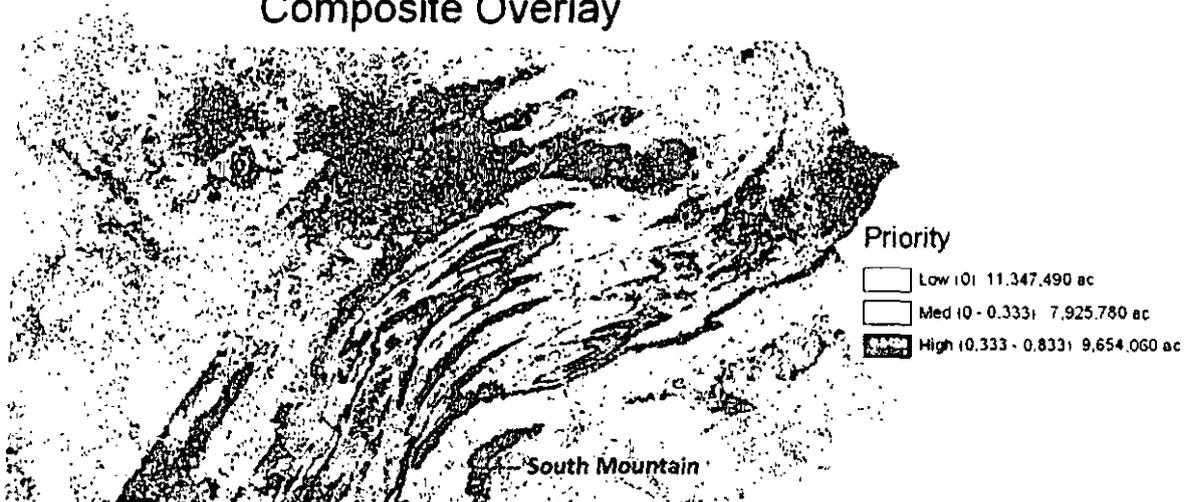
1. Long-term Strategy
2. Priority Landscape Areas
3. Secondary Issues
4. Program Areas that Contribute
5. Key Stakeholders
6. Resources Available/Required
7. Measures of Success
8. Supports National Objective

The strategies were designed to be broad in nature and scope. Some encompass current programs while others suggest the need or potential for future directions. Details for the strategies are being further developed as priorities are determined and implementation is undertaken (DCNR 2010 Strategies:ii).

In assessing the conditions of the Commonwealth's forests, the Pennsylvania Statewide Forest Resource Assessment identified **Priority Landscapes** across the state. To identify the Priority Landscapes, six spotlighted perspectives of landscape were used: (1) Forest Pests, (2) Wildfires, (3) Ecological, (4) Water, (5) Urban, and (6) Working Forests. For each, a priority landscapes map was produced that classifies all 28 million acres of the state into high-medium-low priority categories based on the map's theme. The six priority landscape map results were combined into a composite overlay to show intersecting priority landscape areas (DCNR 2010 Assessment, Appendix 5A:5A-1).

These landscape areas will be utilized as a basis for implementing the strategies developed by the Action Plan. With respect to the six spotlighted perspectives, South Mountain and Michaux State Forest ranked as a Priority Landscape under three: Ecological, Water, and Working Landscape. As a result, South Mountain ranked as a High Priority Landscape in the final composite overlay.

Composite Overlay



Priority Landscapes identified in the Pennsylvania Statewide Forest Resource Assessment (DCNR)

CULTURAL LANDSCAPE ASSESSMENT

This Cultural Landscape Assessment has been undertaken with funding by a Keystone Historic Preservation Project Grant from the Pennsylvania Historical and Museum Commission with additional funding provided by DCNR through the South Mountain Conservation Landscape program under the management of the Appalachian Trail Conservancy.

As noted at the beginning of this chapter, this Cultural Landscape Assessment for the Michaux State Forest is a pilot project and initial phase of the larger South Mountain Cultural Heritage Plan, described previously, focusing on a distinctive core landscape within the region. It will establish a context and provide a model for the documentation and assessment of other South Mountain landscapes. The project will assist State Forest staff in identifying and managing historic cultural landscape features and resources locally for public benefit and will guide communities and other partners in the recognition and treatment of cultural landscapes regionally.

The project has two broad goals:

- To serve as a model for the understanding, assessment, appreciation, and stewardship of historic and cultural resources throughout the South Mountain Conservation Landscape;
- To serve as the historic and cultural component of the management plan for Michaux State Forest.

The significance of a historic property can be judged and explained only when it is evaluated within its historic context. Historic contexts are those patterns or trends in history by which a specific occurrence, property, or site is understood and its meaning (and ultimately its significance) within history or prehistory is made clear. Historians, architectural historians, folklorists, archeologists, and anthropologists use different words to describe this phenomena such as trend, pattern, theme, or cultural affiliation, but ultimately the concept is the same. (NPS 1995/2002: Section V, Understanding Historic Contexts)

Through review of historical background information, resource inventories, and planning documents and through field review of landscapes and resources, this Cultural Landscape Assessment considers the South Mountain landscape's cultural heritage and associated historic resources within a broader context of historical trends to better understand its contribution to national, state, and regional history.

The Cultural Landscape Assessment reviews the surviving physical evidence of cultural activities within several overarching historic contexts and identifies their significance with respect to criteria established by the National Register of Historic Places. Other types of cultural values and associations are also considered where appropriate, such as landscape associations with the history of forestry and conservation and with the historical development of Native American peoples.

Four broad historic contexts are identified and described under which the majority of South Mountain's historic resources developed and its landscape evolved. They include:

- ▣ Mineral Extraction and Industry Context;
- ▣ Forest, Forestry, and Conservation Context;
- ▣ Recreation Context;
- ▣ Impact of Government Context;

The history of each historic context is summarized including national, state, regional, and local significance. Much of the local history is based upon the work of a number of local historians and organizations, who have studied the sites and identified available sources.

Associated historic resources and resource types are identified under each *historic context, sometimes under several distinct categories. Significance, conditions, and issues related to resources are considered. This assessment is not, however, a complete inventory of historic resources either on South Mountain or within Michaux State Forest. Rather, the assessment provides the context for recognizing and identifying resources and suggests the kinds of additional inventory and studies might be undertaken in the future to more fully fill in remaining gaps.*



CHAPTER 2 – THE SOUTH MOUNTAIN LANDSCAPE

The landscape of South Mountain and its surrounding four-county region is unique and is central to Pennsylvania’s historical and cultural development. Rising above its adjacent lowlands, South Mountain’s ridges create a dominating visual presence and historically served as an obstacle to westward movement. Throughout Pennsylvania’s history, from Native American eras to the present, South Mountain has been significant as a source of natural resources.

This dual nature – obstacle to westward movement and source of natural resources – characterizes our relationship with the mountain. The landforms, geology, soils, and waters characteristic of the South Mountain region shaped land use, settlement patterns, and cultural development, creating the south-central Pennsylvania landscape we see today.

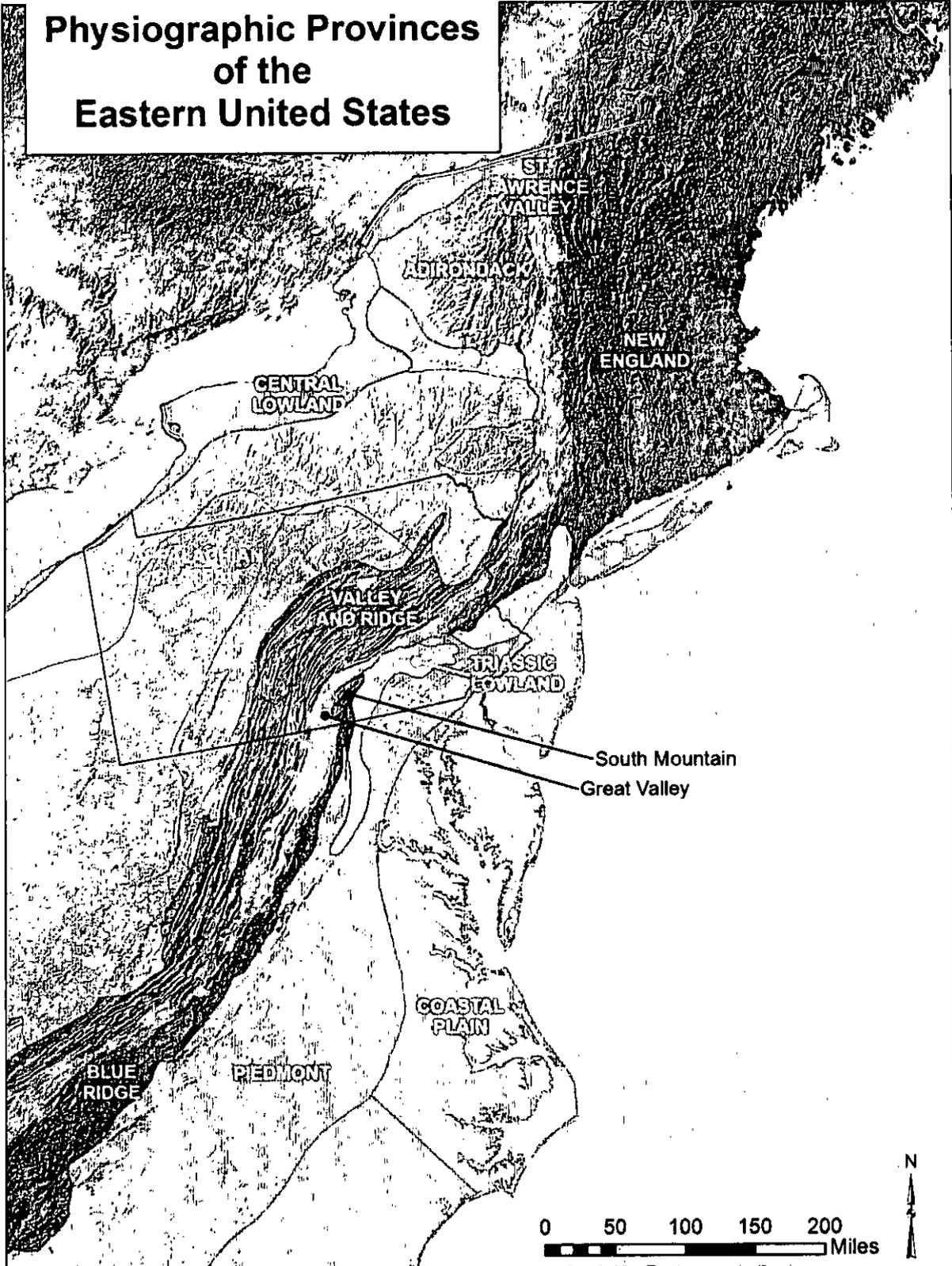
LANDFORMS

The South Mountain Conservation Landscape includes local portions of three vast landforms of national scale and significance.

South Mountain itself is the northern terminus of the great **Blue Ridge Mountains** that extend from northern Georgia through North Carolina and Virginia into Maryland and Pennsylvania. The Blue Ridge Mountains have two general structural components, the broad complex width of the Great Smokey Mountains in North Carolina and the long narrow band of Blue Ridge in Virginia. The Great Smokey Mountains are the highest and most formidable mountains east of the Rockies (Sevon 1991:47; Miller 1995:20).

The Blue Ridge formation extends approximately 70 miles through Maryland and Pennsylvania and is locally known as South Mountain. A complex of ridges and rocky hills, South Mountain begins as a narrow ridge at the Potomac River just east of Harpers Ferry and extends northward, growing wider and higher and joining with the Catoclin Mountains near the Pennsylvania border.

The South Mountain complex is its widest and highest in Pennsylvania in the South Mountain Conservation Landscape. Turning east, the formation plunges into the earth and ends as a series of small rocky hills near Dillsburg. The Pennsylvania portion of the Blue Ridge/South Mountain formation is distinct and different from that in Maryland and Virginia in terms of overall geological structure (Sevon 1991:47; Anthony 2014:1).



Physiographic provinces of the eastern United States

THE SOUTH MOUNTAIN LANDSCAPE

Further north, a similar and related formation reappears as the Reading Prong, a southern extension of the Rambo Mountains in New Jersey, the Hudson Highlands in southeastern New York, and the New England topographic region (Van Diver 1990:15; Miller 1995:20). Between South Mountain and the Reading Prong is a sizable gap, one of the largest breaks in the entire Appalachian mountain barrier and a major avenue heading to the west (Miller 1995:20).

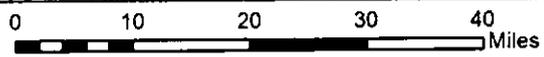
Immediately west of South Mountain and the Blue Ridge formation is the **Great Valley**, a topographically distinct part of Pennsylvania's Ridge and Valley region and its largest and easternmost valley. The Great Valley is part of a trench of continental scale that extends almost without interruption nearly 2000 miles from Quebec to Alabama (Miller 1995:20). The Great Valley portion of this trench stretches from New York to Georgia (Van Diver 1990:14).

In south-central Pennsylvania, the Great Valley is known locally as the Cumberland Valley. To the north, in the middle of Pennsylvania, it is known as the Lebanon Valley and further north as the Lehigh Valley. To the south in Maryland it is known as the Hagerstown Valley, and in Virginia it is the famous Shenandoah Valley.

Regardless of its local names, the Great Valley is known for its fertile limestone soils and was a focus of early European settlement. The valley has also served as an important migration route, a major avenue for emigrants in the 18th and early 19th century from Philadelphia south to North Carolina and west to Kentucky and Tennessee.

To the east of South Mountain are the **Triassic Lowlands**, an area of low rolling topography that blends into the Piedmont region of southeastern Pennsylvania. The Triassic Lowlands of Pennsylvania extend north into New Jersey and New York and south into Maryland. They are disconnected from but associated with similar Triassic formations in Connecticut and Massachusetts, Virginia, and North Carolina (Van Diver 1990:15).

Comprised of red shale, sandstone, and conglomerate, the Triassic region is a rolling plain of reasonably workable soils attractive to agriculture. Intruded into its sedimentary rock formations, however, are areas of volcanic diabase that are resistant to weathering, poor for farming, and form wooded ridges and knobs throughout the landscape.



Rock Type

-  Jurassic Diabase
-  Triassic Shale/Sandstone
-  Ordovician Shale
-  Cambrian/Ordovician Carbonates
-  Cambrian Sandstones
-  Precambrian Metavolcanics

Boundaries

-  South Mountain Landscape
-  Counties

Regional geological formations



GEOLOGICAL FORMATIONS

Similar to its overall landforms, the geology of the South Mountain Conservation Landscape is comprised of three broad categories of rock: the metamorphic rocks of the mountain, the limestone based rocks of the Cumberland Valley, and the shale and sandstone of the Triassic Lowlands.

The Metamorphic Geology of South Mountain

The oldest rocks within the regional landscape are the metamorphic rocks that form the high ridges and hills of South Mountain, the northernmost portion of the Blue Ridge Mountains. These rocks occur in two general formations, the sandstone/quartzite ridges that are the backbone of the mountain topography and the metarhyolite formation that is its east-facing slope.

Precambrian Metavolcanics

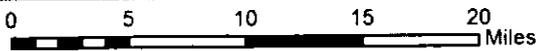
Metarhyolite is a metamorphic volcanic rock that formed as lava flows during a major continental breakup that caused the formation of a major ocean basin more than 600 million years ago in Precambrian time. After the lava flow formed, it was buried and subjected to high temperatures and pressures causing metamorphism and changes to its mineral composition (Way 1986:21).

This formation is also infused with rocks known as metabasalt and greenstone schist which are closely related to the metarhyolite's volcanic history. Together, these rocks are known as the Catocin volcanics. To the south, in Maryland, the more coarsely grained metabasalt, which forms as an intrusive flow in gaps and fractures underground as opposed to surface flow, is more common than the metarhyolite in Pennsylvania (Way 1986:21; Sevon 1991:34).

Metarhyolite is a hard, light grey to purple rock with a very fine, almost glassy grain caused by the rapid cooling of the initial lava. Due to its hardness and chipping characteristics, metarhyolite was used for the making of chipped-stone tools by Native Americans. South Mountain is well known for its pre-historic metarhyolite quarries, a significant historic resource of the area (Carr 2015:115).

Metarhyolite is the predominant rock of South Mountain's eastern slopes and foothills and includes the Buchanan Valley. Its eastern edge is a deep fault line located west of Fairfield, through Cashtown, and east of Bendersville.

Resistant to weathering, the metarhyolite formation is predominantly steep sloped woodland and includes the western edge and upper reaches of the Adams County Fruit Belt. The soils into which it weathers tend to be deep, stony, and well-drained. While about half of South Mountain's metarhyolite formation is too steep and stony for farming, the remaining portion, mostly occurring in long slopes facing southeastward, has been largely cleared and planted with fruit trees (USDA 1967:3).



Rock Type

-  Jurassic Diabase
-  Triassic Shale/Sandstone
-  Ordovician Shale
-  Cambrian/Ordovician Carbonates
-  Cambrian Sandstones
-  Precambrian Metavolcanics

Boundaries

-  Michaux State Forest
-  South Mountain Landscape
-  Counties

Geology

-  Fault
-  Diabase Dike



Geology of Michaux State Forest and the South Mountain Conservation Landscape

Cambrian Sandstone

To the immediate west of the metarhyolite are the metamorphosed sandstone, quartzite, and conglomerate rock formations that form South Mountain's high ridges. Known as the Chilhowee Group, these formations were originally laid as sediments over the Catoclin volcanics in the widening ocean basin of the Catoclin rift (Way 1986:29; Delano 2015). Like the volcanics, they were metamorphosed by intense heat and pressure over time.

Four distinct geologic formations are identified in the Chilhowee Group that together have a sedimentary thickness of approximately 5200 feet. They include the Loudoun, Weverton, Harpers, and Antietam Formations. The Weverton Formation is known for its resistant ledges of conglomerate quartzite, the gravel of which may have derived from the Catoclin volcanics. On South Mountain, the Harpers Formation is represented by a series of white quartzite beds known as the Montalto Member. Only the Montalto Member and the Antietam Formation are reliably dated, due to the presence of fossils which place them in the Lower Cambrian, around 570 million years ago. The other formations are older, Lower Cambrian to Precambrian (Way 1986:29; Sevon 1991:36).

Highly resistant to weathering, these sandstone/quartzite rock formations form a series of high, generally north-south ridges, such as Piney Mountain, Green Ridge, Rocky Mountain, Monalto Mountain, and East Big Flat Ridge. The ridges are then cut laterally by eroding stream corridors, at least some presumed to be along zones of highly fractured or faulted rocks more susceptible to mechanical and chemical weathering (Way 1986:5).

Composed of large grains and chemically resistant to acidic rain, South Mountain's sandstones weather to large pieces not easily moved by fluvial processes (Anthony 2014:2). On the mountain's steep north-western slopes, the resistant Antietam sandstone has very slowly eroded causing formation of a thick wedge-shaped deposit of sandstone-rich colluvium (rock, sediment, and soil) 1/2 to 2 1/2 miles wide and in some places over 100 feet deep over the underlying carbonate rocks. This mantle extends the entire western length of South Mountain in Pennsylvania (Anthony 2014:8).

Water flowing from South Mountain seeps down through the colluvium and into the carbonate rock, flowing west through dissolved underground cavities and emerging at ground level in a series of springs in the vicinity of Yellow Breeches Creek (Anthony 2014:2; Way 1986:9). At the surface, this accumulated colluvium has resulted in a gently rolling, westward sloping topography with occasional depressions and sinkholes and a limited number of surface streams, that are often dry in summer.

In the nineteenth century, South Mountain's ridges were subject to intense logging, providing charcoal for local iron furnaces. Soils formed from the sandstone tends to be moderately deep, well drained, and of medium texture. Erosion generally has been slight, but gulleying has followed the removal of vegetation for logging operations during the nineteenth century. Additional sheet erosion has occurred where fire destroyed the soil's protective cover (USDA 1967:2).

Following the decline of the local iron industry, much of this land, devoid of mature woodland, was purchased by the Commonwealth. As a result, most of the sandstone/quartzite formations on South Mountain are now located within the boundaries of Michaux State Forest.

Limestone Based Rocks of the Cumberland Valley

A continuous deposition of sediments occurred in the ocean basin that began widening in the Precambrian era. As erosion and uplift decreased and the basin filled, less sand was available and limestone and muddy limestones were deposited over the Chilhowee Group sandstones. These carbonate rocks were deposited as sediments in lower Cambrian through Ordovician times, approximately 500 million to 450 years ago, without a structural break and represent a long period of tectonic quiet. Today, they form the geology of the Cumberland Valley (Delano 2015; Sevon 1991:33; Van Diver1990:29).

Cambrian/Ordovician Carbonates

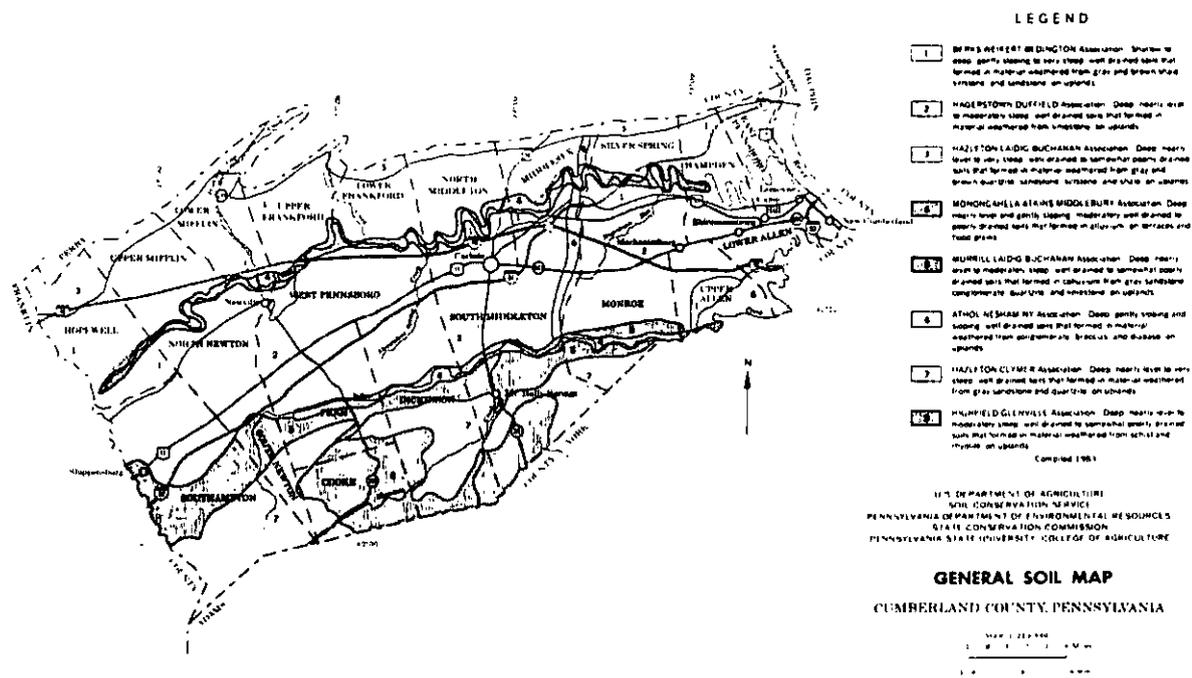
A series of carbonate-rich formations, limestones and dolomites with interbedded mudstones, overlie the Chilhowee Group and are present in the southeastern half of the Cumberland Valley, just west of South Mountain. The series begins with the Tomstown Formation, a dolomite containing thin shaly interbeds, laid immediately over the Chilhowee Group's Antietam sandstone. This is followed by bands of the Waynesboro, Elbrook, Zullinger, and Shadybrook Formations, largely limestone and dolomite, each with its own sedimentary characteristics. These formations extend northwest to the middle of the valley, just beyond Chambersburg, Shippensburg, Carlisle, and Mechanicsburg, and coincide with the western border of the core area of the South Mountain Conservation Landscape.

The Tomstown Formation is the carbonate rock overlaid by the thick wedge of colluvium weathered from the ridges of Antietam sandstone discussed in the previous section. Due to these deposits, Tomstown dolomite is rarely visible on the surface. The soils of the colluvium are deep and well drained to somewhat poorly drained. Its major limitations are surface stones and a seasonal high watertable. The colluvium's rolling surface topography, inclined to the west and northwest, is used primarily for cropland, pasture, and woodland. Orchards are also suitable to its stony soils. Sand and gravel quarries have been opened in some locations to mine its sandy deposits (USDA 1986:7,24).

The Tomstown Formation is particularly significant as the source of iron ore for South Mountain's iron furnaces. As the dolomite weathers, it forms residual deposits (residuum) of clay, sand, and rock on top of the formation, along faults, and in voids. South Mountain's iron ore was formed through the chemical weathering of various minerals in these residual deposits.

The residuum is found along the west edge of South Mountain at the base of the wedge-shaped colluvium mentioned in the previous section, the contact point between the colluvium and the Tomstown dolomite. Where the residuum and its iron ore were shallow enough to get to, they were mined. A small but important formation of Tomstown dolomite and its residuum are also found in the valley of Mountain Creek at the base of Piney Mountain (Way 1986:27; Sevon 1991:59).

THE SOUTH MOUNTAIN LANDSCAPE



Soils of Cumberland County. Reddish and gray colored soils at bottom are of sandstone and metarhyolite on South Mountain. Dark green is soils on colluvium at the base of the mountain. Light green are soils derived from limestone and dolomite. Yellow soils are derived from shale. (USDA 1986)

To the west and northwest of the Tomstown dolomite and the colluvium, the other four carbonate-rich formations weather into soils that are considered the best agricultural soils in the valley. With a gently rolling surface topography, these soils are deep and well drained, formed on uplands in material weathered from the limestone and dolomite below. In most areas, these soils are used for cropland, pasture, and woodland. Their major limitations are erosion, rock outcrops, and sinkholes. Dairying is the primary form of agriculture practiced. Where limestone outcrops occur, land is usually in pasture, and the cultivation of crops is not possible. The limestone of the formations below is also quarried (USDA 1986:7,51).

Ordovician Shales

The western/northwestern side of the Cumberland Valley is underlain by a thick sequence of grey to dark grey shale called the Martinsburg Formation. Deposited as mud in the depths of the ocean basin directly over the carbonate formations reviewed above, the Martinsburg shales date to about 450 million years ago. Somewhat more hilly than the eastern side of the valley, the Martinsburg shale weathers to a soil that is fairly suitable for agriculture, though not as prime as the soils over the carbonate formations. Much of the land is in crops and pasture. The main limitations of the soil are shallow and moderate depth to bedrock and very low to moderate available water capacity (USDA 1986:9,24).

The fairly continuous deposition of marine sediments that make up the rocks of the South Mountain region, from the Precambrian metarhyolite lava on the east to the Martinsburg shale on the west, ended about 450 million years ago.

Successive layers of sediments continued to be deposited over the formations discussed above for approximately the next 100 million years, as the region experienced two periods of mountain building and deposition, the Taconic Orogeny, beginning as the Martinsburg shale was being deposited, and the Acadian Orogeny, about 370 to 400 million year ago.

During both of these events, continental plates closed, mountains were created somewhere to the east, and sediments continued to be deposited over the rocks we see in the South Mountain area today. The younger rocks formed from these later sediments can be seen in western Pennsylvania but have been eroded from above South Mountain. (Van Diver 27:33; Cuff 1989:12; Delano 2015).

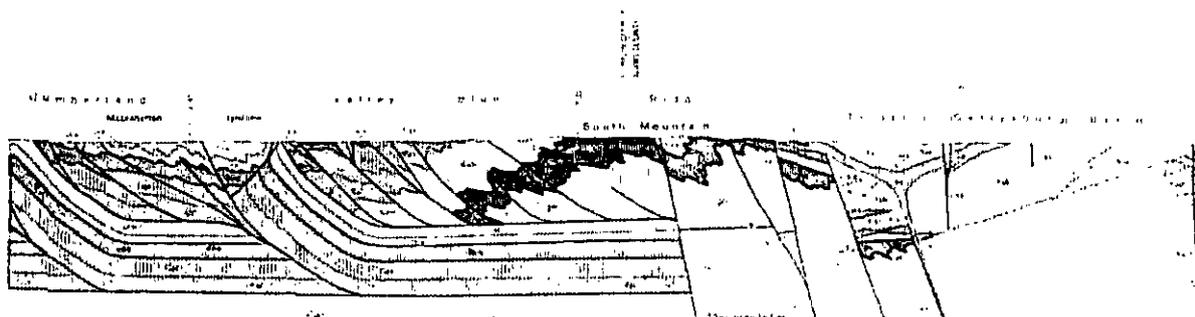
The Alleghenian Orogeny

The structure of Pennsylvania geology was dramatically shaped by a period of intense mountain building called the Alleghenian Orogeny, approximately 300 to 220 million years ago during the Pennsylvanian and Permian geologic periods.

The Alleghenian Orogeny was a violent collision and fusion of the European, North American, and African continental plates forming the super continent Pangea. The east coast of North America was matched up with the projecting northwest coast of Africa. Pre-existing ocean floor was subducted below the Ridge and Valley, and old crystalline rocks were thrust westward over younger sedimentary rocks of the continental margin (Cuff 1989:12).

The effect on Pennsylvania was dramatic as the African continent pushed buried rock formations westward. The collision caused formation of the ancient Appalachian Mountains. The rocks we see today are the roots of those former mountains.

A cross section of today's geological structure shows the dramatic impact of this continental collision on Pennsylvania's rock formations. The impact was more intense to the east and less intense to the west, farther away from the central axis of impact, somewhere off today's east coast.



Geological cross section through the South Mountain region (DER 1980)

In the Piedmont of southeastern Pennsylvania, ancient bedrocks were thrust up and extremely deformed. In the South Mountain region the deeply buried Catoclin metarhyolite, Chilhowee sandstones, and related rocks were thrust up and formed into a vast arch. In the Cumberland Valley and Ridge and Valley province beyond, formations of older rocks were faulted and pushed up over younger rocks in repeating patterns. The violent westward movement of rock

formations reached as far as the Appalachian Plateau of western Pennsylvania, which was only mildly deformed and remained largely intact.

In the older metarhyolite and sandstone rocks of South Mountain, the intense faulting shifted the structural alignment of the formations and is still evident in the topography today. North-south, along the general axis of the formation, faulting weakened the rocks and subsequent erosion has created a series of roughly parallel north-south valleys, such as those of Mountain Creek, the East Branch of Antietam Creek, and the headwaters of the eastern branch of Conococheague Creek (DER 1980; Sevon 1991:62). East-west, across the rock formation, two large faults shifted the structure laterally. The Shippensburg Fault passes through Shippensburg to the west and Pine Grove Furnace on South Mountain. The Carbaugh-Marsh Creek Fault to the south creates the gap through which Route 30 and earlier historic roads and trails traverse the mountain (Sevon 1991:18,43).

Evidence from paleomagnetic data shows that at this time the location on the continental plate that would become Pennsylvania was located almost precisely on the equator (Van Diver 1990:34). The tropical climate and swampy, lowland conditions of this long period created deep vegetative sediments that formed Pennsylvania's coal deposits far to the west of the South Mountain region during the Alleghenian Orogeny (Van Diver 1990:42-43; Miller 1995:205).

Shales and Sandstones of the Triassic Lowlands

Once formed, the North American and African plates began to separate during the Triassic period, about 200 million years ago. In the early stages of separation, crustal stretching and tension occurred that was most intense in the metamorphic belt that would eventually become the Piedmont and Blue Ridge regions, including South Mountain.

The stretching caused fracturing of large blocks of the earth's crust in a line east of the Blue Ridge province from North Carolina to Massachusetts. Great linear blocks along this line subsided, creating wedge-shaped basins into which layer upon layer of sediments poured from the eroding mountains to the east. In addition, lava flowed up through the fractures and injected itself horizontally between the sediments (Van Diver 1990:34; Miller 1995:22;35-36).

These sediments and volcanic flows formed the rocks we now see in the Triassic Lowlands east of South Mountain. A deep fault line separates the younger Triassic sediments from the much older Catoclin metarhyolite on the eastern flank of South Mountain. Less resistant to weathering, the Triassic rocks have eroded into a gently sloping topography of rolling hills, now primarily in agricultural use.

Triassic Shale/Sandstone

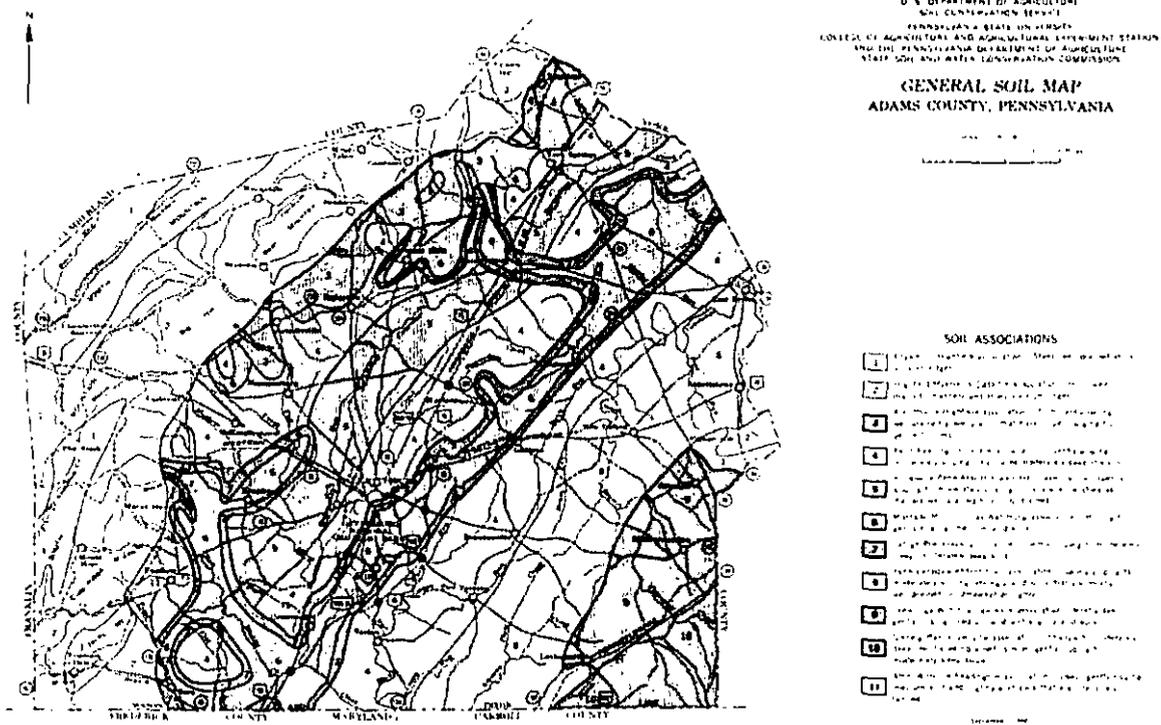
The Triassic rocks are comprised of shales, sandstones, and conglomerates, easily recognizable due to the red color of both the rocks and their soils. The rocks occur in two general formations in the South mountain region and devolve into two broad soil associations.

To the west, forming the foothills of South Mountain mostly in Adams County, is a conglomerate known as Quartz Fanglomerate with well-rounded quartzite

pebbles and cobbles set in a reddish brown, sandy matrix (DER 1980). The rock forms a rolling topography of uneven and complex slopes rising in elevation into the mountain. Its soil is gravelly, well-drained, and set in a matrix of silt and sand with high moisture capacity and that permits the deep penetration of roots (USDA 1967:2).

This is the heart of the South Mountain/Adams County Fruit Belt, the most important fruit-producing district in the state. Its excellent soil water drainage conditions combine with a desirable physical environment well-suited to fruit trees. Good air drainage on the slope and foothills of South Mountain help protect the orchards against late spring frosts (Miller 1995:200)

To the east, in the rolling lowlands, the rocks comprise the Gettysburg Formation, a reddish-brown silty mudstone and shale with thin red sandstone interbeds. The gently rolling topography of this formation is easy to farm and is an important agricultural region of Adams and York Counties. Its soils, however, are low in natural fertility, shallow to the underlying shale, and moderate to low in the moisture availability to plants. The soils are also susceptible to erosion, and many of the steeper slopes are severely eroded. Adequate yields of alfalfa, corn, small grains, hay, and pasture can be produced if management is good and includes heavy fertilization (DER 1980; USDA 1967:3).



Soils of Adams County. Green soils are derived from the shales, sandstones, conglomerates, and diabase of the Triassic Lowlands. Light yellow soils are derived from the metarhyolite formation on the eastern flank of South Mountain. Dark yellow soils on the left edge are the high sandstone ridges of South Mountain. (USDA 1967).

Jurassic Diabase

Throughout the Triassic Lowlands, the volcanic rock that was interjected from below during the period of faulting and rock movement now forms low ridges and knobs that stand above the rolling agricultural lands. Mostly steep-sloped and in woods or pasture with outcroppings, the rock, known as diabase, is resistant to weathering and not suitable for cultivation (Miller 1995:19,35; USDA 1967:3).

By the mid-Jurassic period, 150 million years ago, some of the fracturing and faulting of the older rocks connected to form a dominant rift zone that split the originally broader Appalachian Mountains down the middle and a linear sea filled the gap – the juvenile Atlantic Ocean (Van Diver 1990:33-35; Miller 1995:22;34-35; Cuff 1989:12).

Today's Topography – A Product of Differential Erosion

A long period of relative tectonic stability followed the Appalachian Orogeny and subsequent Triassic faulting as the North American and European/African continental plates continued to separate and the ancient Appalachian Mountains eroded away. By about 30 to 50 million years ago, the mountains are believed to have been reduced to a relatively gently eastward sloping plain (Miller 1995:24,36; Cuff 1989:12).

Since that time, **differential erosion** of hard and soft rocks combined with the periodic mild uplift, increasing the effects of erosion, have exposed the rocks we see today and created today's topographic relief. As would be expected, the hard sandstone, quartzites, and metavolcanics form the slowly eroding higher elevations of South Mountain. The softer and more rapidly eroding limestones, dolomites, and shales form low rolling topography of the Cumberland Valley. Similarly, the softer shales and sandstones east of South Mountain form the gently rolling Triassic Lowland.

The long period of erosion of the Appalachian Mountains and the differential erosion that has taken place since undoubtedly have long and complex histories about which little is known. Their accumulated sediments have presumably built up at the bottom of the continental shelf of the Atlantic Ocean, which continues to expand 150 million years after it began.

More recently in geological terms, the Pleistocene epoch, approximately 2.6 million years ago to 11,700 years ago, saw repeated cycles of **glaciation** in northern latitudes. The continents were essentially in their present positions on the earth during these times. Why the climate fluctuated between glacial and interglacial conditions is an active area of research.

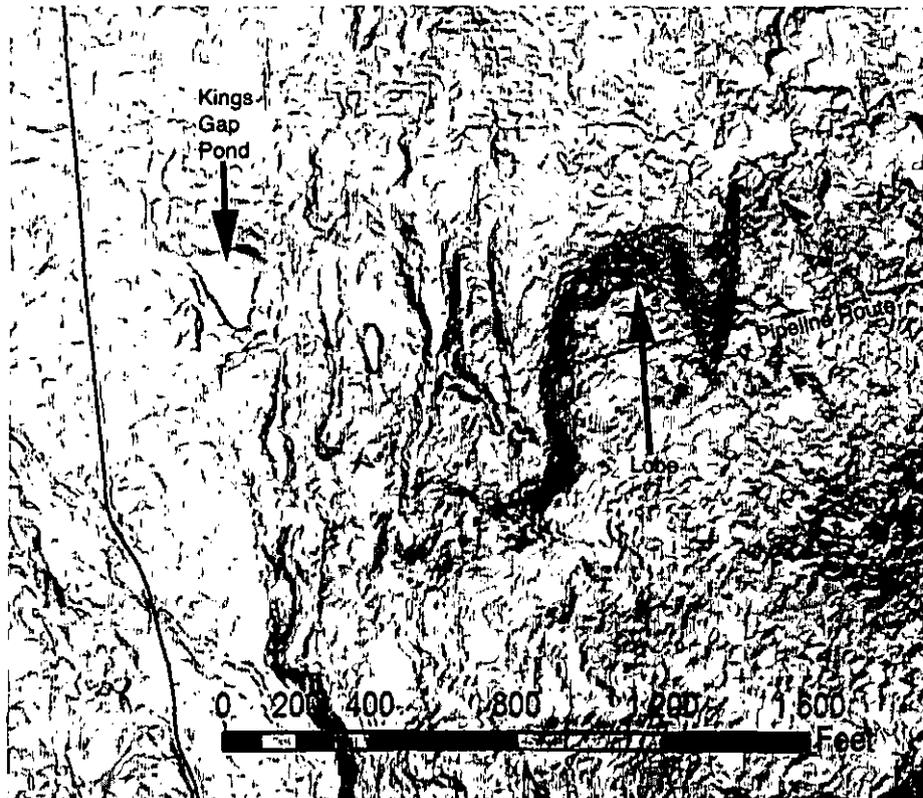
Glaciers reached Pennsylvania during the two most recent glaciations, covering the northwest and northeast corners of the state. The older, the Illinoian age, occurred 350,000 to 300,000 years ago, and the most recent, the Wisconsinan age, occurred 85,000 to 11,700 years ago.

While these glaciers never reached the South Mountain region, their weight and outwash influenced the development of the Susquehanna River and influences of the cold glacial periods can be seen in the rocks of South Mountain (Miller 1995:39-42; Van Diver 1990:16-22).

Tors are projecting rock masses at ridge or mountain peaks continuous with the bedrock below that have not been broken down by weathering. Hammond Rock, a popular outcropping on South Mountain, is believed to be a tor, a prominent erosional remnant that sticks up above an otherwise gently-sloping surface that is inferred to have formed in a periglacial climate during the colder parts of the Pleistocene.

Other similar knobs occur to the south and north of Hammond Rock. During the late Wisconsinan, from at least 16,000 to 14,000 years ago, tundra has been shown to have been present on South Mountain based upon plant identification, *evidence of its cold climate. Large tilted blocks lay next to the core of Hammond's Rock which were cleaved by the expansion of ice as the result of periglacial conditions during the Pleistocene* (Anthony 2014:15; Sevon 1991:80;154-156).

Similarly, lobes of bouldery culuvium (rocks and soil) weathered from the Antietam sandstone of South Mountain have been identified on the mountain's western slopes. Formed under periglacial conditions during the Late Wisconsinan, these lobes moved slowly down the frozen slope as they thawed and expanded in the warmer air while the frozen ground below did not. These lobes are not active in our present climate and are almost perfect replicas of periglacial lobes seen in arctic and alpine regions today. They generally moved only a few centimeters a year (Anthony 2014:8) Other periglacial geologic features have been identified and studied on South Mountain as well (Sevon 1991:72)



Lobe of colluvium that moved downhill under periglacial conditions (Anthony 2014:10)

WATER AND DRAINAGE

Precipitation, the flow of water, and the ability of rock formations and soil to hold and transmit water for wells and vegetation has an important impact upon landscape and land use. The amount of water the region receives is a function of climate and weather patterns. The South Mountain region is a transitional area between climate impacts from the east, the Piedmont and Coastal Plain, and from the west, central and western Pennsylvania.

Weather patterns influencing Pennsylvania generally come from two directions. Coastal storms move up the seaboard from the south bringing moisture off the Atlantic Ocean with winds from the northeast. Western storms move across Pennsylvania generally through the Ohio River Valley, bringing moisture drawn from the south and the Gulf of Mexico. Storm patterns are influenced by fluctuations in the location of the jet stream across the northern United States, which varies but in general is located over southern Pennsylvania in winter and over the Great Lakes, above Pennsylvania in summer (Miller 1995:45).

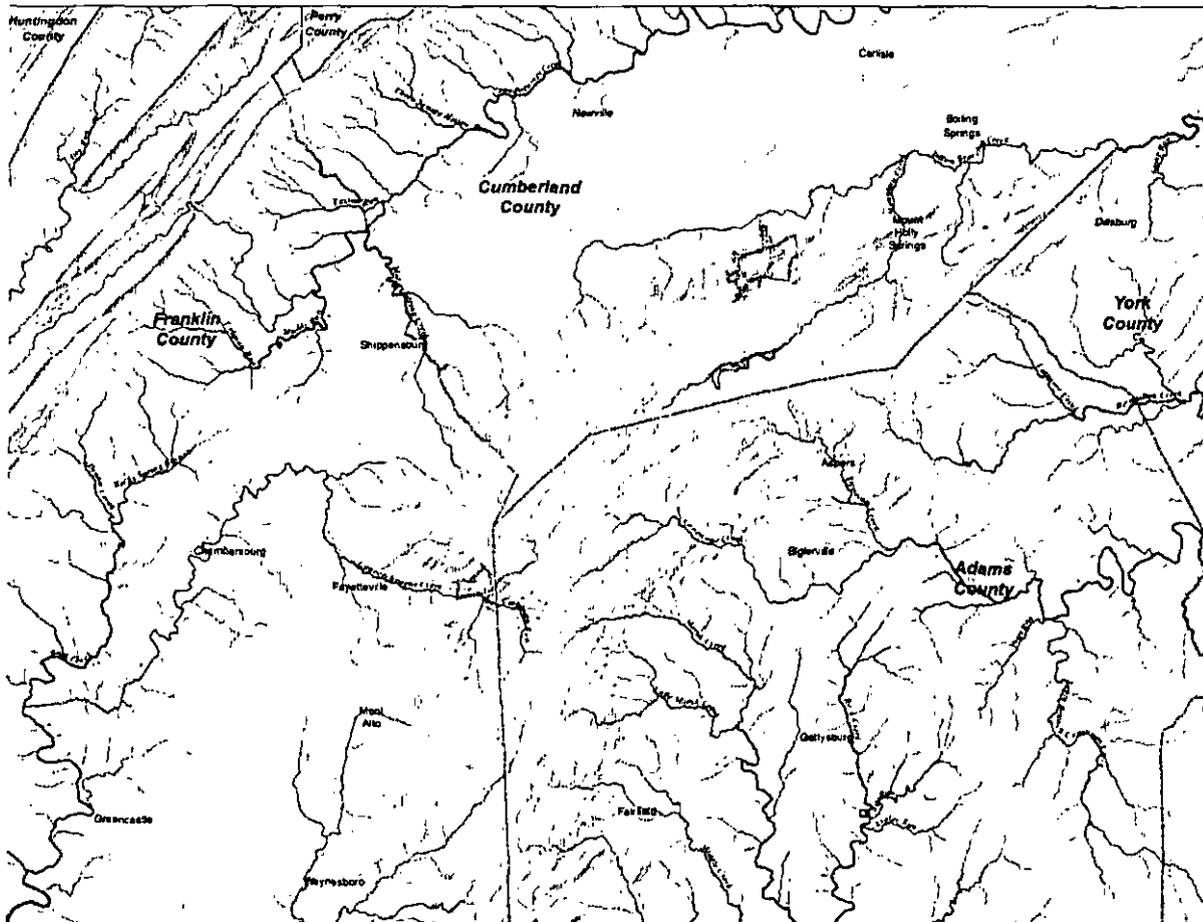
The South Mountain region is more strongly impacted by western storms than by coastal storms, and its **climate** is more continental than maritime. Coastal storms may reach westward to South Mountain and the Triassic Lowlands at their outer edge, but this warmer, moister climate of the Piedmont and Coastal Plain is only mildly felt in York and Adams Counties.

Western storms, however, move directly across the South Mountain region. The slightly higher elevation of the Allegheny Plateau in western Pennsylvania creates a rain shadow across the Ridge and Valley region of central Pennsylvania, including the Cumberland Valley. As a result, the Cumberland Valley receives over 2 inches less rainfall than either western Pennsylvania or eastern Pennsylvania, about 38 to 40 inches per year. The Triassic Lowlands, influenced somewhat by the coast as mentioned above, receives about 40 to 42 inches (Cuff 1989:28; Miller 1995:50).

The flow of streams and the availability of groundwater within the South Mountain region are a direct result of bedrock geology. The region's streams tend to flow along paths of least resistance, over weaker and less resistant rock (Miller 1995:37-38).

The availability of **groundwater** varies by rock type. Limestone and dolomite, soluble in water, are the least resistant and tend to have increased subsurface flow through dissolved solution channels. Water can sometimes move too quickly and unpredictably in limestone, lacking the filtration necessary to remove pollutants. Shale, also weak, erodes but has limited subsurface flow through fractures, limiting the amount of groundwater available and encouraging increased surface runoff after storms. Sandstone is resistant to weathering but allows diffuse subsurface flow through the spaces between grains as well as through fractures and therefore tends to have increased groundwater. Metamorphic rock is resistant to weathering, and its dense crystalline structure inhibits groundwater flow (Cuff 1989:34).

Rivers in the South Mountain region flow either eastward toward the Susquehanna River or south to the Potomac River. In the western Cumberland Valley, there are two creeks flowing through the Martinsburg shale. The Conococheague Creek flows south to the Potomac and the Conodoguinet Creek flows north and east to the Susquehanna. The watershed between them is located half way between Shippensburg and Chambersburg.



Creeks in the vicinity of Michaux State Forest and the South Mountain Conservation Landscape

The **Conococheague Creek** has its headwaters in two branches. The eastern branch originates on South Mountain in the valley along Rt 233 north of Caledonia State Park, to the south near the community of South Mountain, and in the sandstone ridges of the mountain's western flank. The main creek flows west out of the mountain through the fault gap where Rt 30 is located and winds around through the limestone topography to Chambersburg. Two reservoirs on South Mountain, Long Pine Run Reservoir and Birch Run Reservoir form the Chambersburg reservoir system and have historically provided water supply to Chambersburg through this creek. The Birch Run Reservoir has been recently removed.

THE SOUTH MOUNTAIN LANDSCAPE

The western branch originates in the shale topography northwest of Chambersburg and joins the east branch to the south, northwest of Greencastle. The creek then meanders south through Maryland, joining the Potomac River at Williamsport.

The **Conodoguinet Creek** also has two branches, the eastern of which originates in the sandstone ridges of South Mountain's western flank. Various creeks flow west from the mountain through Shippensburg and join the western branch. The creek then flows north and east following the shale formation north of Carlisle and joining the Susquehanna River north of Camp Hill.

Both creeks follow the grain of the Martinsburg shale rock formation. Both creeks have well-defined surface flow in lateral branches and runs flowing down from Blue Mountain. Branches on the east and south sides, flowing from the limestone topography in the center of the valley, are much fewer and less defined due to subsurface absorption and flow. Because the Martinsburg shale is shallow to bedrock and has low groundwater flow, these creeks tend to flow high and rapidly following a rain event, increasing the potential for erosion. Limited water is absorbed either by the soil or through the bedrock (USDA 1986:9,24).

Antietam Creek drains the southwest corner of the Cumberland Valley in Pennsylvania and flows south through Maryland to the Potomac River. It originates primarily in two branches on South Mountain, one flowing through Mont Alto and the other through Old Forge and Glen Forney. The two branches join south of Waynesboro. A reservoir located near the headwaters of the eastern branch provides water supply to Waynesboro. Two additional tributaries drain the limestone topography west of Mont Alto and exhibit the limestone characteristics similar to those discussed below for Yellow Breeches Creek.

Yellow Breeches Creek parallels the base of South Mountain from Brookside and Walnut Bottom north and east to the Susquehanna River at New Cumberland. Well studied by geologists and geomorphologists, the course of the creek lays at the outer edge of the wedge-shaped colluvium deposit weathered from the Antietam sandstone high on the mountain. The colluvium lays over Tomstown dolomite.

Small streams flowing down from the mountain tend to seep into the sandstone-rich coluvium, which transmits the water well. Some of the water flows west/north through the colluvium. The remaining water seeps down into the dolomite and then flows west/north through underground solution channels. The water then re-appears at ground level in a line of springs all along the edge of the colluvium, as well as in the creek itself. Boiling Springs, where the water bubbles up in pools as if boiling, was named for this phenomenon.

As a consequence, the numerous streams flowing off the side of the mountain tend to disappear as they reach the colluvium, water flowing below ground as opposed to on the surface.

To the west of Yellow Breeches Creek in the limestone topography, surface water flow is almost non-existent. Rainwater hitting the ground is quickly absorbed into the soil and rock and is conveyed through underground solution channels. The

direction of water flow and the availability of groundwater can be unpredictable. Sinkholes are prevalent throughout this topography.

Mountain Creek is a significant creek that flows from South Mountain to Yellow Breeches Creek. Formed in a long, well-defined upland valley west of Piney Mountain, the creek flows over a wedge of Tomstown dolomite that was lifted high into the mountain and is the principal factor in the formation of iron ore here and the establishment of Pine Grove Furnace. Mountain Creek flows north and exits the mountain at Mount Holly Springs, where its water fall powered numerous mills in the 19th century.

The east side of South Mountain is drained to the Susquehanna River from the vicinity of Biglersville, Beechersville, and the Fruit Belt and to the Potomac River from south of that area. In the northern area, the **Conewago** and **Little Conewago Creeks** have numerous headwater runs on the east side of Piney Mountain that flow in a complex pattern through the metarhyolite and Triassic conglomerate foothills of the Fruit Belt onto the rolling plain of the Triassic Lowland. Equally complex and well-defined stream patterns then follow the rolling shale and sandstone topography northeast to the Susquehanna River.

In the southern area, from a point about five miles above Gettysburg, a series of small streams flow south across the Triassic Lowlands toward Maryland. The courses of these streams are affected by both the north-south grain of the underlying shale and the presence of diabase, which forms north-south trending ridges and knobs and resists the flow of streams.

On the east side of Gettysburg, these streams form **Rock Creek**. On the west side, they flow into **Marsh Creek**, which also reaches west to the southern Fruit Belt and the eastern slopes of South Mountain. At the southern end of South Mountain, below Cold Springs Road, **Middle Creek** and **Toms Creek** drain the narrow valleys cut into the east side of the mountain. All of these creeks eventually join the *Monocacy River in Maryland, which flows into the Potomac River*.

Characteristic of shale topography, these creeks of the Triassic Lowlands flow full and quickly after rain storms, not absorbing significant amounts of water either in their soils or through their bedrock. Because of shallow bedrock and thin soils with limited water holding capacity, the creeks tend to have low flows between storms, there being limited groundwater to feed them. Water capacity can be a serious issue and limiting factor in the Triassic Lowlands, affecting agriculture, the production of wells, and the installation of septic systems (USDA 1967:3).

ECOREGIONS AND VEGETATION

Vegetation and native plant communities reflect the vegetative context in which the South Mountain is located and the climate, geology, topography, soils, and other natural features that influence local variations. The entire South Mountain region is located within the broad area of the Appalachian Oak Forest of North America's eastern deciduous forest which encompasses most of the lower two-thirds of Pennsylvania (Cuff 1989:52; Miller 1995:74).

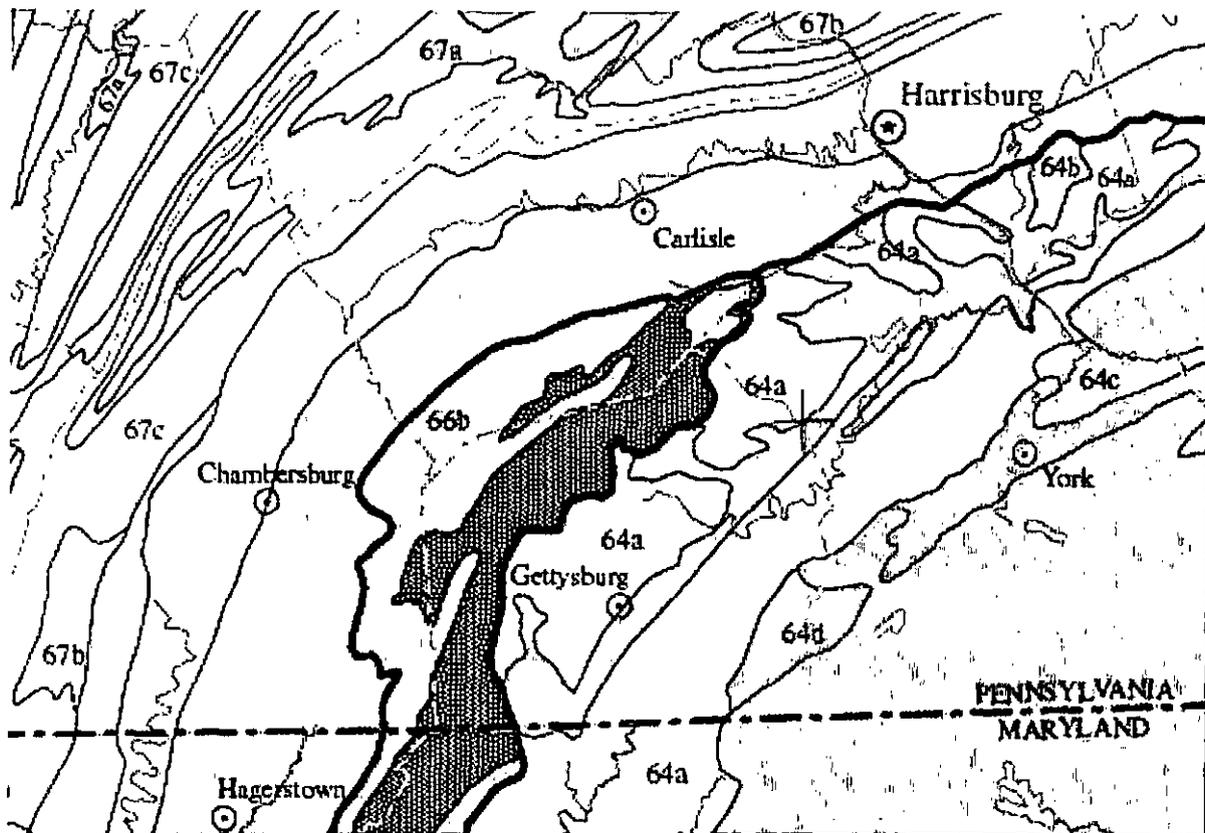
Both natural and human disturbance have had an enormous impact upon the vegetation of the region in terms of the vegetation that is present and the plant communities that develop naturally. With respect to natural disturbance, for example, this area was originally classified as the Oak-Chestnut Forest Region in Lucy Braun's landmark 1950 publication *Deciduous Forests of Eastern North America*. However, the American chestnut that was once a dominant feature of this landscape was virtually eliminated by the chestnut blight fungus introduced to North America in 1904. Other forms of natural disturbance including insects, animals, and storms are ongoing agents of change. Though termed "natural," some of these agents of change are actually an unintended impact of human activity.

The introduction of a considerable number of non-native species by humans over the last three centuries which have since naturalized into the landscape has had a significant impact upon the region's plant communities. Some of these naturalized species are considered invasives and negatively impact the diversity and health of plant communities.

Overall, human activity has been the dominant factor in determining the vegetative character of the landscape of the South Mountain region over the past three hundred years. Before about 1700, most of this area is believed to have been forested, even though impacted for thousands of years by Native American peoples. Only a small fraction of forest cover remains within the region today beyond the ridges of South Mountain, most having been cleared for agriculture and development. Most of the forest that does remain has a long history of logging and is in some stage of regrowth (TNC 2005:6).

Ecoregions

The federal government and state agencies have identified a national system of ecoregions that denotes areas of general similarity in ecosystems and the type, quality, and quantity of environmental resources. Used to inform the understanding, monitoring, and management of natural resources, the ecoregion system uses geology, physiography, climate, soils, vegetation, wildlife, and land use to identify areas of common character. The system is organized into four levels with level IV being the finest grain, which is useful in the understanding of local ecosystems and plant communities. DCNR's Bureau of Forestry has adopted ecosystems based on the national system for forest management.



EPA Level IV Ecoregions. Ecoregion 64 is the Northern Piedmont and includes the Triassic Lowlands (64a) and Diabase and Conglomerate Uplands (64b).

Ecoregion 66 is the Blue Ridge Mountains. On this map South Mountain is shown in green and includes on the right the Northern Igneous Ridges (metabryolite and metabasalt, 66a) and on the left the Northern Sedimentary and Metasedimentary Ridges (quartzite, 66b).

Ecoregion 67 is the Ridge and Valley, including the Great Valley to the west of South Mountain. The Great Valley (also known locally as the Cumberland Valley) includes on the right the Northern Limestone/Dolomite Valleys (67a) and on the left Northern Shale Valleys (67b).

The ecoregions identified for the South Mountain region conform to the geological areas outlined previously in this chapter. Additionally, responding to the extent of human impact on the landscape, the Pennsylvania Natural Heritage Program has identified important natural plant communities and species of special concern within the four counties. The Pennsylvania Natural Heritage Program is a partnership between the Department of Conservation and Natural Resources, Western Pennsylvania Conservancy, Pennsylvania Game Commission, and Pennsylvania Fish and Boat Commission. Surveys identifying exemplary natural plant communities have been prepared for each of the four counties and are reviewed in the discussion of ecoregions below.

Ecoregion 64 – Northern Piedmont

The area in Pennsylvania between the fall line near Philadelphia bordering the coastal plain and the Blue Ridge physiographic province, which includes South Mountain, is within the ecoregion known as the Northern Piedmont. The western portion of this area, within the South Mountain region, is called the Triassic Lowlands and is identical to the Triassic Lowlands geological area discussed earlier in this chapter. The Natural Areas Inventories for Adams and York Counties identify 40 and 90 natural areas of special interest, respectively including areas within South Mountain and the Triassic Lowlands (TNC 1996:6; York County Planning Commission 1997).

Ecoregion 64a – Triassic Lowlands

The Triassic Lowlands are underlain by Triassic shale and sandstone, as discussed earlier in this chapter, and is a plain characterized by wide undulating ridges, broad nearly level valleys, limited local relief, and a mosaic of farms and houses. Soils are shallow to bedrock, only moderately fertile, and have limited water availability to plants. Springs are uncommon because the comparatively flat and undissected relief, in combination with limited permeability, offers little means for ground water to flow to the surface.

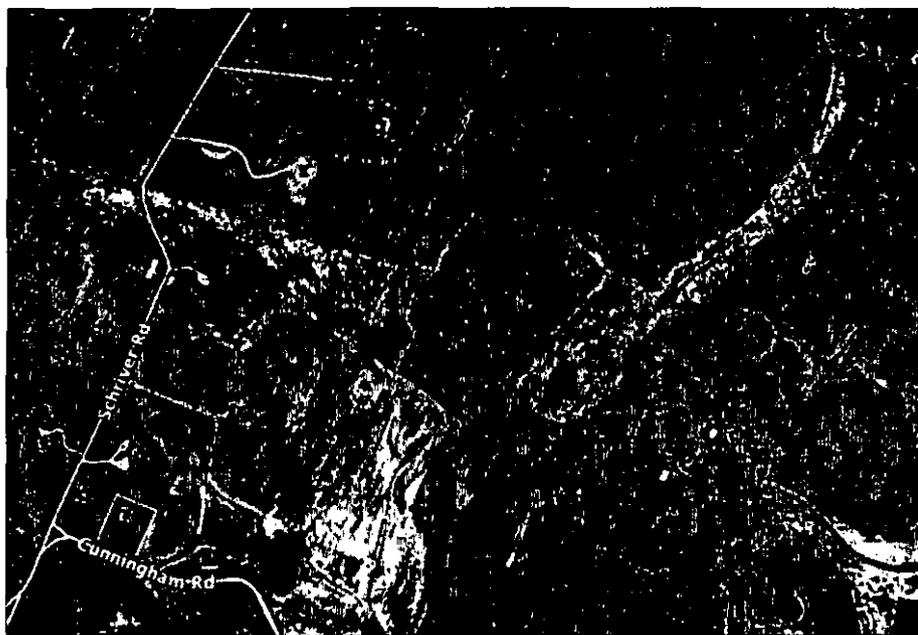
The historic Appalachian Oak Forest has been replaced by a mosaic of farms, houses, and woodland. Agriculture has been favored historically by nearness to urban markets, fairly fertile soils, and a long growing season of 170-183 days. Dairy farming is the main source of farm income. Beef cattle, poultry, fruit, vegetables, and grain are also important. Suburbanization continues to increase throughout the area, especially in proximity to larger communities, with related land uses (Wood 199:19-20).

Very little forest cover remains within the area. Generally, only the steep slopes and wetter area continue to be in woodland, usually dominated by oaks, tulip poplar, and hickory (TNC 1996:14; York County Planning Commission 1997:8). Tulip poplar is the dominant species of many of the remaining woodlands because it grows more quickly after clearing. As the forest matures, however, more shade tolerant species become more prevalent because tulip poplar does not regenerate in the shade of a closed canopy (York County Planning Commission 1997:7).

Hickory tends to be more abundant here than elsewhere within the Piedmont because the soils are less acidic and more calcium- and magnesium-rich than

those derived from non-sedimentary rocks. Red maple and black tupelo are less abundant for the same reason (Wood 1999:19-20).

Some of the unforested lands that were seldom or never plowed support native grasses with scattered small trees similar to sites in Virginia (TNC 1996:16). Wetlands are becoming rarer within the region due to development and are an important resource for conservation.



Agricultural landscape of the Triassic Lowlands south of Gettysburg. Shallow soils derived from shale with little water availability supporting dairy, beef, grains, and pastureland. (Google Earth)

Ecoregion 64b – Diabase and Conglomerate Uplands

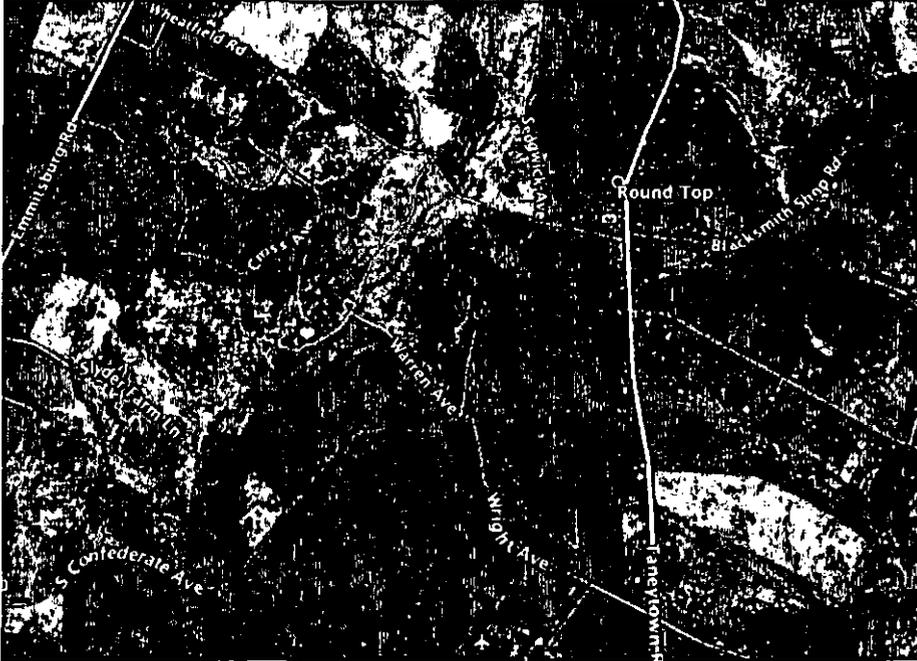
Within the Triassic Lowlands are areas underlain by volcanic diabase that is highly resistant to weathering. These areas are characterized as woody, stony hills and steep ridges where local relief can vary considerably. They include adjacent areas of shale and sandstone that were altered and made harder, denser, and less porous by the intrusion of the volcanic diabase (Wood 1999:19-20). At some locations the diabase formation occurs as prominent hills with large rock outcrops and boulder fields.

Thin, finely textured clayey soils have commonly developed over diabase and are non-acidic and shallow. They are harder to till and best suited for forest or pasture. Interestingly, the diabase has more open joints than the surrounding shale or sandstone and yields more groundwater, which is softer than the hard water from wells in the shale or sandstone (Wood 1999:19-20).

Woodland is common on the diabase uplands, especially where the surface is steep or covered in rocks or boulders. Where farms occur, they are usually scattered among woodland and idle land. Woodland plant communities derive from the original Appalachian Oak Forest and are dominated by white and red

THE SOUTH MOUNTAIN LANDSCAPE

oaks. The flora on soils derived from the diabase intrusions, which are basic in character, are distinctive; acid loving plants are absent from this area (Wood 1999 19-20). The mineral-rich soils may support a diverse herb flora, and several rare plant species are associated with the diabase (TNC 1996:14).



Diabase ridge with woodland vegetation cutting through the agricultural landscape of the Triassic Lowlands. (Google Earth)

Ecoregion 66 – Blue Ridge Mountains

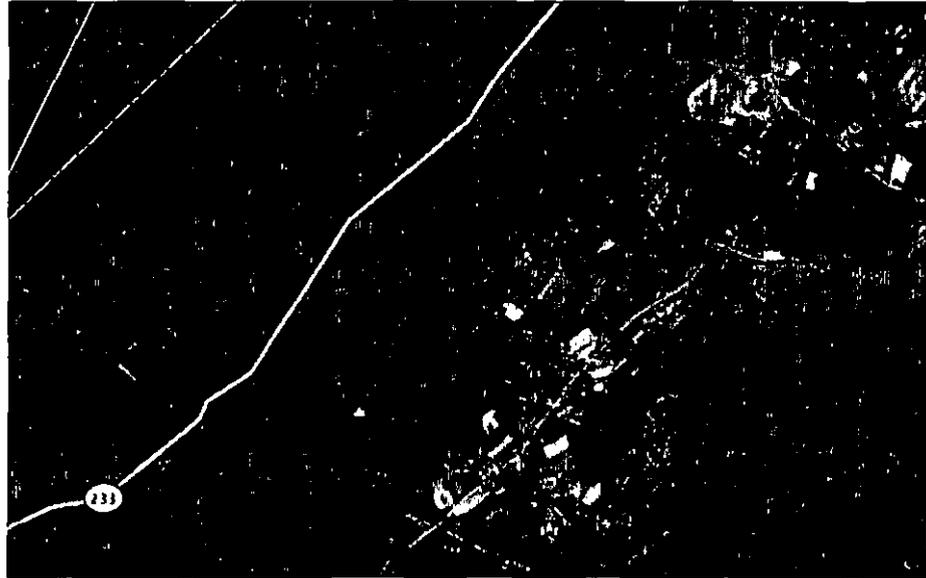
South Mountain is located at the northern end of the Blue Ridge Mountains geological province, as discussed at the beginning of this chapter. The Blue Ridge Mountain ecoregion coincides with this geological province and is comprised of two Level IV sub-regions, one related to the mountain's Catocitic metarhyolite geology and the other to the Chilhowee sandstone geology. Both of these sub-regions extend south from South Mountain to near the Roanoke River in southern Virginia (Wood 1999:23).

In Pennsylvania, DCNR's Bureau of Forestry uses a similar ecoregion identification but does not distinguish between the two Level IV sub-regions. Michaux State Forest is located predominately within the sandstone sub-region.

Natural area inventories of the region identify South Mountain as an "exceptional natural feature" worthy of particular attention. Several globally rare plant and animal species as well as rare natural communities and an abundance of high quality vernal pools are found here. Many of the highest priority natural areas identified in the inventories fall within the South Mountain region and are managed as special natural areas. South Mountain also functions as an important interstate greenway, linking Pennsylvania with southern natural areas (TNC 2005:23).

Ecoregion 66a – Northern Igneous Ridges

The Northern Igneous Ridges sub-region of Ecoregion 66 includes the metarhyolite geological area of South Mountain in Pennsylvania discussed previously in this chapter. In Maryland and Virginia, this sub-region is also comprised of metabasalt, a related igneous rock type formed underground rather than as a surface flow, and diabase. Soils are characterized by low fertility, acidity, stoniness, and steepness.



Rt. 233 on the east boundary of the state forest travels long the top of a high, steep, wooded metarhyolite ridge. (Google Earth)

This area remains extensively forested, and the predominant natural vegetation is successional second growth woodlands derived from the Appalachian Oak Forest plant community featuring oaks and other hardwoods. A number of natural areas of special interest and concern have been identified in this area in the Adams County survey, including steep wooded ravines, seeps on the flank of the mountain, and wetlands. These include seepage swamps, which are relatively small forested or shrub dominated wetlands found on lower slopes where water emerges at the surface with a diffuse flow (TNC 1996:17).

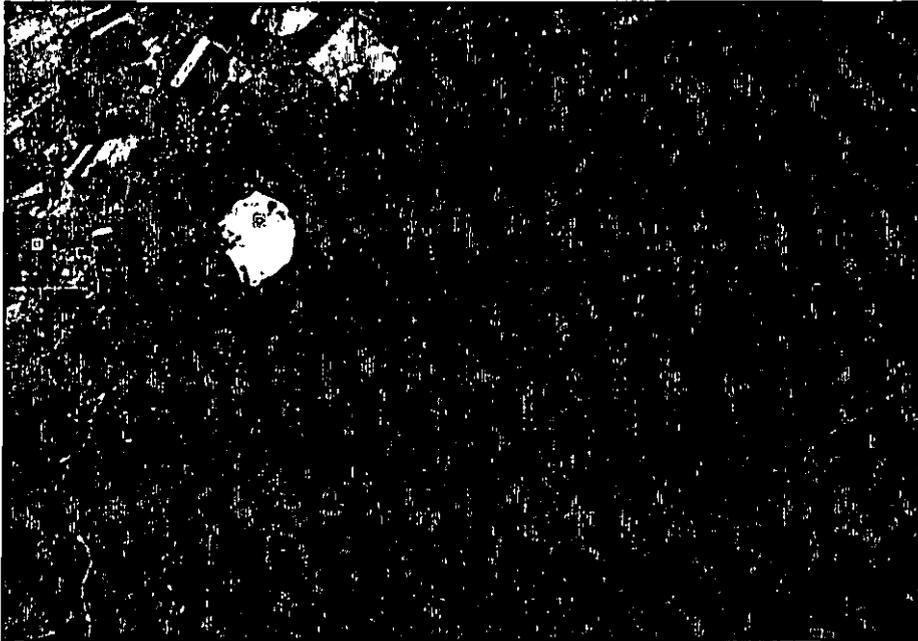
On South Mountain, localized dairy farming and poultry raising occurs, and orchards of the Adams County/South Mountain Fruit Belt are found in the Buchanan Valley and southeast flanks of the mountain (Wood 1999:23-24).

Ecoregion 66b – Northern Sedimentary and Metasedimentary Ridges

The Northern Sedimentary and Metasedimentary Ridges portion of Ecoregion 66 includes the Chilhowee metamorphic sandstone and quartzite geological formations on the west side of South Mountain. Much of this area is within Michaux State Forest and is composed of high, steeply sloping, northeast trending ridges and deep, narrow, somewhat discontinuous valleys. The sandstone geology is resistant to erosion and weathers to thin soils that are stony, steep, acidic, and of low fertility. Streams have limited buffering capacity and are subject to acidification (Wood 1999:24).

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Most of this area is wooded with second growth oak-pine and oak-hickory forest type groups of the Appalachian Oak Forest plant community. Oak species including chestnut, scarlet, northern-red, black, and white oak, along with yellow-poplar dominate the lower slopes. A white-pine forest type is found along some streams, while a mixed oak-pitch pine forest type is common on dry ridge top sites and southwest facing slopes. Red maple, sweet (black) birch, black gum, and hickory are common associates in all the forest types (DCNR 2003 Michaux:7).



Tall sedimentary ridges along the west boundary of Michaux State Forest (bottom left to top right) cut perpendicularly with streams flowing down into the valley. Note sandstone quarry. (Google Earth)

The natural areas inventory emphasizes that several notable variations in the typical mixed oak forest composition occur with relationship to soil, soil moisture, and topography. Drier ridge tops characterized by shallow nutrient-poor soils are characterized by chestnut oak and black gum with red maple and other oaks as associates and understory shrubs including blueberry, huckleberry, and mountain laurel.

Pitch pine-scrub oak barrens are among several of the large areas identified of special significance by the natural areas inventories. Big Pine Flat within Michaux State Forest is an important example of this community type. Many stream corridors and adjacent north-facing slopes are dominated by hemlock with a minor component of yellow birch and an understory of rhododendron.

Vernal pools are a particularly significant set of natural resources with rare species of plants and animals and are located along the toe of the western slopes of the mountain in Franklin and Cumberland Counties. Because they are ephemeral and free of breeding fish, the vernal pools attract many species of salamanders, turtles, frogs, and toads. A number of swamp seeps are identified as significant wetland areas on the mountain (TNC 1996:17; 2004:5; 2005:6-7).

Ecoregion 67 – Ridge and Valley

Ecoregion 67 coincides with the Ridge and Valley physiographic province, which in Pennsylvania extends from the base of South Mountain west to the Appalachian Plateau. In the South Mountain region, this area includes the Great Valley, or Cumberland Valley, which is a distinct area within the province.

As discussed earlier in this chapter, the Cumberland Valley is comprised of two parallel geological formations, limestone and dolomites to the east and shales to the west. These two formations comprise the valley's designated Level IV ecoregions as well.

Ecoregion 67a – Northern Limestone/Dolomite Valleys

The Northern Limestone/Dolomite Valleys ecoregion is located on the eastern side of the Cumberland Valley in Franklin and Cumberland Counties and is characterized by broad, level to undulating, fertile landscape that is extensively farmed. Sinkholes, underground streams, and other karst features have developed on the underlying limestone and dolomite, and as a result, the drainage density is low. Where streams occur, they tend to have gentle gradients, plentiful year around flow, and distinctive fish assemblages (Wood 1999:27).

Farming predominates throughout the area with scattered woodlands occurring in steeper areas. Only a small fraction of forest cover remains, most having been cleared for agriculture or development. Remaining woodlands have second growth and successional variations of the Appalachian Oak Forest, often featuring early successional species. Farming and urbanization have created biological islands where small natural areas are surrounded by agriculture or development. This isolates gene pools of wildlife and/or plant communities, inhibiting gene flow between populations (Wood 1999:27; TNC 2004:6; 2005:5).



Limestone landscape of the east side of the Cumberland Valley with its pattern of intensive agricultural fields and having few surface creeks. (Google Earth)

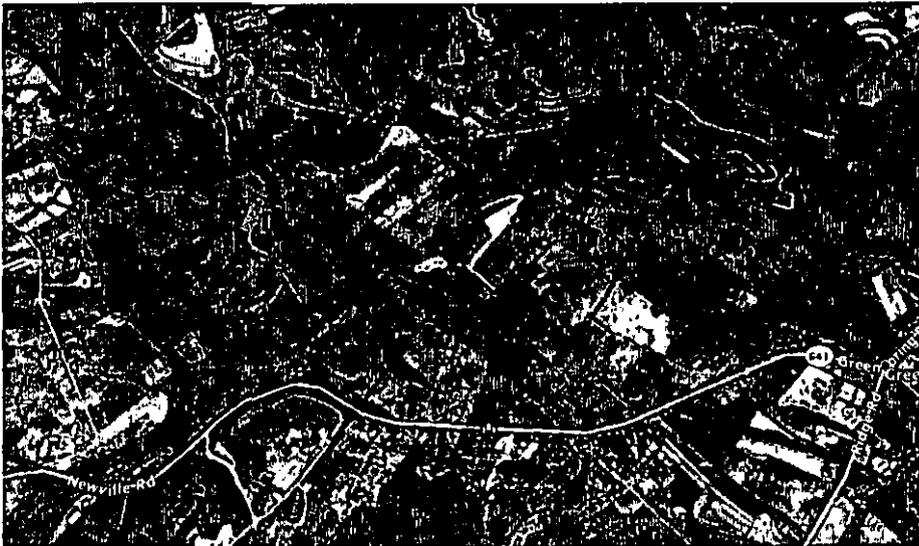
THE SOUTH MOUNTAIN LANDSCAPE

Natural area inventories for Franklin and Cumberland Counties identify a number of significant plant communities, many of which are related to the distinctive springs and seep that occur west of the South Mountain colluvium discussed earlier in this chapter. Special plant communities also occur along streams and in the vicinity of limestone rock outcroppings, where calcium loving species including Sugar Maple and Basswood dominate (TNC 2004:32; 2005).

Ecoregion 67b – Northern Shale Valleys

In the Cumberland Valley, the Northern Shale Valley ecoregion is located along the western side of the valley and is underlain by Martinsburg shale with relatively poor soils. Characterized by rolling valleys and low hills, the underlying shale is not as permeable as the limestone, so surface streams are larger and drainage density is higher than on the eastern side of the valley. More soil erosion occurs over the shale area such that stream turbidity can be comparatively high and the stream habitat relatively impaired (Wood 1999:27; TNC 2004:2).

As on the east side of the valley, farming predominates in this area, however more areas of woodland occur both along streams and on uplands. Scattered shale barrens occur on steep west and south facing slopes (Wood 1999:27). Natural area inventories for Franklin and Cumberland Counties document an increased number of significant plant communities than are found on the east side of the valley. Many occur along stream corridors but some include areas of shale outcrops, loose shale on steep slopes, and bare shale areas where distinctive plant communities have developed (TNC 2004; 2005).



Shale landscape of the west side of the Cumberland Valley with agricultural fields and pastures between patterns of winding streams. (Google Earth)

THE LANDSCAPE'S CULTURAL DEVELOPMENT

The South Mountain Conservation Landscape and its surrounding area experienced a distinctive pattern of cultural development that remains evident in the landscape today. The region's development was influenced by the physical attributes of the landscape—topography, soils, water, natural resources—combined with a unique settlement history and its subsequent evolution.

Chapter 3 of this cultural landscape assessment provides a overview of the South Mountain region's historical development. Later chapters discuss aspects of the landscape in relation to particular historic contexts of state and national significance. Below is a summary of several broad themes of the region's cultural development and a brief description of the resulting landscape we see today.

The Pennsylvania Cultural Hearth

In pre-contact times, before European occupation, south-central Pennsylvania was a sort of backwater area of cultural development, well beyond the zones of more lively development in other parts of North America (Miller 2002:396). The region's prehistoric history is outlined in the chapter on the Native American Historic Context.

The special personality of the Pennsylvania landscape, including the landscape of the South Mountain region, emerged in the 18th century with settlement by various groups of European immigrants and had a national impact. This development may be attributed to three primary factors.

First was the **large number of immigrants** that flowed through Philadelphia and Southeastern Pennsylvania during the 18th and early 19th centuries and their particular ethnic makeup. Philadelphia was a primary entrance point for immigration to the colonies during the 18th century. By the time Southeastern Pennsylvania began to be fully settled, almost a century after the founding of Virginia, Massachusetts, New Amsterdam, Maryland, and southern colonies, lessons had been learned about the effective settlement of new populations. William Penn's policy of tolerance welcomed a wide variety of European groups, particularly English, Welsh, Scots-Irish, and several varieties of ethnic Germans. It was a diverse mixture of groups, most with strong cultural traditions, coexisting through the opportunities presented. Immigrants came as families, extended families, and community groups, many of particular religious persuasions.

Second was the **availability of good land**. Unlike the glaciated landscape of New England and the swampy lowlands of Virginia, Maryland, and the South, Southeastern Pennsylvania offered a vast area of rolling topography with excellent soils that were easily converted to prosperous farms. The region's temperate climate favored the grain-based agriculture practiced.

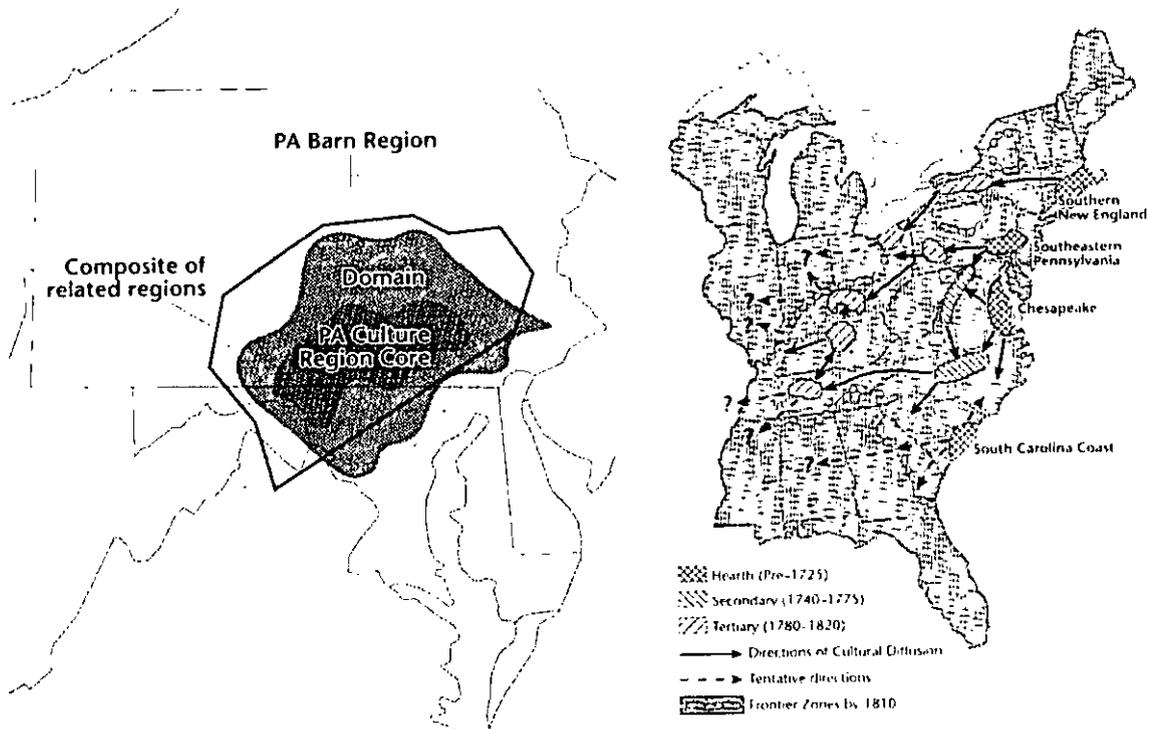
Third was **access to the interior** of the continent. Between the northern tip of South Mountain and the vicinity of Reading, the Great Valley is in direct contact with the Triassic Lowlands to the east, without the imposing physical barrier of the Blue Ridge Mountains found in Maryland, Virginia, and North Carolina and the similar mountains found to the north. Both early settlers and new immigrants had direct access to the valley. From the 1730s into the early 19th century, large

THE SOUTH MOUNTAIN LANDSCAPE

numbers of migrants traveled through Southeastern Pennsylvania, down the valley to Virginia and North Carolina, and west through the southwest tip of Virginia into Tennessee, Kentucky, and the Ohio River Valley. This was a major migration route of the nation’s early settlement. Along this route, settlers spread the cultural traditions of Southeastern Pennsylvania south and west. For much of early American history, Philadelphia and its hinterland served as a funnel through which immigrants and locals entered the major settlement streams whereby the Upper South, Middle West, and places beyond were settled. Because many of these settlers were Pennsylvania-born, many the sons of Pennsylvania farm families, Southeast Pennsylvania innovations and attitudes diffused throughout a broad swath of the continent (Miller 2002:398).

Cultural geographers identify Southeastern Pennsylvania as the Pennsylvania Cultural Area or **Pennsylvania Cultural Hearth** (Cuff 1898:154; Meinig 1986:131; Miller 1995:132; Miller 2002:396; Zelinsky 1993) . The South Mountain region is the western edge of the Pennsylvania Cultural Hearth’s core area, which extends across south-central Pennsylvania from Lancaster and Berks Counties to Franklin and Cumberland Counties.

The predominant characteristic of the Pennsylvania Cultural Health was its settlement by “yeoman farmers” creating a relatively homogeneous yet diverse agricultural landscape of **small independent farms**. Each family farm was a variation on a theme, composed of similar elements in a wide variety of patterns—farmsteads, fields, woodlots, lanes, and other landscape elements that were needed to make the farm work. The settlement pattern of each farm was shaped by the particular characteristics offered by its natural landscape.



Pennsylvania Cultural Hearth (Miller 1995:136-137)

Within this agricultural landscape, **market towns** and crossroad villages were established and provided places where farmers obtained services, purchased goods, and sold produce. A large number of mills to process agricultural produce were built at locations where water power could be harnessed, sometimes a focus for town or village development. Towns and villages became centers of craftsmanship and small business as well as centers of social, religious, legal, and government life.

As agriculture developed through the late 18th and early 19th centuries, an interdependent **market system** matured, binding farm and town, each providing services to the other. Local merchants and wholesalers purchased farm produce for shipment beyond the region. Social, business, and political positions were fluid, flexible, and egalitarian, with many roles and participants.

This agricultural market system was in sharp contrast to the plantation system that had developed in eastern Virginia and the South, where agriculture and craftsmanship were focused on the plantation, and social, religious, and government institutions were concentrated among a few leading families. It was the agricultural market system, however, that spread down the Shenandoah Valley from Pennsylvania and Maryland and west to become a bedrock feature of the nation's heartland.

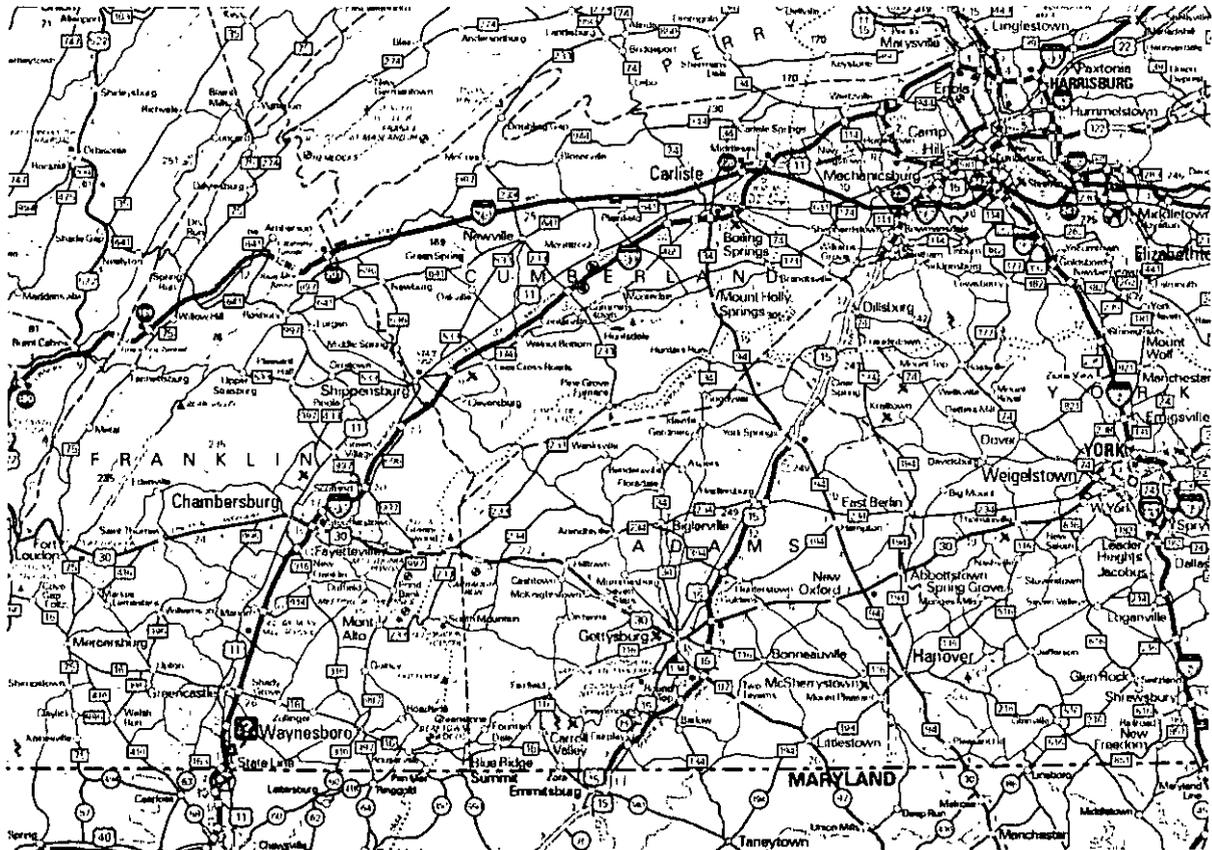
Character defining features of the Pennsylvania Cultural Hearth included the town plan on a grid with a central public square, the linear crossroads village, the Pennsylvania farmhouse, the Pennsylvania barn, the springhouse, other outbuilding and vernacular dwelling types as well as grammar, food-ways, and social customs. The Pennsylvania barn is a particularly visible and widely recognized feature of the region. The Pennsylvania town form, with central square, grid of streets, tight lots, lack of front yards, shade trees, and rear alleys, provided a model that was used throughout the mid-west.

Transportation Networks

Transportation played an important role in the region's settlement, and transportation routes followed logical patterns suggested by topography and ease of movement. From Indian trails, to early wagon roads, to the development of improved turnpikes, to railroads, to early automotive roads, to the interstates of the mid-20th century, transportation improvements used the same or similar routes, avoiding mountains, using valleys, exploiting gaps, and following ridgelines to avoid river crossings.

The earliest **wagon roads** along which migration occurred tracked west through Lancaster, York or Harrisburg, and south down the Great Valley through Virginia. Early roads passed into the Great Valley (Cumberland Valley) either north of South Mountain or through the South Mountain Gap (Cashtown, Rt. 30) or Nichols Gap (Rt. 16). The Great Philadelphia Wagon Road made use of both gaps as well as a route east of South Mountain crossing the Potomac River at Harper's Ferry. Within the valley, the course of Rt. 11 is the historic route south into and through Virginia (Cuff 1989:96).

THE SOUTH MOUNTAIN LANDSCAPE



Transportation network within the South Mountain region

Turnpikes with improved roadbeds were developed linking primary settlement areas in Pennsylvania between 1874 and the mid-1830s. In the South Mountain region, turnpikes included the course of Rt. 11 down the valley from Harrisburg through Carlisle and Chambersburg as well as that of Rt. 30 from Gettysburg through the South Mountain (Cashtown) Gap to Chambersburg (Miller 1995:235; Cuff 1989:96).

The development of **railroads** followed in the mid and late-19th century, which brought about a revolution in the economy with respect to the movement of goods, exploitation of natural resources, development of manufacturing, and urbanization (Miller 1995:140). Within the South Mountain region, railroads were constructed down the Cumberland Valley from Harrisburg paralleling Rt. 11 and linking valley communities in 1839-41 (Cuff 1989:97). Additional routes along Yellow Breeches Creek and linking Gettysburg with Carlisle (with a spur to Pine Grove Furnace) were constructed later.

Railroads linked local communities to the national network. The South Mountain region, however, was never a prominent component of the primary railroad lines of national significance. Nonetheless, railroads were of local significance in the movement of agricultural produce, development of local manufacturing, and for a short while the shipping of natural resources products from South Mountain.

Major **roads** developed during the early twentieth century followed the routes of earlier roads and included today's RT. 11, Rt. 30, Rt. 15, Rt. 34, Rt. 116, and Rt. 16. The Pennsylvania Department of Transportation was established in 1903, and funding for paving of a state road network was approved in 1911 (Miller 1995:240). A national effort initiated in 1913 created the Lincoln Highway (current Rt. 30 across South Mountain), the nation's first coast-to-coast road, by linking and improving a network of local roads. Federal aid for the construction of roads began in 1916.

Most of Pennsylvania's primary roads were paved by 1930 and have been continually improved to the present. A network of nationally designated US highways was created by 1940 and included US Routes 11, 15, and 30 through the South Mountain region (Miller 1995:241). In some areas, particularly along Rt. 30 and Rt. 16, modern improvements and realignments have bypassed and left historic remnants of earlier versions of the road.

The two **interstate highways** through the region that form the backbone of today's automobile network include the Pennsylvania Turnpike, I-76, east-west and I-81 paralleling Rt. 11 south through the valley. The Pennsylvania Turnpike was a pioneering effort in the construction of limited access highways. The portion west of Middletown through the valley and crossing the Appalachian Mountains was opened in 1940. The portion east to New Jersey was opened in 1951 (Cuff 1989:98; Miller 1995:242). The intersection of I-76 and I-81 at Carlisle and the access they provide to key population centers nationally has led to the development of trucking and warehouse facilities of national significance within the region.

Landscape Patterns – Agriculture and Community

Agriculture remains the predominant land use in the areas surrounding South Mountain as it has since early European settlement in the mid-18th century. Market towns and crossroad villages established and developed in the 18th and early 19th centuries remain the center of community life today.

Cultural geographers identify three general types of Pennsylvania landscapes (Miller 2002:400; Miller 1995:135). The earliest and most extensive is the **agrarian landscape** occupied by farm families beginning in the early 1700s and *continuing until the limits of arable land were reached in the 1850s* (Miller 1995:400). Supported by merchants, craftsmen, and services in market towns and villages as discussed above, this agrarian/mercantile, small-scale landscape retains its patterns, structure, and basic integrity throughout the South Mountain region today. The 1850s saw the peak development of the region's agrarian landscape.

A second generation of cultural landscape type emerged in Pennsylvania after 1850 as an **urban-industrial landscape** and developed rapidly in the late-19th century through urbanization, the growth of manufacturing communities and regions, and the emergence of new types of communities related to the mining



Land Use

- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land (Rock/Sand/Clay)
- Deciduous Forest
- Evergreen Forest

- Mixed Forest
- Shrub
- Grasslands/Herbaceous
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands

Boundaries

- Michaux State Forest
- South Mountain Landscape
- Counties



of coal. This landscape included the metropolitan areas of Philadelphia and Pittsburgh; transportation and manufacturing hubs such as Altoona and industrial towns along the Lehigh, Ohio, Allegheny, and Monongahela Rivers; and the coal mining regions of the Allegheny Plateau and Lackawanna Valley. Development of these communities was closely related to the arrival of a variety of new ethnic populations, a polyglot mixture of new immigrants from many places, different from the agrarian English, Scots-Irish, and Germans of the 18th and early 19th centuries (Miller 1995:141; Miller 2002:401).

Facilitated first by the construction of canals and soon after by the construction and maturation of regional and national railroad networks, new types of community and landscape patterns emerged that differed from what had come before. Linked across large areas, these new community landscapes were urban-industrial in character. While they had little in common with the older cultural patterns of the state, they did resemble parallel developments in other sections of the nation.

This late 19th century urban-industrial landscape type, widespread throughout Pennsylvania, is little evidenced in the South Mountain region. Canals were not constructed here. The region's principal transportation focus, south through the Great Valley, significant during the wagon era of the late 18th and early 19th centuries, was not relevant to these new changes.

While railroads certainly influenced manufacturing and growth in the South Mountain region's larger towns, their impact was limited and localized and did not dramatically alter the larger, already well established agrarian landscape patterns. While it might be argued that the devastating impact of the iron industry on South Mountain was similar to that related to coal mining, especially in its later years, the overall landscape patterns related to the iron industry were more closely related to colonial patterns in the eastern part of the state as a variant of the larger agrarian landscape.

The third wave of landscape change in Pennsylvania identified by cultural geographers is most visible and widespread in the growth and spread of suburbs. Closely related to the emergence and influence of the automobile, **roadside commercial and suburban landscapes** are manifestations of advances in transportation and communication, as well as a sign of general affluence. Beginning in the early 20th century and accelerating after World War II, these changes in cultural landscape patterns are seen throughout Pennsylvania in communities of all sizes that are experiencing a degree of economic vitality. They are still evolving today and include the widespread construction of developments with single family homes, apartments, commercial corridors, shopping centers, office parks, and social and institutional facilities.

Within the South Valley region, suburban landscape change can be seen surrounding historic communities all all sizes, along primary commercial road corridors, at interstate interchanges, and at various locations along back country roads. Much of today's community planning and growth management effort is focused on improving the character of this ongoing wave of change.

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In the vicinity of larger cities such as Philadelphia and Pittsburgh, and even around smaller cities such as Harrisburg and York, suburbs have taken on identities of their own as freestanding communities. Within the South Mountain region and much of the larger Pennsylvania Cultural Area, however, suburban development exists primarily as a layering over and within the early 19th century landscape patterns, affecting it but without loss of its essential personality and character (Miller 1995:143).



Suburban landscape superimposed over Carlisle's historic nineteenth century agricultural landscape. Historic downtown Carlisle is on the upper right. Around the historic town are suburban residential areas, commercial areas, and business/warehouse areas heavily influenced by the locations of highway interchanges. (Google Earth)

Within the region of the South Mountain Conservation Landscape, South Mountain stands as an island of green and connected open space. There are no other large areas of natural landscape. In addition to serving as a visible landmark and source of regional identity, South Mountain is a heavily used **recreational destination** both for local residents and for people farther away. The increased access to and use of outdoor recreational attractions such as seen on South Mountain is a consequence of the mobility provided by today's automobile oriented landscape. Recreational use must be balanced with the mountain's significance as an ecological resource and is a challenge for land managers.

The landscape surrounding South Mountain **retains the overall character** of its peak period of agrarian development by the 1850s while absorbing layers of later change. In the Cumberland Valley, agriculture practiced on family farms continues to be the primary land use, predominantly dairy, livestock, and grains (Cuff 1989:203). Historic farmsteads remain as the centers of farm life and tend to be well preserved while adapting to modern farm practices. Most of the region's farmsteads have been identified and surveyed as historic resources.

Field patterns and lot lines reflect historic early 19th century precedents: many long and thin; comprised of parallel lines in a wide variety of local groupings; and conforming to local topography, landscape features, and early road layouts. Many local groupings of field patterns follow the predominant grain of valley's north-south topography.

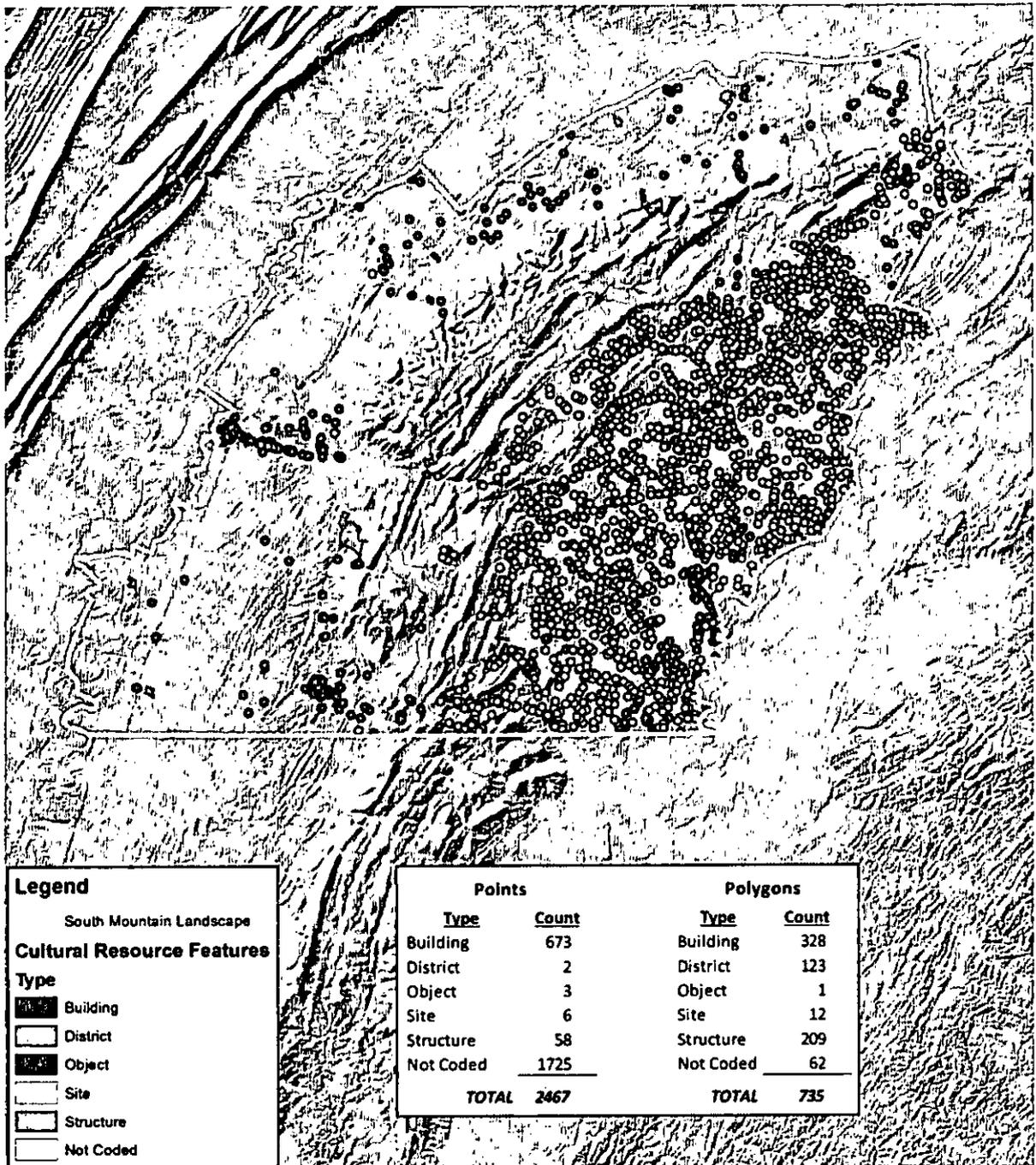
On the eastern side of the valley, with its fertile limestone soils and few surface streams, farms are largely open with few trees and woodlots. On the west side of the valley, field patterns adapt to the winding streams and there are increased wooded areas, often related to the steep slopes along streams. Suburban landscape features introduced throughout the valley have increased the number of trees where they occur, and thin lines of trees can be seen lining roads, streams, railroads, and a few field edges.

Road patterns retain their historic alignments, connecting communities and places in opportunistic patterns (as opposed to planned orthogonal grids) directly connecting destinations while favoring high ground to avoid the need for stream crossings.

Route 11 is the backbone and primary north-south road in the valley, located roughly through its center but on the limestone side where there are fewer streams. Market towns are spaced at approximately 10 mile intervals along the road down the valley toward southern Virginia, with the exception of Carlisle to Shippensburg, which measures about 20 miles. Small linear and crossroads villages are also found along the route as well as on less traveled parallel and transecting rural valley roads.



The village of Mont Alto adjacent to South Mountain. New suburban development has developed around the historic village and in larger subdivisions within the landscape to the north. Yet the overall agricultural character of the Cumberland Valley is predominant. (Google Earth)



Distribution of surveyed cultural resources within the South Mountain Conservation Landscape (PHMP CRGIS data)

The valley's market towns are the regional focus of government, business, commercial, education, and social activity and are generally thriving. Another modern trend of the automobile landscape is the growth of heritage tourism, similar to that of recreational destinations noted above. The growth of heritage tourism within the region is most prominently seen at Gettysburg, a national tourism destination, but is also evident in the revitalization of historic valley

towns such as Carlisle, Shippensburg, Chambersburg, Greencastle, and Waynesboro.

Smaller linear and crossroad villages have not fared as well. Most dwellings in the historic villages are small and closely spaced both to each other and to the road. Historic commercial uses have disappeared. Lacking investment, many are rental properties and not well cared for.

Similar historic 19th century cultural landscape patterns remain throughout the Triassic Lowlands east of South Mountain as well. As discussed earlier in this chapter, the South Mountain or Adams County Fruit Belt along the eastern flank of the mountain is well known and documented as a distinct type of agricultural cultural landscape. Further east, 19th century farms, farmsteads, and crossroad villages dominate the landscape as they do in the valley with similar agricultural land patterns.

In the Triassic Lowlands, however, the topography is more rolling, the streams are more prevalent, the land is less fertile, and outcroppings of diabase create knobs and ridges of woodland as features of the landscape. These features create a somewhat different character to the landscape than is found in the valley. Livestock farming and pasture are stronger in some areas here than dairy and cultivated crops.



Gettysburg (right) in the Triassic Lowlands east of South Mountain. Battlefield preservation has helped preserve historic landscape character in the vicinity of the town. Wooded areas tend to be diabase outcroppings. (Google Earth)



CHAPTER 3 – HISTORICAL OVERVIEW

The South Mountain region, encompassing portions of Cumberland, Franklin, Adams and York counties, has provided important natural, mineral and recreational resources for its earliest inhabitants through the present day. The area's abundant forests and raw materials supported the country's early iron industry, while the fertile limestone soils contributed to the Great Valley's rich agricultural heritage and the slopes of the mountain provided ideal conditions for the orchard culture of the Adams County Fruit Belt. Michaux State Forest, which encompasses the wooded ridge along the top of the mountain, was formed in the early twentieth century and served as an early incubator for state forestry initiatives. Although modern development has overtaken portions of the area, much of the South Mountain region reflects the agricultural and orchard based landscape established in the nineteenth century.

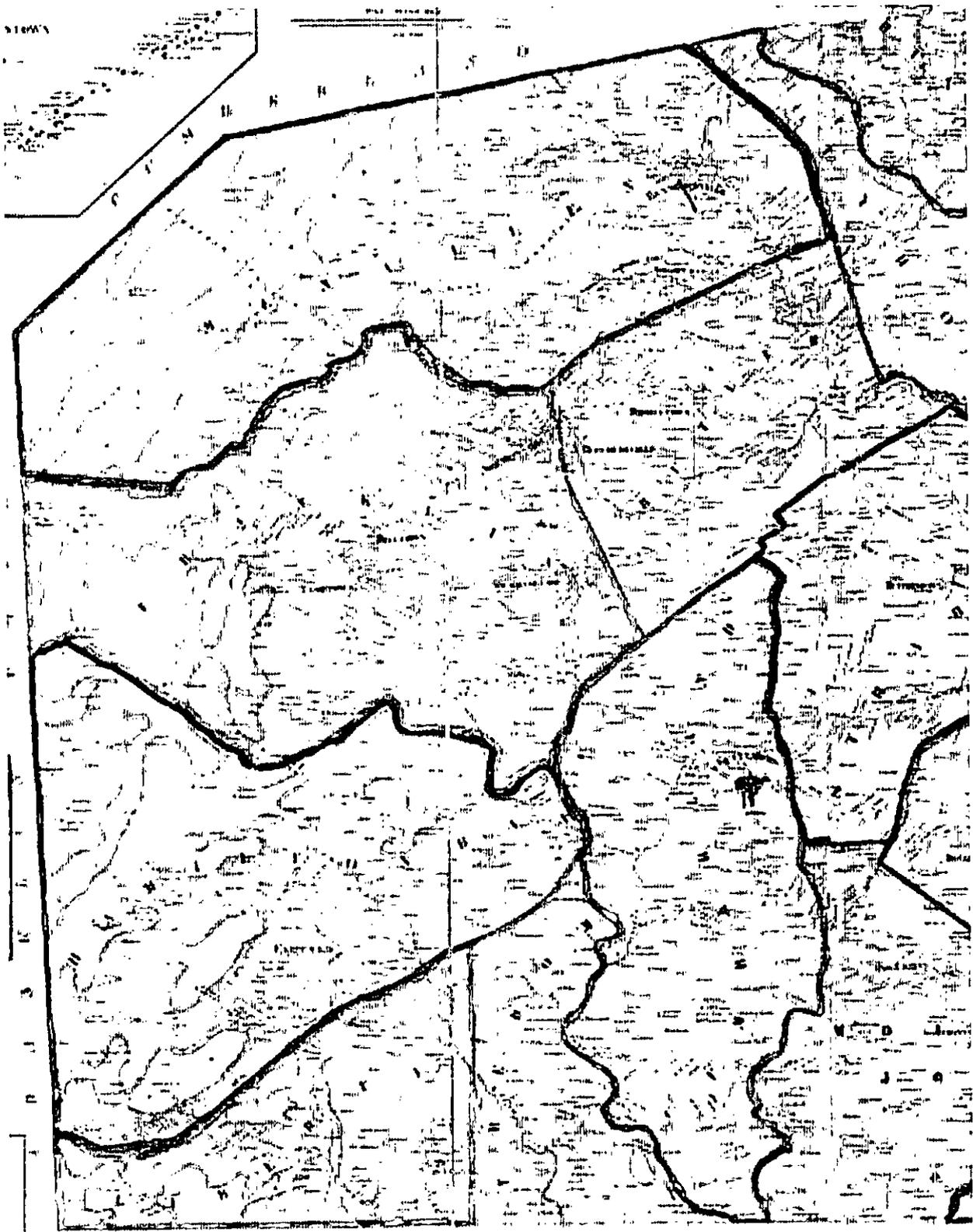
NATIVE AMERICANS ON THE MOUNTAIN

Native Americans were the first human inhabitants of the South Mountain region and the Cumberland Valley. They lived and camped along the area's streams, used minerals and rocks in the mountain formations for tools and weapons, and cultivated crops in the fertile soils of the valleys. They forged paths along natural landforms and hunted game that came off the mountain into cleared areas.

The earliest Native Americans were likely nomadic hunters who lived in temporary camps established as they traveled through the Cumberland Valley. During the Paleoindian period (12,000-10,000 BP), the Indians would have located more permanent villages near the Susquehanna River. Base camps and kill sites have been identified by accumulation of lithic debris and tools associated with animal killing and processing.

As the climate transitioned to an overall warmer and drier one during the Archaic period (10,000-3000 BP), the predominantly conifer forests of the region declined and hardwood trees rounded out the wooded areas. Natives divided themselves into groups, or bands, and began crafting goods, such as tools and weapons made from metarhyolite deposits found in the South Mountain area, as well as quartzite and limestone quarried from the mountain.

The Woodland period (3000-450 BP) saw the establishment of more permanent villages, where the Native Americans transitioned from horticulture to agriculture to grow fruit, grains, legumes, roots, tubers and greens. Also during this period, Indians exploited natural materials and resources to create ceramic goods. By



Western portion of Adams County in 1858 (Hopkins 1858)

HISTORICAL OVERVIEW

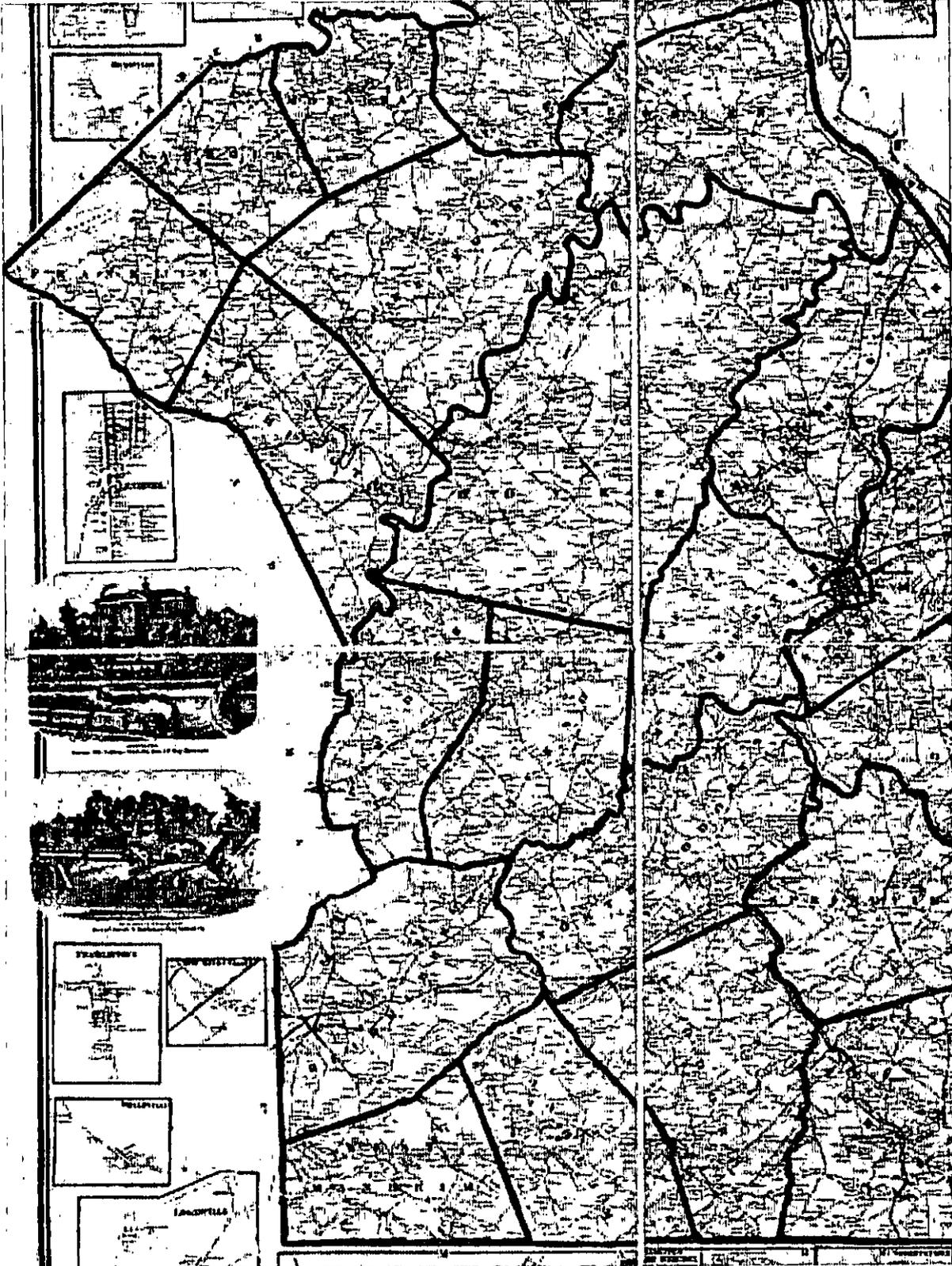
the end of the Woodland period, European explorers had made contact with Native Americans and a time of clashes over land and uneasy settlement occurred.

During the century between ca. 1575 and ca. 1675, the Susquehannocks, an Iroquois speaking culture, occupied much of central Pennsylvania and the Cumberland Valley. These Native Americans tended to move to new fertile lands and water sources every few years, where they hunted, fished and collected their food. The Susquehannocks were at war with the Delaware and Iroquois during the mid-seventeenth century and were eventually driven out of Pennsylvania by the Iroquois, who then gained control of the Susquehannocks land, including the Cumberland Valley. By the early eighteenth century, the Shawnee had migrated to the area from the south and west and established villages in Cumberland County near the Conodoguinet and Yellow Breeches creeks. Most of the Shawnee left the area by the late 1720s as European settlers were claiming lands in Cumberland County (CCCP 2008:4-1 – 4-3).

Although some archaeological evidence of Native American occupation of the area has been identified in the South Mountain region, one of the lasting reminders of these early inhabitants is reflected in the Algonquian names of some local waterways, including the Conodoguinet Creek and the Callapatsink Creek, the original name of the Yellow Breeches. Additional vestiges of the natives' early existence in the area are manifest in several roads and turnpikes running through the valley and across the mountain, many of which intersected at Carlisle. Present day Route 11 roughly follows the Great Trail, Walnut Bottom Road was known as the Walnut Bottom Path, and portions of Trindle Road were part of the Frankstown Path, which traveled east-west across the mountain. (CCCP 2008:4-3 – 4-5).

EARLY EUROPEAN SETTLEMENT (1725-1780)

The broad flat area below the western slopes of the South Mountain is known as the Great Valley. This band of fertile land extends southward into Virginia and northeastward to New Jersey. Within Pennsylvania, the Great Valley is between 10 and 25 miles wide and extends about 150 miles, bounded on the north by long, narrow, steep ridges and on the south by South Mountain and a band of hills that separate the Great Valley from northern Bucks, Montgomery, Chester, Lancaster, and York Counties. Within this larger region, the eastern end of the Great Valley is known as the "Lehigh Valley"; the flat area from Reading to Harrisburg as the "Lebanon Valley"; and the portion from the Susquehanna River to the Maryland line, through Cumberland and Franklin counties, is called the "Cumberland Valley" (McMurry, et al. 2011:9). The portion of Adams County within the South Mountain region includes the eastern slopes of the mountain, with ridges of red shale and sandstone forming rough and rocky hills, and a belt of limestone passing through the southeast corner of the county (Rupp 1848:521).



Western portion of York County in 1860 (Shearer 1860)

HISTORICAL OVERVIEW

South Mountain itself did not attract many permanent settlers, but it did provide valuable iron ore, limestone and sandstone, as well as an abundant supply of timber to fuel the region's numerous furnaces and mills (Rupp 1848:365). Deposits of copper and other minerals were found within the Adams County section of the mountain (Rupp 1848:521).

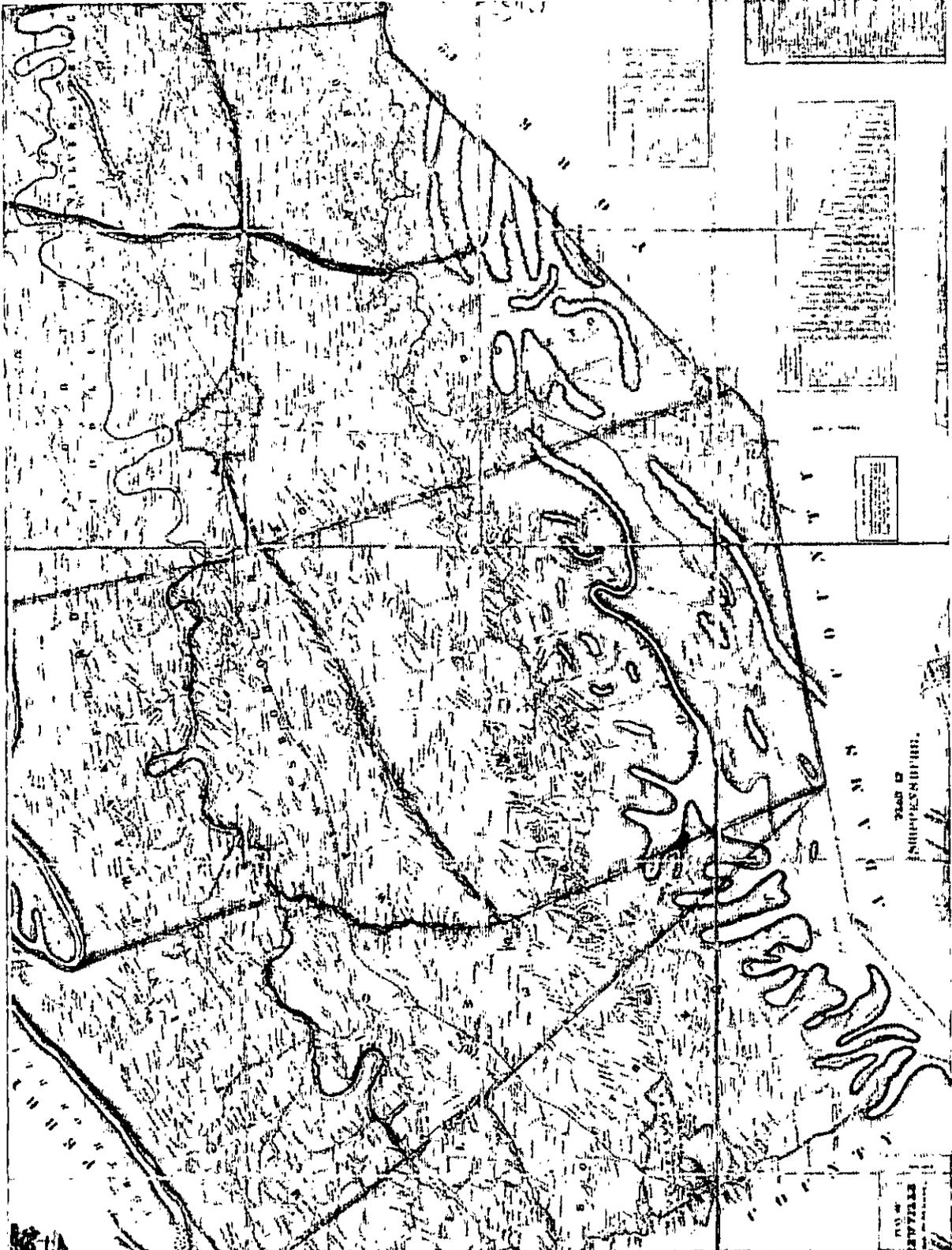
Around 1715, James Letort, noted as the first European settler in Cumberland County, established a trading post near a spring-fed limestone stream (now known as LeTort Spring Run) that ran through the Carlisle area. Letort understood the language of the Shawnee and served as a liaison of sorts between the Indians and early white settlers. He moved west in the late 1720s after an influx of European settlers into the area further strained relations with the Shawnee (CCCP 2008:4-5 – 4-6).

Irish and Scotch-Irish settled in the Cumberland Valley during the 1720s and 1730s, part of a Great Migration, while members of the Six Nations (Shawnee and Iroquois) and Susquehannocks were still living in the area (Rupp 1848:350-351). Like the Native Americans before them, the Europeans settled in the fertile valleys near the region's springs and creeks. German settlers followed, and by the end of the eighteenth century, there were nearly equal numbers of Scotch-Irish and German inhabitants in Cumberland County.

Cumberland County was formed from the western portion of Lancaster County in 1750 and stretched westward from the Susquehanna River. The central portion of the county encompasses the limestone valley between the Tuscarora mountain range to the north and South Mountain to the south, and included the towns of Shippensburg at the southwestern edge and Carlisle as the hub in the center of the county. Smaller towns and villages developed at crossroads, along major waterways and around the forges, furnaces and mills established in the mid-eighteenth century. The Carlisle Iron Works was located in the village of Boiling Springs in South Middleton Township, and the Pine Grove Iron Works, which included Pine Grove Furnace and Laurel Forge, together eventually included about 25,000 acres of mountain land in the southwestern portion of the county.

The first white settlers in what would become Franklin County were Scotch and Scotch-Irish, who claimed "the slate lands" in the 1740s-1750, before the more fertile limestone lands further west were surveyed or located. The slate lands were situated in the eastern portion of the county near the base of South Mountain and provided wood, watercourses and water-meadows and were generally free of rock at the surface (Rupp 1848:484-485).

Franklin County was established in 1784 from portions of Cumberland County. Similar to Cumberland, Franklin is bounded on the east and west by mountains with the limestone valley running through the center. Chambersburg, located in the center of the county, was the principal town, with smaller villages situated at the base of the mountains and in association with the numerous saw and grist mills scattered throughout the county. The Mt. Alto Iron Company was located in the southeastern portion of the county, and Caledonia Iron Works along the border with Adams County.



Cumberland County in 1858, north to left (Bridgens 1858)

HISTORICAL OVERVIEW

Early settlers in the Adams County area were principally Scotch-Irish who landed in the southwestern part of the county 1740s, and some English descendants who settled the borders of Maryland. Germans settled the limestone region between Hanover and Littlestown (Rupp 1848:545). The eastern portion of the county, which had been cleared by Native Americans to facilitate hunting, was almost entirely devoid of timber and was known as The Barrens. Most of the trees grew back following European settlement in the early eighteenth century (Beers 1886:51).

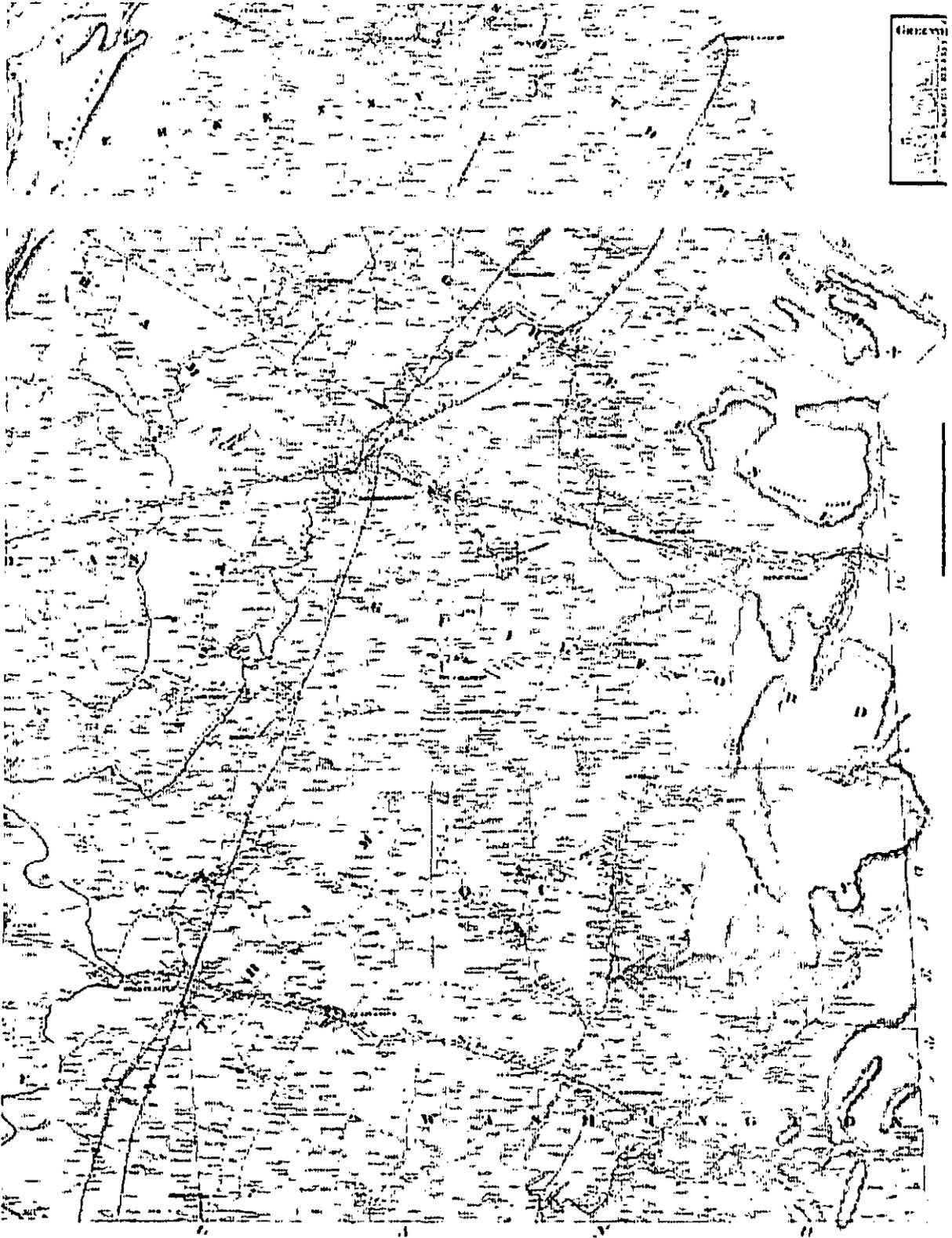
Adams County was erected from the western part of York County in 1800. Bounded on the west by South Mountain, the central and eastern portions of the county consist of rolling hills and a smaller limestone valley to the southeast. Major towns in the county included Gettysburg in the center and Littlestown at the Maryland border, with smaller villages near the eastern edge of the county, and very little early development in the mountain portion.

After the French and Indian War ended in 1763, the Cumberland Valley became more densely populated as European settlers migrated westward. By the end of the eighteenth century, much of the farmland in the valley had been claimed. Settlers also had discovered the valuable iron ore deposits on South Mountain and established the iron furnaces and forges that would characterize the mountain landscape and complement the region's agricultural-based economy through most of the next century.

The earliest farms in the valley would have included a small log or stone house reflective of the settler's ethnic heritage; later, larger and more substantial houses in the area were built of stone or brick with four or five bays and a gable roof. Early barns were typically small ground barns (on one level) because farmers did not need much room for livestock or crop storage. Additional farm buildings included kitchens, spring houses, smoke houses, still houses and bake houses. The farm landscape typically was made up of small crops fields, woodlots, orchards and meadows, with little definition between these elements and neighboring farms (McMurry, et al. 2011c:15-22).

INDUSTRY AND AGRICULTURE (1750-1860)

European settlers brought farming methods from their home countries, but also were introduced to native crops such as corn, beans, peas, squash and melons by Native Americans, who had been cultivating these crops to supplement game and fish in their diets. Farms in the South Mountain region produced crops and goods for their own consumption and for selling and trading to both local and distant markets. This economic model resulted in the production of diverse crops and broadened the farmer's reach and exposure to a variety of goods and services (McMurry 2011b:10). In addition to grain, grass and vegetable crops grown within the Cumberland Valley, farmers planted apple orchards that provided not only fresh fruit, but also dried fruit, cider (both sweet and hard), vinegar, and apple butter (McMurry 2001c:13). Adams County, especially, had the right combination of landforms and soils to excel in tree-fruit culture; however, this industry did not develop until transportation links and innovations in cultivation were established near the end of the nineteenth century (McMurry 2011a:13).



Eastern portion of Franklin County in 1858 (Davidson 1858)

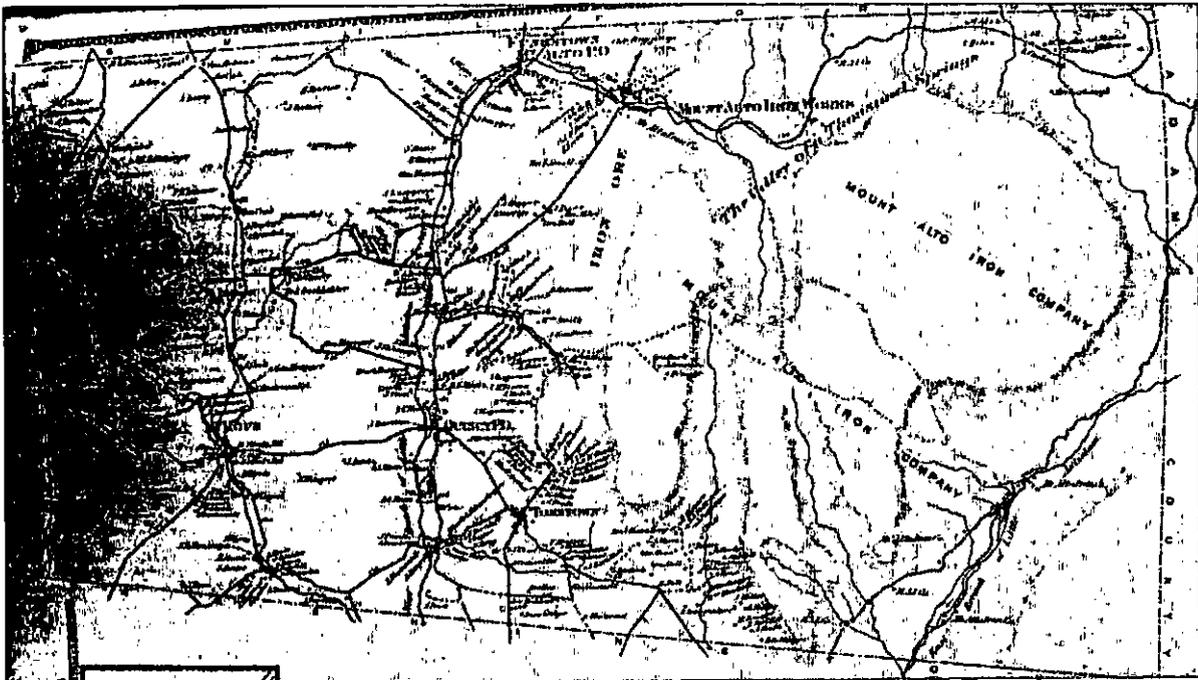
HISTORICAL OVERVIEW

The early settlers focused on clearing land and planting crops to feed themselves and sell to local and regional markets. Despite the limestone rich soil in the Cumberland Valley, farmers found that planting the same crops in the same fields exhausted the soil and nutrients, and some families chose to move from the area to find fresh land to farm. The German farmers who took up the depleted land began rotating their crops among the fields and enriched the soil with lime and other organics, including manure harvested from livestock. This crop-and-livestock system produced a diverse array of both crops and livestock products and proved to make farms more efficient with field husbandry and animal husbandry working in tandem (McMurry 2011c:24). Thus farms in the Cumberland Valley were able to tap into the domestic markets to provide for the growing population and take advantage of the improved roads, and the newly built canals and railroads, to distribute goods (McMurry 2011c:23-24).

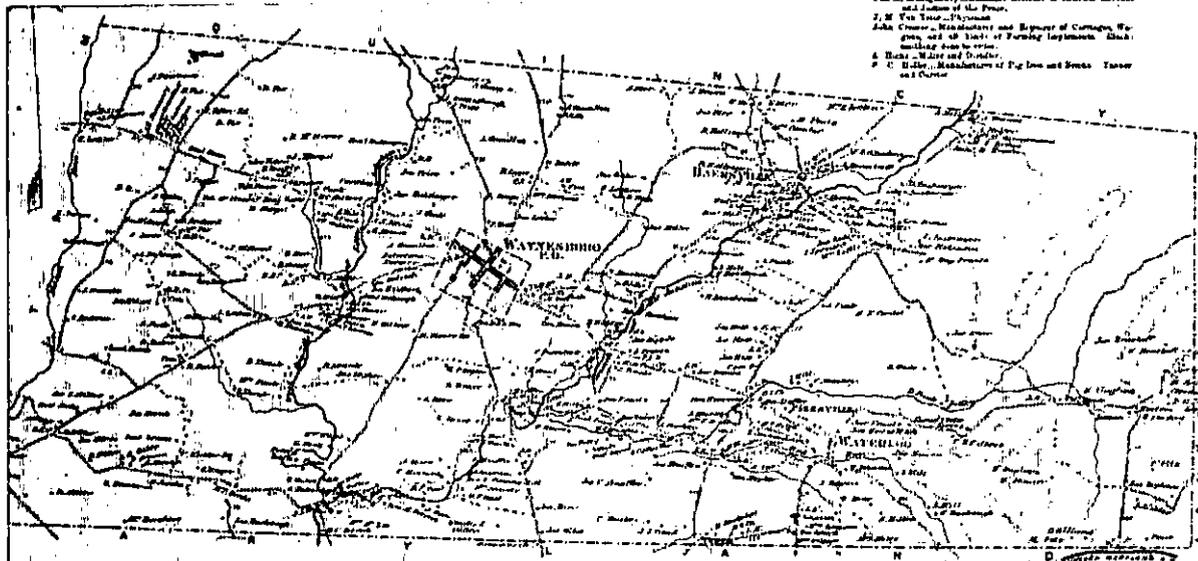
The principal crops grown by Cumberland Valley farmers during the nineteenth century included wheat, corn, oats and hay, supplemented in smaller numbers by other grains, grasses and produce. As part of the newly adopted crop-and-livestock system, livestock in the valley included cattle, horses and swine. The predominance of swine, and rye crops in certain areas, was reflective of the German culture and dietary habits (McMurry 2001c:33).

During this period, farm tenancy rates in Cumberland County were higher than other areas in the Great Valley. In the South Mountain region, vast tracts of land were owned by iron companies and the fertile farmland parcels were often rented out to local farmers who would grow crops and raise livestock for both personal use and providing products back to the company as rent for the land. Another factor contributing to the higher farm tenancy rates in the area was the concentration of Germans, who tended to keep immediate and extended family members together by sharing land, most notably between father and sons (McMurry 2001c:27).

Rupp's 1848 history of several counties in central Pennsylvania – including Cumberland, Franklin and Adams – provides information about numbers and sizes of farms, as well as statistics about local industries. As of 1838, Cumberland County contained 1,474 farms, with average farm size of 110 acres, growing wheat, rye, oats, barley, corn, potatoes, turnips, buckwheat, hemp and flax (Rupp 1848:367), and Franklin County included 2,064 farms, with farm sizes ranging from 100 to 300 acres (Rupp 1848:452). Rupp notes that areas of Adams County were not ideal for cultivation, but application of lime had enriched the soils and agriculture had improved during the first half of the nineteenth century. At the beginning of the century, wheat, grain and feed for horses was brought into Adams from other counties, but by 1840, crops of wheat, rye, corn, hay, buckwheat and potatoes were grown in the county (Rupp 1848:521-522).



Quincy Township, Franklin County in 1868 (Beers 1868)



Washington Township, Franklin County in 1868 (Beers 1868)

HISTORICAL OVERVIEW

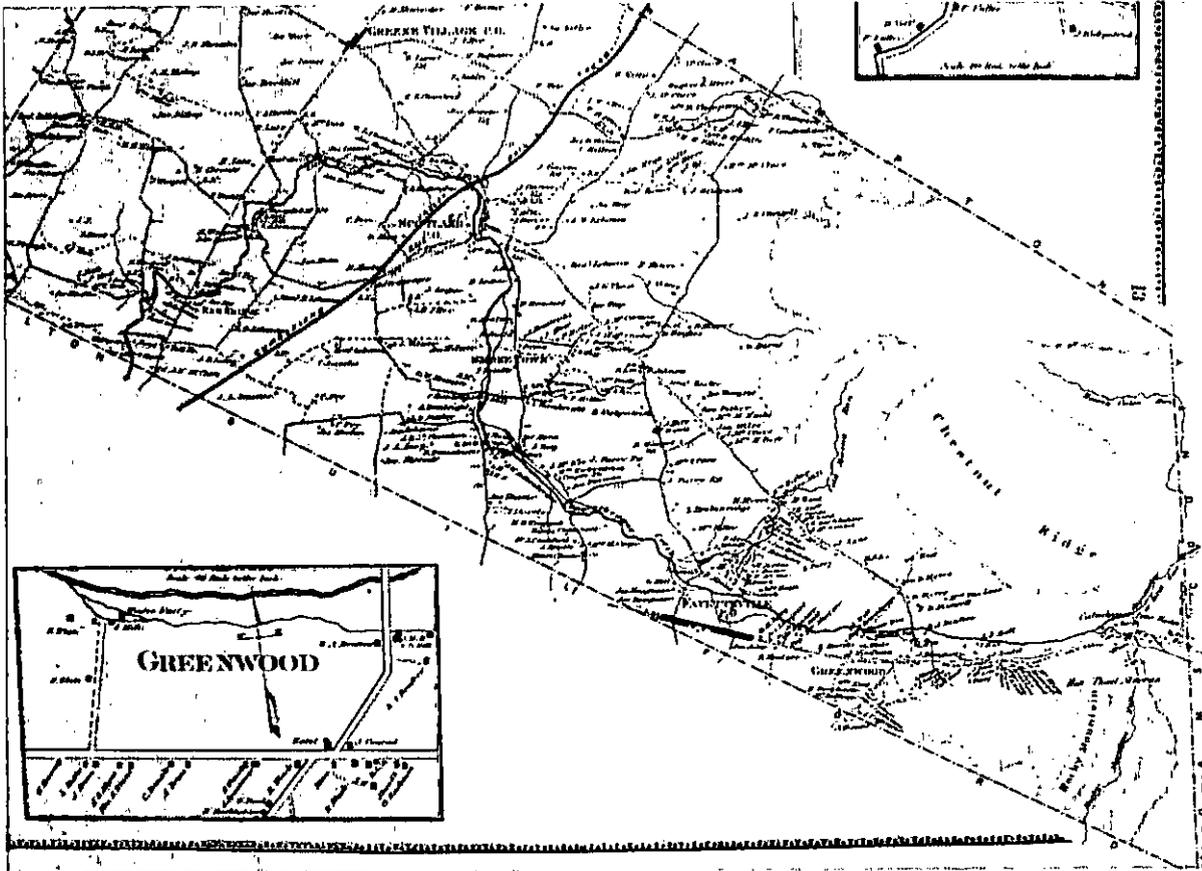
In Adams County, traditional crop-and-livestock farming was occurring in the eastern portion of the county while the western portion of the county was focusing on fruit trees and the development of commercial orchards. In the early decades of the nineteenth century, farmers had discovered that the climate, soils and topography along the eastern slopes of South Mountain were ideal for fruit-tree culture, but it wasn't until later in the century that conditions aligned so that the Adams County Fruit Belt, as the region became known, was able to capitalize on its location (McMurry 2011a:11).

The "Fruit Belt" consists of a 4-6-mile-wide swath of land that includes much of Latimore, Huntington, Tyrone, Menallen, Butler, Franklin and Hamiltonban townships, as well as the villages of York Springs, Bendersville, Biglerville, Arendtsville and Fairfield (McMurry 2011a:8). The fruit belt is situated on the lower eastern slopes of the mountain, at 700-900 feet; the sloping feature of the orchard region allows heavier cold air to drain to the valleys so that the fruit trees are spared from frost damage (McMurry 2011a:10).

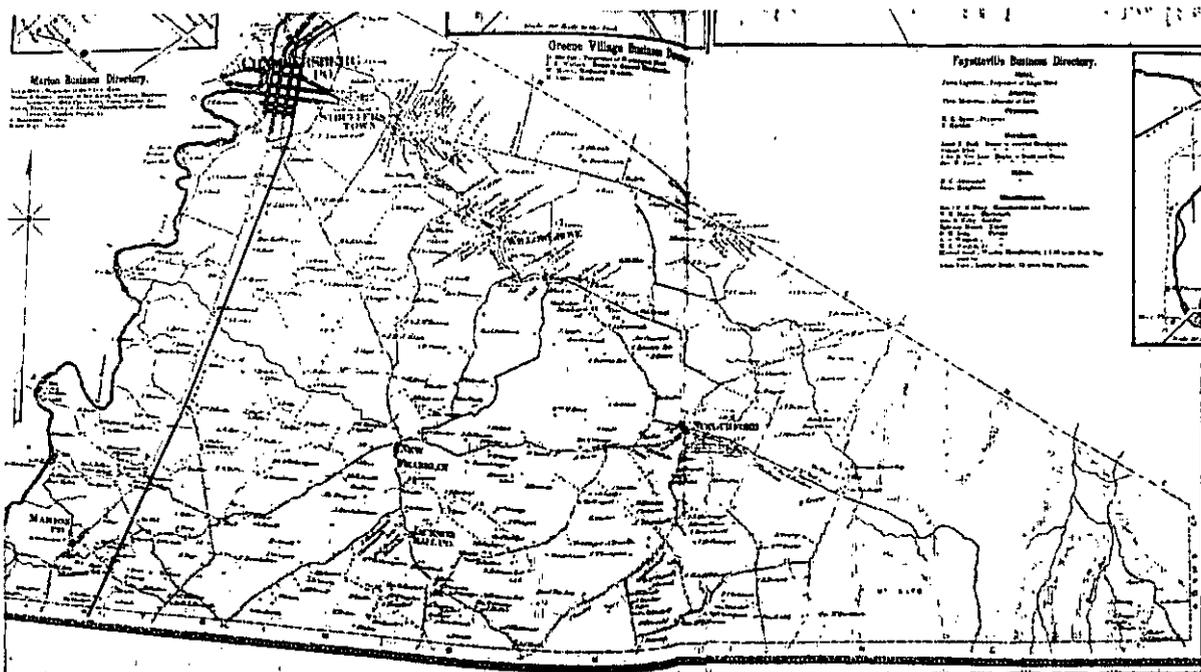
By the mid-nineteenth century, several fruit nurseries had been established in the Arendtsville and Bendersville areas with apple orchards growing hundreds of varieties and at various stages of growth, in addition to peach, pear, cherry and other types of fruit trees (McMurry 2011a:13-14). Other than the few nurseries dedicated to growing and cultivating fruit trees, the nascent orchard industry began as small plots of trees grown in conjunction with grain and grass crops on a mixed farm. The development and expansion of transportation networks into western Adams County during the later decades of the 1800s provided a way to distribute the fruit to both local and regional markets.

Farm properties in the South Mountain region during this period likely included several principal buildings, such as a two-story, four or five bay house with a gable roof, a large barn and a variety of domestic and agricultural outbuildings. The predominant barn type in the area was the forebay bank barn (also known as the Pennsylvania barn), which facilitated the crop-and-livestock system of farming by providing space to store grasses and spent grain for feed, room to house livestock, and storage of manure (McMurry 2001c:48). Domestic outbuildings, likely located closer to the house, would include spring houses, summer kitchens, smoke houses, butcher houses and privies. Agricultural outbuildings would be located closer to the barn, and included pigsties, corn cribs, machine sheds, and occasionally lime kilns. Many farms also included one or more tenant houses. The property would have been divided into small square or rectangular fields, sometimes separated by fencing or other markers, the house and yard set off by a fence, and woodlots and orchard trees, often planted along the property boundary (McMurry, et al. 2011c:38-63). For farms in the fruit belt, the basic domestic and agricultural buildings would be similar to those found in the Cumberland Valley, with barns and other outbuildings (spring house or ice house) being used to store and pack fruit (McMurry, et al 2011a:20).

While farmers were busy settling and cultivating the valley land and the fruit belt slopes, activities on South Mountain focused primarily on the iron industry. The sizeable deposits of iron ore in the mountain were recognized and exploited by



Greene Township, Franklin County in 1868 (Beers 1868)



Guilford Township, Franklin County in 1868 (Beers 1868)

HISTORICAL OVERVIEW

early settlers, who began to establish iron furnaces and forges in the second half of the eighteenth century. In addition to the valuable ore deposits, the vast forested areas of the mountain provided trees for making of charcoal as fuel to power the furnaces. In the early nineteenth century, these industries continued and expanded, and the facilities themselves, as well as the worker housing, nearby villages, transportation networks and vast landholdings dominated the landscape and culture of South Mountain.

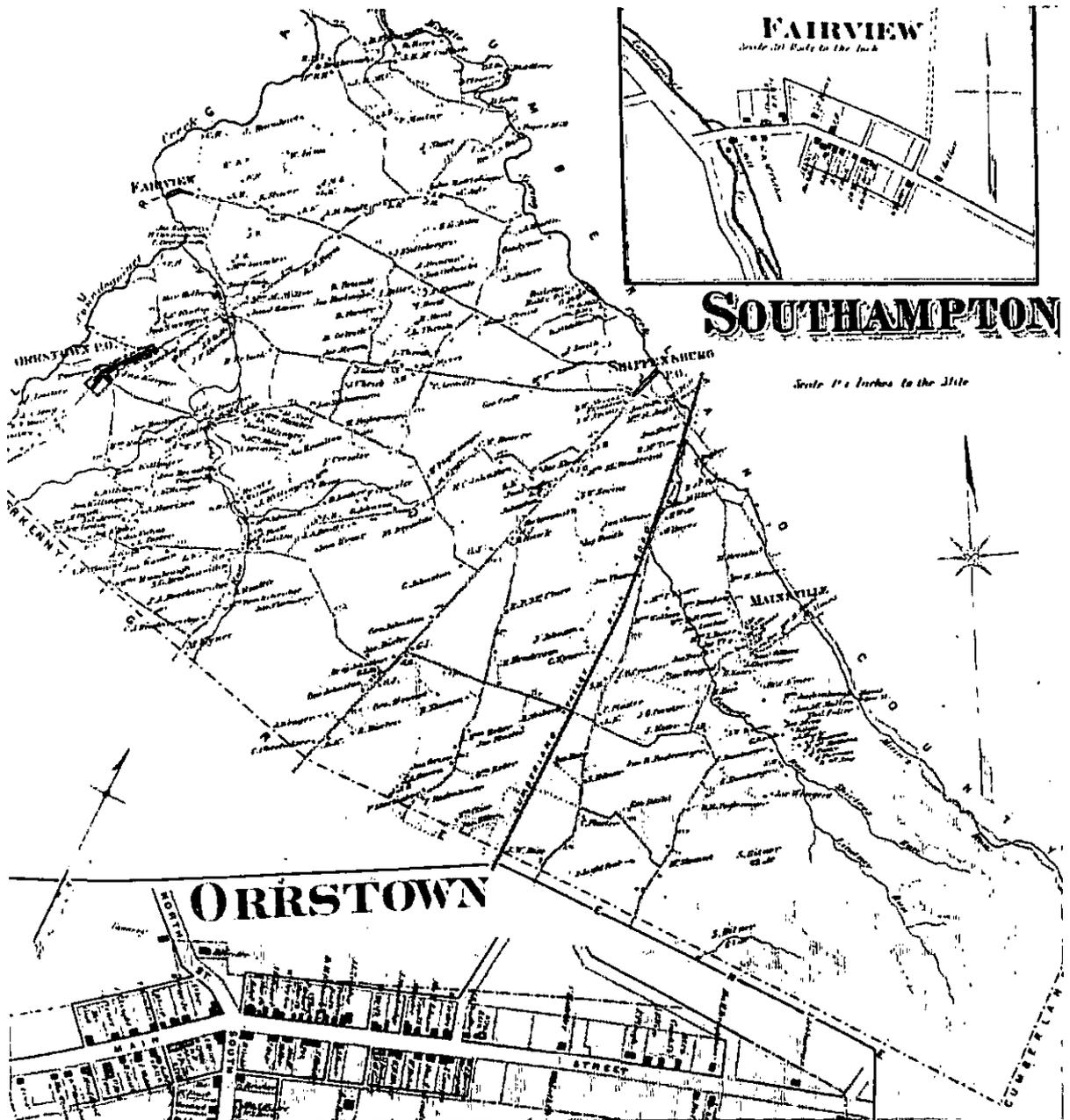
In 1840, Cumberland County included 6 furnaces that produced 2,830 tons of cast iron, and five forges and rolling mills that produced 2,150 tons of bar iron. The furnaces and forges consumed 10,600 tons of fuel and employed 400 hands, including mining operations (Rupp 1848:372). The 1840 census for Franklin County enumerated 8 furnaces that produced 3,810 tons of cast iron and 11 forges, bloomeries and rolling mills that produced 1,125 tons of bar iron. These furnaces and forges used 8,552 tons of fuel and employed 518 hands, including mining operations (Rupp 1848:452). In Adams County, the 1840 census reported only 3 furnaces in the county, which produced 50 tons of cast iron, consumed 50 tons of fuel and employed 10 men, including mining operations (Rupp 1848:522).

THE MATURING AGRICULTURAL LANDSCAPE (1860-1900)

The Civil War had a transformative effect on the country's overall economic, political and social attitudes and also impacted the South Mountain region directly as Union and Confederate troops fought to control the region's transportation corridors, natural and built environments, industries and commercial products, as well as the area's food supplies. Throughout the war, command of rail lines and roadways changed sides periodically, and tracks, rolling stock and depots were frequently destroyed. Local industries, especially those related to iron manufacture and processing of raw materials and crops, were seized by commanders on both sides of the conflict. Farmland, crops and buildings also were appropriated to supply troops with food, lodging and space for military headquarters. The Battle of Gettysburg, fought over three days in July 1863, was a major turning point in the war; however, numerous skirmishes took place throughout the region in association with the battle.

Nineteenth century maps illustrate the range of development and economic activities that were occurring in the South Mountain region. Within Cumberland and Franklin counties, pockets of iron ore were noted in many of the townships that contained mountain land, and iron companies were listed as owners of tens of thousands of acres that provided raw materials and fuel for their enterprises. Most of the mountain land was undeveloped, save for the iron furnaces and forges, whereas towns and villages were located in the foothills and valleys (D.G.Beers 1868; F.W. Beers 1872). Most of Adams County's industry centered on milling and included very little iron-related businesses (Lake 1872).

Though the iron industries appeared as major landholders, the industry had been hit hard by raids and damage related to the Civil War. The industry was eventually affected by innovations in fuel and production and the discovery of high-grade



Southampton Township, Franklin County in 1868 (Beers 1868)

HISTORICAL OVERVIEW

ore near the Great Lakes that supplanted the South Mountain region as a center of iron production (Swartz 1986:5). During the last decades of the nineteenth century, the region's remaining furnaces and forges closed and enterprising owners developed other industrial initiatives as well as parks and recreation areas to attract paying customers on the little used rail lines.

According to the 1872 Cumberland County atlas, iron-related industries included the Carlisle Iron Works in Boiling Springs (South Middleton Township), Laurel Forge and Pine Grove Furnace in Penn Township, and Big Pond Furnace in Southampton Township. Located on the east side of the lake in Boiling Springs, the Carlisle Iron Works included an office, coal house, furnace, forge, grist mill, stable, coal shed and several barns, as well as 10,000 acres of land in the southwestern portion of the township. Owned by the South Mountain Iron Company, Pine Grove included the company's offices and store, furnace, blacksmith and carpenter shops, a railroad depot, grist mill, engine houses, and a boarding house. Laurel Forge included several forge buildings, the manager's residence, coal house, a boarding house, carpenter shop, coal dwelling houses and a depot. Big Pond Furnace was depicted as a smaller operation and included a furnace and forge (F.W. Beers 1872).

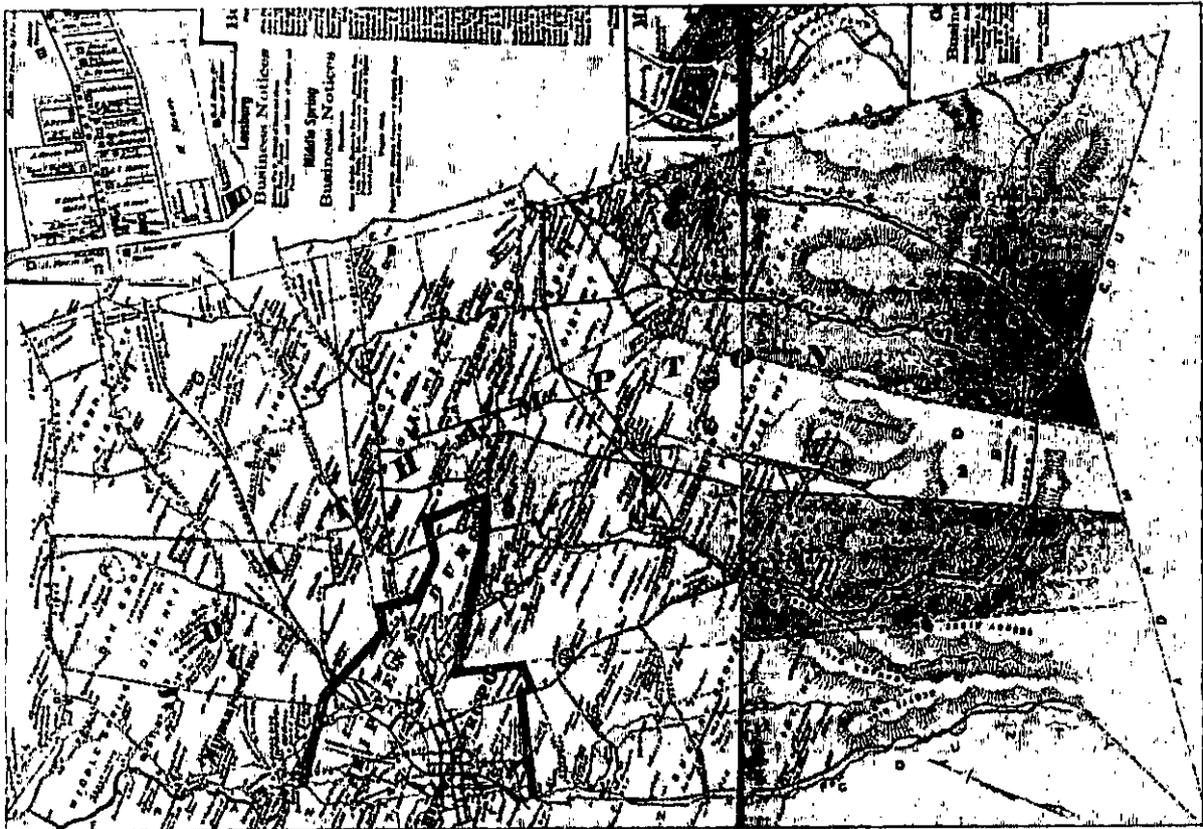
Additional industries noted in Cumberland County included limestone quarries and kilns, sandstone quarries, and paper mills in Mount Holly Springs and Newville. Under the business notices on individual maps, most listings were for farmers and stock growers, with fewer listings for professional or tradesmen. Within the South Mountain region of the county, Carlisle, Shippensburg, Mount Holly Springs, and Boiling Springs were the major community centers, and smaller villages, such as Whitehouse (Dickinson Township), Hockersville, Centerville and Mill Town (Penn Township), Cleversburg, Middle Spring and Leesburg (Southampton Township), supported the farms and industries in the area (F.W. Beers 1872).

The 1868 Franklin County atlas paints a similar picture to that of Cumberland County in terms of occupation and use of the South Mountain region. The Mont Alto Iron Company owned most of the land in the eastern half of Quincy Township, with the iron works located in the northeastern section of the township; a portion of the company's landholdings continued into southern Guilford Township. A number of saw and grist mills were located along the West Branch of Little Antietam Creek. The Caledonia Iron Works was situated in the northeastern portion of Greene Township along the Adams County line. The business included a forge and offices, as well as several other buildings. Chambersburg and Waynesboro were the principal towns in the county, with smaller villages along the foothills and in the valley, including Funkstown, Tomstown, Quincy and Mt. Hope (Quincy Township) and Greenwood, Fayetteville, Scotland, Smoketown and Green Village (Greene Township), and the community of Moneteray in Washington Township (D.G. Beers 1868).

As shown on the 1872 Adams County atlas, the section of South Mountain known as Green Ridge, extended through the county. Within Franklin Township at the northern end of the county, saw, shingle and lath mills were located along the Conococheague and Conawago creeks. Menallen Township also included many



Newton Township, Cumberland County in 1872, north to left (Beers 1872)



Southampton Township, Cumberland County in 1872, north to left (Beers 1872)

HISTORICAL OVERVIEW

saw mills, most of which were located in the mountainous western section of the township. South Mountain Iron Company, which ran the Pine Grove Furnace and Laurel Forge just over the Cumberland County line, owned several properties in the northern and western portions of Menallen Township, between the Piney Hill and Bear Mountain sections of the mountain. Hamiltonban Township contained saw mills, a cooper shop and a carpenter shop in the Green Ridge area of the mountain, with some farming occurring in the valley along the eastern edge of the township. Gettysburg was the principal town in the county, and villages along the base of the mountain included Fairfield, Cashtown, Hilltown, Arndtsville and Bendersville (Lake 1872).

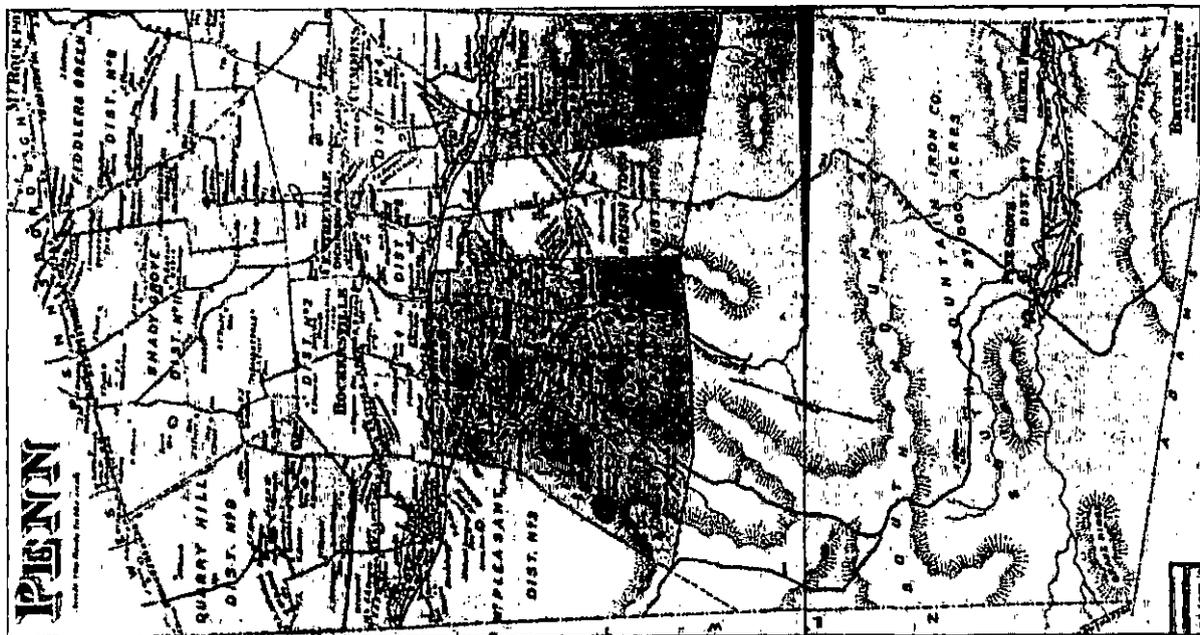
Transportation networks were crucial to moving agricultural and industrial products throughout the South Mountain region and to both eastern urban markets and mid-western outlets. Overland roads roughly followed earlier paths forged by the Native Americans and major roads connected the large towns of the Cumberland Valley with each other and with the state capital at Harrisburg, north and east of the region. The Harrisburg-Chambersburg Turnpike (which generally follows present Interstate 81 and U.S. Route 11), the Chambersburg-Gettysburg Turnpike (roughly parallel to present U.S. Route 30) and the state road from Carlisle to Gettysburg (present PA Route 34) formed the backbone of the road network in the region, along with secondary roads such as Walnut Bottom Road, York Road, Pine Road, Laurel Road and Gettysburg Road. Few roads crossed over South Mountain, though some smaller local roads provided access and circulation around the iron furnaces and forges at the higher elevations.

During the mid-nineteenth century, small independent railroads were built throughout Pennsylvania that linked coal mines, iron foundries to previously distant markets. Regional rail lines also provided an outlet for agricultural products where a farmer could ship goods from the center of the state to the markets in Philadelphia in the same day. The Cumberland Valley Railroad was organized in 1831 and began work on the line in 1836. The first segment between Lemoyne and Carlisle opened in August 1837 and three months later the line was extended southward to Chambersburg. In January 1839, a bridge over the Susquehanna was completed and via connections with other lines, the path from the South Mountain region to Philadelphia was opened (ExplorePAHistory.com 2003:Historical Markers).

The Cumberland Valley Railroad was considered a general-purpose railroad and hauled farm products, iron-ore products and passengers, as well as mail newspapers, parcels and telegraphic communications. During the Civil War, the rail line carried Union troops and supplies and became a target of Confederates. In 1859 the Pennsylvania Railroad bought controlling interest in the Cumberland Valley Railroad, but allowed the regional line to run somewhat independently. During the late nineteenth century, the Cumberland Valley Railroad bought several smaller lines and eventually connected central Pennsylvania with the Shenandoah Valley, as well as West Virginia coal markets and iron ore traffic through and around the South Mountain region (ExplorePAHistory.com 2003:Historical Markers).



Dickinson Township, Cumberland County in 1872, north to left (Beers 1872)



Penn Township, Cumberland County in 1872, north to left (Beers 1872)

HISTORICAL OVERVIEW

The South Mountain Railroad was built in 1868-1869 by the South Mountain Iron Company to provide an outlet for iron products generated from the Pine Grove Furnace. The line connected to the Cumberland Valley Railroad on the east side of Carlisle and included stops at Bonnybrook, Craighead, Mount Holly Springs, among others, before it terminated at Pine Grove. The line was reorganized as the Harrisburg & Gettysburg Railroad in the 1880s (Beers 1886:340). An extension of the rail line from Pine Grove Furnace southward past a slate quarry and into northern Adams County, organized as the Hunter's Run & Slate Belt Railroad, was completed in 1892 (Watts 1991).

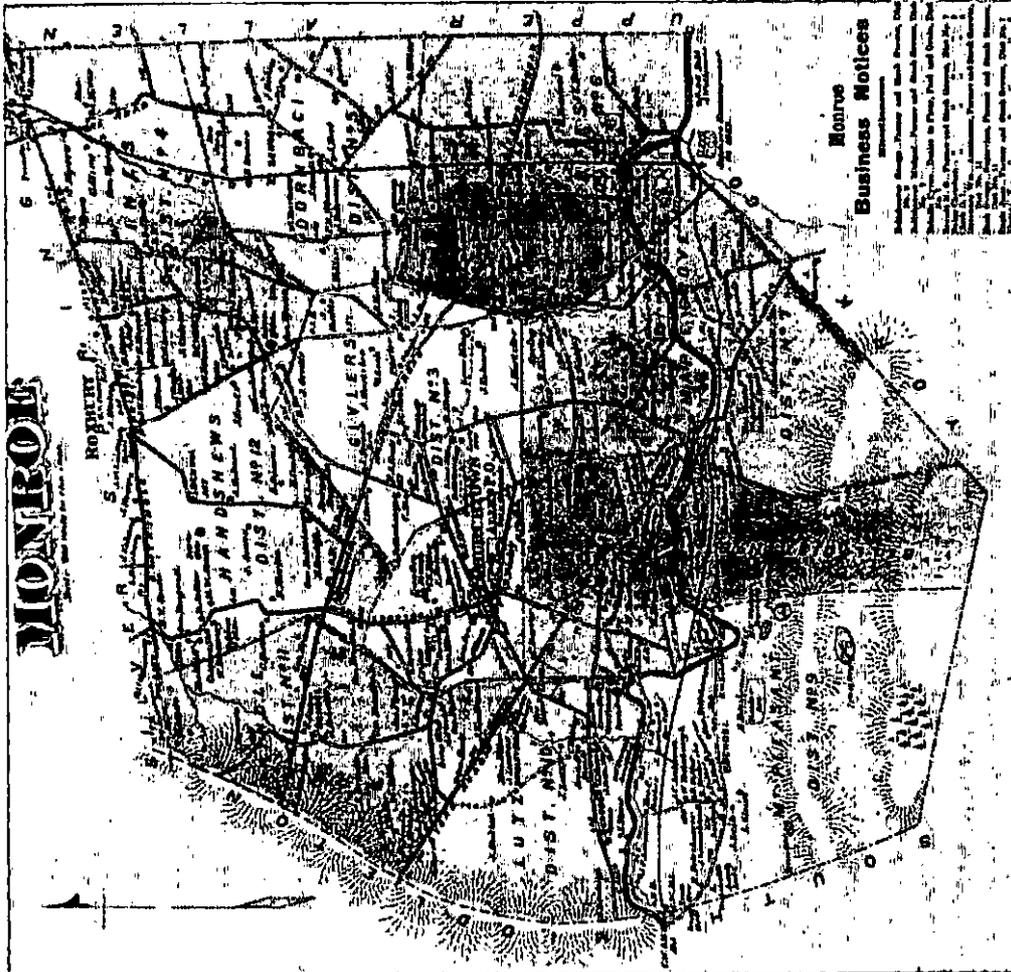
Additional railroads that served the South Mountain region included the Meramar (alternatively known as "Mirimar" and "Miramar"), incorporated by the iron company of the same name to connect the Carlisle Iron Works at Boiling Springs with the western part of the county. Work on the railroad was begun in October 1861 and completed in 1875. The line was eventually purchased and reorganized as the Harrisburg & Potomac Railroad (Beers 1886:347). The Mont Alto Railroad was opened in 1872 and connected to the Cumberland Valley Railroad near Chambersburg and ran to the Mont Alto Park and furnaces in Quincy Township, Franklin County.

By the end of the nineteenth century, the South Mountain region had been settled for nearly 150 years, and the landscape reflected the evolution of agricultural and industrial activities established by the early settlers. The patchwork of farms in the valley, the orchards along the eastern slopes, and the iron and stone industries that claimed the mountain top formed the basis of the region's economy and characterized the diverse landscape knitted together by road and rail networks. Although agriculture would remain the mainstay of the Cumberland Valley, South Mountain itself was about to undergo a significant transformation related to management of its natural and physical resources.

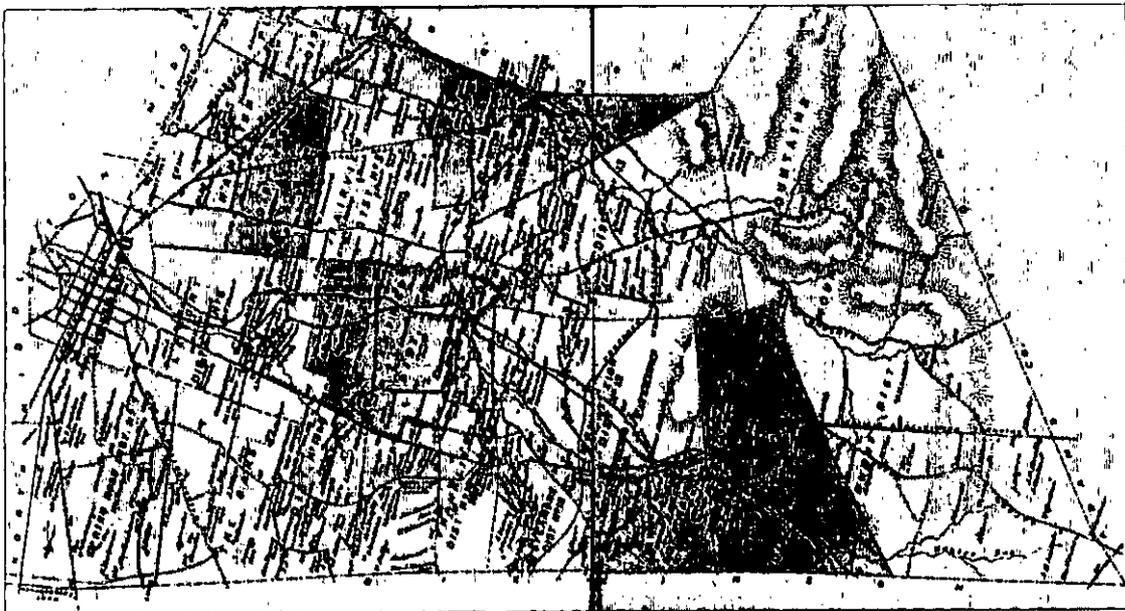
TWENTIETH-CENTURY TRANSFORMATION

Between 1900 and 1940, farmers in the Cumberland Valley focused on dairying, poultry farming and growing wheat, corn, alfalfa, oats and hay crops. Modernization and specialty production transformed agriculture into a more complex business, with automobiles and tractors replacing horses for pulling and hauling, mechanized equipment supplementing manual labor, and railroads and trolleys providing faster and more widespread distribution of products (McMurry, et al. 2011c:64-65).

During this period, dairying was subject to new sanitation requirements so that modifications of nineteenth century barns and construction of separate milk houses were necessary to comply with the rules. At the same time, milk was no longer processed on the farm, but rather was sold in fluid form for direct consumption or to specialty farms that produced butter, cheese, evaporated milk, ice cream or candy (McMurry, et al. 2011c:69). Dairy farmers filled out their herds with cows known for high milk production and feeding and maintaining cows became a year-round activity.



Monroe Township, Cumberland County in 1872, north to left (Beers 1872)



South Middleton Township, Cumberland County in 1872, north to left (Beers 1872)

HISTORICAL OVERVIEW

Poultry farming rose to a more prominent place in the farm economy in the early twentieth century. Cumberland Valley farmers raised turkeys and chickens, posting above average production for both meat and eggs (McMurry, et al. 2011c:70-71). Farmers either modified existing barns or built large poultry houses to accommodate the increased flocks.

By the middle decades of the twentieth century, urban sprawl was encroaching on agricultural land throughout the Great Valley. Farms were reduced in number but enlarged in size, and small-scale diversified regionally oriented farms could not compete with the large-scale capital intensive specialized agri-businesses (McMurry 2011c:118). Suburbanization developed a bit slower in Cumberland and Franklin counties, thus smaller farms persisted in the Cumberland Valley. Specialization continued to focus on dairying and poultry farming, as well as swine production, and crop farming was mainly limited to wheat, hay and corn. Family subsistence activity declined and feed, fertilizer and food were often purchased off the farm. Off-farm employment supplemented farm income (McMurry 2011c:120-124).

While farm orchards became less prominent in the Cumberland Valley, commercial orchards took over large-scale fruit production in the Adams County Fruit Belt. San Jose Scale, a destructive insect, inflicted widespread damage to Pennsylvania's farm orchards at the turn of the century. As Adams County orchards were coming of bearing age ca. 1905, an effective spray treatment was developed, and the orchards were able to control the pest and continue to plant and cultivate fruit trees (McMurry 2011a:24). Large orchards were discernable by the 1930s and the distinctive fruit belt landscape began to take shape. Although apples were the most popular tree fruit, peaches, cherries, nectarines, plums and pears were also grown in the area and these shorter-lived, smaller trees were inter-planted between immature apple trees as a way to generate additional income (McMurry 2011a:38).

Apples were shipped out of Adams County by rail, bound for European markets and to processing plants to be evaporated, canned or made into cider, vinegar or apple butter (McMurry 2011a:25). By the mid-twentieth century, Adams growers shipped large amounts of fresh apples and were in competition with apple growers in the western United States to supply fruit to national markets. However, nearly half the Adams apple crop went to processing, where Adams County became a national leader (McMurry 2011a:45).

The fruit belt landscape changed during this period, with diversified agriculture giving way to orchard specialization, and the overall the apple orchards took on a more uniform look. Dwarf trees took up less space but yielded high production and the closely spaced plantings, as well as contour planting, further transformed the appearance of orchards on the slopes of South Mountain (McMurry 2011a:68-69).

Farms in the South Mountain region included many of the same buildings described under nineteenth century farms, but some of the older buildings were altered to accommodate raising poultry or to meet dairy sanitation standards (McMurry, et al., 2011c:81-85). New buildings that likely appeared on many farms included silos, which stored silage feed and facilitated increased

productivity for dairy cows; garages; milk houses; milking parlors; poultry houses; and stable barns and freestall barns to house large herds of cattle. Farmsteads were often landscaped, with the house and vegetable gardens surrounded by fences, shade trees and lawns, and utility lines were strung along roadways. Other landscape features of the twentieth-century farm consisted of smaller areas devoted to pastures, woodlots and farm orchard; fencing; contour plowing and strip cropping; and ponds, which served recreational uses, as well as water for irrigation and mixing sprays (McMurry, et al. 2011c:86-117;126-140).

While Cumberland Valley farms maintained many of the same building complexes and field patterns throughout the nineteenth and twentieth centuries, fruit farms exhibited more dramatic changes. In the early decades of the twentieth century, new buildings associated with fruit farming included cold storage facilities, packing houses (located near railroad sidings), and roadside stands. Processing plants, such as canneries, evaporators, vinegar making facilities, were found in Biglerville, Aspers, Gardners and other villages (McMurry, et al. 2011a:29). Additional built resources dating from the mid-twentieth century included packing and sorting houses, bulk bin storage, migrant housing, apiaries, water tanks and ponds for irrigation and spray mixing (McMurry, et al. 2011a:49-72).

With the decline of the iron industry that had dominated the mountain land and resources, opportunities were opened up to promote conservation and recreational uses of the forests and rudimentary infrastructure already in existence. Formal forest conservation and management programs put into place during the early twentieth century, along with the establishment of parks and camps developed through government assistance and private contributions, resulted in both physical and philosophical changes to South Mountain.

Encompassing nearly 85,000 acres in Cumberland, Franklin and Adams counties, Michaux State Forest was named to honor Andre Michaux and his son Francois Andre, French botanists who traveled through Pennsylvania in the second half of the eighteenth century and left funds to promote the progress of agriculture and silviculture in the state. Inspired by conservation lectures given by Dr. Joseph Rothrock, funds were used to establish the Pennsylvania Forestry Association in 1886 and formation of a Governor's Commission to study the forest situation around the turn of the century. Originally a division of the Department of Agriculture, the Department of Forestry was formed as a separate entity in 1901 (Swartz 1986:4).

The Pennsylvania legislature passed an act authorizing the purchase of unseated lands for forest reservations; the first purchase of land for what would become Michaux State Forest was 558 acres in April 1902. Later that same year, over 18,000 acres were acquired from the Mont Alto Iron Company and about 14,000 acres were purchased from the Caledonia Mining Company. In a series of sales during 1912-1913, 16,869 acres in the Pine Grove Furnace area were bought from the South Mountain Mining and Iron Company. Initially, these collected forest areas were called Forest Reserves, but the names were later changed to state forests after Gifford Pinchot became Commissioner of Forestry in 1920. Following several reorganizations of the department and combining of landholdings, the state forest operation in the South Mountain area was renamed

HISTORICAL OVERVIEW

Michaux, which included Caledonia, Pine Grove Furnace and Mont Alto parks, as well as the Mont Alto Nursery. (Swartz 1986:4)

Establishment of the State Forest Academy at Mont Alto in 1903 had a major influence on the forest. Students learned forest management through forest fire control and tree planting, and later included a research component instituted in 1929 (Swartz 1986:5). The forest itself had gone through a number of physical changes beginning with removal of original timber for use to make charcoal as fuel for the iron industry to major forest fires occurring between 1890 and 1930 and blights, insect invasions and damage from deer throughout the twentieth century (Swartz 1986:5).

During the 1930s, the country fell into a deep economic depression and the federal government developed several make-work programs where the unemployed were provided work opportunities and a paycheck in exchange for undertaking infrastructure improvement projects. One of these programs, known as the Civilian Conservation Corps (CCC), established camps throughout the country's state parks and forests with the goal of protecting, restoring and maintaining forest resources and building roads, bridges, dams and public recreational camp facilities.

The CCC was especially active in Pennsylvania and had 151 camps, second only to California (DNCR State Parks: The CCC Years). Several of these camps were established on South Mountain within Michaux State Forest, including camps at Old Forge, Pine Grove, Big Pond, and Caledonia (Swartz 1986:6). Camp Penn at Old Forge is operated by a private entity and many of the original buildings constructed by CCC workers remain. The camp at Pine Grove was converted to a prisoner of war camp during World War II and was occupied by German Naval officers, Rommel's Africa Corps and Japanese officers. The POW camp disbanded and the property was later leased to various church groups through the 1972. The camp was abandoned, however, and the buildings were sold or demolished by the Bureau of Forestry, though foundations of the structures still exist on the site (Swartz 1986:6).

In addition to the scientific and land management aspects occurring within the forest, other activities were occurring that resulted in diverse uses and highlighted the benefits of the mountain. Dr. Joseph Rothrock, who recognized the benefit of pure mountain air and clean water, founded a camp near Mont Alto for the treatment of tuberculosis patients. The facility was under the jurisdiction of the Department of Health between 1907 and 1967, when it was transferred to the Department of Welfare. The hospital was converted to a senior care home for individuals discharged from a state mental institution and is known as the South Mountain Restoration Center (Swartz 1986:6; Yellnik 2001:30).

The forest has supported recreational activities beginning in the late nineteenth century with the establishment of parks, picnic grounds and dance pavilions at Caledonia and Mont Alto, and Pine Grove. A portion of the Appalachian Trail was located within Michaux State Forest by at the early 1930s and shelters and cabins for overnight use by hikers are located within the forest. Currently, the 36 miles of the trail in the South Mountains is in public ownership. Further recreational

uses of the forest include camping, fishing, hunting, horseback riding, bird watching and rock climbing (Swartz 1986:20-21).

MODERN LANDSCAPE

Today, the South Mountain region contains a mix of historic and modern buildings, uses and landscape features. The South Mountain anchors the region and its forested stands provide areas for recreation and education. The valley on the western side of the mountain is largely agricultural in nature, with some modern development extending around larger settled areas, such as Carlisle, Shippensburg and Chambersburg. The eastern slopes of the mountain are still dominated by commercial fruit orchards. Large plots of regularly spaced trees and packing and processing facilities are located in the area.

Modern highways have replaced some of the older major roads that extend through the area; the portion of Interstate 81 within Cumberland and Franklin counties was constructed during the 1960s and 1970s, and currently is a heavily travelled through corridor that supports a large amount of commercial truck traffic. Trucking companies and warehouses represent much of the modern development in the vicinity of I-81.

Though some modern commercial and industrial development has cropped up in the area, the South Mountain region continues to reflect the diverse uses and landscape features that attracted Native people and Europeans to settle the area.

Guidelines for Projects with Potential Visual Effects in Pennsylvania

September 2014

The Pennsylvania State Historic Preservation Office (PA SHPO) has developed guidance for the identification and assessment of effects of proposed transmission towers, cell towers, wind turbines, highways, and new construction on historic buildings, structures, and landscapes. Under Section 106 and the State History Code, it is the role of our office to provide comments on the effects a project may have on historic properties. Some effects, such as demolition of a historic property or disturbance of an archaeological site, can be easily evaluated and determined to be adverse. However, assessing the impact of visual changes is often more subjective and may require more in depth evaluation and discussion.

The purpose of this document is to outline the process necessary for the identification of those resources where the introduction of new visual elements would diminish integrity, thereby significance and a property's National Register eligibility. Guidelines for the assessment of adverse visual effects are also included.

Avoidance of adverse visual effects on historic properties is the recommended course of action for projects. If adverse effects cannot be avoided, then it is necessary to work to minimize adverse visual effects through changes to the project's location, scale, or design. If the adverse visual effects cannot be avoided or minimized, then it may be necessary to mitigate to compensate for the loss of integrity.

Integrity and Significance

Integrity is critical to the ability of a property to convey its historic significance. Therefore, when developing a survey, properties in the APE should be considered in light of the criteria for significance and aspects of integrity for which they are significant. Evaluation of whether the introduction of a new feature will adversely affect a property's aspects of integrity is critical.

Questions to be asked include:

- Is setting a character defining feature of the resource?
- Will the project introduce new features into the setting?
- Will the project remove existing features from the setting?
- Would the introduction of new features or the removal of old features in the setting of this property affect its integrity? If so, which aspects?
- Would changes to the identified aspects of integrity affect the ability of the property to convey its significance?

In assessing visual effects for historic properties, the criteria for significance and the aspects of integrity provide a fairly qualitative method for determining visual effects on historic properties. For example, integrity of setting is critical to a farm's (farm complex and associated lands) ability to convey its agricultural significance. The introduction of a tower in the view shed of the farmstead or the removal of associated landscape features, such as tree lines, woodlots, or field patterns, could alter integrity of setting and feeling. However, if the setting of a property is not critical to understanding its significance (resources significant for architecture alone), then the introduction of a new visual feature or removal of surrounding features may not diminish the integrity of the property.

Identification of Historic Properties

This step of the Section 106 process begins with a Phase I or identification level survey. This includes sufficient field work and background research to delineate the Area of Potential Effect (APE) and identify resources previously evaluated for National Register eligibility as well as those that meet the 50-year-age consideration within the APE.

1) Delineation of APE

The delineation of the APE should take into account the view shed or those areas from which the project may be visible. For example, a tower or power line may not be located on a property but it could introduce new features into the landscape, thereby affecting a property's relationship to its setting, which may include surrounding features as well as view sheds. The APE is based on a project's potential to effect above or below ground resources. Therefore, it is critical that the identification report include a well developed project description with sufficient illustrations to justify the APE that is delineated. An initial APE should be delineated broadly and then refined based on site conditions, as outlined below.

Initial APE

Transmission Lines

If the proposed line will be constructed within the existing ROW and there are no new areas of vegetation proposed for clearing outside of the existing maintained ROW and there will be no substantial increase in tower height (<10% or 20' increase, whichever is greater), the initial APE will include those resources that are within and adjacent to the existing ROW.

If the proposed line to be constructed within the existing ROW and new areas of vegetation will be cleared outside the existing maintained ROW, the initial APE will consist of all resources that are within 0.5 miles on either side of the existing ROW.

If the proposed line to be constructed within a new ROW, the initial APE will consist of all resources that are within 0.5 miles on either side of the existing ROW.

Cell Towers

Two Nationwide Programmatic Agreements define the APE for visual effects for the construction of new cell towers and collocation of antennas on non-tower structures:

https://apps.fcc.gov/edocs_public/attachmatch/FCC-04-222A3.pdf

<http://wireless.fcc.gov/releases/da010691a.pdf>

For new cell tower construction:

- If the proposed new tower is 200 feet or less, the APE is one half mile from the tower site.
- If the proposed new tower is more than 200 feet but less than 400 feet, the APE is $\frac{3}{4}$ mile from the tower site.
- If the proposed new tower is more than 400 feet, the APE is 1 $\frac{1}{2}$ miles from the tower site.

For collocations on existing buildings or structures the APE is 250 feet from the tower location.

An alternative APE can be determined upon agreement between the FCC applicant and the PA SHPO.

Wind Towers

The initial APE for wind turbine towers will be 5 miles.

Refined APE

The initial APE can be refined through an examination of topography, changes in elevation and vegetative cover, using GIS based modeling, to include only the anticipated extent to which a project may be visible from. The refined APE should be checked during the field survey and justified and fully documented in the identification report. As vegetative cover can change, the report should include meta-data on the date of the vegetative cover information used for the GIS analysis.

2) Background Research

Once the APE has been established, it is necessary to conduct sufficient background research to determine the nature and extent of previously identified historic resources within the boundary. This begins with an examination of Pennsylvania's online resource

database, CRGIS, and survey files available at the PA SHPO office in Harrisburg. In addition, topographic maps and aerial photography should be reviewed to identify areas of high archaeological site potential within the APE. If the APE includes agricultural properties, the Pennsylvania Agricultural Context should be consulted to determine what types of properties can be anticipated within the APE. In addition, in those locations where the APE includes contiguous farmsteads and surrounding open space, current and historic aerials should be compared to determine if there is the potential for a rural historic district.

3) Identification/Reconnaissance Report

a. Research Design

The methodology should justify the APE boundary and outline the background research and field survey methods. Recommendations for future survey efforts should be based on the potential of the project to affect the significance of identified property types.

Typical examples of projects and resources that could be affected by associated changes in setting include:

- Historic farms with associated woodlots, hedgerows, stone walls, and/or field patterns that would be affected by clear cutting in order to provide a transmission line right of way.
- Rural historic districts that would be affected by the location of a transmission line through the associated landscape.
- A twentieth-century estate designed to take advantage of prominent view sheds of a ridge line on which a wind tower is proposed.

b. Survey Results

The Abbreviated Historic Resource Survey Form should be used for initial identification of those resources 50 years in age or older that would be potentially affected by the introduction of the project.

A table of properties in the APE should be provided. The table should include name of property, address, previous survey documentation (including determinations of eligibility), and surveyor recommendations for future survey work.

c. Mapping and Illustrations

All mapping and illustrations must be of high quality and in color, of readable scale, and should include sources and dates. At a minimum, the following should be included to convey the project's potential to affect historic properties:

- Project location and APE boundary, shown on a 7.5 minute USGS quadrangle
- Aerial mapping showing the location of the proposed towers
- Aerial mapping with all 50-year-old resources within the APE, showing the relationship of the resources to the project
- Photographs and mapping of previously identified resources including rural historic districts
- Pictures of the APE showing view sheds to and from National Register listed and eligible resources and those areas where changes in the landscape will occur (tree cutting, access roads)
- Illustrations of the type, size, and scale of the proposed towers

The results of the identification/reconnaissance report should be reviewed and discussed with PA SHPO staff prior to the evaluation investigation. PA SHPO staff will work with the agency or their applicant to determine which properties require documentation beyond the Abbreviated Historic Resource Survey Form as well as the application of appropriate historic contexts.

For projects where there are relatively few resources that would be affected by a project, it may be possible to present the APE and document and evaluate National Register eligibility of resources in one submission rather than preparing separate identification/reconnaissance and evaluation/intensive survey reports.

Evaluation of Historic Properties

Properties identified as warranting further survey because of the potential of the project to affect their significance should be documented and assessed for National Register eligibility on the Historic Resource Survey Form (see *Guidelines for Architectural Investigations in Pennsylvania* (2014) for further guidance). The Pennsylvania Agricultural Context should be consulted in the assessment of eligibility of agricultural properties. Documentation should include a discussion of those landscape features or view sheds that are critical to the ability of a property to convey its historic significance.

Assessment of Effect

For those resources identified as eligible for listing in the National Register, the impact of the project should be assessed. If it is determined in consultation with PA SHPO that the proposed project will significantly and negatively impact a historic property, the agency should propose measures for avoiding or minimizing the effect. Avoidance of adverse effects on historic

properties is the recommended course of action for projects. If properties cannot be avoided, then it is necessary to consult with the PA SHPO and other consulting parties to minimize adverse effects through changes to the project's location, scale, or design

In assessing the potential effects of a project on historic properties, the criteria for significance and the aspects of integrity are factors that require evaluation. Assessments of effect should present the following information:

- Detailed project description
- Property's historic significance. It is necessary to understand the property's historic significance and integrity in order to evaluate the project's effects on the property's eligibility for listing in the National Register of Historic Places. The focus of the analysis should be consideration of setting.
- Brief physical description of the property with a focus on natural topography, setting, and man-made or natural features that enhance a historic property's significance and integrity. This should also include a discussion of the nature and quality of the view to and from the historic property. For example, specific viewsheds that enable the property to convey its significance should be noted.
- Assessment of physical effects. This assessment should focus on how the project will affect those physical features that convey the significance and integrity of the historic property.
- Assessment of visual effects. The historic property's relationship to its setting, which may include surrounding features and open space, should be taken into account. This includes the view from the historic property as well as the view toward a historic property.

Findings of effect should be justified through relevant illustrations, all of high quality and color, with mapping at a scale that is readable and source data identified

- For each identified property, aerial photographs showing the boundaries of the property, location of primary and secondary resources, and landscape features should be provided. The aerial photograph should also show the location and direction of ground photographs, a depiction of line of site and distance from the resource to the project. The date of the aerial photograph should be noted.
- Photographs should include views from the entire property, including secondary resources and historic landscape features, not just the primary resource. Panoramic photographs or photograph montages are especially useful to visual analysis.

- Plans of proposed and existing (if applicable) designs, including elevations.
- For those projects introducing new features or towers that will be substantially taller (>10% or 20' increase) within the view shed of a historic property, photosimulations of the new tower are warranted.

Adverse Visual Effects

In general, a project can be considered to have an adverse visual effect to a historic property if it diminishes the integrity of the resource to the point that it can no longer convey its historic significance. Examples of potential adverse effects include:

- Elimination of open space or a scenic view that is critical to the ability of a property to convey its historic significance.
- Elimination of a sufficient number of small scale features (fence rows, tree lines, field patterns, etc.) that a property can no longer convey its historic use and significance.
- Introduction of a visual element that is incompatible, out of scale, detracts, or is out of character with the setting of a property or district.
- Blocking or intruding on a scenic view or blocking the view from one historic property to another.

If adverse effects cannot be avoided or minimized, then it may be necessary to mitigate to compensate for the loss of integrity, also in consultation with the PA SHPO and other consulting parties. Projects subject to Section 106 of the NHPA review require execution of a Memorandum of Agreement by the Federal agency, PA SHPO, the project applicant, and any consulting parties in order to address the adverse effect of the project.



CHAPTER 4 ■ EVALUATION AND RECOMMENDATIONS

The Cultural Landscape Assessment for Michaux State Forest provides a unified understanding of the interconnected cultural and natural history of South Mountain through a geographic and demographic regional context intended to support appropriate preservation of related resources. The Cultural Landscape Assessment identifies important historic cultural and natural resources of the South Mountain landscape so that stakeholders may consider appropriate measures for their protection, management, and interpretation. It promotes recognition of resource importance, the communication of this importance to resource users, and the development of strategies for their appropriate management. This study may be used as a point of departure for the development of other types of studies such as interpretive plans and management and master plans. In addition, this study is intended to serve as a framework for additional research, investigation, and planning, as well as a model for other land management studies, projects, and plans.

Principal goals of the Cultural Landscape Assessment are the identification of types cultural landscape resources that are present within the South Mountain landscape and articulation of their value and importance. Through such awareness, specific resources can be identified in the field and appropriate strategies can be developed for their management and interpretation. The plan considers various types of cultural landscape resources through a lens of a historic context—an overarching historic theme that demonstrates how each resource is tied to a larger framework of historic activities that occurred on the local, regional, and/or national scale during a similar time frame. Connecting South Mountain resources to a broader context makes it easier to evaluate their importance, connect features across time and space, and develop thematic narratives.

EVALUATING THE IMPORTANCE AND VALUE OF HISTORIC RESOURCES

One of the purposes of the Cultural Landscape Assessment is to assist Michaux State Forest and the South Mountain Partnership in identifying, preserving, and protecting the historic integrity of natural and cultural resources reflective of the history and evolution of the South Mountain landscape. The legacy of South

Mountain's industrial and mineral extraction, forestry, recreation, and governmental heritage survives today throughout the built environment and cultural landscape. Preserving and protecting these resources that have survived from past periods of South Mountain's history ensures that future generations will have the opportunity to experience and learn about the region's rich legacy and conserves recreational and cultural tourism opportunities. Knowledge of the character, composition, and history of cultural landscape features will enable *Michaux State Forest and the South Mountain Partnership* to address preservation needs and consider methods for conveying the importance of the region's heritage to visitors through interpretation.

Principal goals of the Cultural Landscape Assessment are the identification of cultural landscape resources and an articulation of their value and importance that can be used to guide appropriate management strategies and interpretive programs. The plan considers each cultural landscape resource through a lens of the historic context – an overarching thematic discussion of how each feature is tied to a larger framework of activities that occurred on a local, regional, and/or national scale during a similar time frame. By connecting South Mountain resources to a broader context, it becomes easier to evaluate their importance, connect features across time and space, and develop thematic narratives.

CULTURAL LANDSCAPES

This assessment treats South Mountain as a single cultural landscape that can be subdivided into component parts, each of which possesses a site-specific history as well as a connection to broader themes and trends. Cultural landscapes are defined as “geographic areas, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values (Birnbaum 1994).”

As with many cultural landscapes, South Mountain also has the potential to reveal much “about our [human/society's] evolving relationship with the natural world (Birnbaum 1994).” The historic cultural features of the South Mountain landscape are uniquely tied to the environment and the region's natural features and systems. *This is especially true given the environmental stories the South Mountain landscape relates about forest devastation and the rise of conservation and forestry in Pennsylvania.*

Cultural landscapes are typically:

composed of a number of character-defining features, which, individually or collectively contribute to the landscape's physical appearance as they evolved over time. In addition to vegetation and topography, cultural landscapes may include water features such as ponds, streams, and fountains; circulation features, such as roads, paths, steps, and walls; buildings, furnishings, including fences, benches, lights, and sculptural objects.

Most historic properties have a cultural landscape component that is integral to the significance of the resource... A historic property consists of all its cultural resources—landscapes, buildings, archeological sites and

EVALUATION AND RECOMMENDATIONS

collections. In some cultural landscapes, there may be a total absence of buildings (Birnbaum 1994).

The South Mountain landscape includes historic resources with the potential to reveal important aspects of our country's industrial, forestal, agricultural, recreational, and governmental history.

To explore and express the key linkages among uses and users, this study employs a cultural landscape approach to documentation and analysis, tying the origins *and subsequent uses of cultural features whenever possible to elements of the environment*, and making connections at the landscape level to illustrate the context within which cultural activities occurred.



The Fruit Belt, eastern flank of South Mountain

THE ROLE OF THE NATIONAL REGISTER OF HISTORIC PLACES

This Cultural Landscape Assessment is concerned with evaluating the importance of South Mountain's historic resources. The most widely accepted metric for evaluating the significance and integrity of historic resources is the National Register of Historic Places. The Cultural Landscape Assessment uses National Register criteria to identify the historically important elements and features worthy of preservation and, most importantly, to indicate why they should be protected.

For cultural landscapes, documenting the physical conditions associated with a place and assessing and evaluating the importance of natural and man-made historic resources is crucial to determining a strategy for their management. Cultural landscape analysis involves two primary activities: evaluating historic significance and assessing historic integrity. Both are tested against criteria determined by the National Register of Historic Places, which has developed

nationally-recognized methods for evaluating the significance and integrity of historic resources. Many resources that are not individually eligible for listing in the *National Register* may none-the-less be significant to a cultural landscape as contributing resources.

NATIONAL REGISTER OF HISTORIC PLACES ELIGIBILITY

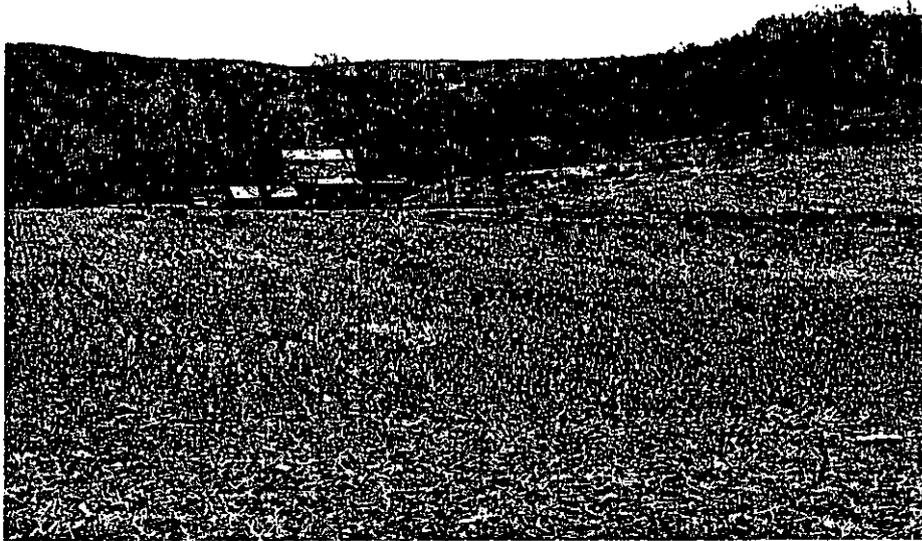
The National Register defines historic significance as “the importance of a property to the history, architecture, archeology, engineering, or culture of a community (NPS 1997:3).” For a property to be eligible for inclusion in the National Register of Historic Places, it must possess significance under one of four *National Register criteria*. The *Criteria for Evaluation* state:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A. That are associated with events that have made a significant contribution to the broad patterns of our history; **or**
- B. That are associated with the lives of persons significant in our past; **or**
- C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; **or**
- D. That have yielded, or may be likely to yield, information important in prehistory or history (NPS 1995).

The significance evaluation identifies the important historical associations of the property, as well as its architectural, archeological, and social value. The property’s significance is also tied to a period of time in which its important contributions were made and the historic contexts within which the activities that occurred on the property may be placed. The assessment and evaluation considers the site’s history within recognized historic contexts to determine its contribution to the broad patterns of American history. It is important to note that historic resources, particularly cultural landscapes, may have several areas of historical significance, and that “An understanding of the landscape as a continuum through history is critical in assessing its cultural and historic value (Birnbaum 1994).”

Features within a property that are related to a particular historic context and that were present during the context’s identified period of significance are considered to be “contributing features” to the historical significance of the property. However, contributing features must also possess integrity.



Farm in the Cumberland Valley, western flank of South Mountain

Integrity is the ability of a historic property to convey its significance. Therefore, the significance evaluation must be completed first. The National Register defines historic integrity as “the authenticity of a property’s historic identity, evidenced by the survival of physical characteristics that existed during the property’s prehistoric or historic period (NPS 1997:4).” Integrity is assessed through seven aspects defined by the National Register:

Location is the place where the historic property was constructed or the place where the historic event occurred;

Setting is the physical environment within and surrounding a property;

Design is the combination of elements that create the form, plan, space, structure, and style of a property;

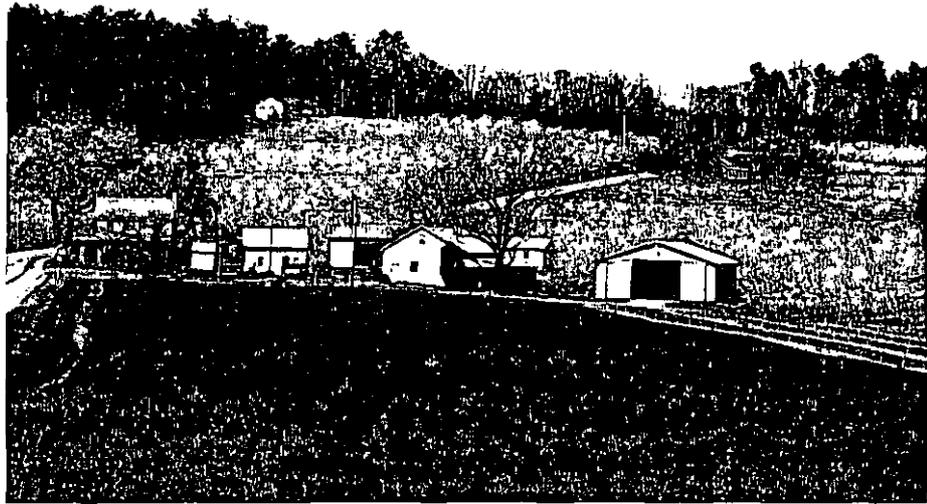
Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property;

Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory;

Feeling is a property’s expression of the aesthetic or historic sense of a particular period of time; and

Association is the direct link between an important historic event or person and a historic property (NPS 1995:44-45).

In order to retain historic integrity, a property must possess many of these seven aspects.



Farm in South Mountain's Buchanan Valley

Integrity is assessed by identifying the character-defining features of a historic resource and determining whether enough of these features remain and are visible to convey the determined significance. Character-defining features are prominent or distinctive aspects, qualities, or characteristics of a historic property that contribute significantly to its physical character. More simply put, character-defining features are those things that make a property special, make it worthy of inclusion within the historic property or district, and make it more than one in a crowd. Any time that one of those features is removed or hidden, it detracts from the understanding and character of the property, diminishing its importance. In order to retain historic integrity, character-defining features must be preserved and protected.

MULTIPLE PROPERTY DOCUMENTATION

A specific approach to evaluating the significance of the South Mountain landscape is the National Register of Historic Places Multiple Property Documentation Form, which assembles information for complex historic sites that may be best addressed as more than one individual property. The Multiple Property Documentation Form allows for the nomination of groups of related significant properties, and recognizes the themes, trends, and patterns of history shared by the properties. The form is organized into historic contexts and defines the property types that represent those historic contexts.

The Multiple Property Documentation Form streamlines the method of organizing information collected in surveys and research for registration and planning purposes. It facilitates the evaluation of individual properties by comparing them with resources that share similar physical characteristics and historical associations.

The Multiple Property Documentation Form is a cover document and not a National Register nomination in its own right, but serves as a basis for evaluating

EVALUATION AND RECOMMENDATIONS

the National Register eligibility of related properties. It may be used to nominate and register thematically-related historic properties simultaneously or to establish the registration requirements for similar properties that may be nominated in the future. When nominated and listed in the National Register of Historic Places, the Multiple Property Documentation Form, together with individual National Register Forms, constitute a multiple property submission (NPS 1999).

Information common to the group of properties is presented in the Multiple Property Documentation Form, while information specific to each individual building, site, district, structure, or object is placed on an individual National Register Nomination form. As a management tool, the thematic approach provides essential information for historic preservation planning because it evaluates properties on a comparative basis within a given geographical area and because it can be used to establish preservation priorities based on historical significance (NPS 1999).

A Multiple Property Documentation Form has been prepared for Michaux State Forest related to forestry and Civilian Conservation Corps resources by students at Shippensburg University (Couser undated). This existing form should be reviewed and expanded if determined appropriate using information outlined in this Cultural Landscape Assessment. An additional Multiple Property Documentation Form could alternatively be prepared to address other relevant contexts identified for South Mountain as part of this Cultural Landscape Assessment.



Boiling Springs, north of South Mountain where the region's iron industry began

NATIONAL REGISTER SIGNIFICANCE OF THE SOUTH MOUNTAIN LANDSCAPE

The South Mountain landscape covers a vast land area that bears witness to a complex history of cultural use that has influenced the composition and character of the built and natural environment. It is the land on which a complex history of cultural use has influenced both the natural and built environment. The South Mountain region is a cultural landscape possesses historic value for its association with events and trends in local, state, and national history. Numerous historic cultural and natural resources are present within the South Mountain landscape to convey these historic associations. The historic features that comprise the South Mountain landscape can be tied to interesting and significant stories of past residents and other interested parties that merit recordation and interpretation for the benefit of a wide range of visitors.

When examined within the framework of state and national historic significance standards, many of the features present within the South Mountain landscape appear to contribute to a property or properties that are potentially eligible for listing in the National Register of Historic Places. Listing in the National Register of Historic Places is an honorific designation that conveys special consideration when government-authorized or sanctioned projects suggest physical change of the property and/or property's setting. Listing involves a rigorous evaluation process and requires a property to meet several criteria of a historic context that provide historic context for the property.

Among the many values of listing on the National Register of Historic Places is the use of information in land planning and management, ability to raise awareness of the importance of place, the site understanding that comes from the process of completing the nomination, and the potential to take advantage of rehabilitation tax credits and/or other grants and program funds that require National Register listing.

The South Mountain landscape, either in whole, or in part or parts, likely constitutes one or more rural historic districts that are significant at the state and local levels under National Register Criteria A, B, C, and D in the areas of Agriculture, Architecture, Conservation, Early Settlement, Industry, Recreation, Science, and *Politics/Government during the period of ca. 1730 to 1966*. The year 1730 was selected as the potential beginning of an overarching period of significance as the origin of early European-America settlement within the region, while 1966 represents the fifty-year age consideration for listing properties in the National Register of Historic Places. Specific resources may have a more limited period of significance within this broader extended period. There are, however, examples of resources being listed prior to the fifty year age consideration.

This period of 1730-1966 spans the significant events and associations of several historic contexts important in the region. The contexts include, but are not limited to, mineral extraction and industry, forestry and conservation, recreation, agriculture, and the impacts of war and public programs on local lifeways. Each of the related activities have left evidence on the landscape. There is a wide range

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of historic resources and cultural landscape features that appear to contribute to the significance of the South Mountain landscape; these are presented in the historic context in the chapters that follow.

Although the evaluation of historic resources focuses primarily on surviving above-ground resources, it is highly likely that the South Mountain landscape possesses significance and information potential through features that exist in the below ground archeological record (Criterion D). That is certainly the case for prehistoric quarries already recognized on South Mountain and is also highly likely the case for historic iron industry sites that have yet to be fully studied. Although documentation of archaeological resources is beyond the scope of this project, it constitutes one of the areas recommended for future investigation.



Remnant of the Lincoln Highway in the South Mountain Gap

INTERPRETIVE VALUE OF THE SOUTH MOUNTAIN LANDSCAPE

In addition to preserving and protecting important cultural landscape features, the Cultural Landscape Assessment of South Mountain recommends that Michaux State Forest and the South Mountain Partnership use the information contained herein to support planning efforts and initiatives. The development of thematic interpretive programming will connect residents and visitors more deeply to the place and enable them to more easily understand and appreciate the significant resources and history in the South Mountain landscape.

Recommendation #1:

At present, site-specific interpretation is undertaken primarily in the two state parks on South Mountain—Pine Grove Furnace State Park and Caledonia State Park. Regionally, there are other local historic sites that present their stories, while county visitor bureaus promote local history and sites and several

connective storylines. Automobile and walking tours have been developed by a range of organizations and local governmental entities that tie visitors to themes such as bird watching, agriculture, craft, and local history. These types of efforts should be supported and expanded to include a wider range of resources and sites, tied to regional themes and coordinated with site presentations.

Recommendation #2:

The South Mountain landscape has the ability to tell many stories spanning centuries of time and generations of inhabitants. The local stories of life and cultural heritage, often interesting in their own right, are generally representative of significant broad themes in American history. The South Mountain landscape offers the potential to reach a diverse audience on several levels, and to be of compelling interest to local residents as well as visitors from across the nation and other countries. Interpreting the many stories that can be teased out of the history of South Mountain is an essential part of the protection strategy for the property's heritage resources. Interpretation helps to engender stewardship of the resources and the support of the regional community as well as the broader public.

Recommendation #3:

Interpretation should be thought of as more than simply providing visitors with names, dates and descriptions of events. In some cases, interpretation should feature inspirational stories, highlight enlightening facts, and shed light on how the present place that visitors are experiencing came to be. Interpretation should focus on a central tenet of highlighting the themes—the central concepts or ideas—that give an interpretive subject significance. Interpretation should focus on the big ideas that convey the meaning of an event, story, or resource. The interpretation should convey interpretive themes using the stories and resources tied to the actual place where things happened. It is important to connect these places to the broader context within which they fit.

The National Park Service expresses interpretation as a process of helping each visitor find an opportunity to personally connect to a place (NPS 2007). Making connections means communicating concepts that every human being, regardless of culture or background, can understand and relate to. Effective interpretation, therefore, should be considered for its ability to connect with a wide audience, and as many universal themes as possible.

Interpretation tied to place, yet inclusive of multiple stories and cultures, will offer the greatest appeal to a diverse audience. However, interpretation is only successful when it uses information to reveal meanings and relationships. Good interpretation should stir visitors' emotions and provoke reconsideration of the facts. It should be engaging rather than didactic, dynamic rather than passive.

Recommendation #4:

Future interpretive planning for the region should build upon well-developed themes that emerge from sound research and documentation. Such themes are critical to establishing an effective intellectual and emotional connection with the place for visitors. This connection will ultimately enable visitors to understand the significant meanings inherent in the South Mountain landscape and to come away with a sense of engagement.



Gravel road constructed by the Civilian Conservation Corps

RECOMMENDATIONS FOR ONGOING INITIATIVES

The most important accomplishments of this Cultural Landscape Assessment have been (a) identification of the key themes or historic contexts through which the South Mountain landscape developed, (b) identification of the types of resources associated with those themes and contexts, and (c) recognition of how local stories are connected to the larger regional picture. In undertaking this assessment, it has become evident that there is a great deal of interesting work yet to be done.

The seven overarching points that have become clear in the preparation of this Cultural Landscape Assessment are:

1. South Mountain is an integral part of a larger, regional, predominantly agricultural landscape.
2. The underlying characteristics of that regional landscape are defined by clearly delineated natural attributes – geology, landforms, soils, water, and ecosystems.
3. The region's natural landscape was dramatically altered—devastated—by the eighteenth and nineteenth century settlement of European peoples but remains remarkably resilient.
4. The South Mountain region retains historic significance and integrity as a nineteenth century agricultural landscape. Strong cultural patterns

visible upon the landscape today are comprised of character-defining features that became fully developed by the mid-nineteenth century.

5. Within the regional landscape, South Mountain has always been a source of natural resources – both prehistorically and historically, continuing today. The natural resources of importance have changed over time.
6. South Mountain is historically significant primarily for (a) the role that the iron industry played in the regional economy and (b) its role in the development of forestry and conservation in Pennsylvania.
7. Today, South Mountain remains significant for forest stewardship and as a regional recreational resource.

Recommendation #5:

Avenues for future research are based on gaps in the documentation that was readily available to the team involved in writing this Cultural Landscape Assessment. Targeted research and investigation involving specific topics is warranted as funds and time permit. Some of the avenues for future research identified through development of the Cultural Landscape Assessment are discussed in the paragraphs that follow.

In undertaking this project, the extent to which the South Mountain landscape is integrated with the larger regional landscape required the examination of history and historic patterns of development beyond what occurred on the mountain itself – incorporating the heritage of the Great Valley (Cumberland Valley) to the west and the Triassic Lowlands to the east. The extent to which the histories of specific sites on South Mountain have been studied is uneven, and their stories are tied to larger regional stories that are also poorly documented.

The information needed to undertake a project of this type is varied and extensive in nature. In trying to pull together available information for this assessment, the assistance of local historians was critical, both in identifying sites and identifying sources of information. The important stories of South Mountain have not been well told. Primary sources have yet to be fully investigated and assimilated. Secondary sources tend to be broad and general and lack the depth and rigor warranted of their subjects. Older articles and monographs are not well referenced and are sometimes inaccurate and incomplete.

One of the values of this Cultural Landscape Assessment is that it provides a list of sources available to future researchers. Although the list is likely incomplete, certainly with respect to primary sources, which we have not had the time to research, a tremendous amount of information is assembled, particularly as it relates to the historic contexts conveyed in the chapters that follow. The available sources vary in quality, but they enable us to see the big picture to which individual sites and resources relate.

With the large picture in place as covered by the historic contexts, interesting work remains in drilling down to explore and document individual resources on South Mountain. The multiplicity of sites associated with the iron industry, for instance, are not well recorded. Sites associated with the establishment of early

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state forest or specific projects undertaken by the Civilian Conservation Corps also require the mining of archives for primary documents.



Signage along a South Mountain portion of the Appalachian Trail

Most of what is known to date, both in terms of sources and on-site investigation, is currently housed in the minds and private collections of local historians. Their work is invaluable and needs to be recognized, appreciated, synthesized, and made more widely accessible. Historians working on similar topics at one end of the mountain are not necessarily in communication with historians at the other end of the mountain. Topics that overlap have not yet been fully related. Pulling the threads of this knowledge together is a future endeavor of great value.

With these points in mind, the following additional observations and recommendations on different areas of activity are suggested for consideration.

The South Mountain Partnership

- DCNR's South Mountain Conservation Landscape initiative and the **South Mountain Partnership** are the best vehicles for coordinating a regional approach to a variety of inter-related issues, programs, and activities, including those related to historic preservation. Participation in the initiative appears impressive. There is no other comparable regional forum.
- The South Mountain landscape is larger than the lands encompassed by Michaux State Forest. A **South Mountain Focus Group** should be created within the South Mountain Partnership to focus specifically on the South Mountain landform itself to establish consensus on priority issues and initiatives, guide the implementation of projects, and coordinate with

regional activities. The South Mountain Focus Group should include representatives of the state forest, state parks, county planning agencies, conservation organizations, friends groups, mountain farms and businesses, and others as appropriate.

Within this framework, **ad hoc groups** should be created on an as-needed basis to undertake specific implementation initiatives and actions related to recreation, preservation, and interpretation. Some of those initiatives *should include those outlined below.*

Management Plan for Michaux State Forest

- Michaux State Forest is planning to update its management plan in 2016. This Cultural Landscape Assessment should be adopted as a **foundation document** for the management plan.
- Chapter 6 of this Cultural Landscape Assessment provides background on the historic context of **Forest, Forestry, and Conservation** and identifies the types of historic and cultural landscape resources associated with that context. The management plan for Michaux State Forest should *recognize this historic context and the value of those historic and cultural landscape resources.*
- Michaux State Forest is historically significant for its **leading role** in the establishment of a conservation ethic and forestry program in Pennsylvania. This role is not simply historic, but should be ongoing and continuing as a foundation principle in the management plan.
- The most important focus of the management plan should be the cultivation, re-establishment, and stewardship of a **healthy and diverse forest ecosystem**. This point raises interesting questions about both defining and managing for that ecosystem. Re-establishing previously existing historic conditions is not the goal. The most appropriate and important forest ecosystem for South Mountain is likely one that has never actually existed before. This is to be determined by biologists, wildlife experts, foresters, and others in the scientific community.
- The management plan should address critical management issues of local, state, national, and international importance as identified in recent and ongoing state forestry plans. Michaux State Forest should **continue to be a leader** in conservation, forestry, and ecosystem management – a living laboratory for experimenting, developing, advancing, and using creative techniques and cutting edge methodologies. Biodiversity, habitat preservation, and climate change are likely to be among the critical issues addressed.
- Michaux State Forest has limited staff capacity and funding. **Partnerships** are going to be essential in undertaking the range of activities needed to achieve the goals and implement the strategies and objectives of the management plan. The South Mountain Partnership should be a primary vehicle for undertaking those partnerships.



Vernal pond near Kings Gap

- The management plan should be aware that **historic resources** are found throughout the forest and should be identified and appropriately treated. For the most part, historic resources within the state forest are not fragile. Examples include historic wagon roads that are now trails; or former industrial sites, quarries, and charcoal hearths that are now topographic features; or Civilian Conservation Corps projects that remain as gravel roads or park amenities that are still in use.

Some resources, however, are fragile and endangered, such as the prehistoric quarries along Snaggy Ridge, which have been widely recognized, and the Big Pond furnace stack, which, while technically on private land, is located within a few feet of state forest boundaries and is associated with features that have yet to be documented (as well as about 5,000 acres of state forest land). In early February 2016, the landmark remnant stone wall of the barn on the historic farm at Camp Michaux associated with Pine Grove Furnace collapsed and South Mountain lost an important piece of its history.

Such features should be recognized and receive special consideration and protection where possible. This **Cultural Landscape Assessment** should be used as a point of departure in recognizing, appreciating, and protecting the range of historic resources within the state forest.

- The locations and conditions of many of the historic resources referred to in the previous bullet point have yet to be documented. The management plan should support the **identification, survey, and documentation** of historic resources, discussed further below.

- The management plan should encourage the **interpretation** of historic resources as a part of ongoing programming and a partnership initiative within the South Mountain Partnership.
- The management plan should recognize the historic role that **recreational activities** have played within the region and how they continue to contribute to regional quality of life. Recreational activities should also be a partnership initiative.
- **Leased sites** within the state forest should be recognized and treated as historic cultural resources such as would be appropriate within a local historic district.



Leased camp near Pine Grove Furnace

Survey of Natural, Historic, and Cultural Resources

- The Pennsylvania State Historic Preservation Office is considering upgrading its **Cultural Resource Geographic Information System (CRGIS)**. The South Mountain Partnership should participate in the consideration of how that system should be upgraded and serve as a leader in its implementation.
- The South Mountain Partnership should create a **comprehensive regional GIS database** of the historic natural and cultural resource information in collaboration with local universities that includes state, county, and local data layers. The system should be integrated with the GIS databases of county planning offices, as possible. Historic resource surveys should be recorded on the Partnership database.

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- Through the leadership of the Adams, Cumberland, Franklin, and York County planning offices, the South Mountain Partnership should spearhead **upgrading of historic resource surveys** for the region. Methodologies should be developed through which surveys may be upgraded township-by-township through partnership initiatives organized at the local level and coordinated through county planning offices. Surveys should be designed to use the upgraded CRGIS noted above and Pennsylvania State Historic Preservation Office methodologies. Incentives, guidance, and technical support should be provided.



Earthen dam at Big Pond Furnace constructed by the Civilian Conservation Corps

- Surveys should use a **cultural landscape approach**, identifying landscape patterns and overlaying elements of the natural landscape that affect them. Historic road networks, boundary systems, farm configurations, communities, landscape features, and other features characteristic of regional settlement patterns should be identified to provide a context for the survey of individual buildings, structures, and sites.
- The regionally significant **historic contexts** to which resources relate should be confirmed and added to. Agricultural context studies already prepared by the Pennsylvania State Historic Preservation Office for the Cumberland Valley and the Fruit Belt should be used as a starting point along with those in this Cultural Landscape Assessment. Additional historic contexts significant to the region should be identified. **Resource types** (or typologies) inherent within each context should be identified and outlined for use in local surveys.

- For the South Mountain landscape in particular, a systematic long-term program for the **survey and documentation** of individual historic sites and resources should be undertaken. Such surveys could be undertaken by university students under academic and professional guidance. A methodology should be developed using the Pennsylvania State Historic Preservation Office forms and standards. Efficient standards for photo documentation and drawings for sites and structures should be developed using CAD. The documentation should be incorporated into regional Partnership and county GIS systems and into CRGIS as discussed above.

In the preparation of this Cultural Landscape Assessment, as noted above, it became evident that the level of survey and documentation of historic resources on South Mountain requires further work. Surveying of individual resources was not part of the scope of this project, but should be undertaken as a systematic long-term initiative. Even sites as well-known as Caledonia Iron Furnace and Old Forge have been poorly studied and documented. For some sites, such as the iron furnace properties, **period plans** should be prepared showing how the sites evolved over time, deepening understanding of how sites were used and the significance of both present and missing resources.

Suggested priorities for survey and documentation in the South Mountain landscape include:

- Nineteenth century wagon roads and trails;
- Iron furnace properties as described in Chapter 5 of the assessment, including property boundaries, ore banks, sites of former support buildings and housing, water power systems, farms, and other site features;
- Early forestry initiatives from primary source documents;
- Civilian Conservation Corps camps and projects from primary source documents (*roads, trails, recreation sites, plantings, etc.*); and
- Late nineteenth century and early 20th century recreation sites.

Historical Research

- Support the work of **local historians**, historical societies, and historical organizations in undertaking research on topics, sites, and people associated with South Mountain.
- Compile a **comprehensive annotated bibliography** of sources and references associated with South Mountain history. Organize or cross reference the bibliography by topic. Note locations or resources and how to access materials. Note the quality and limitations of materials. Provide links to materials available online, and post new materials online where possible.
- **Archive** collected materials with county historical societies. Create digital archives that can be accessed by researchers and the general public.



Remnant stone wall of historic barn at Camp Michaux, recently collapsed

- Assemble a comprehensive digital collection of **historic maps** of the South Mountain region. Include the maps in the South Mountain regional GIS database. Overlay historic maps on contemporary map layers. Analyze historic maps to identify cultural patterns that developed over time and remain evident in the landscape today.
- Confirm and expand the **historic contexts** significant to the region.
- Identify and prioritize **research topics** for use in an organized, long-term program of historical research. Some topics may be broad and contextual while others may be site specific. Organize a **research program** to be implemented over time by university students and local historians according to their interests. Use an established **research protocol** to coordinate work, provide consistency, and promote standards of quality.
- Convene a **round table** of local and university historians from the four counties that could meet periodically to share interests and information and could serve as a **council of scholars** to coordinate and guide regional research.
- Review the existing **Multiple Property Documentation Form** for forestry and Civilian Conservation Corps sites prepared for South Mountain by Shippensburg students to determine whether it needs to be updated or amended. Prepare new Multiple Property Documentation Forms for other historic contexts for South Mountain discussed in this Cultural Landscape Assessment. Relate the survey and documentation of individual sites to those Multiple Property Documentation Forms.

- Work with local and regional partners to undertake **special research studies** of groups and types of historic resources. Recent studies of mills in Cumberland County and of the legacy soils of mill ponds throughout the Cumberland Valley should be models for the development of future similar studies.
- Consult with archeologists at the Pennsylvania Historical and Museum Commission to determine what additional investigations should be undertaken related to the **Snaggy Ridge** prehistoric quarries or elsewhere on South Mountain. (See Chapter 5, page 5-12)



Hammond Rock

Interpretation and Storytelling

- Use a **regional approach** to interpretation and storytelling using the landscape to tell representative stories of meaning, significance, and interest. Use interpretation as a way of **engaging residents** and visitors and encouraging support for landscape conservation, historic preservation, and community enhancement. This approach is used by many of Pennsylvania's state and national heritage areas.
- Adopt a **regional branding and identity** for the South Mountain Partnership to which each county and community can relate and which can be cooperatively marketed. Form a regional heritage tourism marketing collaboration with recognition by the Pennsylvania Tourism Office.
- Adopt key storylines that relate to characteristics and attributes of the cultural landscape. Use the storylines to attract public interest and

provide gateways to deeper themes and topics. The following six storylines are suggested:

- **The Natural Landscape** – Highlight the structure, characteristics, and qualities of the South Mountain region’s natural landscape – geology, landforms, waterways, ecosystems, etc. Feature special natural areas identified within each county and on South Mountain. Closely coordinate interpretation with recreational opportunities, especially hiking and the Appalachian Trail.
- **Forestry and Conservation** – As suggested in the South Mountain Partnership’s 2009 Fermata study, tell the story of South Mountain and Michaux State Forest’s leading role in the development of a conservation ethic and the practice of forestry in Pennsylvania.
- **Agriculture** – As also recommended in the Fermata study, focus on the history and current practice of agriculture within the region, both farming in the Cumberland Valley and the Fruit Belt of Adams County. As emphasized, the South Mountain Conservation Landscape retains historic significance and integrity to the period and character of its mid-nineteenth century agricultural landscape. It is the western edge of what cultural geographers refer to as the Pennsylvania Cultural Hearth. Its characteristics are visible throughout the landscape and are prominent in community identity and branding. The Fruit Belt is historically significant to the late nineteenth and early twentieth centuries. Contemporary local foods, agricultural products, events, and life should be featured.
- **Iron Industry** – Interpret the regional story of the iron industry on and around South Mountain and how it was an integrated part of the nineteenth century agricultural landscape. Feature Pine Grove Furnace, Caledonia, and Mont Alto State Parks on South Mountain. Embrace the entire South Mountain landscape in the storytelling. Connect to other furnace sites and adjacent communities and landscapes. Connect the iron industry’s environmental story to the rise of conservation and forestry.
- **Civil War** – Use the story of the Confederate approach to and retreat from Gettysburg as a means to engage visitors, connect communities and interpretive sites, and connect to regional landscape themes. The Civil War story is of great public interest, and Gettysburg is a national tourism destination. Take advantage of it to tell a comprehensive regional story across the landscape. Include stories of the Monterey Pass Battlefield and the Underground Railroad’s relationships to the Caledonia and Pine Grove Furnace ironworks. Feature Thaddeus Stevens as a potential topic of interest to connect sites regionally through *interpretation*.

- **Lincoln Highway** – Similarly, use the popular story of the Lincoln Highway and state designation of the Lincoln Highway Heritage Corridor as a vehicle through which to tell the recreational story of South Mountain and the region. Use the story to move visitors through the landscape, connecting communities along and beyond the Route 30 corridor. Relate the story to other recreational activities within the region.
- Prepare a **regional interpretive plan** to link existing interpretive sites related to each storyline. Identify touring routes. Provide interpretation at each designated site along the routes. Feature historic communities where services such as restaurants are provided as destinations. Develop new interpretation and interpretive experiences to fill out and connect storylines at existing sites and to incorporate new sites to be identified. Develop overarching interpretive media to provide the regional context for each storyline and connections across the landscape.
- Prepare a similar **interpretive plan for South Mountain**. Feature the Natural History, Iron Industry, and Forestry and Conservation storylines. Use the state parks as focal points and key destinations. Strengthen interpretation at the state parks. Develop driving routes on the gravel roads through the mountain landscape with interpretive stops at appropriate locations. Use hiking trails and natural features to convey stories. Feature the Appalachian Trail.



Broken cemetery stone at Pine Grove Furnace

Historic Preservation

- Organize a **Historic Preservation Network** within the South Mountain Partnership comprised of local historical commissions, historic architectural review boards, historical societies and organizations, and other historic interests. Conduct periodic workshops at various locations throughout the year to meet, consult, exchange information and

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experiences, have presentations of interest. Use the Network to promote historic preservation at the grassroots level.

- Form a **leadership group** through the network to spearhead regional advocacy, provide support to local preservation groups, and coordinate regional preservation initiatives.
- Prepare a **regional historic preservation plan**. Coordinate closely with county planning offices with the goal of having the plan adopted as a supporting element of county comprehensive plans. Identify regional preservation issues and needs. Develop approaches and strategies for preservation of agricultural landscapes, market towns, and crossroad villages. Highlight and support local community preservation programs. Coordinate with land conservation, agricultural conservation, greenway, and open space initiatives. Coordinate with economic development, community revitalization, and heritage tourism interests. Use a cultural landscape approach. Identify means through which historic preservation and landscape conservation can be seen as contributing to local quality of life.

CONCLUSION

South Mountain is a relatively undiscovered landscape of "firsts" with an incredible interplay of distinct cultural land uses and activities occurring repeatedly over the same terrain. Protecting evidence of this heritage and sharing the stories of the individual resources, their connection to larger systems, and the layer upon layer of cultural use over time is of interest to a variety of audiences.

The power of the cultural landscape approach to looking at the South Mountain landscape is its ability to reflect several significant themes and stories simultaneously. Michaux State Forest and South Mountain are significant for their state and regional focus on forestry and conservation. In the past and in the future, they have and will influence the way forestry is conducted so that healthy ecosystems, diversity, and resilience are central to our relationship with the natural landscape.



Big Pond Iron Furnace – threatened resource

Agricultural Resources of Pennsylvania, c. 1700-1960

**Great Valley Historical Agricultural
Region, 1750-1960**

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This document is a parallel to the official National Register MPDF narrative. The two versions are not identical, but they contain the same information differently organized. National Register policy prohibits embedded images in official documentation. These PDF versions re-integrate the images for the reader's convenience. The National Register documentation was completed and submitted piecemeal. This PDF document reflects the updates made during the process of making statewide coverage together, again for the reader's convenience.

Conceptualization: Historical Farming Systems and Historic Agricultural Regions

Pennsylvania presents interesting intellectual challenges for the agricultural historian and archaeologist. The watchword for Pennsylvania's agricultural history is "diversity." The widespread transition to a relatively specialized monocrop or single-product system did not really take hold until after the Second World War in Pennsylvania. Beginning in the settlement era and stretching well into the twentieth century, diversity of products was a hallmark of nearly every farming region as a whole, and of individual farms too. As late as 1930, the state Agricultural Experiment Station Bulletin proclaimed "the largest number of farms in Pennsylvania are the farms with some diversity of crops and livestock production."¹ According to the 1930 Federal census, nearly 53 percent of the state's farms were either "General," "Self-Sufficing," or "Abnormal" (mainly part-time) farms. "Specialized" farms were defined as those where at least 40 percent of farm income derived from a single source. These included types labeled variously as "dairy," "cash grain," "fruit," "poultry," and "truck farms."

Over time, regionalism declined in significance within Pennsylvania, yet farming across the state remained surprisingly diverse. Along with other eastern states, Pennsylvania agriculture shared in the general shift more towards specialization, commercialism, state oversight, industrialization, decline in farming population, and the like. This trend is recognized in the context narrative. However, it is

important always to keep in mind that existing literature on Pennsylvania agriculture exaggerates the degree of change before 1950. In 1946, Penn State agricultural economist Paul Wrigley identified “Types of Farming” areas in Pennsylvania. Only the Northeast and Northwest were given descriptors that implied specialization; these were dairying areas. The rest were given names like “General Farming and Local Market section.” Equally significant was the fact that statewide, the top source of farming income – dairying -- only accounted for a third of farm income. To be sure, there were pockets where individual farms specialized to a greater degree (in terms of the percentage of income derived from a single product), but these were the exception rather than the rule; overall even in the mid-twentieth century, Pennsylvania agriculture was remarkably diversified both in the aggregate and on individual farms.²

Even many farms defined as “specialized” by the agricultural extension system were still highly diversified in their products and processes. This was because so many farm families still engaged in a plethora of small scale activities, from managing an orchard, to raising feed and bedding for farm animals, to making maple sugar or home cured hams. Many of the resulting products would not necessarily show up on farm ledger books because they were bartered, consumed by the family, or used by animals, or sold in informal markets. In other words, they fell outside strictly monetary calculations of “farm income.” Yet they were important aspects of a farm family’s life and took up a good deal of family members’ time. Indeed, we can’t understand the historic agricultural landscape without acknowledging these activities, because they so often took place in the smokehouses, poultry houses, potato cellars, summer kitchens, springhouses, and workshops that appear so frequently in the rural Pennsylvania landscape. These spaces might not be well accounted for (if at all) in a conceptualization that emphasizes commodity production, but they become more readily comprehensible when we take into account the broader diversity of farm productions. Another important benefit of this perspective is that it preserves—indeed reclaims—contributions that a preoccupation with specialized market commodities tends to obscure, for example those of women and children.

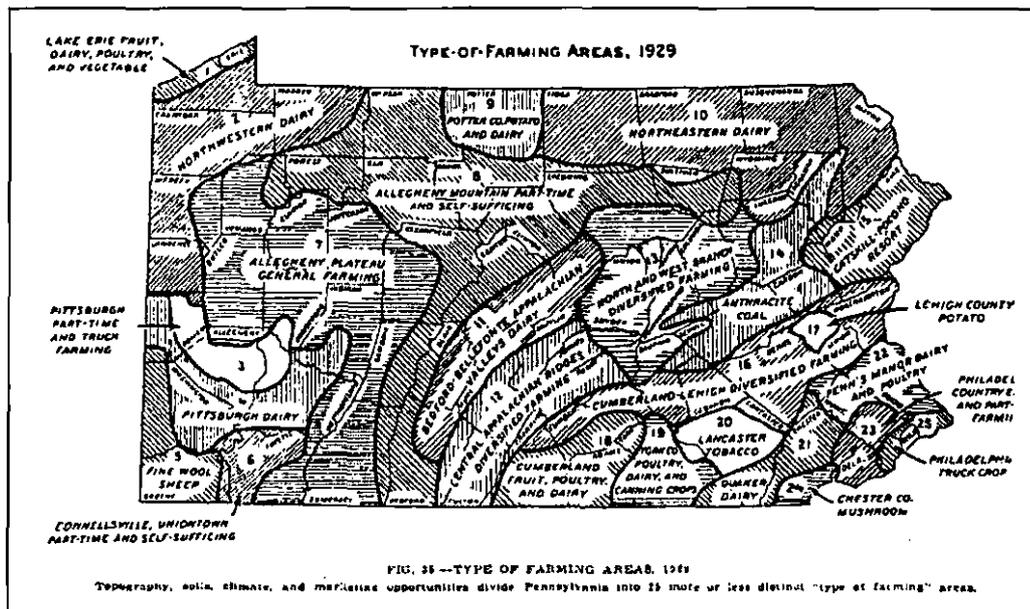
Acknowledging the historic diversity of Pennsylvania farm productions helps to clarify much, but it also raises a fundamental challenge for conceptualizing an approach that will faithfully convey Pennsylvania’s agricultural history, and make

it possible to understand the landscape that was created as people farmed in the past. How can we make sense of this sometimes bewildering variety? Added to diversity of products we must consider a diversity of cultural repertoires; a diversity of labor systems; diversity of land tenure arrangements; varied levels of farm mechanization; 93 major soil series; ten different topographic regions; and growing seasons ranging from about 117 to over 200 days. The concept of a "farming system" was found to be particularly helpful as a framework for understanding how agriculture in Pennsylvania evolved. A "farming system" approach gathers physical, social, economic, and cultural factors together under the assumption that all these factors interact to create the agricultural landscape of a given historical era. Physical factors like topography, waterways, soils, and climate set basic conditions for agriculture. Markets and transportation shape production too. Other components, equally important but sometimes less tangible, form part of a "farming system." For example, cultural values (including those grounded in ethnicity) influence the choices farm families make and the processes they follow. So do ideas, especially ideas about the land. Social relationships, especially those revolving around gender, land tenure, labor systems, and household structure, are crucial dimensions of a farming system. Political environments, too, affect agriculture.

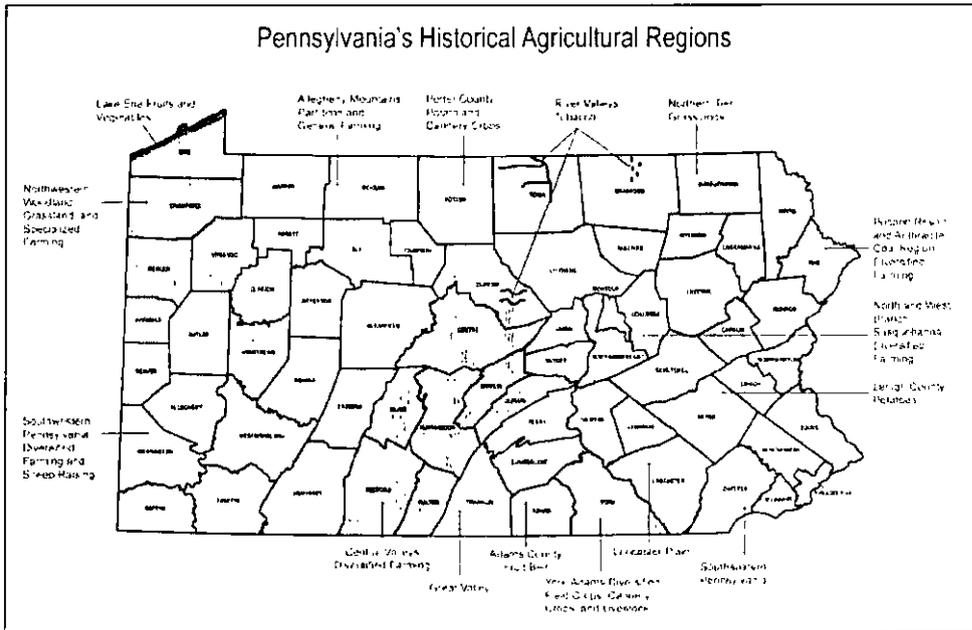
The idea of a "farming system" opens the way to a more comprehensive and accurate interpretation of the historic rural Pennsylvania landscape. For example, because the notion of a "farming system" includes land tenure and mechanization levels, we can identify a distinctive region in the heart of the state where sharecropping and high mechanization levels supported a cash-grain and livestock feeding system. This allows us to interpret the tenant houses, "mansion" houses, multiple barn granaries, large machine sheds, and crop rotation patterns that typify this region. Or, by including cultural forces as part of a system, we can differentiate a three-bay "English" barn from a three-bay German "ground" barn. By attending to labor systems, we can appropriately interpret the Adams and Erie fruit-belt areas that relied on migrant workers. And so on. So whether we seek to interpret German Pennsylvania, the "Yorker" northern tier, home dairying areas where women dominated, or tobacco farming in Lancaster County, the "farming system" approach is key to understanding all aspects of the rural Pennsylvania farm landscape—not only the house and barn.

Identification of Historic Agricultural Regions

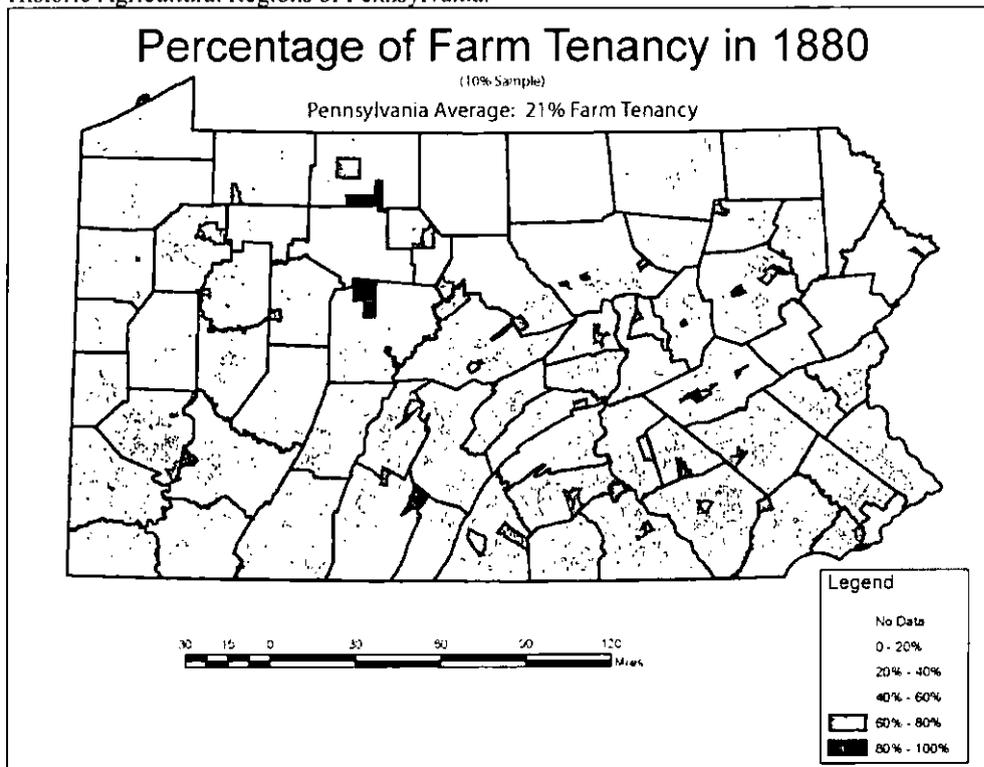
Mapping done by agricultural economists in the early twentieth century identified "Types of Farming" areas based on soil types, topography, markets, climate, and production. These helped to establish clear regional boundaries to the extent that topography, climate, and soil types set basic conditions for agriculture, and they also aided in identifying twentieth century production patterns. However, the agricultural economists were mainly interested in production and markets; they did not take into account other important factors which shaped the landscape, especially ethnicity, labor patterns, and land tenure. For this cultural and social data, cultural geographers' work has proven valuable, because it maps information on settlement patterns, building types, ethnic groups, and even speech patterns. And finally, new maps of farm tenancy were generated for this report. Examples of these maps are reproduced below. Together, these resources were used to outline regions that allow us to avoid a "one size fits all" approach on the one hand, and the over-detailed focus on a single farm on the other.



From Penn State College Agricultural Experiment Station Bulletin 305: "Types of Farming in Pennsylvania," April 1934.



Historic Agricultural Regions of Pennsylvania.

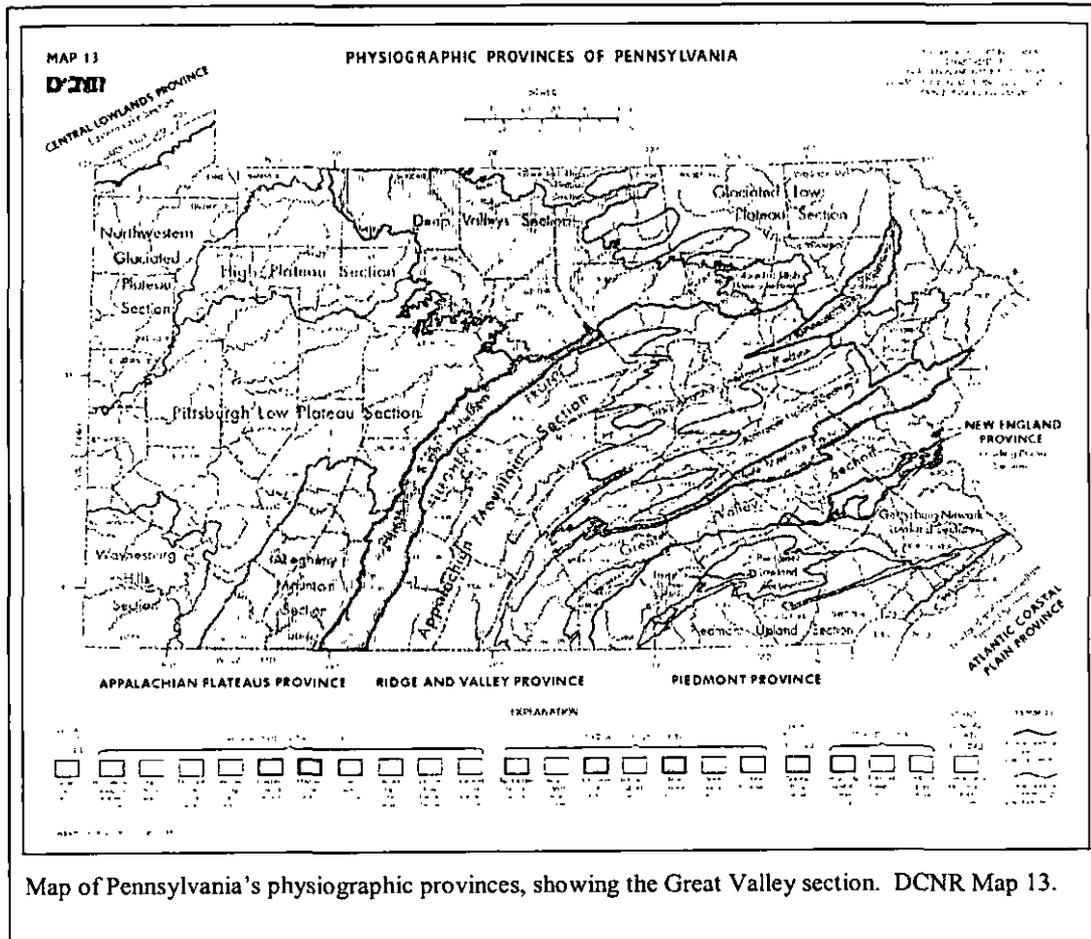


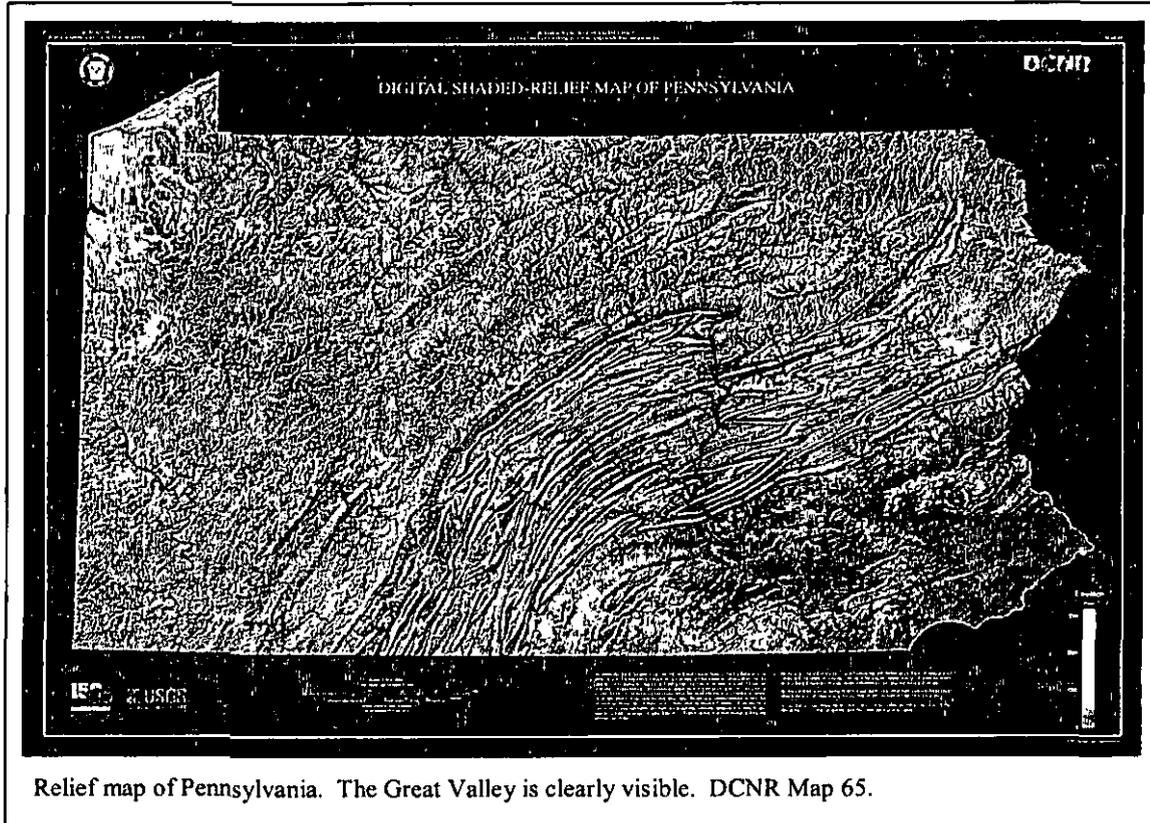
Share Tenants as a percentage of all farmers, 1880.

1 Emil Rauchenstein and F. P. Weaver, "Types of Farming in Pennsylvania." Pennsylvania Agricultural Experiment Station Bulletin # 305, April 1934, 39.

2 Paul I. Wrigley, "Types of Farming in Pennsylvania." Pennsylvania Agricultural Experiment Station Bulletin # 479, May 1946.

Location





Pennsylvania's "Great Valley" is a broad, relatively level valley which runs from Northampton County in the northeast, in a rough arc westward through Lehigh, Berks, Lebanon, southern Dauphin, Cumberland, and Franklin Counties, turning southward and continuing across the state line. Some geographers treat it in its own right; others consider it as part of the Ridge and Valley province. In either case, all recognize that it is not confined to Pennsylvania; it becomes the "Shenandoah" Valley in Virginia, and extends northeast into New Jersey. The Great Valley is bounded on the north by long, narrow, steep ridges, penetrated by gaps and given various names along its route. On the south, South Mountain forms a sharp boundary, and a band of lesser hills separates the Great Valley from northern Bucks, Montgomery, Chester, Lancaster, and York Counties. The Great Valley is between 10 and 25 miles wide, and extends about 150 miles in Pennsylvania. Traditionally, within this larger region the "Lehigh Valley" comprises the eastern end; the "Lebanon Valley" the flat area from Reading to Harrisburg; and the "Cumberland Valley" from the Susquehanna to the Maryland line.¹

The narrative considers Franklin, Cumberland, and Lebanon Counties to lie wholly in the Great Valley. However, northern Northampton County probably fits better with the

Pocono-Anthracite region; southern Berks with Southeastern Pennsylvania; and northern Dauphin with the North and West Branch Susquehanna Region. Northwestern Lehigh County, a notable potato growing region historically, has its own separate narrative.

Climate, Soils, and Topography

Climatic conditions in this large area vary. The growing season ranges from about 121 to 180 days, but averages around 150 in most places. Annual average precipitation ranges from 40 to 42 inches. Mean annual temperatures are in the low 50s Fahrenheit.

Summers are relatively hot and winters cool. Important waterways within the Valley include the Delaware River, on its eastern edge; the Lehigh; the Schuylkill; and the Susquehanna and tributaries. Most run across the valley, but the tributaries (such as the Conodoguinet in Cumberland County) often run along it. Soils are alfisols and ultisols. One distinguishing feature in most of the valley is that limestone is the parent material. Sandstone and shale are the other important parent rocks. According to the Penn State online "Agronomy Guide," in the Ridge and Valley region the limestone soils "are usually deep, well drained, have high root zone available water-holding capacity, and have few rock fragments. The shale-derived soils are less productive because of their acidic nature, steep slopes, and generally low root zone available water-holding capacity. The soils in the valleys are on level or undulating land, and erosion potential is low to moderate. The valley soils are used intensively for agriculture."² The two most important agricultural soil associations in the valley are the Hagerstown-Duffield and Berks-Weikert, which are limestone and shale soils respectively.³

Since the Valley's defining features are topographical, topography has already been discussed under "location" above.

Historical Farming System

Mid-Eighteenth to Early Nineteenth Century: Diversified Small-Scale Farming and Wheat for Export

The land lying within the Great Valley had been acquired by 1737, and pockets were well settled by 1760, especially in areas now covering southern Dauphin, Lebanon, and Berks Counties. These include places such as Tulpehocken region in Berks/Lebanon, the Reading area in Berks County (especially the Oley Valley, just on the Great Valley's edge), and the region around Carlisle in Cumberland County. After the French and Indian Wars, more and more people followed the corridor and filled it up. By 1813 the present county boundaries were set with the creation of Lehigh County in 1812 and Lebanon County the following year. The population in the valley came from varied backgrounds. The British Isles were well represented, with English, Welsh, and most notably Scots-Irish people. Around 1800, the Scots-Irish still dominated in the western portion of the valley, in Cumberland and Franklin Counties. French Huguenots, Swedenborgians, and Mennonites came from the Continent. German-speaking people from the Rhine Valley and Switzerland came to Pennsylvania beginning around 1720 with the immigration peaking around the time of the Revolution. During this time period, they slowly gained in their proportion of the rural population in the region. By 1800, geographer Mark Hornberger estimates, German-speakers comprised over 65 percent of the population in most of Berks and Northampton Counties, with the percentage diminishing further westward. In many Cumberland County townships, for example, more than a third of the people came from English backgrounds and another fifth were Scots-Irish or Irish.⁴

Transport corridors were rudimentary during this period. Reading and Easton were connected by road, and the Schuylkill River connected Berks County to Philadelphia for part of the year. Similarly, the Susquehanna was seasonally navigable. By the late eighteenth century, a road ran west through the valley from Reading to Harrisburg and on down through Chambersburg.⁵

Products, Mid-Eighteenth to Early Nineteenth Century

Land distribution occurred in a protracted and complicated process. Some holdings were quite large—over a thousand acres—and slowly these were broken up into smaller parcels and sold for farms. Still, it was not unusual for a landowner to possess 200 or 300 acres in these early years. Clearing proceeded steadily, yet it took a long time, so crop acreage might only be 20 or 30 acres, plus some meadow land and orchard land. Crops were generally not rotated; instead, land was allowed to lie fallow periodically. These basic facts underlie analysis of production and trade patterns.⁶

Early farm production in the Great Valley region was quite diverse, but nonetheless patterns do emerge. Commentators during the colonial and early national periods mentioned wheat, buckwheat, rye, oats, and barley as typical small grains. Some sources mentioned spelt, an Old World grain. Within this broad list, rye was as important as wheat in Berks, Lebanon, Lehigh, and Northampton Counties, while west of the Susquehanna total wheat production probably surpassed rye. (Accurate figures are not available before 1840, so an assumption is made based on the 1840 census data plus earlier observers' comments.) This difference can be attributed partly to cultural preferences, and also to differences in soils. In this period, the eastern counties were much more heavily Pennsylvania German than were those west of the river. An article in the *Farmer's Register* noted that in Lehigh County, the Pennsylvania Germans much preferred rye bread, and also fed rye to animals.⁷ Rye straw was also prized for roof thatching. A second reason why wheat gained the upper hand in the western counties was probably that they had more of the favorable Hagerstown soils. Regardless of proportions, wheat was important throughout the region, especially in terms of its potential for generating income. As grain or flour, it found its way to mills and markets, often ending up in Philadelphia or Baltimore and beyond. As whiskey, it brought greater profits to farmers distant from markets. (This was also true for corn.) This is an important factor; unlike farms in the southeast, most farms in the Great Valley were still poorly connected to markets at this time. Corn (maize) was grown, but its importance varied before 1800, after which it became much more common. Oats was important as a feed crop, and small quantities of barley supplied brewing needs.

Fiber crops occupied an important place in the farm economy in the "Age of Homespun." Flax and hemp were most often mentioned. Potatoes, cabbage, turnips, and many other garden crops fed humans and animals. By the end of the period, clover and timothy hay had begun to be deliberately planted. Orchards were planted immediately and within a generation, families were well supplied with fruits. Apples were the mainstay, yielding not only fresh fruit but dried fruit, vinegar, cider, apple butter, and hard cider. Historian Michael Kennedy has noted that besides the obvious outlets in major port cities, farm markets developed quite early at local mills and ironworks. These were well distributed throughout the region. Kennedy mentions beans, onions, wood, veal, parsnips, venison, cucumbers, molasses, greens, peas, leather, limestone, tallow, wax, straw, hops, hides, and feathers as items that were traded in these rudimentary markets. Others included processed items such as stockings, clothing, linen, baskets, soap, thread, cheese, vinegar, shingles, charcoal, and candles.⁸

Livestock were few and generally fended for themselves. Nonetheless, horses, steers, milk cows, swine, sheep, and poultry were kept. Not only meat, but butter, fiber, cloth, and feathers were important livestock-derived products.

By 1892, Theophilus Cazenove traversed the Great Valley and noted thriving farms with "large fields of wheat, corn and buckwheat" as well as clover, tobacco, potatoes, flax, cabbages, and carrots. He continued: "the hollows are good pasture...the houses are stone, and several of log and stone." Farmers were selling beef, mutton, veal, wheat, salt, and butter; "they have all become rich, through the high price of grains since the French Revolution." Anne Royall summed up the livestock practices with this observation of the Lehigh Valley: "large sleek cattle, few sheep, and few horses in sight, but a number of fine hogs running at large in the woods."⁹

In sum, the early farm economy in the Great Valley mixed subsistence, cash grain production, bartering, and other forms of exchange to create a highly diversified, small-scale agricultural system.

Labor and Land Tenure, Mid-Eighteenth to Early Nineteenth Century

Farm production relied heavily on human energy in this period. Slow oxen were the main draft animals, and farm implements were few and crude. The wood plow, scythe, flail, hoe, and rake were important implements. So, people were the main requisite for farming. They came mainly from family; every man, woman, and child had his or her own allotted duties, and at peak times everyone joined in the same work. Additional labor was obtained through neighborly exchanges.¹⁰

Another important labor source came from various types of “bound” or “unfree” labor. For example, under the “redemptioner” system, young adults with few resources paid for their trans-Atlantic passage by working for a period of years. These people came from all over Europe, including the British Isles. Some criticized the redemptioner system as a form of “white slavery,” while others saw it as a practical system that benefited both worker and employer.¹¹ Indentured servitude was another form of “bound” labor, usually involving a child or teenager bound to a family for a period of several years, laboring in return for some training and possibly schooling, as well as room, board, and clothing. In 1818, for example, Lehigh County widow Eva Hoatz indentured her daughter to Adam Michael. The agreement read:

Heidelberg Township, Lehigh County, April 15, 1818. An agreement between Eva Hoatz, widow, and Adam Michael, as follows: first, Eva Hoatz hires her daughter, Magdalena Hoatz, to Adam Michael for four years, and Adam Michael shall give Magdalena Hoatz: a new cotton tick with sixteen pounds of feathers; a plaid cover for the whole bed, a new homemade cover; a linen bedsheet and one of new home-spun, two new pillows, one large and two small; a new tow-colored bedspread; a new low bedstead for a new and complete bed; a new chest with five drawers; a cow or nine pounds of money in lieu of the cow; a new spinning wheel, a new iron kettle of medium size, also a pan; furthermore during the entire term of employment he must keep Magdalena Hoatz supplied with clothes for Sunday and work-a-day wear, and must send her to school for three months and to *catechetical instruction and confirmation*. He must present her with a new dress of her own choosing, except that it shall not be a silk dress; and Magdalena’s

employment begins January 1818. Signed on the day and date above given.

Witnessed by: Adam Michael, John Peter, Georg Hoatz¹²

A very few slaves also appear on farms in the documentary record for the period.¹³ The central point here is that most farm laborers were “unfree” in the sense that they were subject to binding, usually multiyear, agreements. Patriarchal power was so strong that even family labor was ‘bound’ to some extent, since men exerted considerable legal control over wives and children.

Tenancy was an important institution. Sometimes it functioned as yet another means of obtaining and controlling scarce farm labor, but also it allowed people to ascend the “agricultural ladder,” accumulating resources while renting in order later to purchase land. Rates of tenancy are not available for this period in the Great Valley, but it is safe to say that it figured prominently in the agricultural system. Documentary evidence is readily available; for example, in Cumberland County, an 1805 sharecropping contract between Nicholas Schwerdt (the tenant) and William Alexander specifically explained how crops would be divided and expenses distributed.¹⁴

Another important point to consider about labor in this time and place is that many people combined farming with other occupations, often trades like cabinetmaking, shoemaking, or carpentry, or even with professions such as the ministry.¹⁵

Buildings and Landscapes, Mid-Eighteenth to Early Nineteenth Century

Houses, Mid-Eighteenth to Early Nineteenth Century

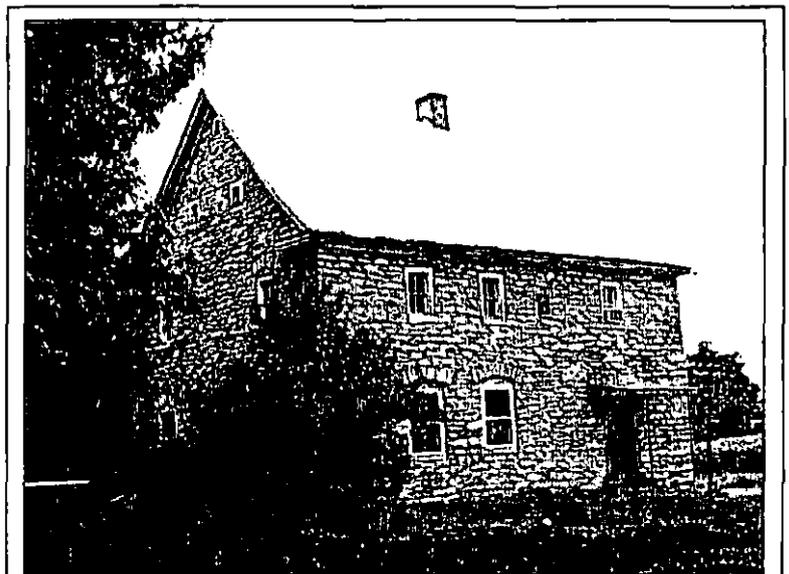
Architectural survivals from before 1800 represent only the upper end of Pennsylvania housing. Overwhelmingly, the typical eighteenth-century dwelling was a small log structure, often only a single story. In Cumberland County, for example, the average house c. 1770 measured about 21 by 26 feet and had two rooms and a loft.¹⁶ The 1798 Direct Tax offers detailed evidence that the building stock consisted of log dwellings with around 600 or 700 square feet of living space.¹⁷ These buildings offered little room for agricultural processing work or storage.

The larger early houses in this region are among the most famous in Pennsylvania, so they have been much discussed by architectural historians. The reader is referred to the excellent works on colonial Pennsylvania architecture for detailed discussions about these buildings. For the purposes of this narrative, an attempt will be made to offer a broad and brief synthesis of major house types and their relationship to agriculture.¹⁸

The cultural mixing in colonial Pennsylvania is represented in the many architectural traditions that were combined and recombined. The famous "Continental" house, for example, was favored by German speakers. It featured a roughly square foot print, a front elevation with asymmetrically placed openings, a roof-ridge chimney, and a floor plan dominated by a long narrow kitchen with central hearth, a "stove room" heated off the hearth, and a "kammer" or chamber. Variations on the type were built in stone, log, half-timbering, and frame. Often these houses would have a full cellar through which ran a stream or spring. Some of these were vaulted. The one-or two-level attic often contained room for grain storage and a smoke chamber for smoking meats. The agricultural significance of these houses is in their extensive productive spaces. Cellar areas were important work and storage sites, while storage and processing occurred throughout the house. Over time, continual interactions among cultural groups resulted in modifications to the "Continental" house type.

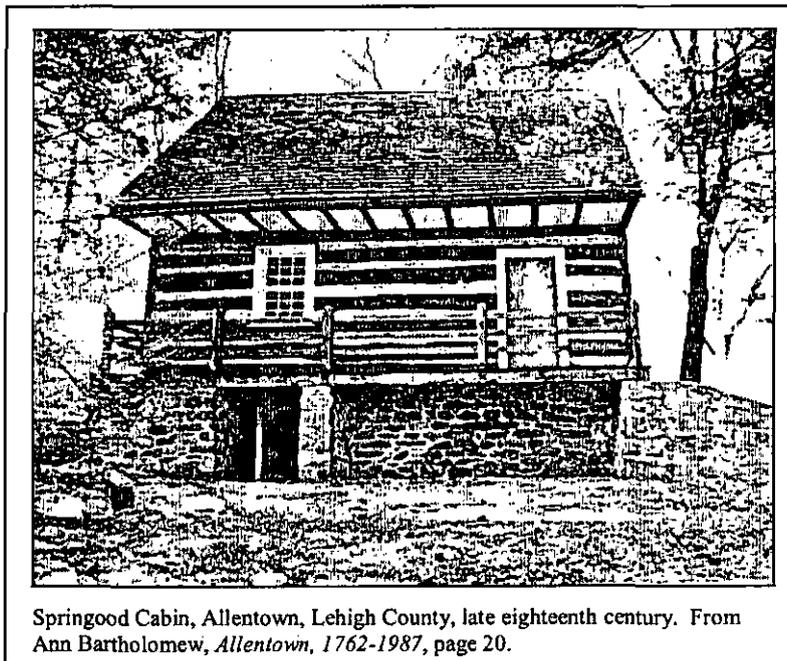
In Cumberland County, evidence appears in the built environment that Scots-Irish people were adapting into log their traditional stone one-story, one- or two-room dwelling. Some had a hall-and-parlor configuration.

Over time, the average dwelling became more substantial and less "ethnically" distinct. All cultural groups embraced Renaissance



Immel house, Jackson Township, Lebanon County, 1759.
Site 075-JA-004.

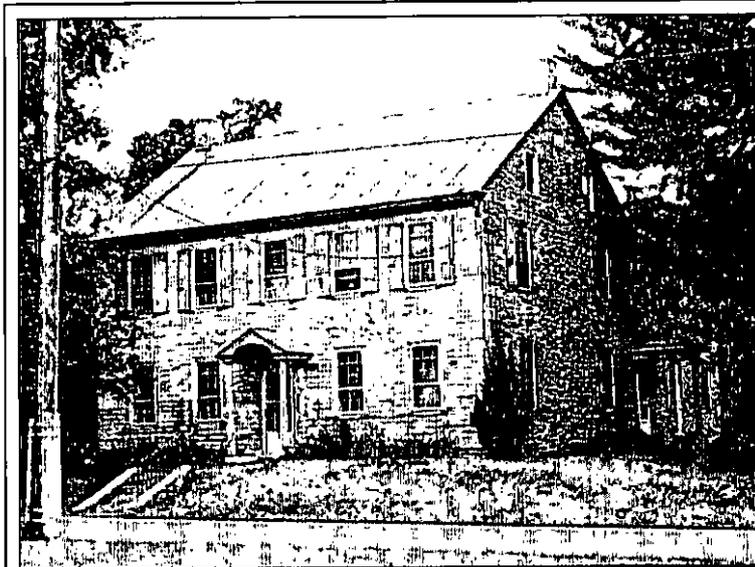
ideals from Europe, which architecturally translated into features such as exterior symmetry (regularly spaced windows in a three-, four-, or five-bay front elevation), rooms with specific functions, and passages or hallways which separated interior spaces. The central chimney was replaced by gable-end chimneys. Often the change was only superficial; exterior symmetry might mask more traditional interiors. Productive spaces continued to be integrated into dwellings, especially the large kitchen and vaulted cellar and sometimes attic storage and processing too. Sometimes the kitchen appeared as a substantial ell.¹⁹



Springgood Cabin, Allentown, Lehigh County, late eighteenth century. From Ann Bartholomew, *Allentown, 1762-1987*, page 20.



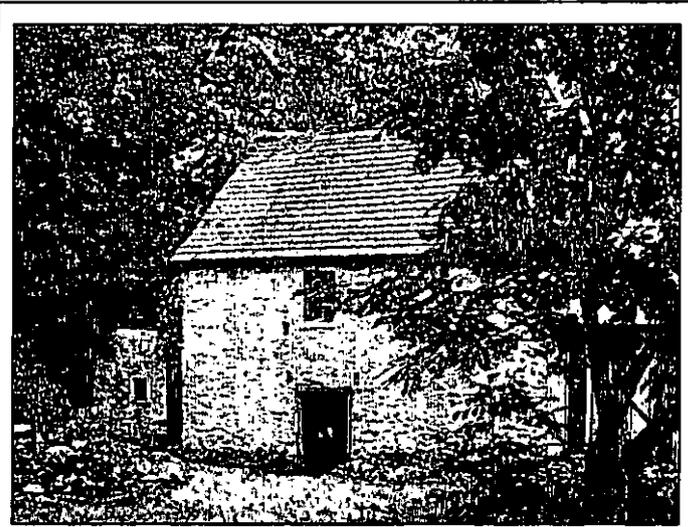
House, Jackson Township, Lebanon County, c. 1789. Site 075-JA-003.



House, Jackson Township, Lebanon County, 1838. Site 075-JA-005.

Barns, Mid-Eighteenth to Early Nineteenth Century

Because livestock were few and crops small, barns were either absent or quite modest in scale, especially before 1800. Often the Direct Tax lists a log “stable” rather than a proper barn. These early buildings were small and built all on one level. For this reason they are sometimes called “ground barns.” These tripartite



Abraham Bertolet ancillary house, Oley Township, Berks County, c. 1740. This building had a first story kitchen.

structures had a main entrance in the long side, leading to a threshing floor. In turn the floor was flanked by a hay mow and stable areas. This space accommodated the modest needs for hay storage, grain processing area, and housing a few select animals. Very few of these survive intact. Some years ago Robert Ensminger documented one in Berks County but it is now badly deteriorated.²⁰ The Casper Maul barn in the Oley Valley, 1791, is a late example in stone. In Cumberland County, the Alexander Leckey barn is a late-eighteenth century survival. It has double log cribs and is not banked, though at 25 feet by 60 feet it is large.²¹

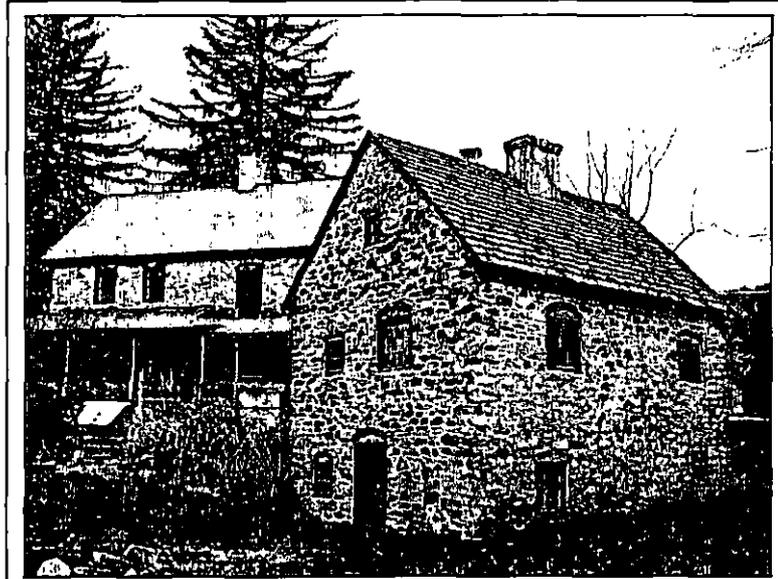


Casper Maul barn, Oley Township, Berks County, 1796.

Outbuildings, Mid-Eighteenth to Early Nineteenth Century

Outbuildings were relatively scarce during this early period. Most commonly found in the documentary record are kitchens, spring houses (also called “milk houses”), still houses, bake houses, and smoke houses. Philip Pendleton has identified an “ancillary

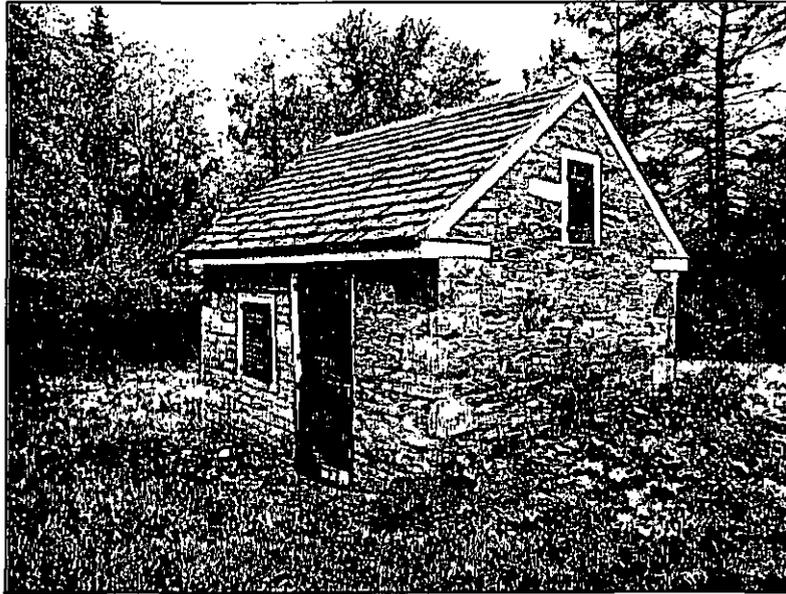
house” type which often encompassed more than one of these functions, or served as a second house for grandparents or tenants.



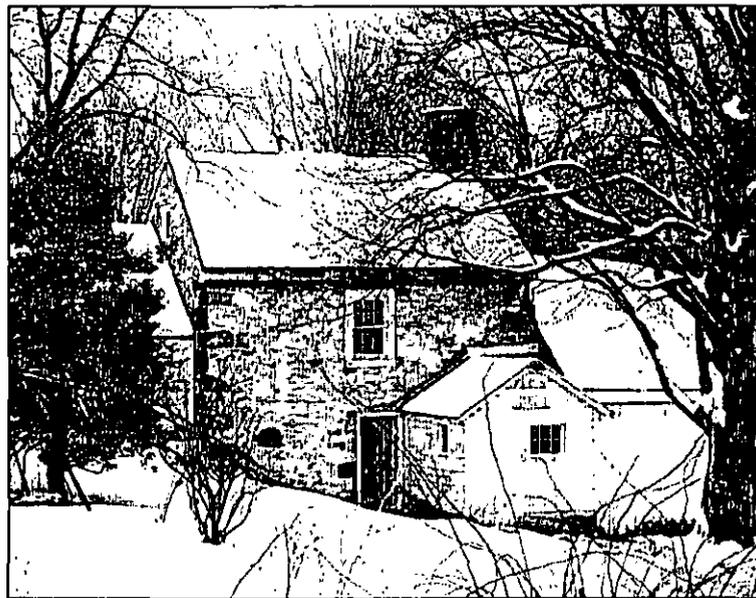
Keim Homestead ancillary building, Oley Township, Berks County, c. 1760. This banked structure had a spring in the basement and accommodated a wood-turner shop on the upper level.



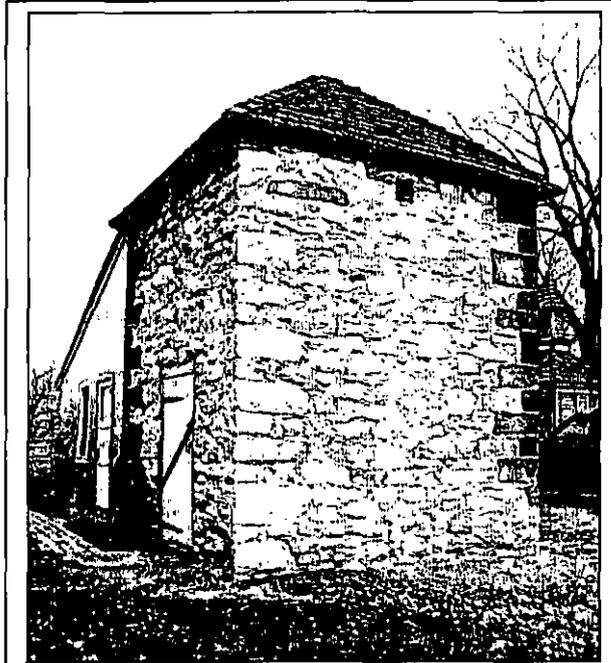
Bakehouse, Bertolet-Herbein homestead, Berks County, reconstructed, date uncertain. The bake oven was situated in the rear, but a “squirrel” tail ran the smoke back into a chimney on the roof ridge. A sheltered area protected workers and products.



Dairy or wash house, Schaefferstown, PA, late eighteenth or early nineteenth century. The interior is lined with shelves.

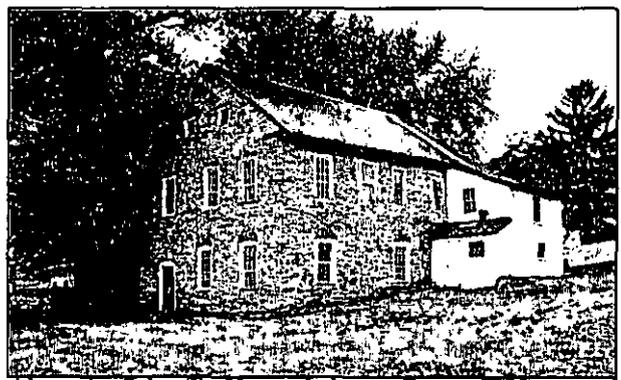


Spring house, Cumberland County, late eighteenth or early nineteenth century. This combination building has a spring in the basement and a fireplace on the upper level.



Smokehouse, Tulpehocken Manor, Jackson Township, Lebanon County, late eighteenth century. This large structure held large amounts of meat and was secured with a hand wrought iron bar.

There is evidence to suggest that still houses were as common as other farm outbuildings of the era.²² The distilling process required both water and heat, so a still house would probably have a water source and a fireplace. No free-standing still houses were documented in the Pennsylvania Agricultural History Project field study. However, architectural historian Nancy Van Dolsen in earlier work documented two still houses in Cumberland County, both dating c. 1800-1825. They were banked, built of stone and were rectangular with a large length:width ratio, measuring about 12 by 20-24 feet. A stream ran through a channel in the lower level floor and there were stone troughs there also. On the upper level were "...a gable end door, slit openings for light, and a fireplace."²³ Spring houses could be, and were, used for distilling. In particular, it would seem that springhouses with an upper level fireplace would be well suited to distilling.²⁴ The Alexander Schaeffer



Alexander Schaeffer House, Lebanon County, mid-eighteenth century. Historians are fairly sure there was a still in the lower level.

farm house in Lebanon County has architectural and documentary evidence that distilling took place in its basement.

The farm landscape in this period would have been a patchwork of small crop fields, woodlots, orchards, and meadows. Philip Pendleton points out that it “would have taken on a rather ramshackle appearance to modern eyes,” since no lawns set off the house and fencing was rudimentary. Stump fields lent an unfinished air to the landscape.²⁵ Except for boundaries that might mark longstanding property lines, these features do not survive.

Early Nineteenth Century to c. 1900: Diversified Grain-and-Livestock Farming

A major agricultural transition took place around the turn of the nineteenth century throughout eastern and central Pennsylvania. It began with crisis. The infamous Hessian fly invaded southeastern Pennsylvania in the 1790s and caused widespread devastation, prompting farmers to reconsider their overreliance on wheat. In any case, some observers believed that soil exhaustion was beginning to set in. In 1807, Thomas Jefferson's Embargo delivered another blow to grain producers, making foreign markets less accessible. European recovery after the Napoleonic Wars, then the Panic of 1819 and ensuing depression also forced readjustments. Competition from newly opened wheat lands in the Genesee River Valley of New York State and in the nascent Midwest brought low-priced grain into competition with Pennsylvania wheat.

Though painful, these disruptions were eventually overcome, because the much anticipated “home market” was becoming a reality, as the nonagricultural population in the young republic expanded. In the Great Valley, inland towns like Easton, Allentown, Reading, Lebanon, Harrisburg, Carlisle, and Chambersburg grew rapidly, providing domestic markets to replace lost overseas outlets. The nonagricultural population grew in rural areas, too, as the economy diversified and agriculture mechanized. At the same time, transportation infrastructure knitted the region together. Improved macadam road, plank roads, and turnpikes made road travel easier. The Lehigh Canal was completed in 1829 and the Union Canal in 1830. The latter penetrated right into the Great Valley and connected it with Philadelphia. Barely as soon as the canals opened, rail links followed.

Already by the mid-1840s the Cumberland Valley Railroad passed through the county's center, and by the late 1850s rail lines traversed the entire length of the Great Valley. Philadelphia, Lancaster, Baltimore, New York City, and Pittsburgh were now more easily accessible.²⁶

These domestic markets could be supplied with products that (unlike wheat) were consumed fresh. This meant that not only fruits and vegetables, but livestock and livestock products (meat, butter, cheese, eggs, and so on) took on new possibilities for eastern farming families. The basic agricultural adjustment made in this changing atmosphere was to shift from a crop-centered system to a crop-and-livestock system which incorporated rotations, manuring, and liming and which produced a diverse array of both crops and livestock products. Crop rotation avoided unproductive fallows as a way to replenish the soil, instead substituting a sequence of crops, usually corn, wheat, oats, and grass. The grasses (for hay and pasture) contained timothy and clover, which improved soil texture and returned organic matter to the soil; this process was often enhanced by liming. Fertilizing with barnyard manure was a second key aspect in rotations. Manure had to come from confined livestock, and so the field husbandry and animal husbandry worked in tandem. At the same time, earlier constraints on available labor power began to drop away. Industrialization brought farm mechanization, both increasing the (rural and urban) consuming population and making the new style of farming feasible.

A Lehigh County correspondent for the *Farmer and Gardener* in 1834 summarized the changes:

... the introduction of the use of lime in farming, and the culture of clover about 20 years ago, wrought a most salutary revolution, and saved the second and third rate lands from being deserted for the far west. Every summer adds to the number of solid and capacious barns, and old ones enlarged.... Common rotation, 1st. clover, 2d. Indian corn, 3d, oats or flax, and potatoes, manure, 4th, wheat, 5th and 6th, clover...

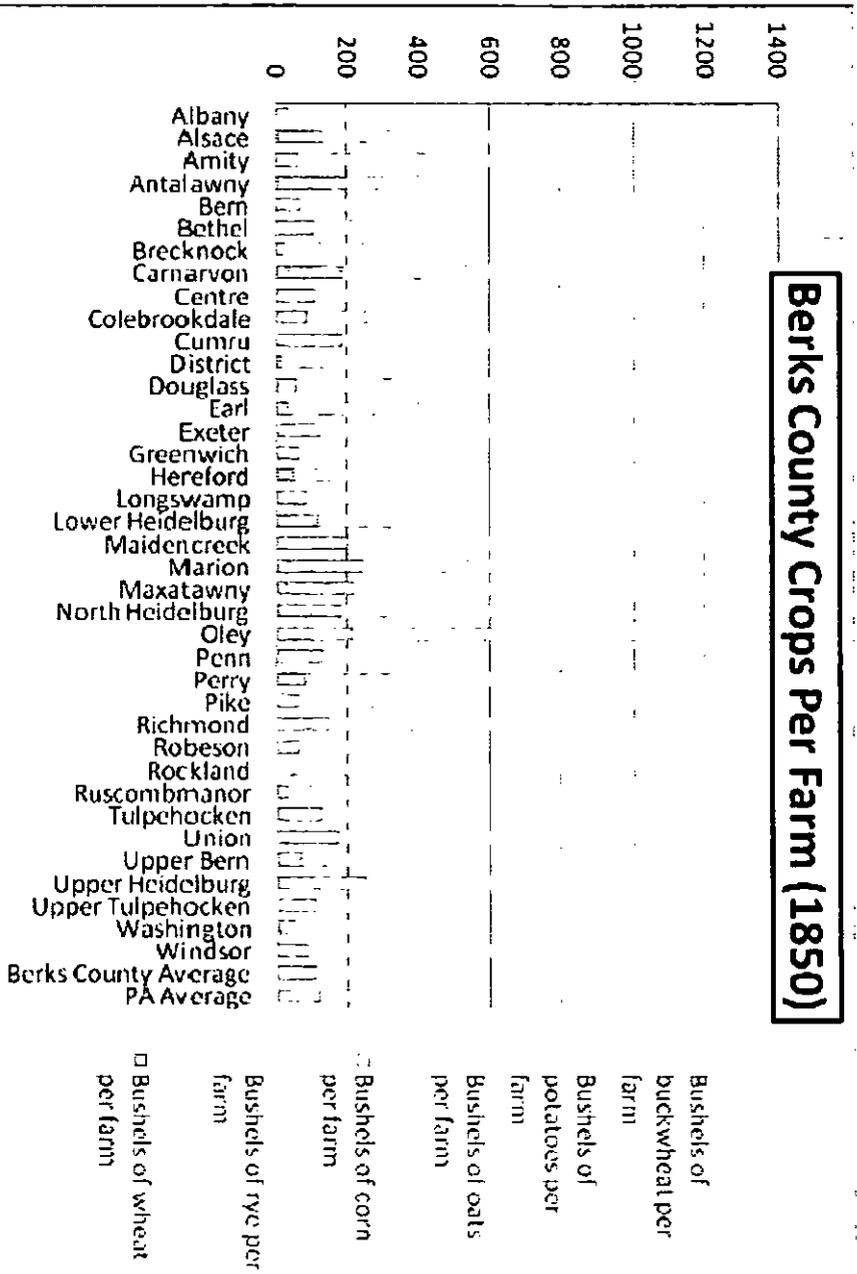
This correspondent also noted that liming had “quick and immediate” effect on rye culture, which as we have seen was quite important there.²⁷

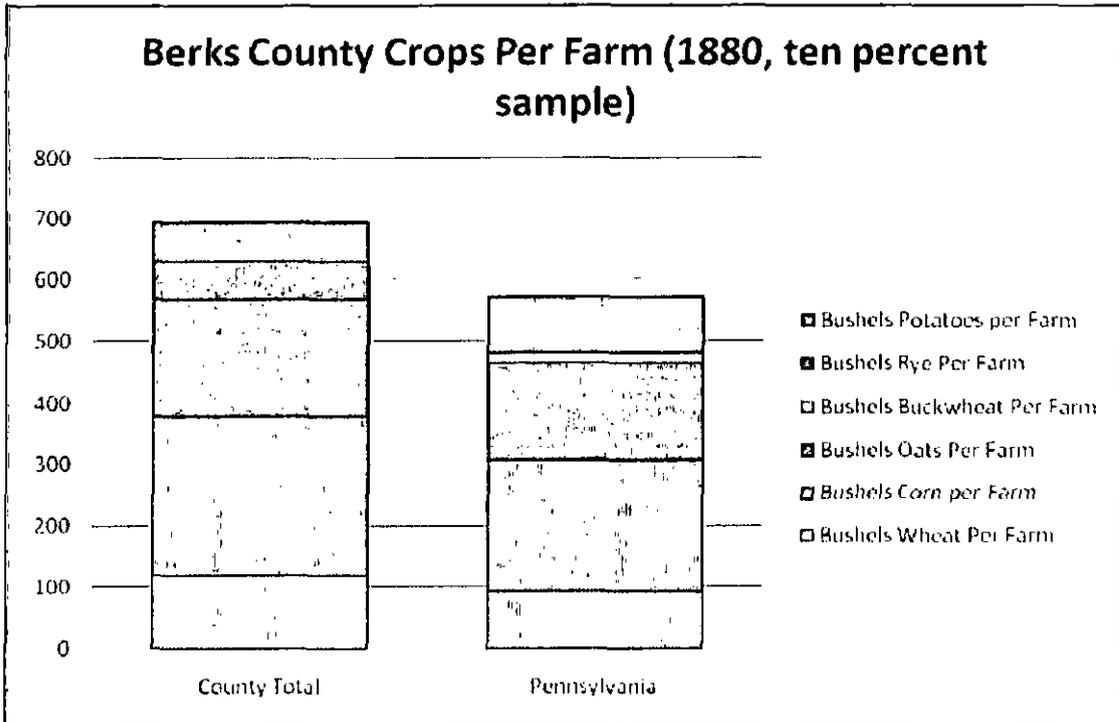
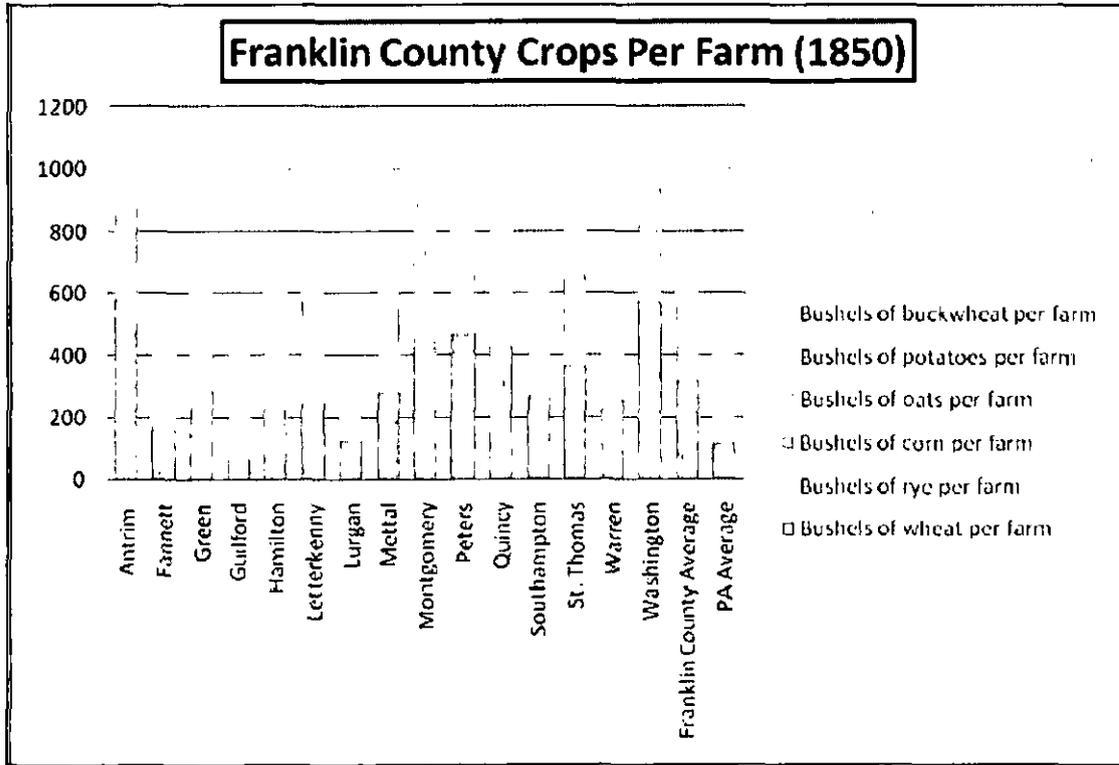
An important social trend in the Great Valley during the nineteenth century was its increasingly Pennsylvania German flavor. Not just rural areas, but cities like Reading now became predominantly Pennsylvania German. By 1880, in Cumberland and Franklin Counties the percentage of Pennsylvania Germans had risen; most Cumberland County townships were now at least 45% German. During these years the people in the rural hinterland developed their rich Pennsylvania German cultural life. Without indulging in hoary stereotypes about the Pennsylvania Germans, it is possible to argue that this period represented a flowering of Pennsylvania German rural culture. In the years of the early Republic “Germans in Pennsylvania” coalesced to become “Pennsylvania Germans.” Since colonial days, German speakers in Pennsylvania had evolved a common dialect and established church communities and schools. Immigration from German-speaking lands had trickled to a stop by the early nineteenth century. Settled Pennsylvania German communities developed a sense of common identity through struggles over such issues as state-sponsored schools and religious evangelicalism, and through conflict with the newly arrived “forty-eighter” Germans. Pennsylvania German cultural practices and forms peaked during these years. In few places was this more evident than in the rural Great Valley.

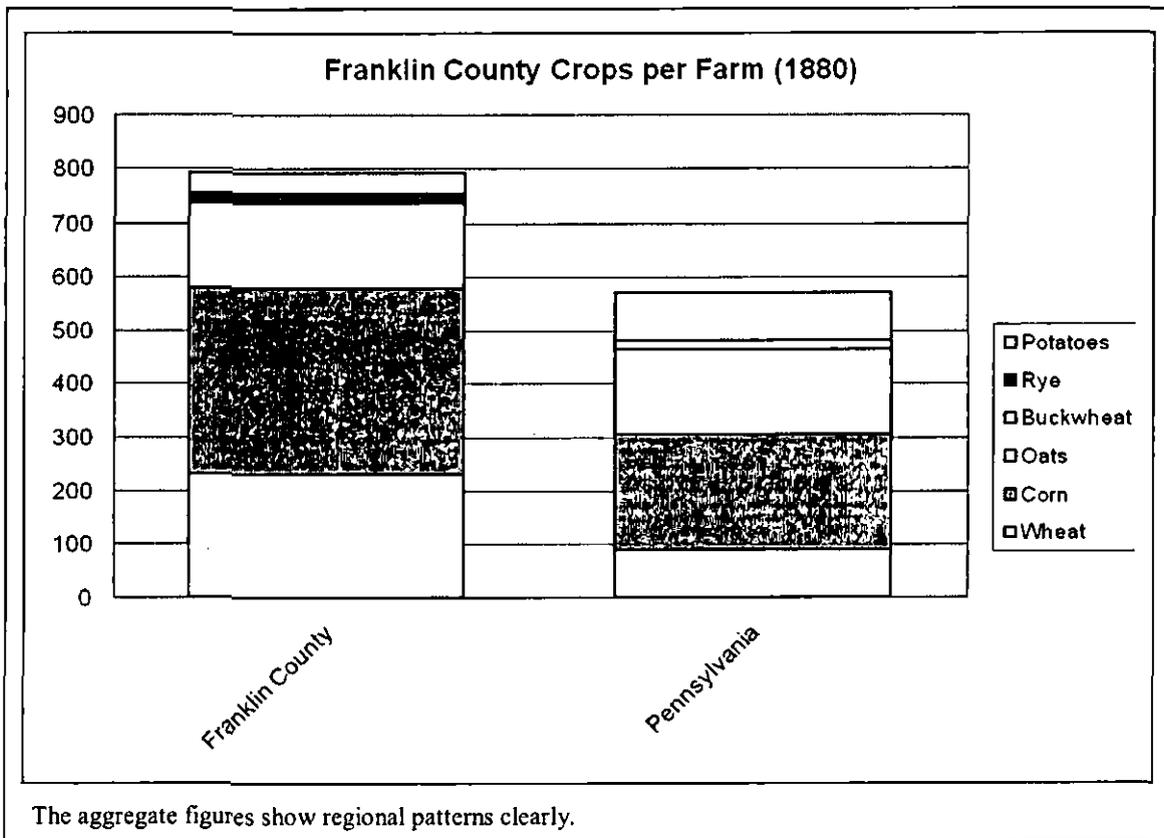
Products, Early Nineteenth Century to c. 1900

Nineteenth-century farm families in the Great Valley developed a richly varied agricultural economy. In general, crop production still exceeded state averages, while the number of livestock was lower than average. The one factor accounting for the difference in livestock numbers, however, is that almost no sheep were raised in the Great Valley. Great Valley farms actually had more cattle, horses, and swine than the average Pennsylvania farm. These formed the basis of intensive crop-and-livestock systems, while sheep were raised on pasture. The crops and livestock produced on Great Valley farms often went to local or regional markets, but almost everything had interchangeable uses, from livestock feed to family food to neighborly exchange. The Valley’s pronounced Pennsylvania German character subtly shaped production patterns.

Agricultural statistics are available for 1838 in some cases, and together with the 1850 figures, they reveal that the new system was settled and flourishing. The typical farm was smaller than average for the counties east of the Susquehanna; about average in Lebanon and Dauphin Counties, and larger than average west of the river. This probably reflects the timing of settlement rather than any fundamental differences. Throughout the Great Valley, farms had significantly more improved acreage, on average, than the typical Pennsylvania farm. Great Valley farms produced large crops of wheat, corn, and oats. Corn acreage and production rose rapidly to take a central place in the crop rotation.²⁸ Most corn stayed on the farm; it was either fed to livestock or consumed by humans. At mid-century rye was still grown in Lehigh, Berks, and Northampton Counties, but by the end of the century rye had become less important even there. Barley, buckwheat, potatoes, turnips, hops, and hemp took up small acreages but provided important feed and fiber. Hay production was above average throughout the Valley, at 15-18 tons per farm. This reflected the prevalence of rotations and the need for livestock feed. Hay was also sold and sent out via rail.²⁹ The 1838 census for Cumberland County split the accounting for hay lands into acreage for clover (21,900); timothy (4,160), and "natural meadow," only 2,170 acres. This shows impressively the extent to which hay land had been developed and brought into a rotation system.

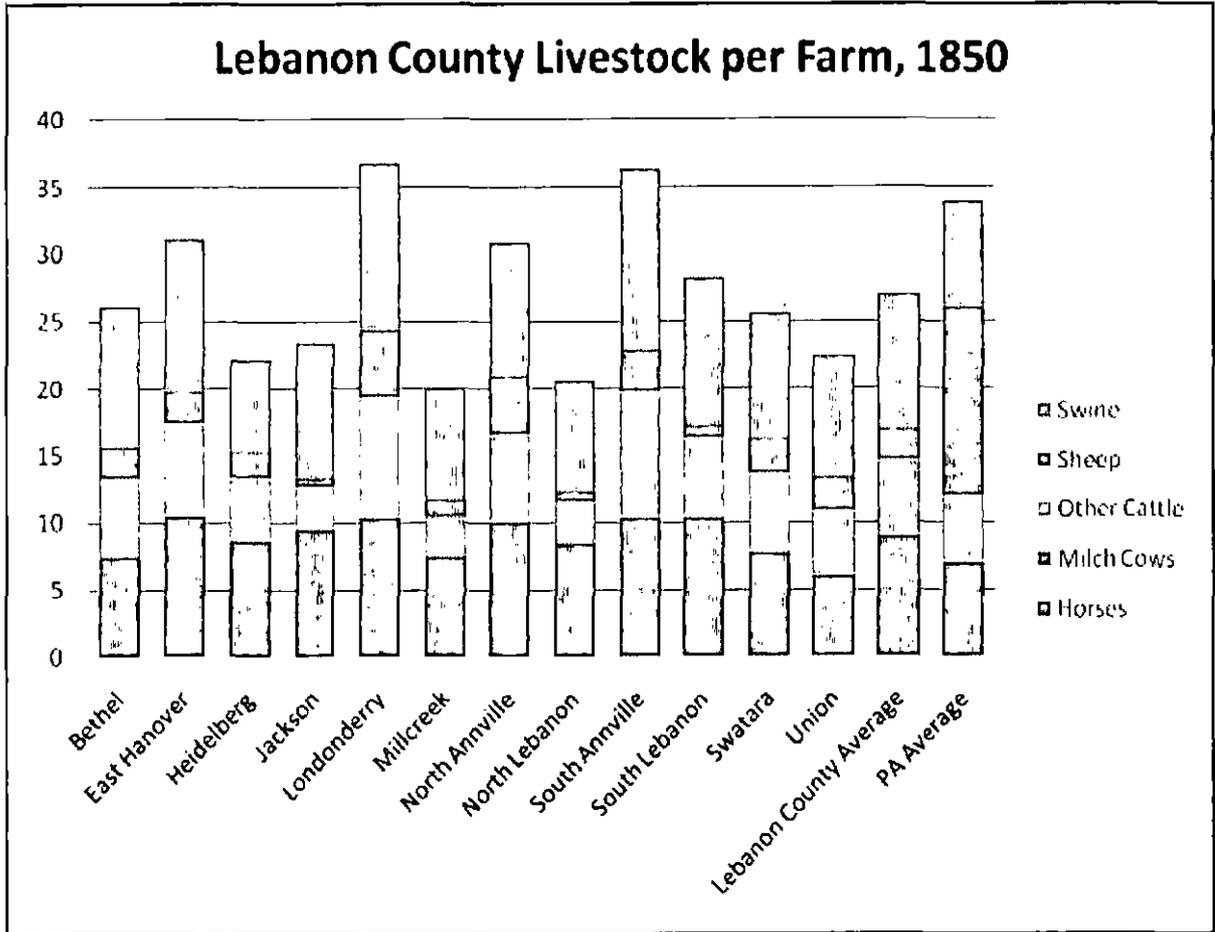


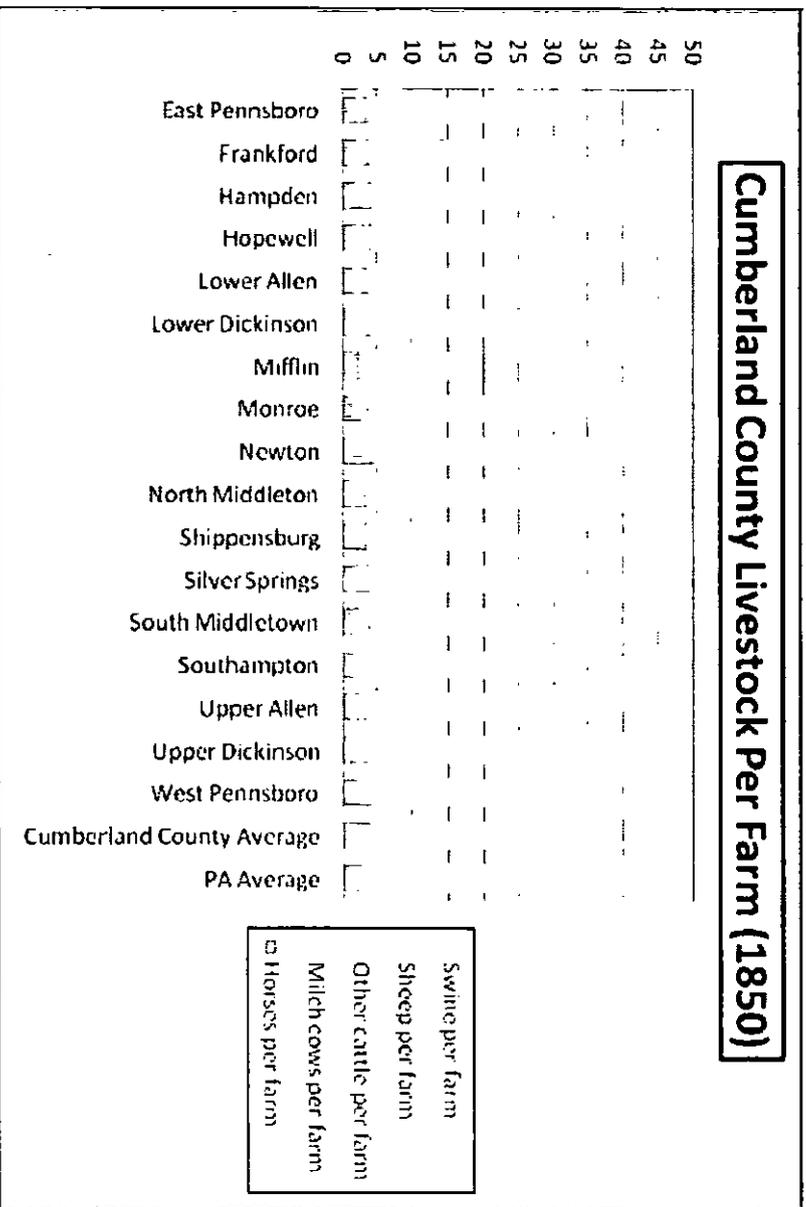


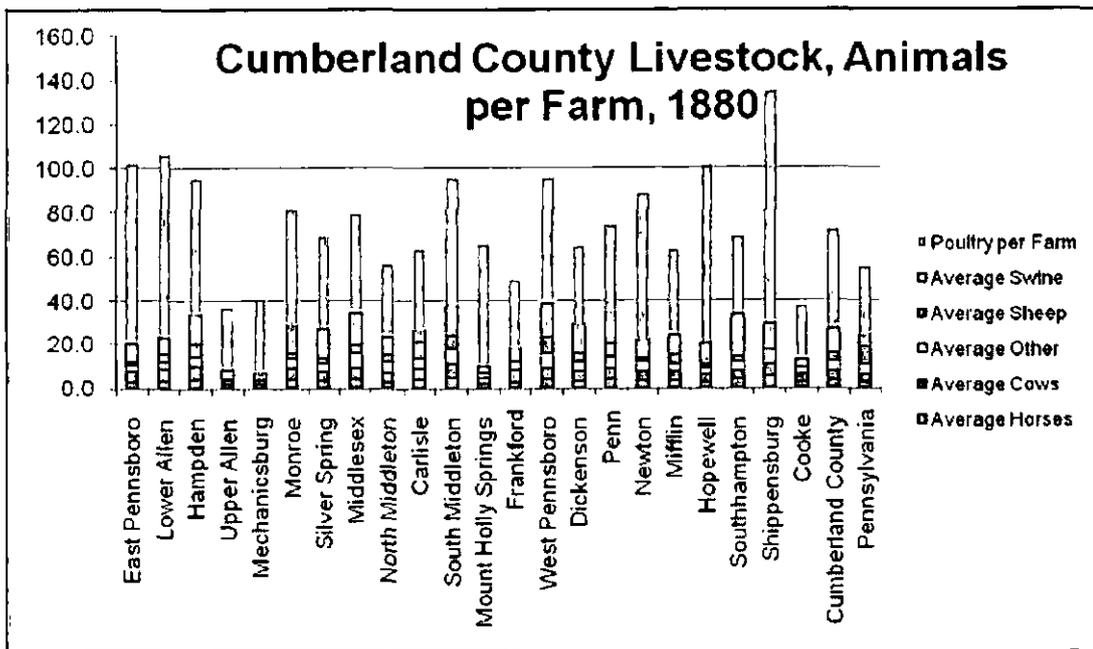
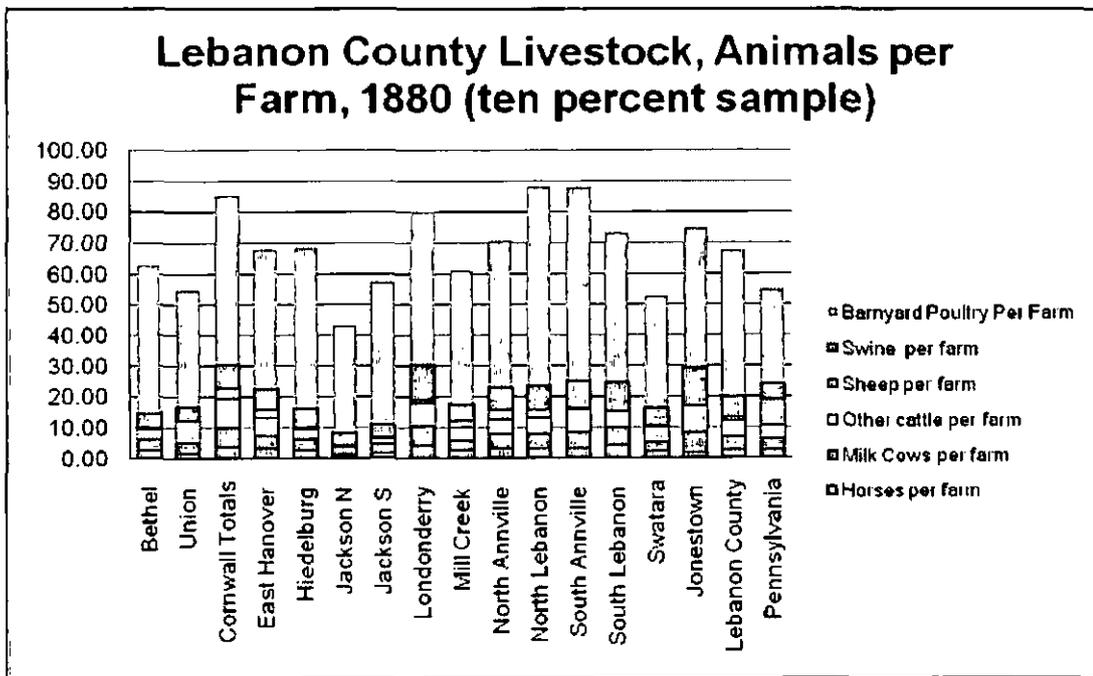


Throughout the nineteenth century, Great Valley farm families kept two or three horses; about four milk cows and a few steers; half a dozen sheep; and more than a dozen swine. In 1854 Eli Bowen, author of the *Pictorial Sketch-Book of Pennsylvania*, noted that livestock production was shaped by access to railroad lines. Nearer the railroad, the farmers “turn their produce... into the dairy, or dispose of their grain by the ushel,” while further away they “are compelled to feed cattle during the winter...” purchasing from western drovers and sending on fattened cattle to market in the spring.³⁰ Swine were far more important in the Great Valley, and sheep far less important, than in the state as a whole. The typical farm in the Great Valley had ten pigs, and often more. Pork was central to Pennsylvania German diet and foodways; food historian William Woys Weaver estimates that pork consumption was twice that of beef consumption.³¹ Farm families slaughtered two or three hogs, and sold the rest. Sometimes pig raising occurred in a mutually profitable relationship with the distilling industry. In Lehigh and Northampton Counties, for example, local farmers took their live hogs to a commercial distillery in Catasauqua, where the hogs were fed on distillery waste. When fattened, the pigs were taken back to the farm for slaughter. The distillery also purchased farmers’ corn.³² Dairy

production was about average; Great Valley farms produced a small surplus of butter. Some townships produced more because they were near good markets, especially as the century went on.







The array of farm products was remarkable. Beeswax, cord wood, soap, and candles were enumerated in the 1838 tally.³³ Many farms had limekilns, and burned lime in the off season to sell and to spread³⁴ Clover seed was a valuable commodity.³⁵ Orchards by now were mature and productive, supplying apples, peaches, pears, and cherries.

Small fruits like raspberries and strawberries were also grown. The family vegetable garden yielded a year's supply of cabbage, beans, squashes, parsnips, carrots, tomatoes, and many other items. Poultry for meat, eggs, and feathers were found on every farm; an 1848 Dauphin County report estimated there were "25 to a family."³⁶

What was "Pennsylvania German" about these agricultural production patterns and processes? How do we separate the impact of ethnically neutral factors like markets and soils?

James Lemon argued that in colonial Pennsylvania, the Germans' agricultural practices were no different from others'. He persuasively showed that everyone grew the same crops, including unfamiliar New World plants like corn and squash. He also found that everyone practiced the same "extensive" kind of farming, and shared a tendency to settle on scattered individual farmsteads – both decidedly against European tradition. More recently, scholars such as Gabrielle Lanier and Cynthia Falk have challenged other stereotypes. The evidence for the nineteenth century suggests that Pennsylvania German agriculture was very much geared to raising what local soils and climate could yield, for the best market prices. Pennsylvania Germans' highly diversified portfolio of crops and livestock did not differ in content from that of Pennsylvania's "Yankee" areas. Few "ethnic" qualities attached to such universal practices as selling hay or grain, milking cows, or planting an orchard. Even the Pennsylvania Germans' consumption patterns shared a great many features in common with dominant American practices. Yet at the same time, local cultural preference surely shaped some production choices. The preeminence of hogs in livestock raising is an example. One might expect to find swine in the "Yankee" Northern Tier, where they could be fed dairy by products. But "Yankees" preferred beef to pork and they did not raise a lot of pigs. Another case in point is the persistence of rye.

Ethnic practices asserted themselves most noticeably after harvest or slaughter. Many raw products were further processed on the farm. Hogs were converted to fresh pork and smoked ham, bacon, and sausage. *Panhaas*, or scrapple, was a Pennsylvania German favorite made from trimmings, spices, and corn meal. Blood pudding was made at slaughtering time. Milk was made into butter, but also into *smier käse* (a soft cheese),

and cottage cheese. Apples were converted to *snitz* (dried, sliced apples), apple butter, cider, and applejack. Cabbage became sauerkraut. Cucumbers and other vegetables were pickled. Corn was dried. In short, a great many farm productions in the Great Valley helped support Pennsylvania German foodways. These practices were blends of European and American foods and customs. Folklorist Don Yoder has noted that Pennsylvania German cuisine is “an American hybrid...” The “Germanic cuisine that was brought with the emigrants in the seventeenth and eighteenth centuries has been subtly changed, through simplification and acculturation.”³⁷

It would be a mistake to consider the results as purely geared toward family subsistence. A memoir about the *Harrisburg Broad Street Market in the 1840s and 1850s* (sometimes dubbed the “Dutch market”) shows a flourishing market in these same products:

... the memories (of the old market houses) remain. We all remember the substantial unpretentious buildings, well ventilated and airy, through which the blasts of winter swept without hindrance, and where the snows piled up in pretty hillocks... When we recall the tons and tons of all manner of produce and luxuries to tickle the palates of hungry men, women, and children, and the barrels and barrels of ‘Smear Kase’ and apple butter that were distributed... and the ark loads of juicy beef and mutton and pork, and the miles of sausages and puddings, and the ten thousand bushels of apples and peaches and pears and plums, and the pyramids of golden butter and millions of fresh laid eggs that were carried away from the old market, we stand aghast...³⁸

A 1943 history of the Harrisburg market noted that in the nineteenth century one could buy “All the things you can buy today and some products that have gone out of existence since our forefather’s [sic] day. There were sausages of all kinds, both fresh and smoked; “smier kase” and “cottage cheese” mixed with cream or milk. Cream, sweet milk, buttermilk, dried fruit or “snits,” a kind of ginger bread called “Lep kucher,” teas of many varieties, fruits, vegetables of many kinds, poultry, live and dressed. Before Memorial Day there was always a large supply of many varieties of flowers that are today practically unknown.”³⁹

Labor and Land Tenure, Early Nineteenth Century to c. 1900

Family still constituted by far the most important source of farm labor. Gender and age shaped the division of labor, but not rigidly. Men usually did jobs like feeding steers, plowing, mowing, planting, cutting cordwood, and cradling grain, while besides the cooking and baking, women raised poultry, prepared produce for the town market, milked the cows, made butter and cheese, and tended the garden. However, as before, all adults worked together frequently. Corn husking, haying, grain harvesting, butchering, potato and apple harvesting, and apple butter making are just some of the tasks in which all adults shared.⁴⁰ Photographer Winslow Fegley recorded men, women, and children going about their work in Berks County.

Where non-family labor was concerned, farm labor practices had changed in important ways. The transition to free wage labor was essentially complete by about 1830. Some farm households engaged wage workers on a long-term basis, paying by the month or even contracting for an entire year. In other cases, hired men and women worked intermittently, for instance during harvest time or when a new child was born. Regardless of whether they worked by the day or year, wage laborers had become integral to farming. By 1838, for example, in Berks County there were reportedly over 6,000 farmhands (or more than three for each farm) “steadily employed” at \$9 per month.⁴¹ Probably most of these workers were from the local neighborhood. The cash nexus subtly changed the employer:worker relationship, since fewer obligations or constraints bound the two together. Historians note a reforming trend urging farmers to adopt ideals of efficiency, time-consciousness, and sobriety. These shifts were gradual.

Farm mechanization dramatically changed both labor processes and labor needs during this period; more work was done using animal and machine power, and less human power was required. This is a familiar story and it played out in a thoroughgoing way throughout the Great Valley, since its farms were more highly mechanized than typical Pennsylvania farms. Sale announcements, probate inventories, and account books help to measure the shift. An ad in the March 7, 1860, *Northampton Journal* was typical.

Among the items to be auctioned were:

Four horses (of which one is a good breeding mare with foal, and one a stud), seventeen head of cattle, of which seven are good milch cows, six heifers, one large Devonshire bull with three young bulls of the same stock, nine head of hogs, one breeding sow with pigs, one four horse wagon and body, one two horse wagon and body, one truck wagon, one spring wagon, one sulky, one first rate pair of bob sleighs, two good wood sleds, one plank sleigh, one sett of quiller harness, one sett of Yankee harness, one sett leader harness, and plough harness. Five ploughs, two barrows, one Fanning Mill, one cutting box, one chop chest, hay ladders, mixing trough, log and other chains, manure forks and rakes, one cradle and scythe. Also a small assortment of Household Articles consisting of two cooking stoves, one parlor stove, one bedstead and bedding, one corner cupboard, cider mill trough, one table, and about forty Bushels planting potatoes.

Note that this collection of tools lists old style hand tools like manure forks with a more modern grain cradle and fanning mill.

By 1886, Judge Heister of Dauphin County could look back and recount the cumulative effect of mechanizing many different processes:

...In early years I made a regular pilgrimage to Powell's and Lyken's Valleys during the month of May to engage eight or ten skilled workmen with scythe and cradle to help with haying and harvest. In those days the ministers of the gospel for the sake of health and social enjoyment, came to the country and made a hand in the field; now they go to the sea shore. ... Now we send one man with a pair of horses and mower to the field, and he will do the work of ten men in a day. The next day a man with a tedder and one horse, and he will do the work of ten men in turning the grass. Again we send a man and one horse with a rake and he will do the work of ten men in gathering into winrows, and when the hay is ready for the barn, with the hay fork and horse power we unload a ton and a half of hay in twenty minutes. So with threshing, instead of spending half the winter in tramping out the grain with horses, we engage a steamer and in a few days, by threshing 400 bushels of wheat or 600 of oats a day, the work is done.⁴²

Land tenure practices in the Great Valley shaped the region's social and architectural landscapes. Estate records, court records, and the like show that tenancy was pervasive in Pennsylvania throughout the nineteenth century. The 1880 Federal agricultural census offered the first systematically collected tenancy data. In that year, tenancy rates statewide averaged about 20 percent, but in the Great Valley, they were significantly higher, ranging from 28 percent in Berks County to 37 percent in Cumberland County. By 1900, fully half the farms in Cumberland County were operated by tenants or managers, and in the other Great Valley counties typically over 40 percent were tenanted.⁴³

The iron furnaces in the region owned vast tracts and often maintained tenant farms. The Colemans in Lebanon County, for example, reportedly owned 22,000 acres. Little is known about these tenancy arrangements.⁴⁴ Most farm tenants in the region were share tenants working for a relative – that is, for compensation they received an agreed-upon share of the farm crops. The tenants usually paid taxes, and often supplied their own livestock and some tools. A Cumberland County rental agreement was described in the 1883 report of the county agricultural society: “the farm is worked by a tenant on shares. He has the use of the buildings, orchard, and garden, free of rent. He has all the benefits of grass, hay, fodder, and straw, *conditioned* on its all being consumed on the farm and converted into manure. He gets, for his share, one half the wheat, corn and oats raised on the farm. He furnishes all the machinery and motive power. He performs, or pays for, all the labor done on the farm; he builds and repairs the fences, and does the hauling necessary thereto (I paying for the material;) he pays the school tax and road tax; he furnishes one half the seed wheat, seed oats, seed corn, and grass seed sown.”⁴⁵ Some tenants stayed over a long period, but usually the term was one year. “Flitting” day, March 1 or April 1, found streams of farm families on the road with their belongings. Winslow Fegley captured “flitting day” with vivid photographs in Berks County toward the end of the century.⁴⁶

Share tenancy in the Great Valley had a familial and ethnic dimension. The institution had a strong kinship basis. In other words, landlord and tenant were often related, most frequently as father and son, but sometimes uncle and nephew, or father-in-law and son-in-law. In the 1820s a German immigrant schoolteacher named Jonas Gudehus noted that

the Pennsylvania Germans had a practice of “lending” their land to their sons and then retiring: the American German parent “often lease[s] his children the plantation (‘loans out’ one says there), moves into the city and leads a carefree life. However, he remains the owner of his possessions as long as he lives and when he dies then his children all get an equal share of the estate...”⁴⁷

The ethnic aspect of kin-based share derived from common customs stretching back to German-speaking Europe in the early modern period. One was the *Altenteil*, or literally, “old peoples’ part.” This custom was a kind of old-age insurance in which a child received access to land in return for supporting the aged parent. Should the mother become a widow, the share rent made up her widow’s dower.⁴⁸ Among the Pennsylvania Germans, kinship-based share tenancy filled a very similar function.

Buildings and Landscapes, Early Nineteenth Century to c. 1900

Houses, Early Nineteenth Century to c. 1900

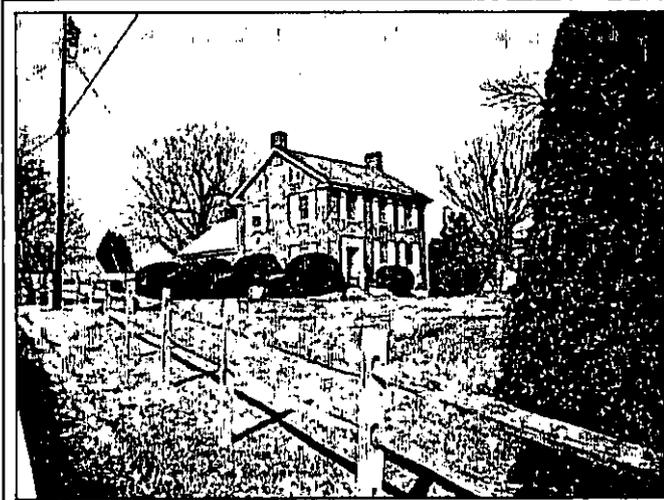
During this prosperous time, modest log houses gave way to larger and more substantial dwellings of stone, brick, or frame. Extant houses from the period are numerous. The most common types are variations on the “Pennsylvania farmhouse” form – that is, a square-proportioned, double-pile, three, four- or five-bay house.⁴⁹ The “four-over-four” version of the Pennsylvania Farmhouse was especially popular. Often it had two central front doors. Most farm houses had at least two stories, and some had two and a half, or two full stories above ground plus a walk-in basement. Five-bay versions usually had a central doorway. These dwellings had interior gable end chimneys, sometimes just for stove flues rather than fireplaces. Exterior ornament was usually spare, and sometimes out of date.⁵⁰ The two-story ell with integral double-decker porch was popular, especially in the Cumberland Valley. The nineteenth-century Pennsylvania Farmhouse interior spaces and layout often represented subtle adaptations of the Pennsylvania German “stove room” and kitchen, and sometimes had no hallways; external openings were not reliable clues as to floor plan. Some productive spaces from the colonial era house, such as the attic granary and smoke house, had been moved to specialized outbuildings. The large farm kitchen still played an important productive role.

Scholars have noted a common architectural strategy of putting adapted “German” spaces behind updated “Georgian” facades. However, this blending could occur even on the farmhouse exterior. At least two examples from the mid-nineteenth century (in Franklin and Lebanon Counties respectively) have a formal, symmetrical eaves side oriented to the “public” side of the farm, and an asymmetrical gable end oriented to the “work” side, with doors entering directly into the kitchen. To be sure, these are not common, but they are notable instances where the builder chose to express both “traditional” and “formal” values on the building’s exterior.

A stereotype about the Pennsylvania Germans invokes their conservatism. Numerous period observers voiced the opinion that the Germans were resistant to change. The historical evidence does suggest that there is some validity to this characterization; for example, German Reformed and Lutheran congregations resisted such innovations as Sunday School, and migration rates were low. However, cultural patterns were more complex than simple rejection of change. This can be seen in the landscape. A good example is in the custom of casing log buildings in brick. This was a popular strategy for updating farm buildings, especially in Cumberland and Franklin Counties. Architectural historian Nancy van Dolsen has shown how the practice allowed farm families to give their houses a new look, while expressing frugality and respect for the past in re-using an old building.⁵¹ Moreover, it was not unknown for farming families to try out new forms such as the “foursquare,” or to give their Pennsylvania Farmhouses contemporary trim.



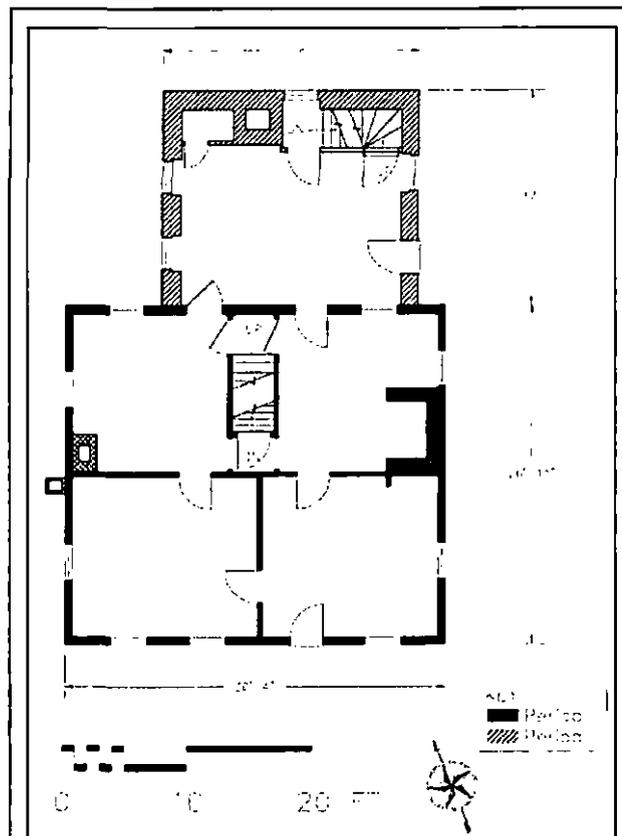
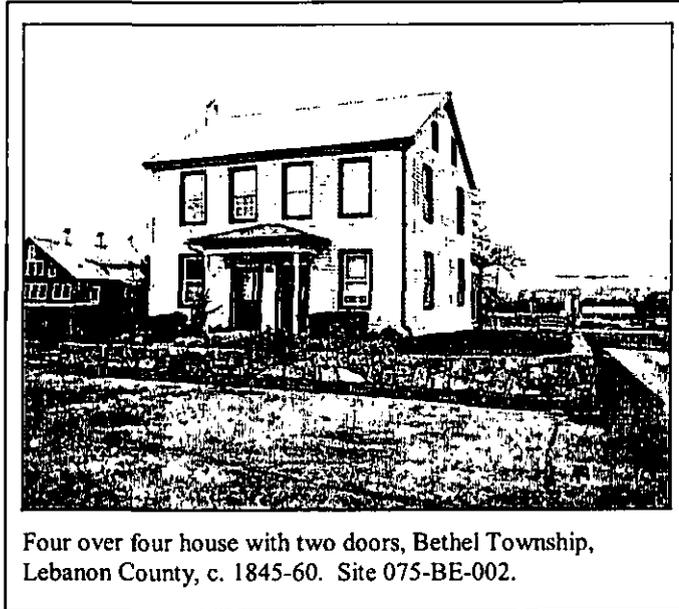
Five-bay house with center door and walk-in lower level, South Annville Township, Lebanon County, 1855. The lower level has a spring house and kitchen, and is connected to the first floor by a dumbwaiter. Site 055-AN-005.



Three-bay house with side door, Antrim Township, Franklin County, 1825-45. Site 055-AN-011.



Four over four house with one door, Mill Creek Township, Lebanon County, 1843. Site 075-MC-008.





Four over four house, Oley Township, Berks County, c. 1870. The corner quoins, window trim, 2/2 sash, and porch ornament give the form an updated look.



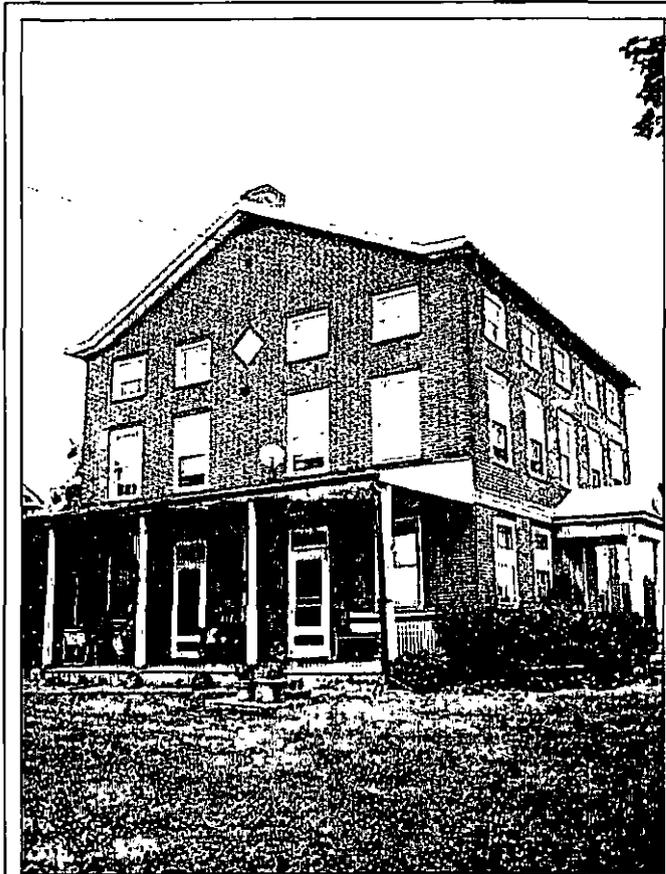
Four over four house with Victorian trim, Bethel Township, Lebanon County, c. 1875-90. Site 075-BE-001.



House with formal Georgian front and informal gable end entry. The porch and tree obscure it a little, but the gable-end entrance leads to a kitchen and the front is symmetrical and more formally trimmed. Mill Creek Township, Lebanon County, c. 1855. Site 075-MC-011.



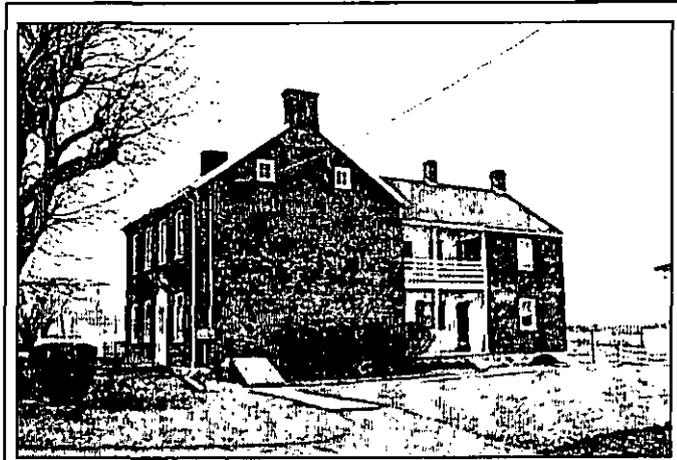
House with formal Georgian front and informal gable end entry, South Annville Township, Lebanon County, built by Commodore Perry Steinmetz in 1852. South eaves side. This was the "public" front. Site 075-SA-006.



House with formal Georgian front and informal gable end entry, South Annville Township, Lebanon County, built by Commodore Perry Steinmetz in 1852. West gable end. This was the kitchen side and faced the working part of the farm. Site 075-SA-006.

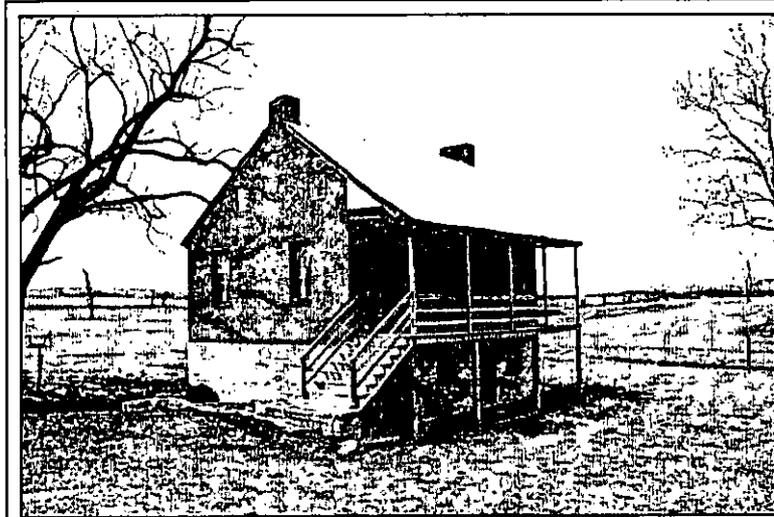


Foursquare house, Washington Township, Franklin County, c. 1865. Built by Jacob Miller. Site 055-WA-002.

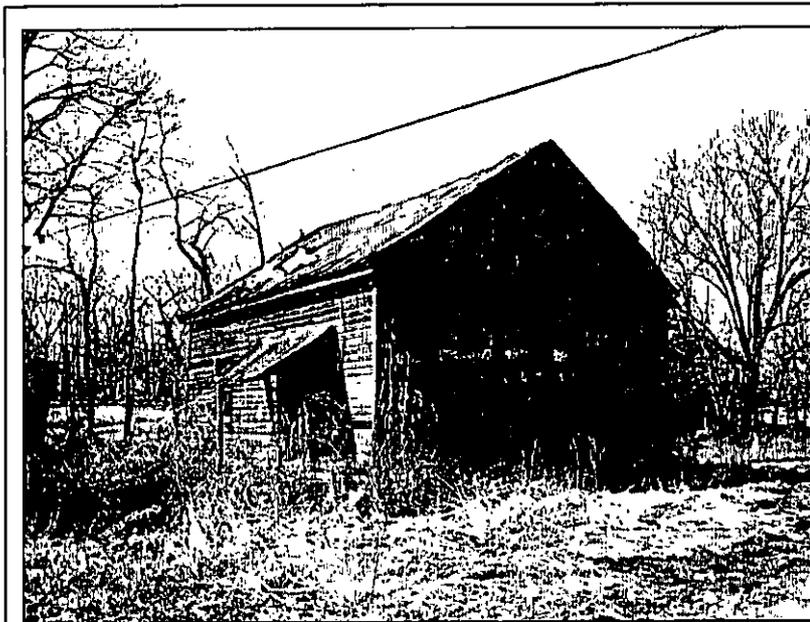


Brick-cased log house, Washington Township, Franklin County. The main section was built around 1820 and cased with brick around 1850; the ell was added later in the nineteenth century. Site 055-WA-003.

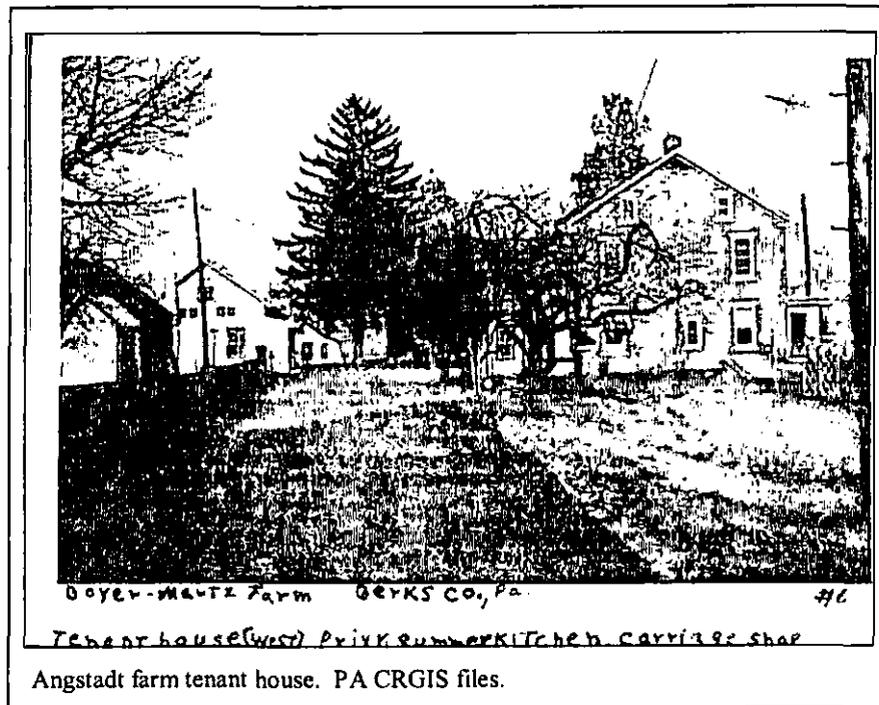
Tenant houses were ubiquitous in the nineteenth-century Great Valley landscape. Sometimes a farm would have a main house (sometimes referred to as the “mansion” house), and a second house for tenants. In his 1844 history of Berks County, I. Daniel Rupp noted that “According to the report of 1838, there were two thousand and twenty-one farms, averaging seventy-five acres each. The whole number of stone farm houses, was one thousand two hundred and fifty four; brick houses, two hundred and seventy nine; wood farm houses, one thousand nine hundred and fifty five; tenant houses on farms (not farm houses) one thousand two hundred and five.”⁵² If Rupp was correct, somewhere around a third of farms had both a main house and a tenant house. Nancy van Dolsen has documented tenant houses in Cumberland County, and field study in Franklin County documented several farms with a main house and tenant house. Another type of tenant house formed the main house on a separate tenant farm. It is more difficult to identify these tenant houses definitely, because often they were quite substantial.⁵³ The National Register listed Knorr-Bare and Angstadt farms in Berks County each have substantial tenant houses.



Ancillary house, possibly a tenant house, Montgomery Township, Franklin County, early to mid-nineteenth century. Site 055-MO-004.



Log tenant house, Antrim Township, Franklin County, early to mid-nineteenth century. The house has a three-room floor plan. Site 055-AN-009.



Barns, Early Nineteenth Century to c. 1900

The famous Pennsylvania forebay bank barn had begun to appear in the late eighteenth century, but it was not the predominant type until well into the nineteenth century. Some of the most evocative examples of the type are found in the Great Valley. Its main diagnostic feature is the projecting 7-8 foot forebay, or overshoot. The barn is banked, and organized such that the upper level consists of central threshing floor(s), flanked by mows for hay, straw, or unthreshed grain; and one or more granaries (sometimes in the forebay, sometimes next to a mow on the bank side). The Pennsylvania Barn almost always has a gable roof. On the lower level, stable and stalls (organized crosswise to the roof ridge, separated by alleyways for humans) housed horses, milk cows, beef cattle, and sometimes sheep or hogs. Traveler Joel Cook noted in 1882 that "red paint is evidently cheap in the Lebanon Valley, ... for all the farm buildings and many of the houses are painted in cardinal."⁵⁴

The Pennsylvania Barn was a highly flexible form. It ranged in size from just 20 feet long to over 100. It could also accommodate features such as an "outshoot" or "outshed" that would extend back from the bank side; multiple threshing floors and haymows; a root

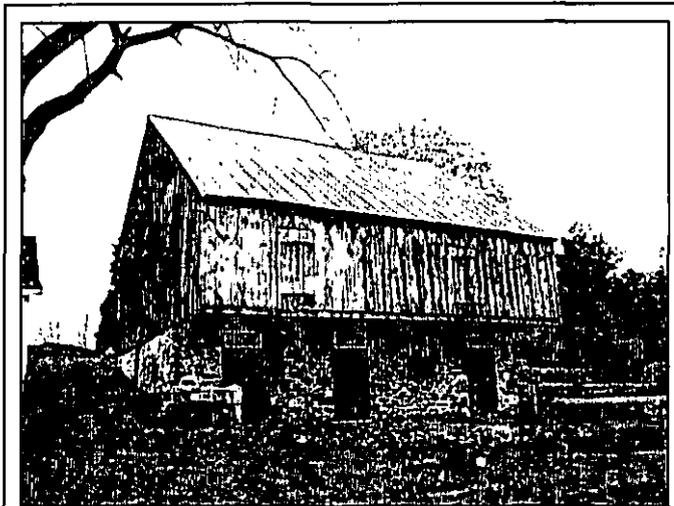
cellar; a corncrib/machinery shed extension; a machinery bay on the lower level; or a 'horse power' on the bank side, or sometimes in the basement. The forebay might project unsupported, or it might have supporting endwalls or posts. Nomenclature for these various features varies, too. But, it is important to remember that in order to be considered a Pennsylvania Barn, a barn must have these essential features: a projecting forebay and banked construction, almost invariably with the eaves side in the bank.

The Pennsylvania Barn exemplified and facilitated the new grain-and-livestock agriculture. That is why it appeared when it did. Historian Steven Stoll has compared the Pennsylvania Barn to a cow -- taking in raw materials and producing milk, meat, and manure. Indeed, the barn promoted productivity and its stable level and yard functioned to collect the valuable manure (generated with feed stored in the upper levels) and to combine it with straw to make it the perfect dressing for crop fields. A local historian wrote that "straw, grain, corn stalks, and refuse from the stables" were "trampled under the feet of fattening cattle during the winter. The barn-yards were cleaned once a year... and this refuse was spread over the fields and plowed under the soil.... the farmer who had a large barn-yard full of manure to haul out, after harvest, was looked upon as a model."⁵⁵ The animals' confinement and the collection of manures really distinguished the new farming from the old; colonial farmers had kept livestock, but because they grazed freely, they were not really part of a highly integrated system. Pasture continued as an important seasonal feeding ground, but to it was added the barn as shelter and manure collection facility.

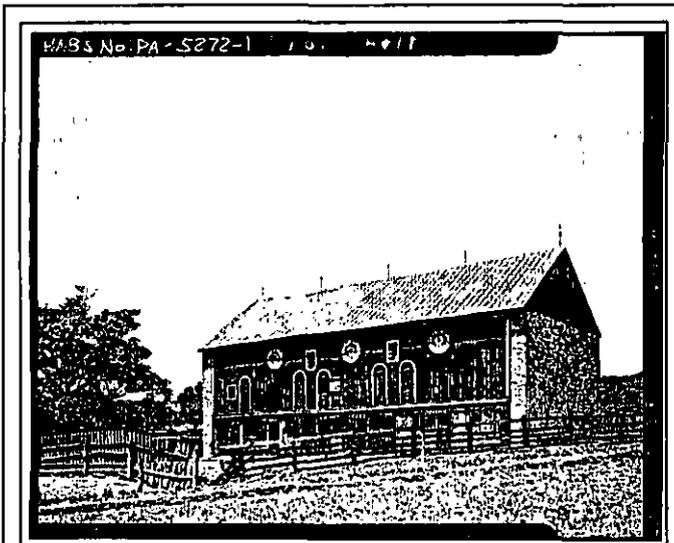
With its rational, centralized organization and gravity-fed multi-level arrangement, the Pennsylvania Barn also represented a response to an increased need for labor efficiency. Provision for horses reflected mechanization.

Practically every variant on the Pennsylvania Barn can be found in the Great Valley. A small barn in the Oley Valley shows how the form could be adapted to have just one threshing floor and mow. The Diller Barn in Cumberland County, by contrast, had five threshing floors, two mows, a seven-bin granary, and a cistern by the time it reached its final size. An 1863 ad in the

Franklin Repository, listed a “cistern at the house, and one at the barn for watering stock.”⁵⁶ One nineteenth-century site in Franklin County had a cistern apparatus integrated into the barn ramp area. The National Register-listed Boyer-Mertz (aka Angstadt) Farm in Maxatawney Township, Berks County has no fewer than five stone cisterns. Joel Cook held that “all the barns in this section [near Reading] have cisterns underneath, collecting the rain that falls on the roof, to secure a supply of water in time of drouth.”⁵⁷ Barns might have rear outshed granaries; gable end machinery bays; or straw-shed ell additions. There was apparently a horse power room on the National Register-listed Ernest Angstadt farm in Maxatawney Township in Berks County. The barns were executed in brick, stone, log, and timber frame. Some were decorated with painted designs. The examples from the Great Valley, shown below, show the variety and underlying it a remarkable consistency in basic form.



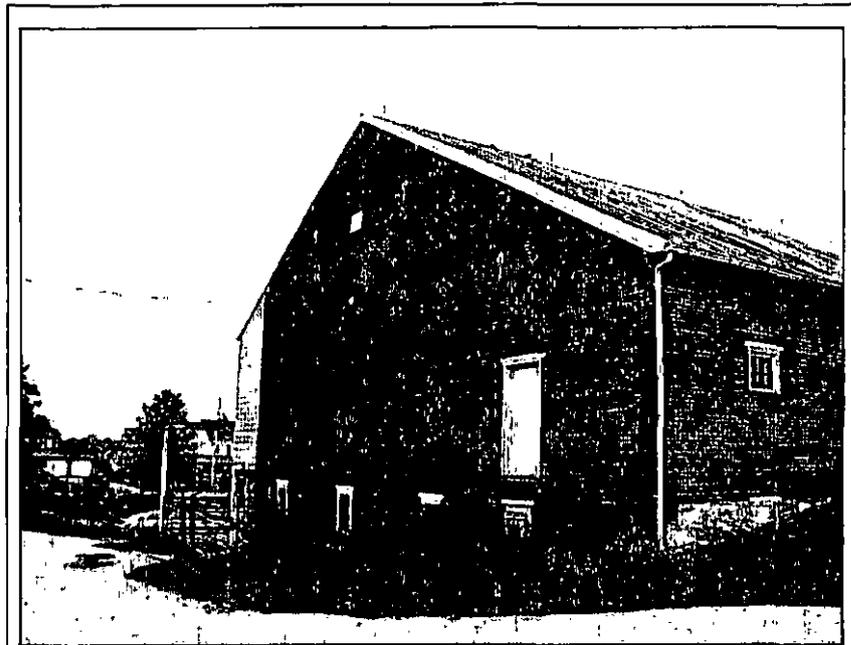
Pennsylvania barn, Oley Township, Berks County, early nineteenth century.



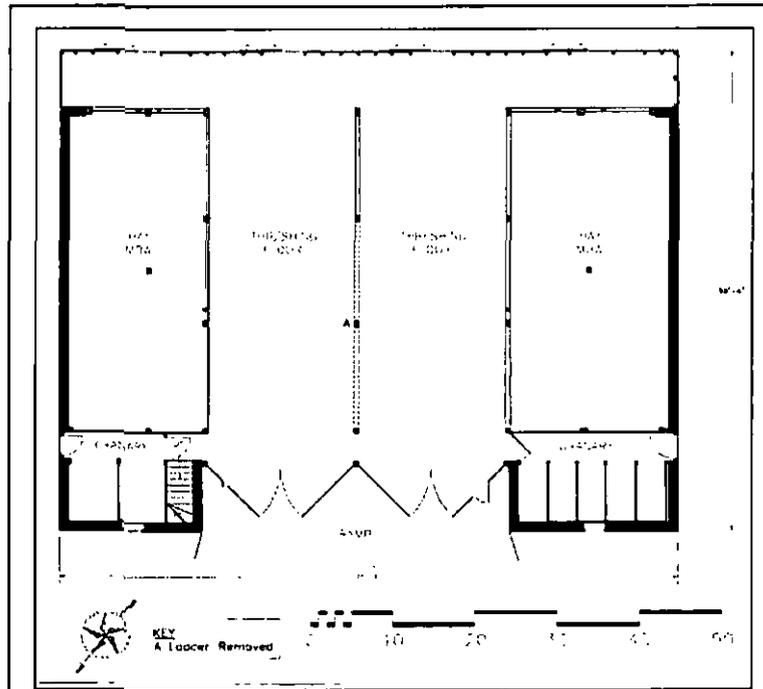
Pennsylvania barn, near Moselem Springs, Berks County, date unknown, photographed 1941. The paint scheme on this barn included red, yellow, blue, and white. HABS, digital ID <http://hdl.loc.gov/loc.pnp/hhh.pa1541>.



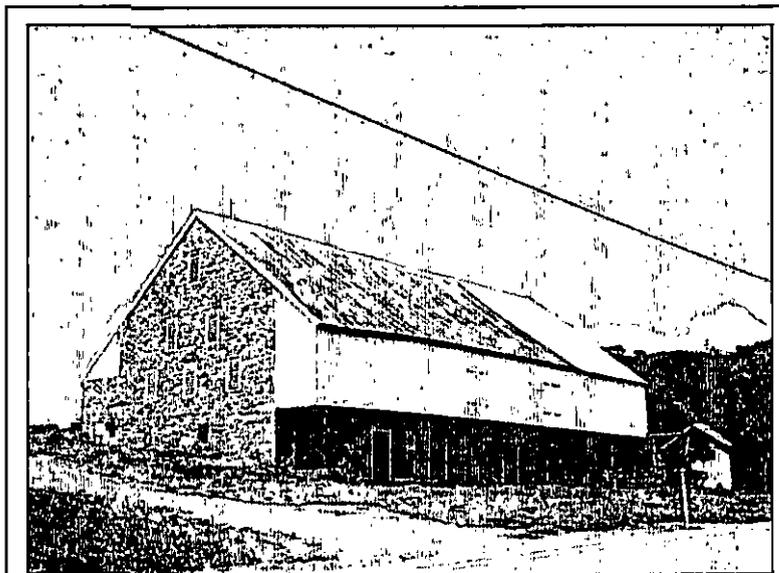
Knabb barn, Oley Township, Berks County, 1829.



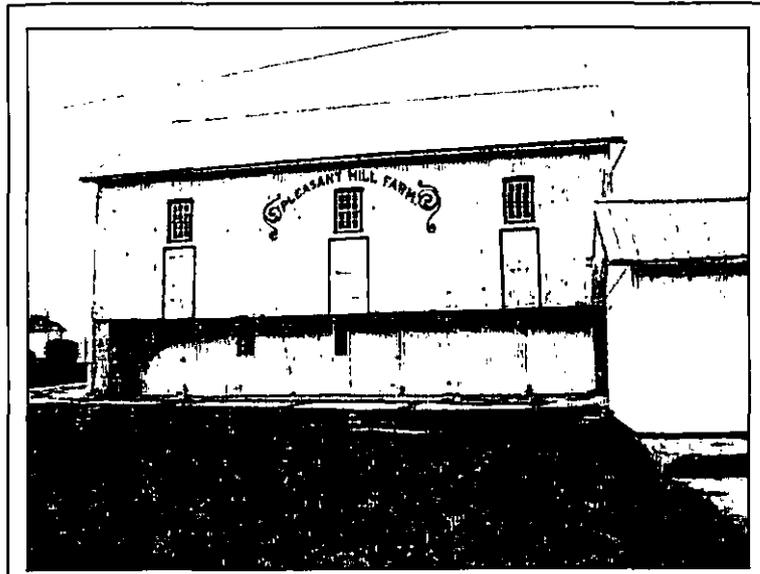
Jacob Plank barn, Cumberland County, 1853. This barn has rear granary outsheds.



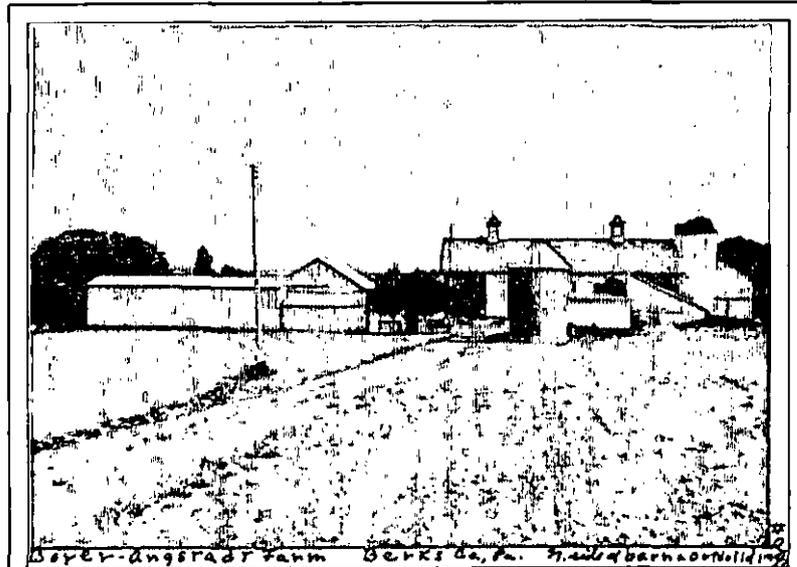
Floor plan, Plank barn. CHAD.



Waggoner Barn, Cumberland County, 1858.



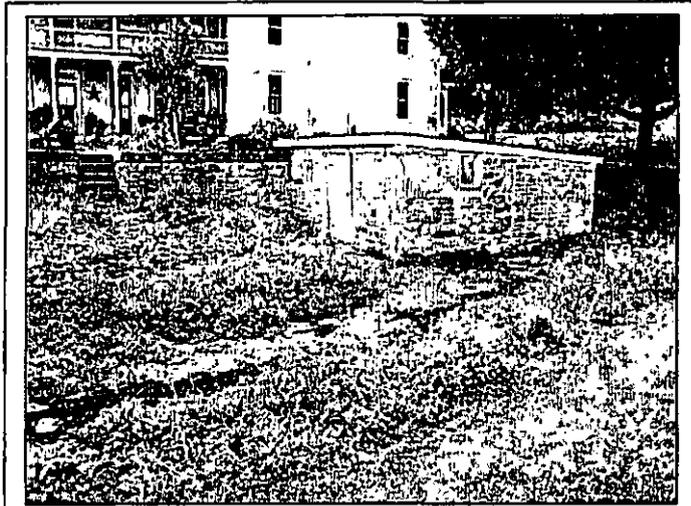
Frame Pennsylvania barn, Jackson Township, Lebanon County, 1895. The basic form continued to be built all the way through the century. Site 075-JA-009.



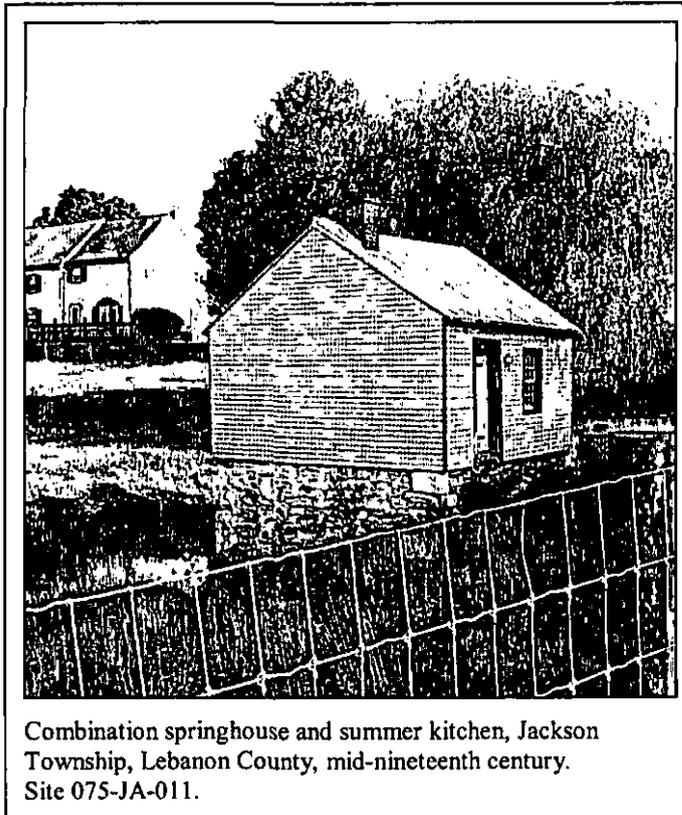
Boyer-Mertz farm (aka Angstadt), Maxatawney Township, Berks County. The shed-roof structure on the barn bank side housed a horse power. PA CRGIS files.

Springhouses, Early Nineteenth Century to c. 1900

Springs often determined a farm site, and care was taken to protect the family's water source. As well, springhouses provided work space for cooling milk and separating it, then for butter making and storage. Springhouses often had two levels, sometimes appearing in combination with living quarters or a summer kitchen.



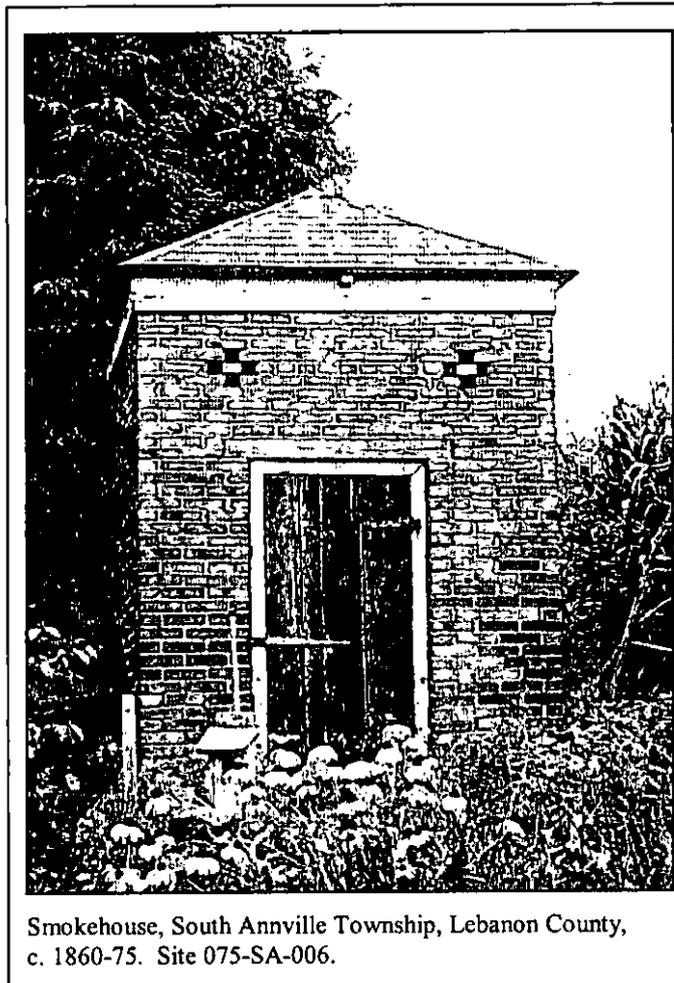
Springhouse, Heidelberg Township, Lebanon County, c. 1850.
Site 075-HE-003.



Combination springhouse and summer kitchen, Jackson Township, Lebanon County, mid-nineteenth century.
Site 075-JA-011.

Smokehouses, Early Nineteenth Century to c. 1900

The hog was central to Pennsylvania German foodways. Not only was fresh pork relished, but smoked pork products, especially ham and bacon, appeared in many a Pennsylvania German dish. The smokehouse was therefore a common sight on Great Valley farmsteads. It was usually located within the house's orbit. Smokehouses could be frame, but probably more were brick or stone. The smokehouse was a small building with a roughly square footprint and gable or pyramid roof, and only a few small openings. Inside, hooks and nails provided a place to hang the meat. The care given to architectural detail and finish just confirms the importance of this small building.



Smokehouse, South Annville Township, Lebanon County,
c. 1860-75. Site 075-SA-006.

Bake Ovens, Early Nineteenth Century to c. 1900

A few outdoor bake ovens were documented in field study. Some farm women continued to bake bread at home well into the nineteenth century.

Butcher Houses, Early Nineteenth Century to c. 1900

Most often work at butchering time took place in a summer kitchen or wash house, but some farms had a separate building called a "butcher house." Characteristics of buildings documented as "butcher houses" varied. Butcher houses documented in Lebanon and Lehigh Counties, for example, had ample lighting, siting between house and barn and near the smoke house, interior counters, and set-kettles.



Bake Oven, Straban Township, Franklin County, mid-nineteenth century. Site 055-ST-002.



Butcher house, North Lebanon Township, Lebanon County, c. 1900. Site 075-NL-001.

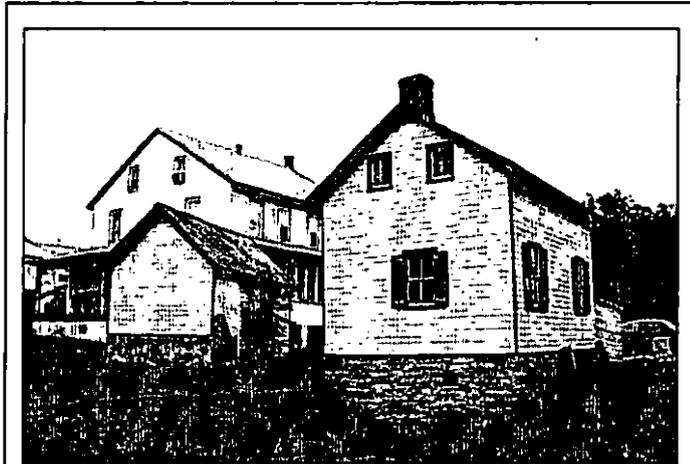


Butcher house, Heidelberg Township, Lehigh County, c. 1900. The interior has a brick housing and two round receptacles for set-kettles. Site 077-HE-007.

Summer Kitchens, Early Nineteenth Century to c. 1900

Throughout Pennsylvania in the late nineteenth century, farm families elaborated and diversified their diets. Of course rural people had long possessed numerous and subtle skills relating to food preparation and processing; but now newly available supplies and technologies reworked the possibilities. Orchards matured, garden patches expanded, products from far away became available, and to the old staples of corn mush, meat, and sauerkraut farm families added more cakes, pies, preserves; made more poultry dishes; and slowly shifted away from pork to beef. There were several key ingredients to this change. One was the cookstove. Reliable, affordable coal-burning cookstoves were now far more widely available, just as the wood supply for traditional outdoor ovens diminished. As the cookstove replaced the open hearth, two important consequences followed. Cookstoves generated intense heat in the farm kitchen, so summertime cooking became difficult. Second, food preparation changed. More separate dishes could be prepared simultaneously. Expectations rose for dietary variety.

To accommodate the intensified subsistence activity, and to get the hot summertime cooking out of the house kitchen, more summer kitchens appeared. The free-standing kitchen was not a new building type, but it became more common in this period and its use was likely more seasonal than in the past. The typical Great Valley summer kitchen would be a small detached building, usually gabled and made of frame. It would have ample windows for light, at least one door for access, a stove, and sometimes a set-kettle for heavy work. It was usually very close to the main kitchen. Sometimes a decorative cupola with dinner bell sat on the roof ridge. The summer kitchen facilitated increasingly complex and demanding women's productive work. The work was productive because it resulted in tangible articles to consume, sell, or trade. The summer kitchen's siting near the main house reflects its preeminence as primarily a women's space.

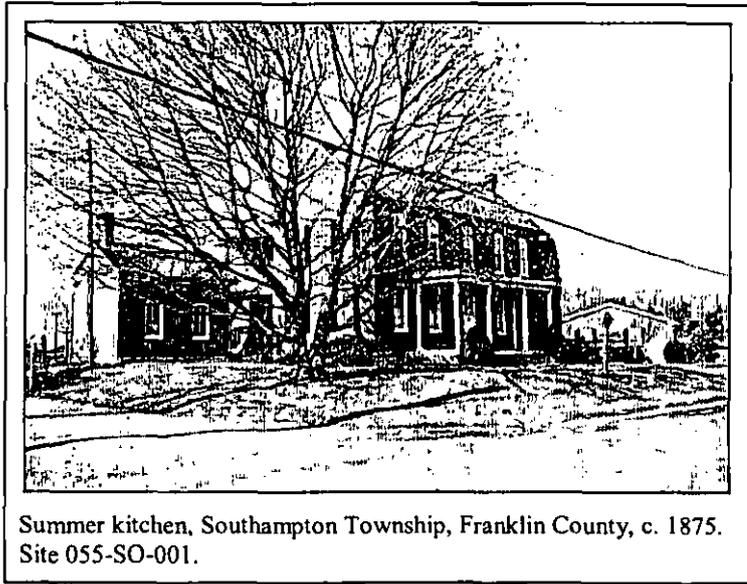


Summer kitchen and springhouse, Mill Creek Township, Lebanon County, c. 1860. Site 075-MC-008.



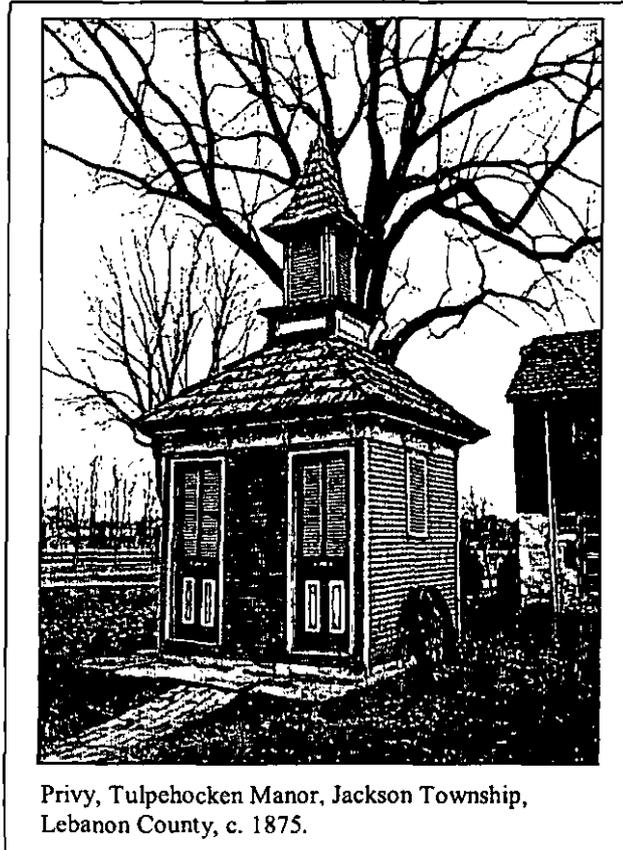
Summer kitchen, South Annville Township, Lebanon County, c. 1850-70. Site 075-SA-004.

The examples offered here depict summer kitchens in the Great Valley. Their size, architectural finish, and relationship to the house all reinforce their centrality in the farm economy.



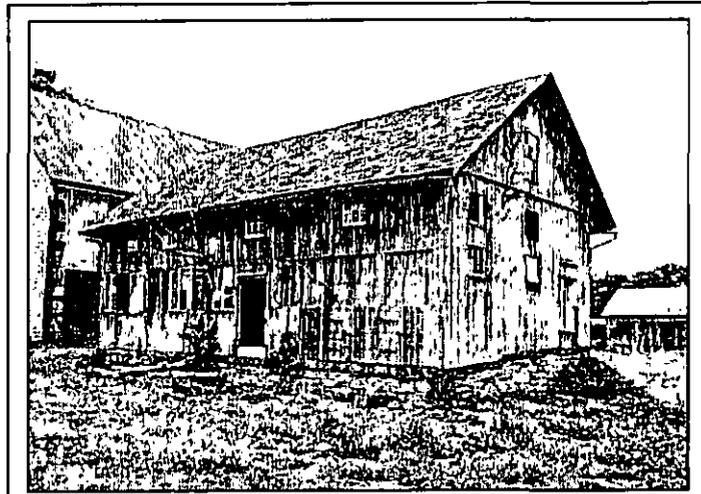
Privies, Early Nineteenth Century to c. 1900

Few privies survive from this period, even though every farmstead had one. One rare upscale survival can be seen at Tulpehocken Manor in Lebanon County.

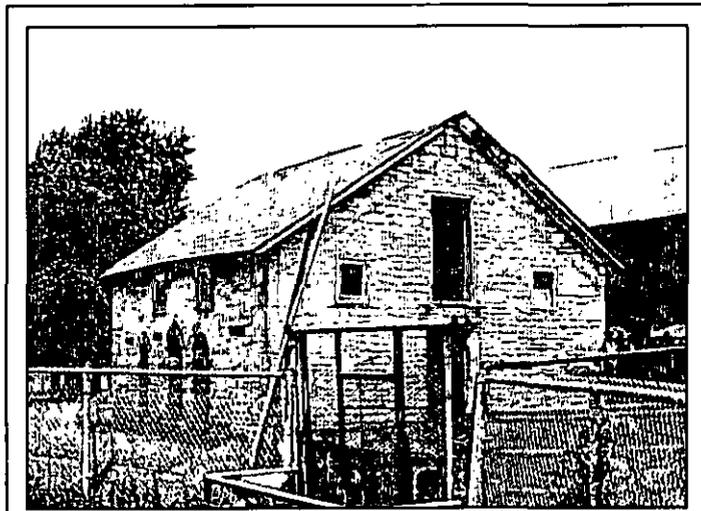


Pigsties, Early Nineteenth Century to c. 1900

Given the importance of pigs in the Great Valley farming economy, the pigsty occupied a prominent place in the farmstead organization. Normally it would be situated at right angles to the barn, on the forebay side. Its distinguishing features include low doors on one eaves side, which allowed the animal to move back and forth between narrow indoor and outdoor pens. An aisle along the opposite side, accessed by a human door in the gable end, allowed humans to enter and tend to the animals safely. Light was admitted through high windows. Often a low pitched shed roof covered the interior pens.



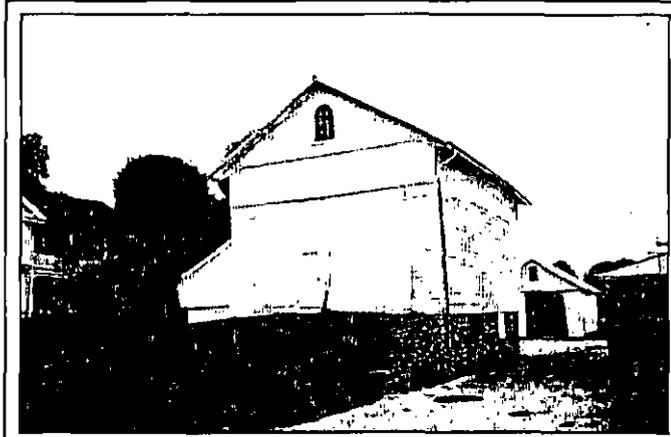
Pigsty, Heidelberg Township, Lebanon County, c. 1870. Note the low doors to the right (pens are gone) and human door on the gable end. Site 075-HE-003.



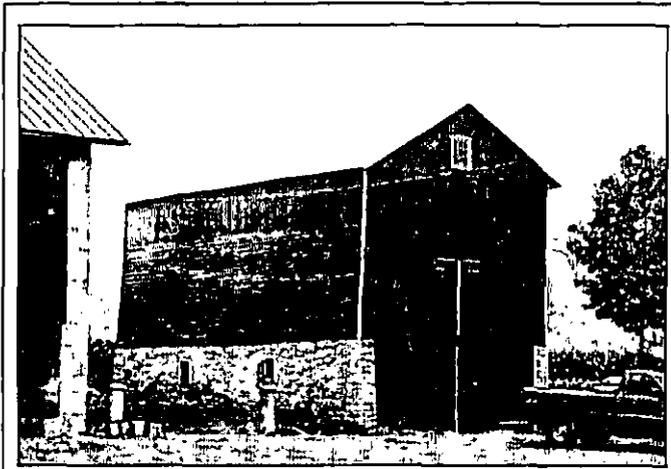
Pigsty, Heidelberg Township, Lebanon County, c. 1865-75. A rare stone example with decorative brick arches over the doors. Site 075-HE-006.

Machine Sheds, Early Nineteenth Century to c. 1900

With the sharp rise in mechanization came a need for dedicated storage. In the Great Valley region, machine sheds began to appear on farms in and after the mid-nineteenth century. These could be quite elaborate. For example, two-level sheds with a gable-end bank entry often appeared. Another common local type had an asymmetrical gable roof, with two doors in the gable end, one larger and one smaller.



Machine Shed and corn crib, Heidelberg Township, Lebanon County, late nineteenth century. Site 075-HE-009.



Machine Shed and corn crib, Mill Creek Township, Lebanon County, late nineteenth century. Site 075-MC-001.



Machine Shed and corn crib, North Anville Township, Lebanon County, late nineteenth century. Site 075-NA-001.

Root Cellars, Early Nineteenth Century to c. 1900

The root cellar facilitated storage in the pre-refrigeration era, by taking advantage of constant below ground cool temperatures. Some were quite elaborate, with vaulted stone roofs and shelving.



Root cellar, Straban Township, Franklin County, late nineteenth or early twentieth century. Site 055-ST-001.



Root cellar, Schaefferstown, Lebanon County, date unknown. This cellar has a vaulted ceiling.



Root cellar, Keim homestead, Oley Township, Berks County, early nineteenth century.

Lime Kilns, Early Nineteenth Century to c. 1900

Lime was an important product, not only for agriculture but for uses such as mortar and disinfectant. Lime used with clover helped to increase yields and improve soil productivity. Many farms in the Great Valley once had lime kilns, but few have survived.

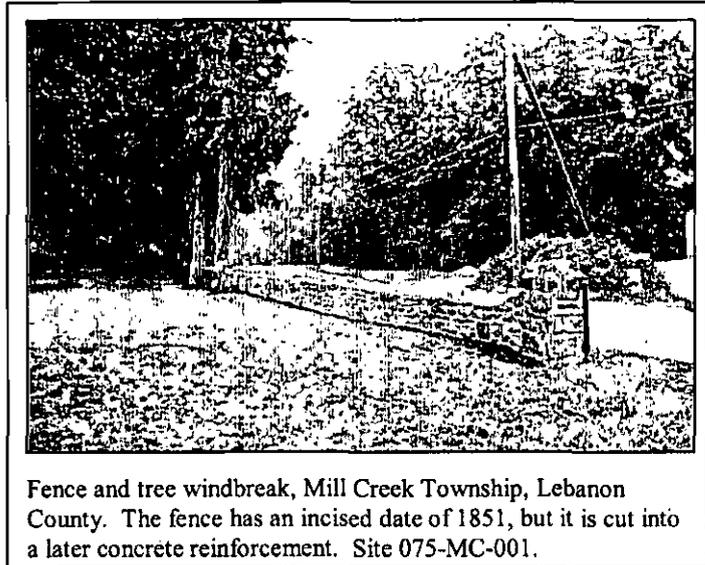


Lime kiln, South Annville Township, Lebanon County, date unknown. Site 075-SA-003.

Landscapes, Early Nineteenth Century to c. 1900

The most evocative images of landscapes from this period are surely those taken by Berks County photographer H. Winslow Fegley. His views were perhaps less idealized than those which appeared in county atlases and local histories. The farm was divided

into small, square or rectangular fields, sometimes descriptively named. By this time, sturdy post and rail fencing often divided pastures and fields, and ornamental iron or picket fences set off the house's yard. Most farms had a woodlot and an orchard. Often fruit trees were also planted along a field boundary or property line. Little



Fence and tree windbreak, Mill Creek Township, Lebanon County. The fence has an incised date of 1851, but it is cut into a later concrete reinforcement. Site 075-MC-001.

in the way of fencing remains from this period, and many fields have been consolidated. However, some treelines and property boundaries may date to the nineteenth century, and a few stone or ornamental fences also remain.⁵⁸

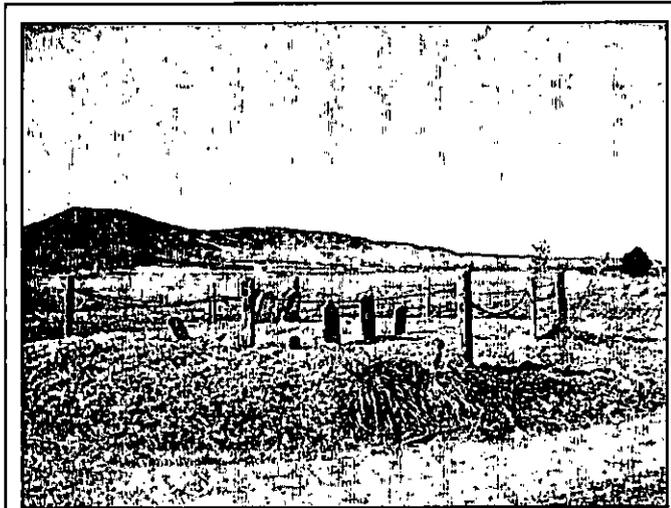


Stone fence, Antrim Township, Franklin County, date uncertain. Between sites 055-AN-006 and 007.



Evergreen fence line, Montgomery Township, Franklin County, date uncertain. These appear to have been deliberately planted; they are probably Eastern Red Cedar, really a juniper (*Juniperus virginiana*).⁵⁹

Another notable rural landscape feature that appeared on a few farms was the enclosed family burial ground.



Family burial ground, Franklin County. The stones date mainly from the 1850s.

1900-1940: Diversified Crops, Livestock, and Poultry

The twentieth century saw rapid urban growth in Great Valley cities and towns. Allentown, for example, grew by 46 percent between 1900 and 1910 alone.⁶⁰ The Berks County agricultural extension agent reported in 1920: “All of the farms in the County are situated ideally with respect to markets. The city of Reading (110,000 population) and a dozen or more country towns of several thousand population each, afford splendid markets for milk, fruits, vegetables, eggs, meats and produce in general. Railroad and Trolley Express facilities make it quite possible to ship to Philadelphia and other markets outside the County. Eight large public markets, established for years in Reading, bring thousands of producers and consumers together several times a week.” Farming families in the region continued to supply these markets and to practice a diversified crop and livestock farming, modified from the previous period. The most important stories during this period concern modernization. The horse slowly gave way to the tractor and auto; sanitation requirements, centralized processing, and fluid milk markets transformed dairying; new crops such as alfalfa made their appearance; and poultry keeping came to occupy a prominent place in the farm economy. Prosperity was succeeded by difficult times in the twenties and thirties, yet for many the farm provided a hedge against hard times. Overall, though, farm numbers declined throughout the Great Valley, while average farm size increased or stayed stable.⁶¹

Products, 1900-1940

The most important field crops in the Great Valley in the early twentieth century were wheat, corn, oats, rye, and hay. The 1927 census shows that throughout the Great Valley, farms averaged significantly more acres of wheat, corn, and oats than in the state as a whole, and often more hay also. A 1924 Cornell University thesis graphed field crop trends over time (between 1880 and 1923) in Cumberland and Franklin Counties. The data show a notable drop in oats acreage; this was probably because horses were less used for farm power and because oats were not a very profitable crop. Hay, wheat, and potato acreage fluctuated from census to census, but over time did not rise or decline notably. Corn acreage rose perceptibly. Rye acreage increased briefly between 1910 and 1920 only to decline after Prohibition. Yet these minor grain crops like rye

continued to be grown, even if they might bring small profit, because each had a place in the rotation.⁶² The livestock – rotation – manure – crop cycle continued to be practiced.

Wheat was grown with notable success on the limestone soils in the Valley. The region had actually increased its relative importance within the state for wheat growing, so much so that George Fiske Johnson pronounced that “the southeastern counties as a group are making wheat history.” Though within a national context Pennsylvania wheat farming continued to decline in significance, it is nonetheless notable that Great Valley farming families found it worthwhile to raise wheat well into the twentieth century. The evidence suggests that wheat was valued for several reasons. In 1925 A. C. Berger explained of Lebanon County wheat that “Wheat has retained its position in the cropping systems not only because it is profitable to produce wheat for sale but also because Lebanon County farms require a large amount of straw in dairy and livestock production for bedding.” Wheat grown in the region went to several destinations. In Lebanon County in 1924, for example, 130,000 bushels were shipped out to New York City and Philadelphia for eventual export. As well, “the mills of the county, outside of those in the city of Lebanon, mill local wheat exclusively,” reported Berger. This flour also ended up in the export trade. In this respect, Great Valley agriculture continued a tradition established in colonial times.

In other parts of the Great Valley, local and regional mills and bakeries supplemented overseas markets for wheat grown in the region; one source noted that in Berks County, pretzel factories bought local wheat.⁶³

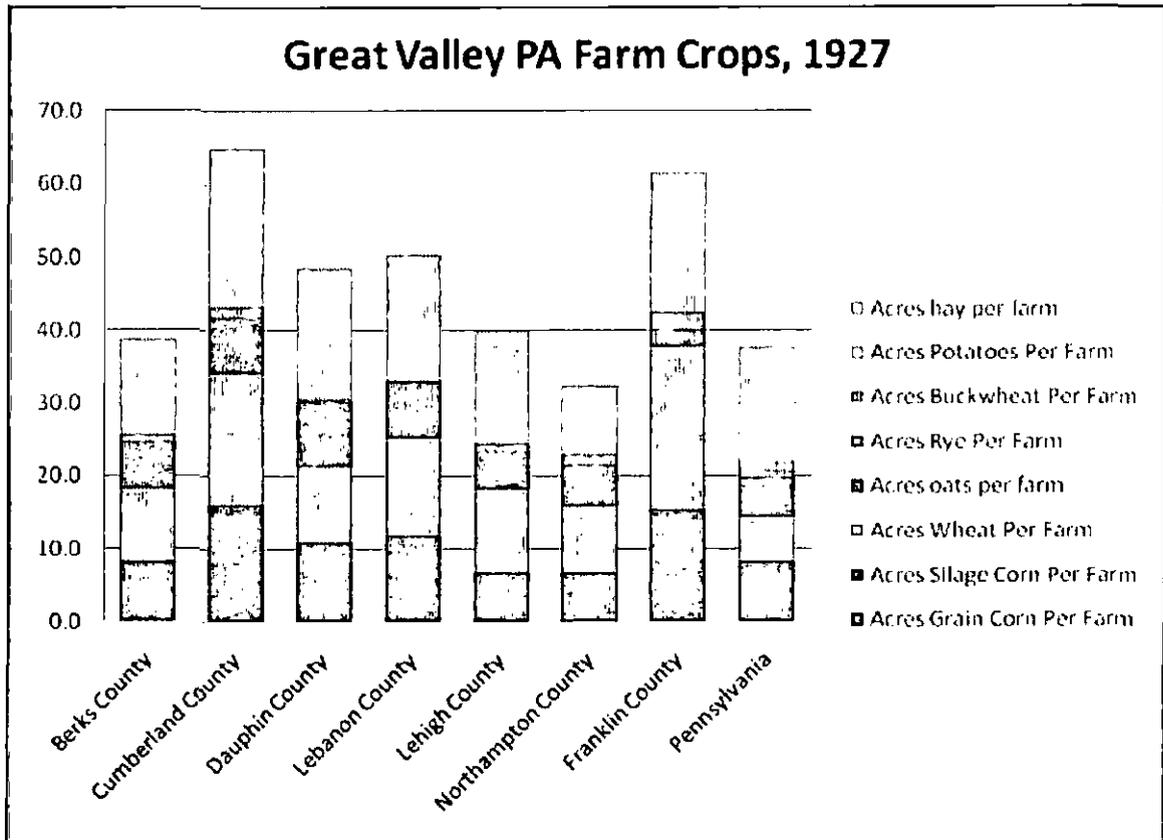
Corn became significantly more important than it had been before, both in terms of acreage and of total production. It was used mainly in animal feed; human consumption was less important than before. The Berks County agricultural extension agent noted in 1915 that “Corn is the principal crop in the rotation on most farms.” Acreage-wise, it was third next to wheat and hay. Around 1900, locally-selected varieties prevailed; by 1940, varieties promoted by the Extension service, such as Lancaster Sure Crop, had gained in popularity.

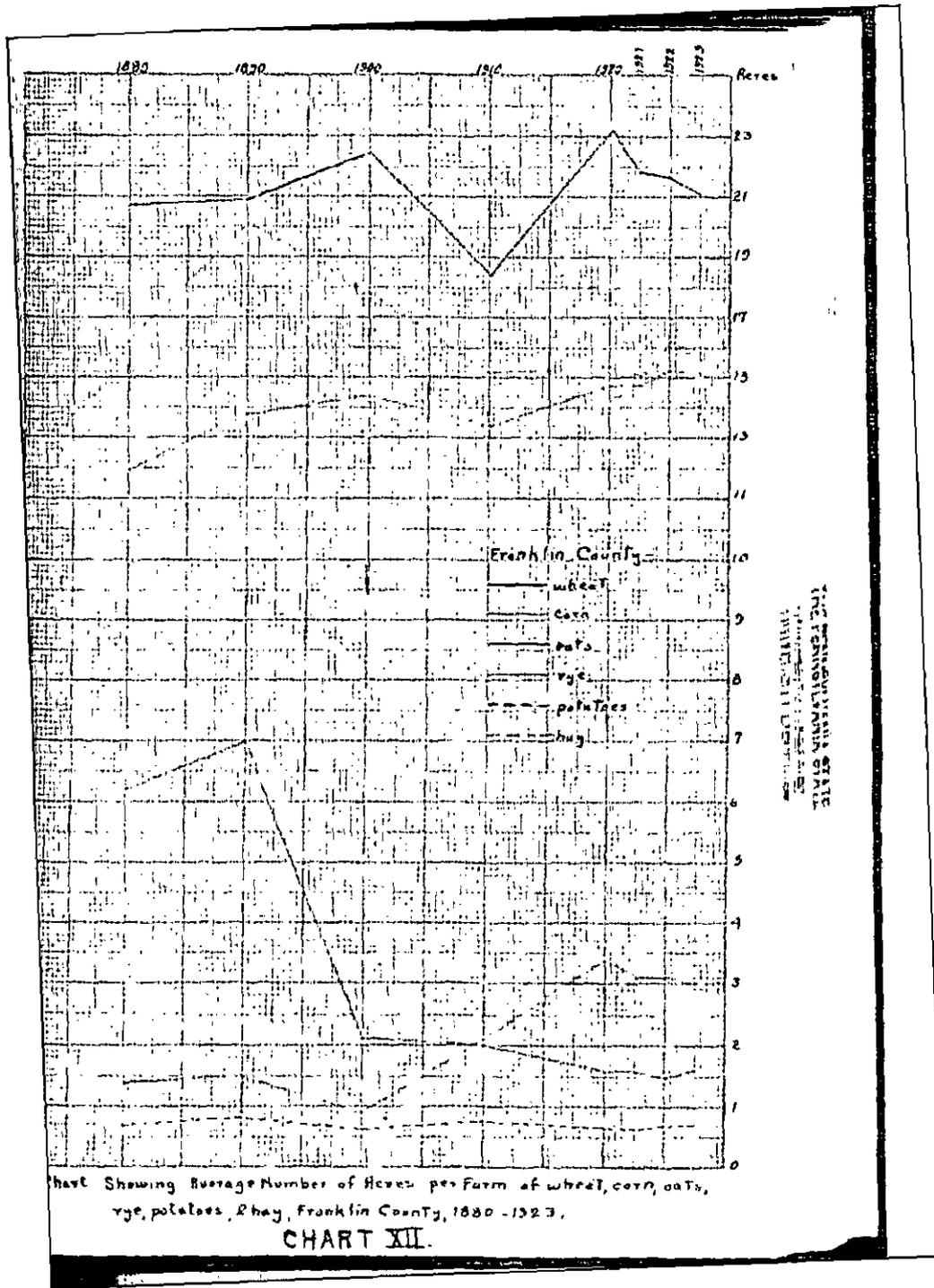
Hay was a valuable crop throughout the Valley.⁶⁴ It was mainly fed on the farm, but some was probably sold to urban and industrial markets, especially before about 1925 when horse drawn transport was replaced by trolleys and autos. The most important shift was the trend toward legume hays (mainly clover and alfalfa) and away from timothy. The agricultural extension agents promoted alfalfa, and their advice was taken in some counties. By 1938 the Northampton County agricultural extension agent claimed that there were 10,000 acres planted in alfalfa there.

Potatoes were grown for family use and for market throughout the region. By this time, northwestern Lehigh County and portions of Berks (Albany Township) and Northampton Counties (Moore Township) had specialized in potato production, but in the Great Valley itself virtually all farm families also raised some potatoes. In the 1920s Lebanon County potatoes, for example, were sent out by truck to Harrisburg and also peddled door-to-door after the harvest.⁶⁵

Small amounts of tobacco were grown in scattered pockets.

This is a notable era in crop production, because for the first time, per-acre yields were rising. "Production by expansion," i.e., through adding cropland, had given way to "production by concentration," i.e., improved per-acre yields. This was accomplished by using improved varieties, following better cultivation practices, and in some instances (such as potato and fruit culture) more widespread use of sprays. The extension service tested and promoted newer varieties such as Pennsylvania 44 wheat and Lancaster Sure Crop corn.⁶⁶





Livestock patterns on Great Valley farms continued in many respects as before, with some adjustments. Horses by no means disappeared during this period, but their numbers did decline slowly as farm families acquired automobiles and tractors. Interestingly, at least to the mid-1920s, the number of mules rose, suggesting a trend to less demanding

draft animal power. Perhaps once horses were no longer needed for transport, they were unfavorably compared with mules for draft purposes.

The agricultural extension agents noted that dairying accounted for an increasing proportion of farm income.⁶⁷ In Berks County, for example, the agent reported in 1916 that “Dairying is one of the chief agricultural industries in Berks County. The majority of our farmers depend upon their dairy herd for a large part of their cash income.” In 1933 the Berks agent had a more specific figure of about 44 percent of county farm income derived from dairying. In Lebanon County in the mid-1920s it was around 38 percent.⁶⁸ Yet at least through 1927 the actual number of milk cows on a typical Great Valley farm was not appreciably greater than the state average, and in most cases was actually less than average. Nor had other signs of specialized dairying, such as silage corn acreage, affected aggregate figures much. The overall figures do mask a tendency towards more milk cows in townships with good access to markets, so we may conclude that dairying specialization was occurring within the region, but in fairly concentrated geographic areas. For example, in Dauphin County, there were more milk cows per farm and more silos and silage corn in townships near Hershey; in Franklin County, Peters Township and Washington Township bordered Mercersburg and Waynesboro respectively, and they too had more signs of dairying in the landscape.

The dairy business changed fundamentally during this period. Milk was no longer processed on the farm. It was sold in fluid form for direct consumption or for centralized processing into products like butter, cheese, evaporated milk, ice cream, or candy. In the Great Valley, especially Lebanon and Dauphin Counties, the Hershey Candy Company profoundly influenced dairy production, annually collecting “millions of pounds of milk” from a wide catchment area. Agricultural economist A. C. Berger criticized Lebanon County farmers for relying on Hershey, arguing that they gave up higher prices in the Philadelphia market. However, he also noted that Lebanon County producers “have not met the inspection requirements [of the Philadelphia market]” and we may speculate that perhaps local farmers preferred to sell to Hershey at a sure (if lower) price and not invest in changes necessary to meet more stringent sanitation requirements elsewhere. Though corporate and oral histories suggest that the Hershey Company did monitor farms for cleanliness, it seems that their requirements were still not as stringent as those for fluid

milk to be consumed directly. Hershey Company promotional materials bragged that “Our location helps very much in producing that superior rich flavor in Hershey’s milk Chocolate and Almond Bars we do all our milking with sanitary milking machines.” For candy production, condensing the milk also probably eliminated some microbes. Hershey thus could take less than Grade A milk.

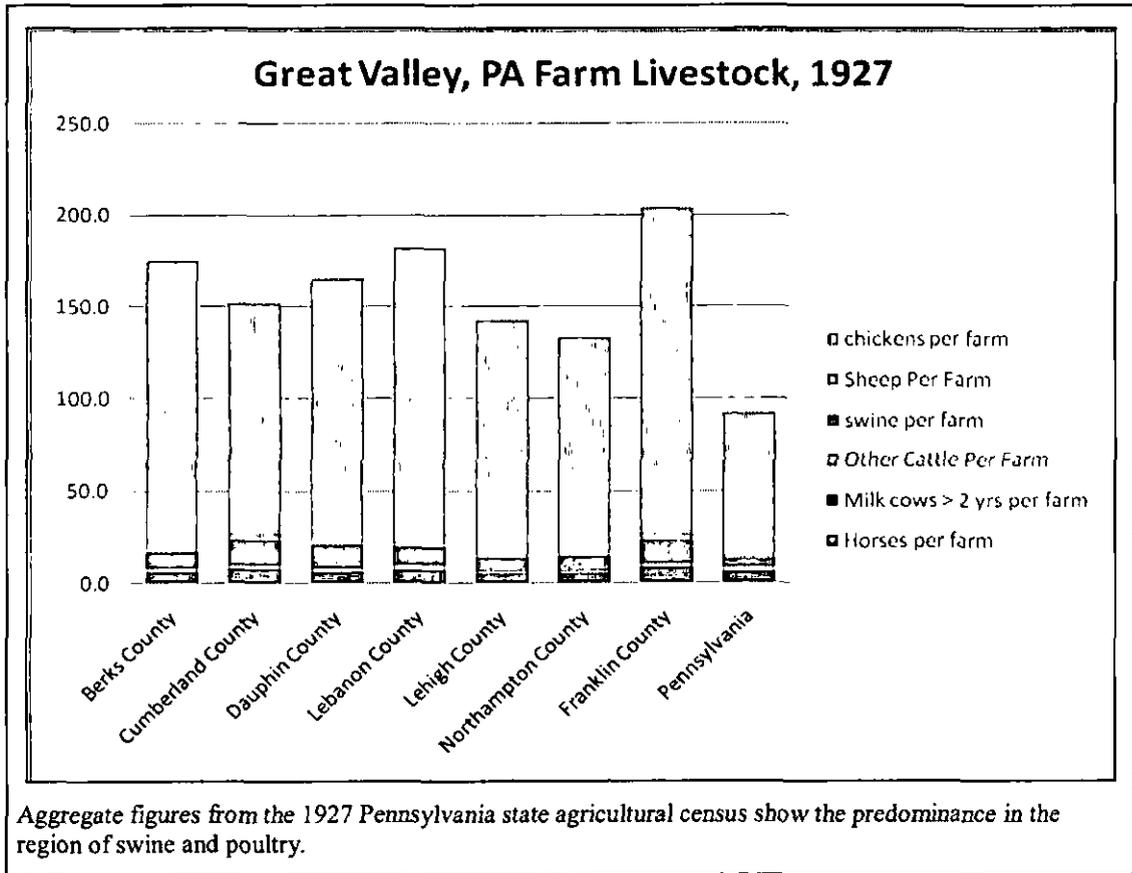
Up to about 1930, milk in cans was transported to the factory by a trolley system extending east to Lebanon and west to Harrisburg. Milk accounted for most of the trolley traffic, and at one point a 3,000 gallon glass-lined bulk tank was put into service. After 1930 milk delivery shifted to trucks. Local dairy farmers depended on Hershey for markets; when in 1937 the CIO-affiliated union of workers at the candy factory staged a sit-down strike, dairy farmers were among those who picketed and even reportedly physically assaulted the strikers.⁶⁹

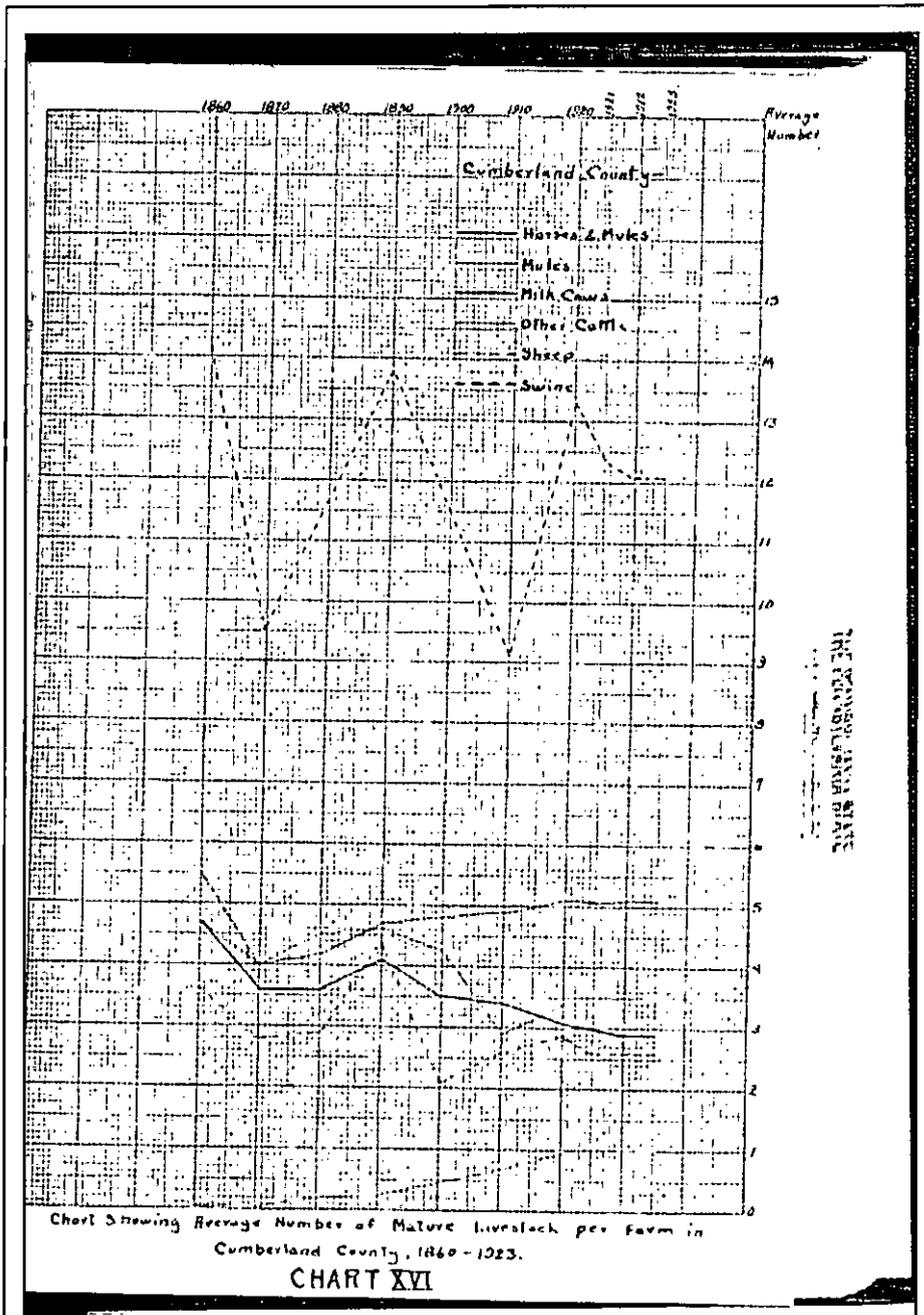
In general the shift to fluid milk production had important implications for farming. For example, interest rose in higher producing cows, since income now depended on quantity production rather than value-added processing. Breeds such as the Holstein, Guernsey, and Jersey were more often mentioned – though they did not come to dominate immediately. Secondly, quantity feeding and year-round milking became a goal, spurring interest in feed crop improvement and silage. Thirdly, with the rise of a milk-consuming public came demands for better sanitation. Municipal and state government bodies imposed sanitation requirements on milk distributors, and they in turn pressured producers into compliance.⁷⁰ Farmers who would not or could not meet requirements had access to some markets but not others.

Swine continued to be important in the Great Valley throughout the period. Both high lard-yielding types and leaner breeds were raised. The “heavier farm-raised and fattened hogs, usually old breeding stock,” were sold locally or slaughtered for home use, while the lighter ones went to cities within the region.⁷¹ Steers were fed on some farms, particularly in Lebanon County; these animals were shipped out.⁷²

The biggest development in the livestock industry was a dramatic rise in poultry products. Great Valley farms quickly outstripped state averages for poultry meat and egg

production. Turkey farming was locally important within the region. The Berks County agricultural extension agent noted in 1932: "Turkey raising is becoming an industry of some note in our county. We have what is believed to be the largest flock in the country, ten thousand and more turkeys raised this year on this farm. Other flocks of 500 to 2,000 turkeys are growing in number. A larger majority of the turkeys sold on our local markets through chain stores and independent stores during the last Thanksgiving season were turkeys grown within our county. The number of imported turkeys on our markets has been reduced to a very small percentage."⁷³ The vast majority of poultry production, however, was chickens. Poultry products went to local and regional markets. In Lebanon County, for example, a 1925 report noted that "Over 200,000 head of poultry were collected by hucksters in Lebanon County last year," a third of which were sold in the county and the rest shipped to Reading and Philadelphia. Hucksters must have handled nearly all the chickens that were marketed in Lebanon County, because total local production for 1924 was 268,000 birds, and that includes consumption by the farm family. Local marketing cooperatives also seem to have helped poultry farmers. In Berks and neighboring counties, for example, the Tri-County egg auction in 1936 sold around 20,000 cases of eggs, helping to pull local supplies from hucksters and local markets and in turn forcing prices up.⁷⁴





Paul Edinger, "The Trend of Agriculture in Adams, Cumberland, Franklin, and York Counties, Pennsylvania." MS Thesis, Cornell University, 1924 (no department given), between pages 38 and 39.

Fruit production received a good deal of attention from extension agents during this period. It was a challenging time for orchardists. The San Jose scale infestation descended on the region in the early twentieth century, wiping out many home orchards. In Berks County by 1933 the extension agent thought that "Fruit growers are alert as to

their responsibility in the production of quality fruit if they would meet competition from more distant regions. The farm orchard of a fraction of an acre or a very few acres, is rapidly passing out.” The agent was correct, but quite a few small commercial orchards hung on, and in Franklin and Cumberland Counties especially, larger ones on the mountain slopes remained viable.⁷⁵ In the other counties, fruit production was concentrated in one or two townships. For example, in 1927 Palmer and Forks Townships, Northampton County, accounted for most of the county’s peaches and apples. The orchard areas are clearly visible on period aerial photographs. Some of these products went to local processors, some was sold at roadside stands, some probably was shipped out, and some was sold by huckstering.

Liming of soil continued to be a common practice. The Berks County soil survey of 1909 noted that many farmers had their own kilns and burned limed for their own farms and that of their neighbors. The author took a dim view of lime use, though: “Considering the whole area it may be said that lime is used in too large amounts, and there is considerable waste of time and labor in its application.”⁷⁶

As before, myriad smaller-scale production and processing strategies occupied an important place in the farming economy, especially during the lean Depression years. One of the more ingenious and unusual cash-generating activities was pursued by a Berks County farm woman who not only sold conventional goods at the Reading market, but raised raccoons to sell for “coon field trials.”⁷⁷ However, most farm people concentrated on long-proven strategies. A Northampton County home economics extension survey of 1934 is revealing. The specialist reported that farm families grew between twelve and twenty-seven different vegetables, averaging twenty. On average each family canned 107 quarts, including beets, carrots, corn, spinach, string beans, lima beans, peas, “Sauer Kraut,” and tomatoes. Tomatoes were the most popular canning vegetable. The agent added that “... cabbage was stored in generous amounts by all but 12 families... 521 heads of endive were stored by 13 families...” In Berks County that same year, one farm’s canning output was described: “The variety of vegetables canned were – squash, eggplant, peas, tomatoes, okra, sauerkraut, beets, succotash, corn, string beans, cauliflower. The fruits were – plums, blackberries, peaches and apple sauce.” Other

sources mention cabbage, onions, beans, sweet corn, tomatoes, cucumbers, and sweet potatoes.⁷⁸

These goods as before went both to family subsistence and to market. For example, the Berks County home economics extension agent in 1933 mentioned that “Mrs. William Geiger of Geigertown expects to can asparagus for retail trade.”⁷⁹ Many families had huckster routes.⁸⁰ Cities in the Great Valley served as redistribution points for goods brought in from outside, and also maintained venues for sales of “locally-produced fruit and vegetables.” During this period, there were separate marketing processes for local and non-local goods. A thorough 1925 publication describing “Agricultural Production and Marketing in Lebanon County” noted that in the main, “local farm produce is sold generally by the producer to the retailer or directly to the consumer,” the latter either at market houses or by “street peddling.” Lebanon had city markets to channel goods from the countryside to urban dwellers, but most of the county’s fruit and vegetable needs were supplied by Lebanon County farms, and never entered Lebanon City markets at all. The items that came in on railroad cars were things that couldn’t be grown locally, like citrus fruits and bananas.⁸¹

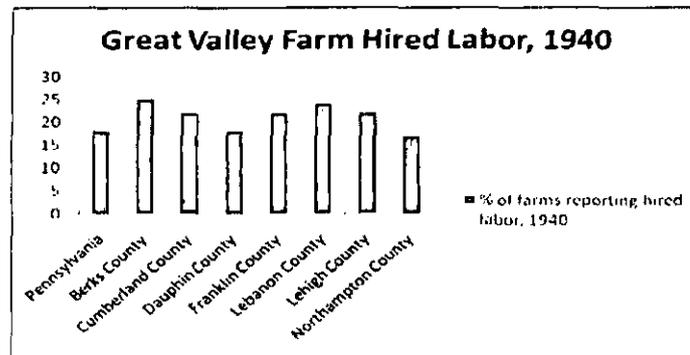
It is difficult to estimate the economic impact of these direct sales, since contemporary agricultural statisticians had few good ways to keep track of them accurately. One 1943 essay about Dauphin County market houses referred to a study which estimated that sales at farmers’ markets accounted for “one-fourth of the average annual value of all Pennsylvania farm products sold” other than milk and milk products. Unfortunately the author did not give a citation for that reference. If the assertion was accurate, farmers’ market sales could have accounted for a significant portion of the value of Pennsylvania farm products sold annually.

Labor and Land Tenure, 1900-1940

Great Valley farms continued to be worked mainly by family members, supplemented by wage laborers. In 1909 the Berks County soil survey authors noted: “The question of farm labor in Berks County is not as serious as in some sections, because many of the women and children work in the fields. On many small farms, therefore, no extra farm

hands are needed.”⁸² In 1940, the published US Census figures suggested that no more than a quarter of Great Valley farms used hired labor from outside the family.

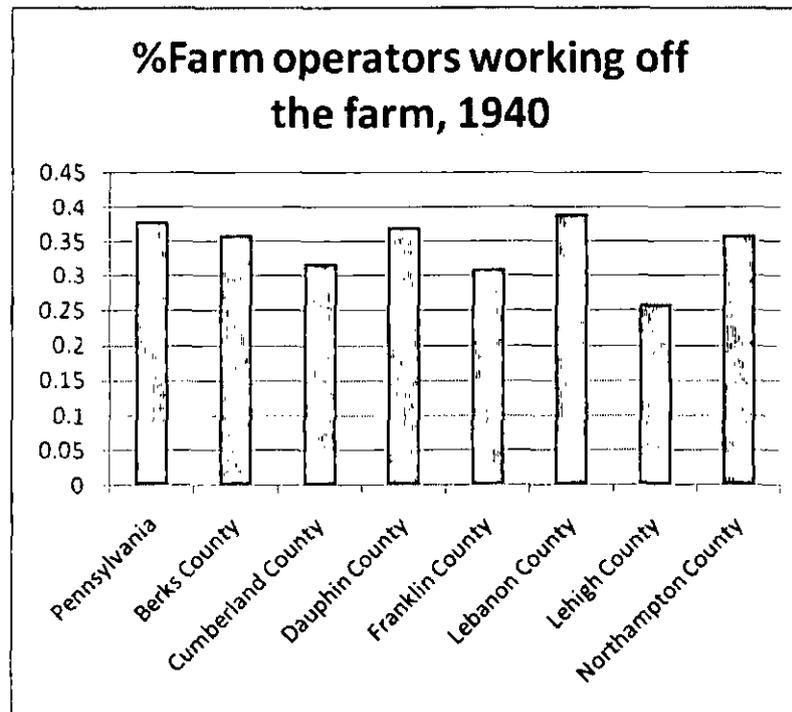
The 1909 soil survey reported that when farmers found outside laborers, they often paid them \$15 a month including board. This increased during the summer months, where many laborers were paid \$20 a month. Day laborers were often paid a dollar a day, with a raise to \$1.25 a day during the time of harvest. By 1925, it seems that farm labor costs had risen in Berks County. That year a local historian complained that “Hired help on the farms of the county is a most serious problem at this time. A wage of \$30 to \$40, with board, lodging, and washing included is quite commonly paid. This is the equivalent of about \$80 to \$100 per month. Some farmers are paying men more than this. Day labor on the farms commands \$4 to \$5 per day. These wages don’t seem to be high when compared with wages of tradesmen and industrial workers, but the farmer cannot afford to pay higher wages and in some cases not as high wages as he is paying, because of low returns on crop and livestock products.” Industrial employment in the region must have presented competition for labor and driven up wages to some extent, at least until the Depression hit.⁸³



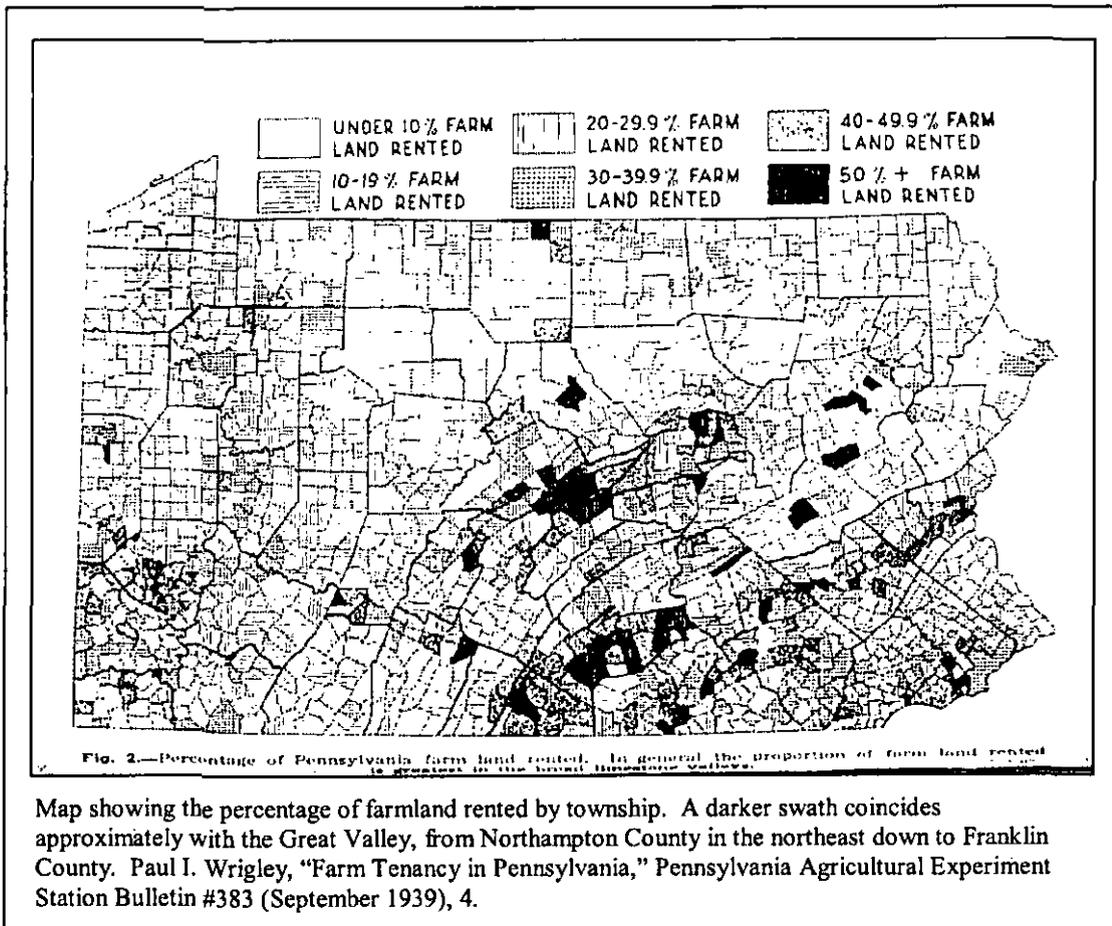
Labor processes and patterns were changed again by a second phase of mechanization, this time by a slow shift away from animal power to steam or fossil fuel powered machinery. The stationary gasoline engine could replace horse power to drive threshers, silo fillers, and the like. Gasoline powered tractors provided draft power in the fields to pull plows, harrows, reapers, and mowers. Automobiles furnished personal transport, and trucks added the ability to transport farm produce. Electricity (either from a power line or from an independent generating plant) could power pumps for running water, lights for

working, and household appliances. Studies in other areas have shown that these new technologies changed work patterns. For example, some farm women found themselves running errands using a car, and perhaps cutting back on work in the fields. Shared communal tasks such as “husking bees” disappeared, but newer ones like silo filling arose. In the Great Valley counties, distinctive farm technology choices were made with respect to statewide patterns. For example, tractors were quite a bit more popular in the Great Valley than in the state as a whole. This makes sense when we consider that mostly the terrain was fairly flat, and crops were so important in the region. Trucks and automobiles were also much more prevalent than in the state as a whole in 1927; nearly every farm had one motorized vehicle and many had more than one. A well developed road network and the importance of huckstering explain these choices. On the other hand, in general the region lagged behind the rest of the state in electrification, running water, and telephones. It is tempting to speculate that these choices reflect a lower status for household work and -- by extension -- for women. No in-depth research has closely examined the issue, but studies for other areas show that families deliberated together about these costly conveniences. Particularly during the depression decades 1920-1940, the farm’s viability was the first priority. Moreover, many women chose mobility and maintaining social ties over household appliances. A historical study in a different state quotes one farm woman as saying, “you can’t go to town in a bathtub.”⁸⁴

Off-farm labor by farm household members was not quite as important in the Great Valley as elsewhere in Pennsylvania, probably because farms were more economically viable than in regions like the Allegheny Plateau. Nonetheless, by 1940 a quarter of all farm operators in the region worked off the farm at least part of the year. Off-farm labor also was related to what agricultural economists called “part-time” farms. Part-time farms surveyed in Berks and Northampton Counties in the 1930s showed that farm products accounted for less than twenty percent of farm income, and off-farm employment for three-quarters. Textiles and slate/cement industries offered employment in these Berks and Northampton respectively. Women and children did most of the work on these farms. Off-farm labor statistics were only collected for farm operators, i.e., male household heads; the impact of women’s wage labor is therefore difficult to ascertain.



Tenancy continued to be a central institution in the Great Valley. In 1927 tenancy ranged from around 20 percent in Northampton County in 1927 to 40 percent in Cumberland County. (State wide, it was 25%.) In general, higher tenancy rates seem to have been correlated with the percentage of farmland that was rented in a given area. (In other areas, southeastern Pennsylvania for example, the overall percentage of tenants was low, but they farmed a disproportionate land area, indicating that a different social dynamic was at work.) As before, share tenancy was the most common form of landlord:tenant relationship. Some agricultural economists believed that changing conditions rendered share leases less effective than before, but they seem to have persisted anyway.⁸⁵

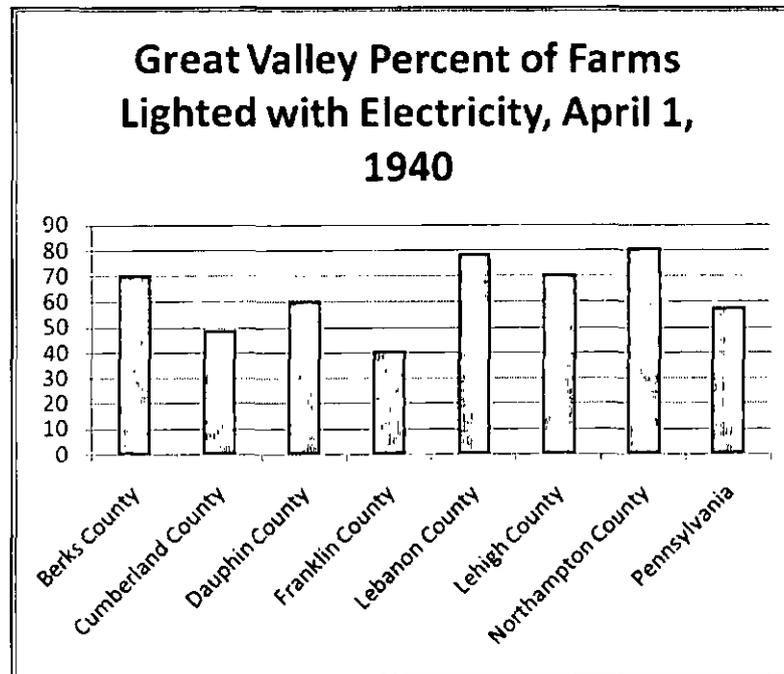


Buildings and landscapes, 1900-1940

Houses, 1900-1940

The large and substantial houses built in the previous century continued to serve farm families in the Great Valley. In Cumberland County, for example, one study concluded that half the farmhouses in use in 1940 had been built before 1900. The chief changes to older farm dwellings would be the slow installation of electricity, running water, and (in some places) central heating. However, as the chart below shows, relatively few farms in the Great Valley had these conveniences even by 1940. Two-thirds of Cumberland County houses lacked indoor toilets and bath facilities, while a fifth lacked electricity as late as 1945. Notably, 23 percent of Cumberland County farm dwellings in 1945 housed more than one family – probably reflecting kinship based farm tenancy.⁸⁶ As far as architectural style was concerned, few houses documented in field study appeared to have

been updated during this period. The stability in architectural form and fashion can be attributed to Pennsylvania German cultural conservatism; economic stress, particularly after 1920; and the basic soundness of the nineteenth century house. Since family and household size probably declined, and less agricultural work was performed there, these Pennsylvania Farmhouse types probably sufficed well in the twentieth century.



Those few new houses documented for the period were bungalows and foursquare houses. These were popular forms in the early twentieth century, and their appearance in the countryside shows that Great Valley farm families didn't always reject new styles.



Bungalow, Hamilton Township, Franklin County, c. 1925-1940. Note the matching smokehouse in the rear. Site 055-HA-001.



Bungalow, Lurgan Township, Franklin County, c. 1925-1940. Site 055-LU-001.



Foursquare house, Heidelberg Township, Lebanon County, c. 1910-1940. Site 075-HE-004.

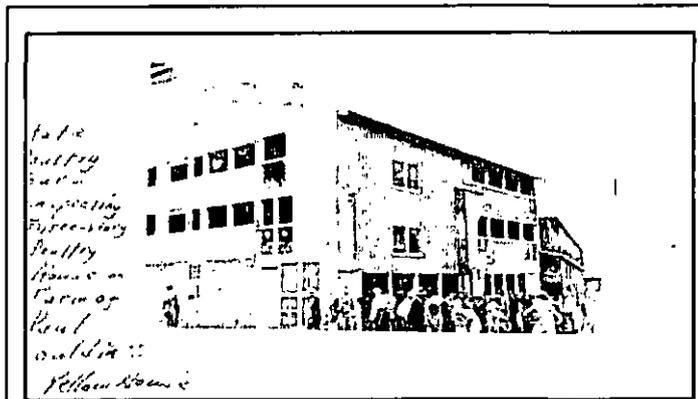
Barns, 1900-1940

Few new barn types were documented that date securely to this period. Rather, nineteenth-century Pennsylvania forebay barns continued to serve. They were often extensively altered. Two main alteration strategies were documented in the Great Valley region. One was adaptation of the Pennsylvania forebay barn for poultry. The other was renovation to comply with dairy sanitation standards.

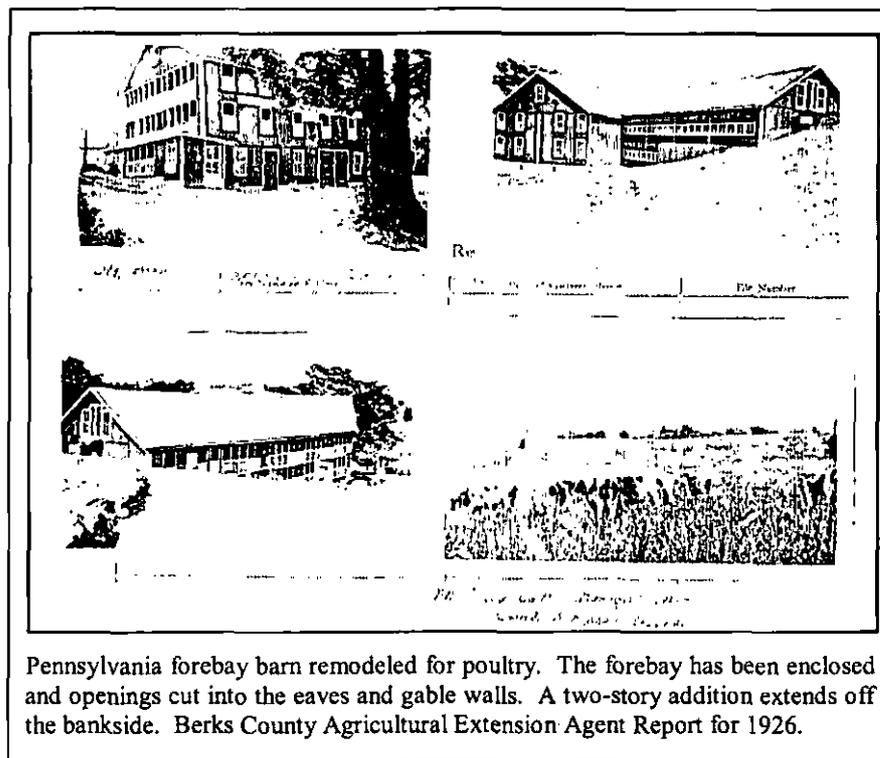
Each renovation has a distinct and recognizable architectural signature.

As poultry increased in numbers and importance, barn adaptations for chickens became more common. Barns adapted for poultry are easy to spot; their walls have been pierced by numerous small openings for light, and often

they are clad with shingle or other material to keep out drafts. Inside they may be fitted with nesting boxes, perches, and facilities for waste collection and disposal.



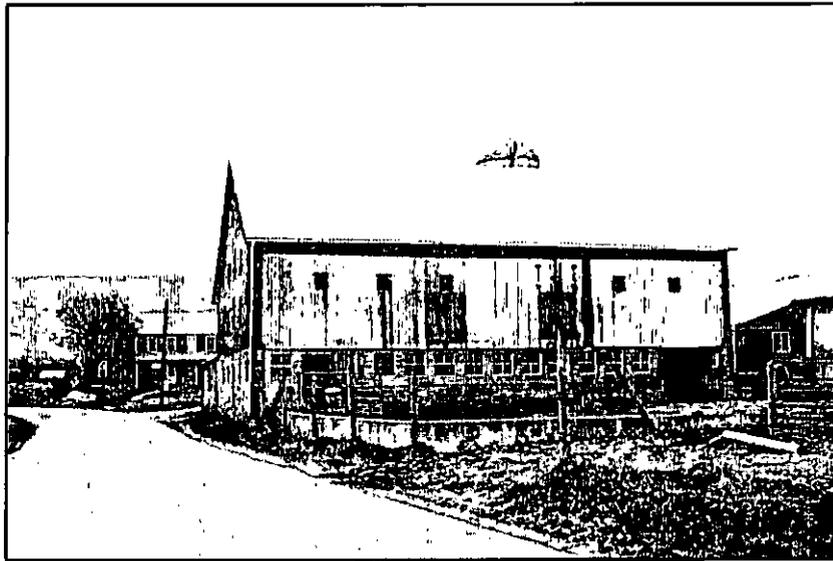
Barn in Berks County adapted for poultry. On the stone foundation of an earlier Pennsylvania Barn, a two story shed-roof enclosed addition was built over the forebay area. Windows admitted light and a chute in the front center permitted waste disposal. Berks County Agricultural Extension Agent Report for 1929.



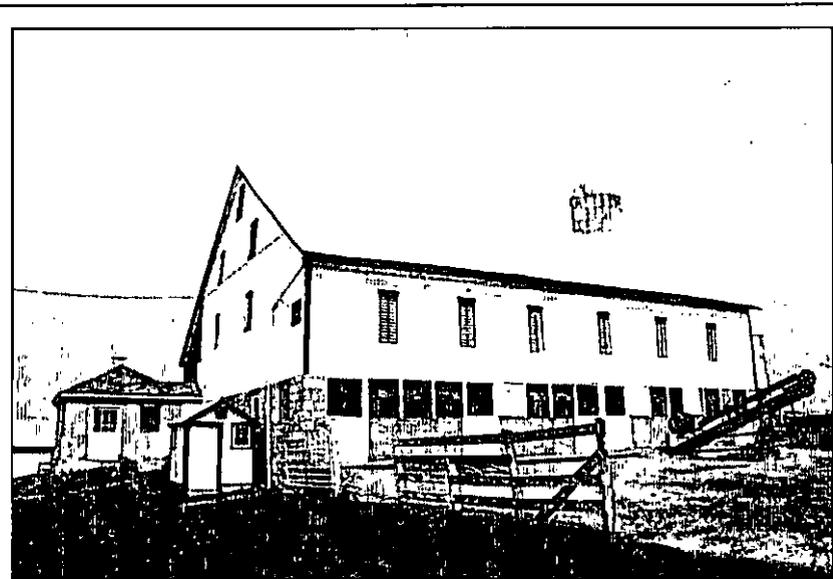
Pennsylvania forebay barn remodeled for poultry. The forebay has been enclosed and openings cut into the eaves and gable walls. A two-story addition extends off the bankside. Berks County Agricultural Extension Agent Report for 1926.

As agricultural conditions changed, dairy farmers were encouraged, and eventually required, to remodel their barns. By the twentieth century, scientists had connected diseases like bovine tuberculosis to human illness, and efforts began to test herds and move towards decreasing (if not eradicating) animal diseases. The germ theory of disease helped to foster an emerging critique of the Pennsylvania Barn as unsanitary and unhealthy. The forebay and lower-level basement animal quarters were now regarded as liabilities: the forebay because it kept out germ-killing light from an already dim interior, and wood stalls because they were thought to harbor germs. The short crosswise ranks of stalls were also criticized as inefficient for farm labor. These views were expressed through reform literature and eventually legislation. In the twentieth century, increasing concerns about the safety of the milk supply prompted municipalities and states to legislate sanitation requirements for producers. At the end of 1932, the Berks County agricultural extension agent reported that “The New Jersey milk law which goes into effect January 1, 1933, affects several hundred producers in Northern Berks. More light in the stables, all floors concrete, horse stables separated by tight partitions, and a number of other requirements are resulting in a hardship to these producers at this time.” Other recommended or mandated changes might include installing manure alleys

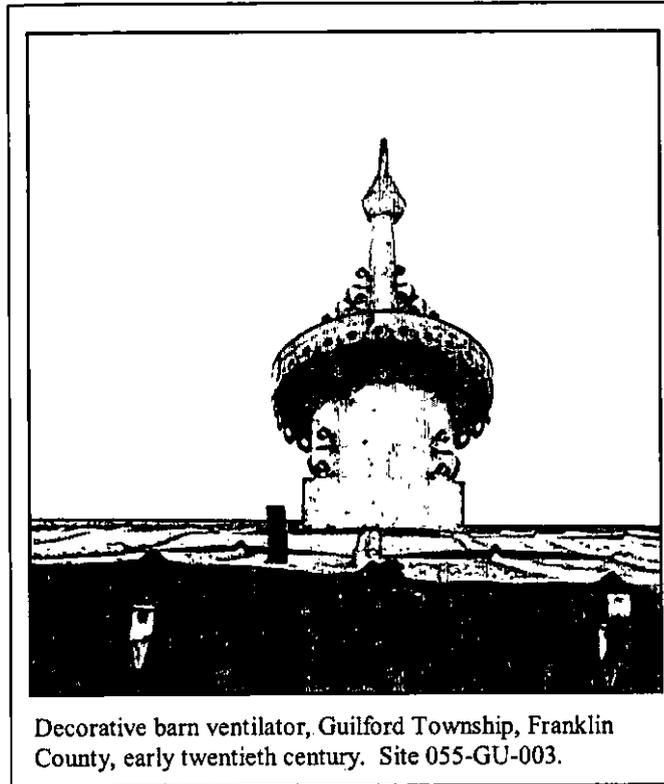
and metal stanchions, and improving ventilation. Some regulations required that pigsties be located at a distance from cow stables. Gradually these requirements extended over a larger and larger number of dairy farms. Their cumulative impact can be seen on the landscape.⁸⁷

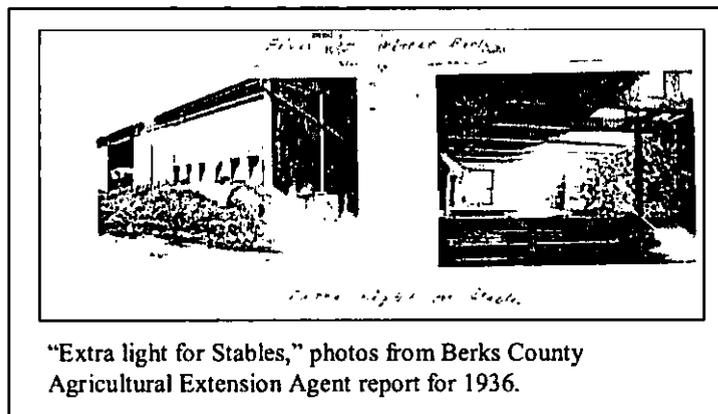
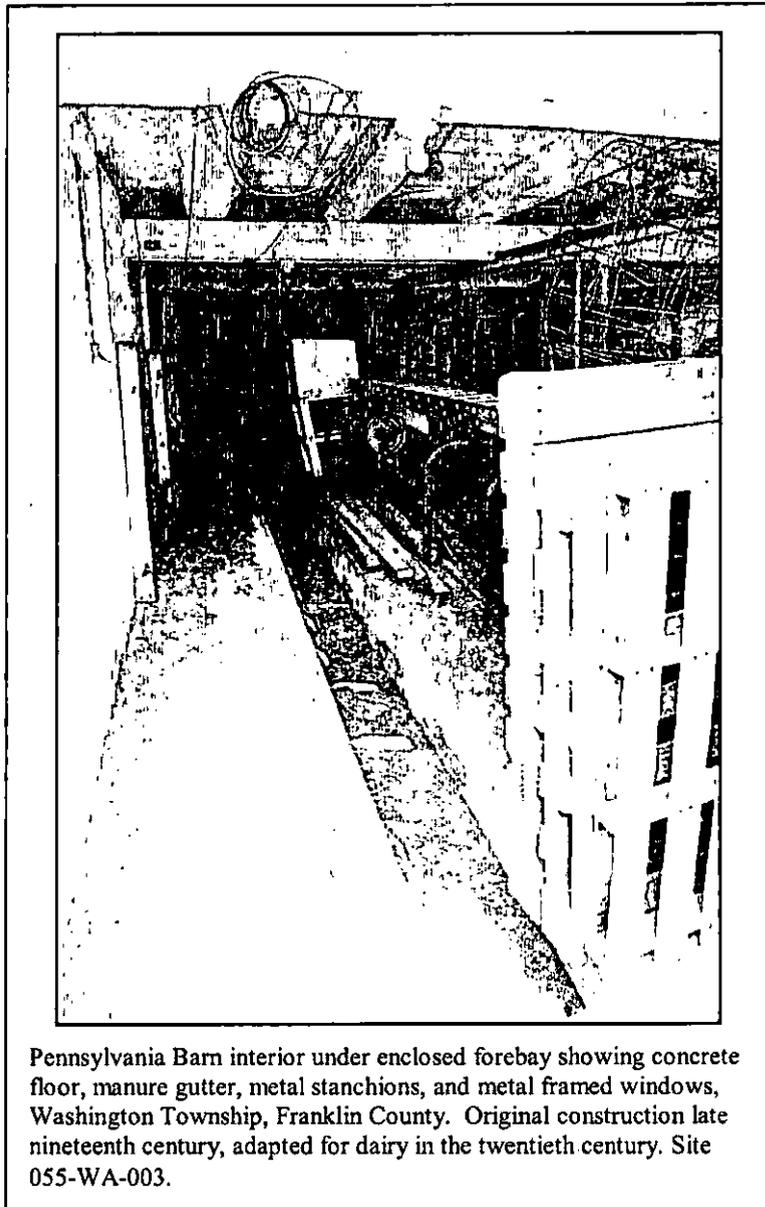


Pennsylvania brick-end barn adapted for dairy, Lurgan Township, Franklin County. Originally built 1858, altered in the early twentieth century. Site 055-LU-004.



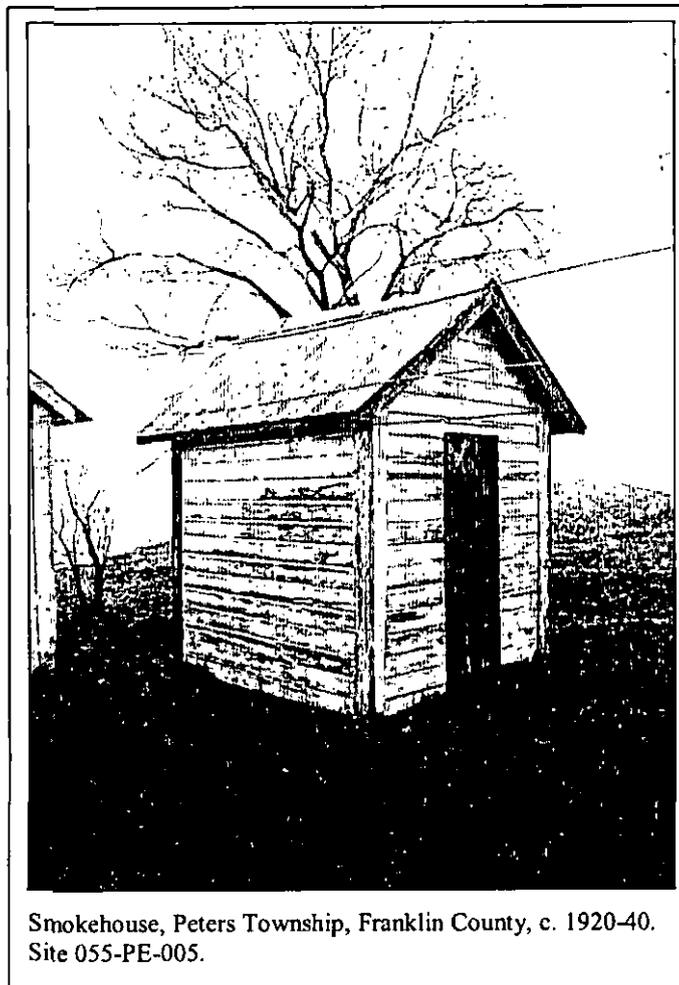
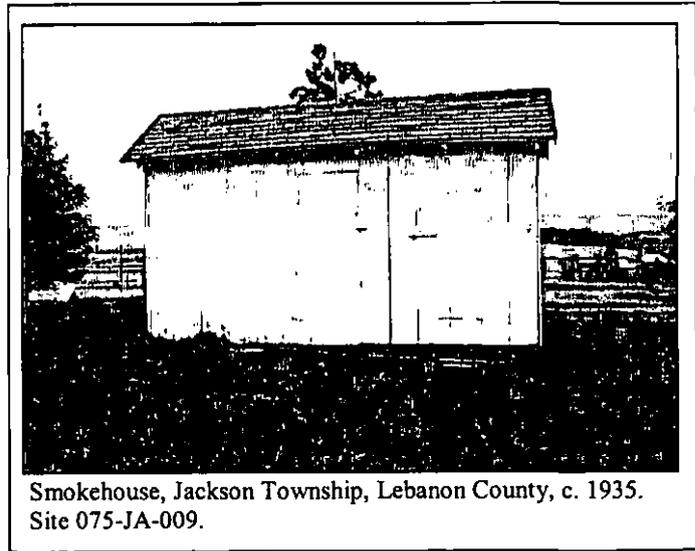
Pennsylvania forebay barn adapted for dairy, Washington Township, Franklin County. Original construction late nineteenth century, adapted early twentieth century. Note the canted metal framed windows combined with concrete block wall and traditional Dutch doors. Site 055-WA-003.





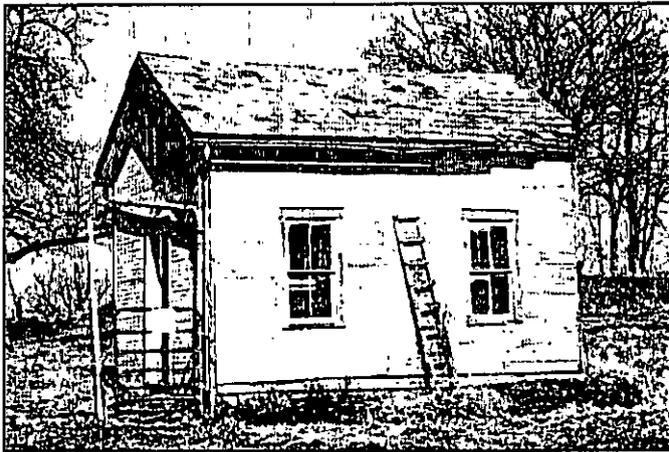
Smokehouses, 1900-1940

Butchering and meat smoking continued to have a strong presence in local life and thus in the landscape. New smokehouses from this period are relatively common.



Summer Kitchens, 1900-1940

Summer kitchens continued to be intensively used, so new ones were built during this period. Twentieth century summer kitchens tended to be light frame structures, clad in beaded board or plain board siding. They lacked fireplaces, but often might have a built-in brick housing for a set-kettle. Documented examples also tended to be a bit farther from the house than their nineteenth century predecessors, though too few examples were surveyed to detect a consistent pattern. Otherwise, their function was the same as in the nineteenth century.



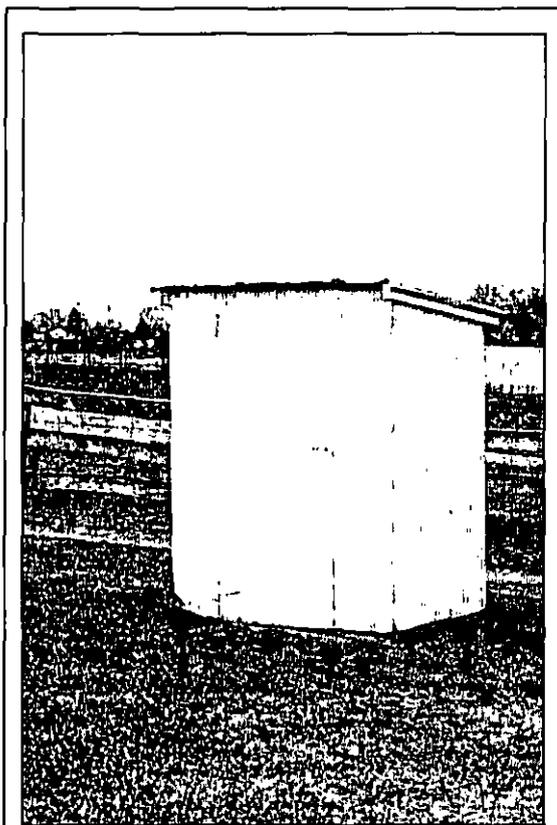
Summer kitchen, Antrim Township, Franklin County, early twentieth century. Site 055-AN-006.



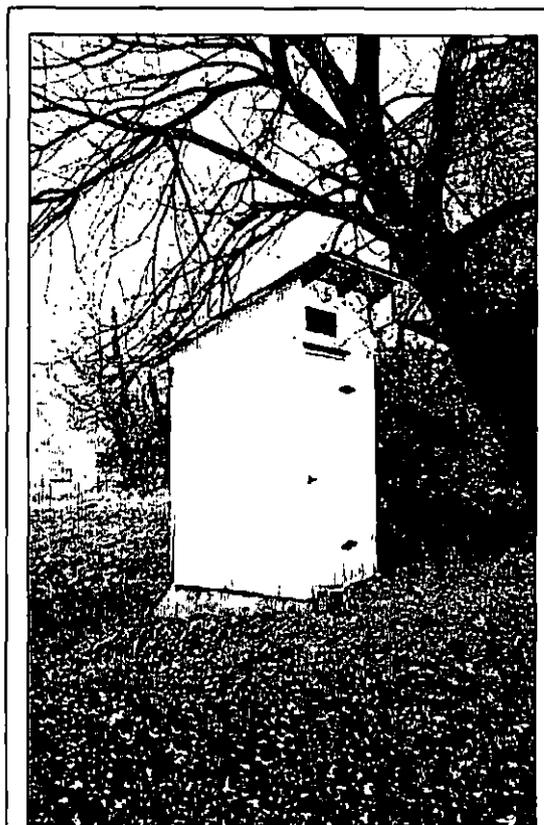
Summer kitchen, Heidelberg Township, Lebanon County, c. 1925. The interior contains a built-in brick set-kettle and there is a bake oven off the end. Site 075-HE-003.

Privies, 1900-1940

Indoor toilets were rare in the rural Great Valley well into the twentieth century. The privies documented in field study dated to about 1925-50.



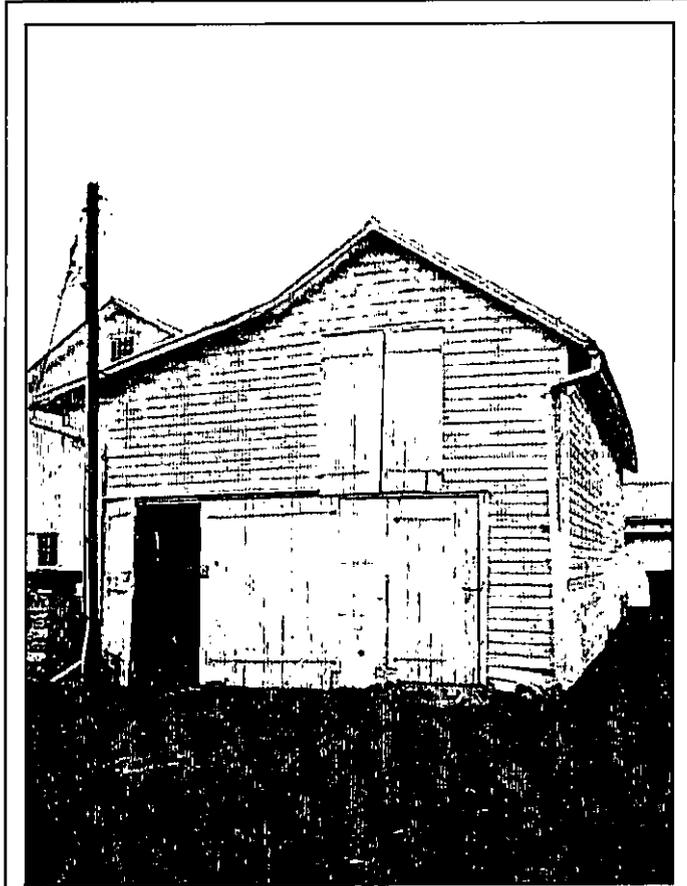
Privy, Washington Township, Franklin County, c. 1925-45. Site 055-WA-003.



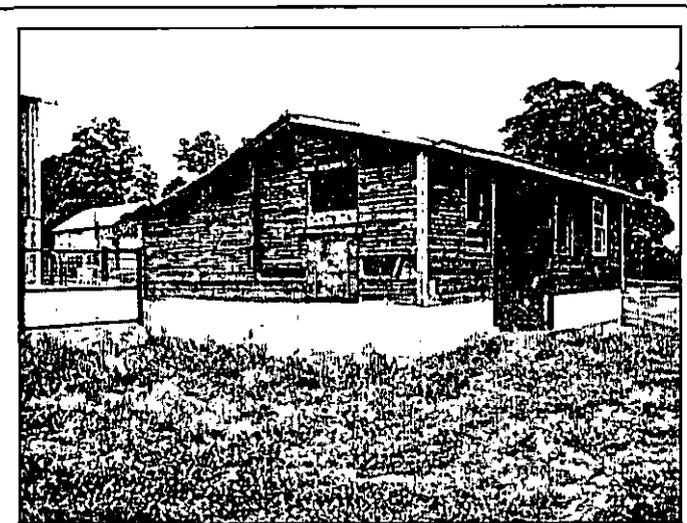
Privy, North Annville Township, Lebanon County, c. 1925-45. Site 075-NA-001.

Pigsties, 1900-1940

During field study, anecdotal evidence from property owners indicated that pigsties were more numerous before dairy regulations forced their removal away from cows and milk. At some sites, then, pigsties were moved or torn down. However, examples were nonetheless documented from this period. Swine occupied such an important place in Pennsylvania German agriculture and cultural life that housing them continued to be necessary.



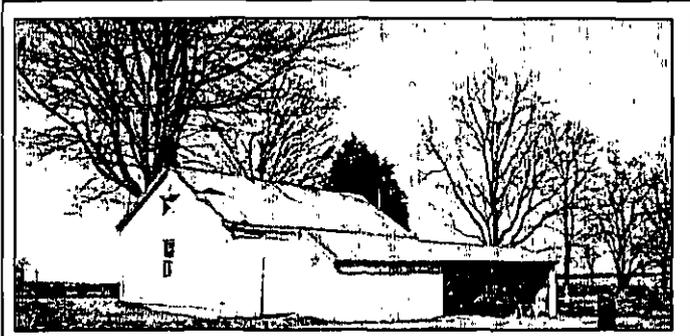
Pigsty, South Londonderry Township, Lebanon County,
c. 1940. Site 075-SL-001.



Pigsty, South Annville Township, Lebanon County, c. 1930-
50. This building later served as poultry housing.
Site 075-SA-006.

Machine Sheds, 1900-1940

The second wave of agricultural mechanization brought with it a renewed need for shelter to conserve these expensive implements.



Machine shed, Antrim Township, Franklin County, c. 1925-45.
Site 055-AN-011.

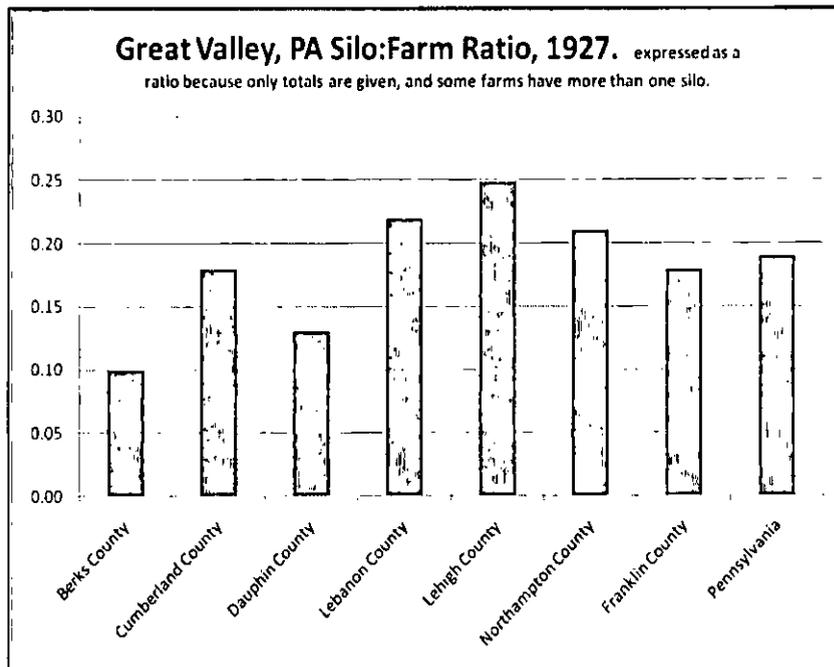


Machine shed with corn cribs, added bays, and poultry windows, Swatara Township, Lebanon County, c. 1925-1945.
Site 075-SW-002.

Silos, 1900-1940

A significant new outbuilding to appear on the agricultural landscape in this period was the silo. A silo is an airtight structure that holds fresh organic matter (moisture content 50-65 percent) destined for winter animal feed. It is filled with shredded or chopped grass, corn, or sometimes other plant material, which ferments into a highly nutritious and palatable feed. Silage feed resulted in significant productivity increases for dairy cows, and also permitted marginal farms to carry more animals. Ensilage was first publicized in the US in the late nineteenth century when the results of experiments in Europe became known. In the Great Valley, its adoption occurred over a long period. In

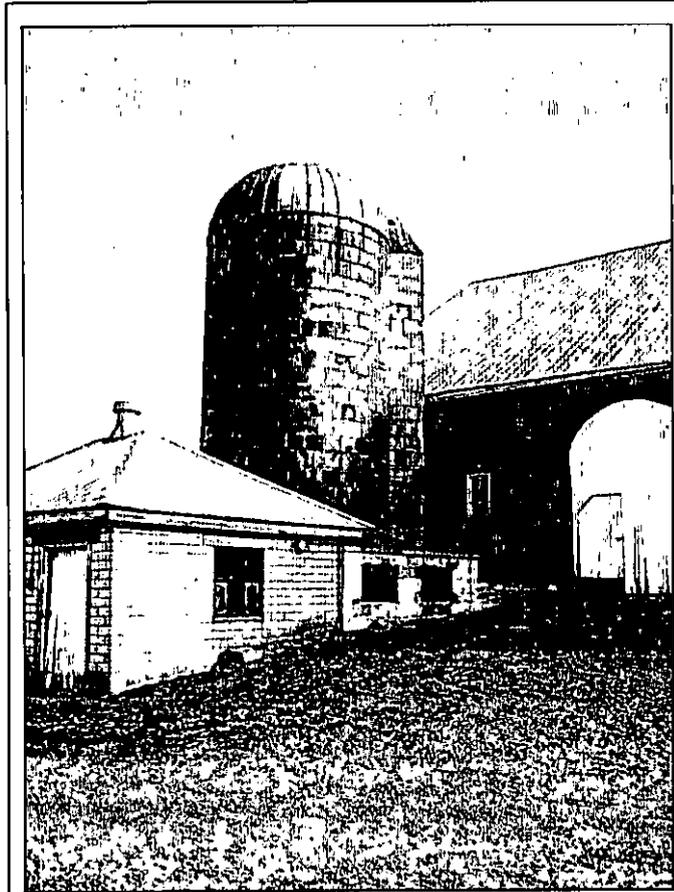
the Great Valley in 1927, some counties had more silos than in Pennsylvania as a whole, while others had fewer; but in any case, no more than a quarter of farms in any county had silos. Overall, silos were not as prominent a feature in the Great Valley as they were in more heavily specialized dairy areas such as the Northern Tier. The number surely increased by 1940, but no data are available to determine exactly how much.



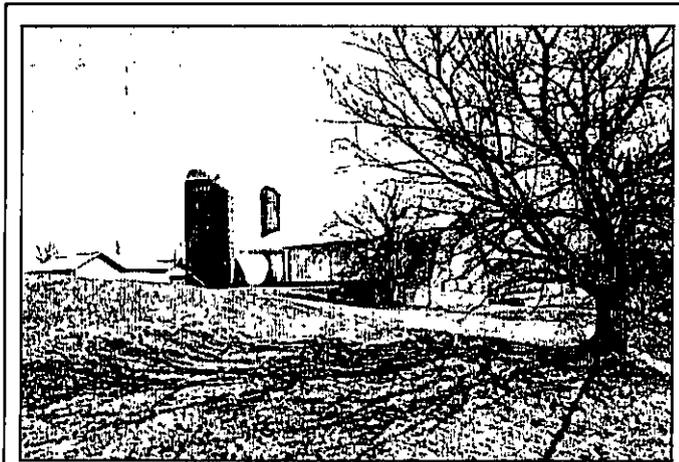
Silos can be constructed horizontally in pits, or vertically. Most silos of the first half of the twentieth century were vertical. Early silos were sometimes placed inside the barn, rectangular in shape, and of wood construction. These were quickly supplanted by round vertical silos located outside the barn, usually in a spot that would permit efficient filling (usually from holes in the top) and unloading (usually from a tier of doors from which silage was thrown down an exterior chute, which contained a ladder for access to the doors). Early silos were unloaded by hand, from the top. The land-grant establishment published many “how-to” brochures aimed at helping farmers build their own silos of wood or concrete. A 1918 Pennsylvania State College circular mentioned wood stave, hollow tile block, poured concrete rings, concrete staves, concrete blocks, metal, and bricks as silo construction materials.⁸⁸ Commercial organizations marketed many types of silos too. Some sold special curved brick; others made tiles; still others advertised systems depending on interlocking rings of poured concrete. Cement staves became

popular after about 1910 and continued in popularity for several more decades. Galvanized iron was a less important but not uncommon material.⁸⁹

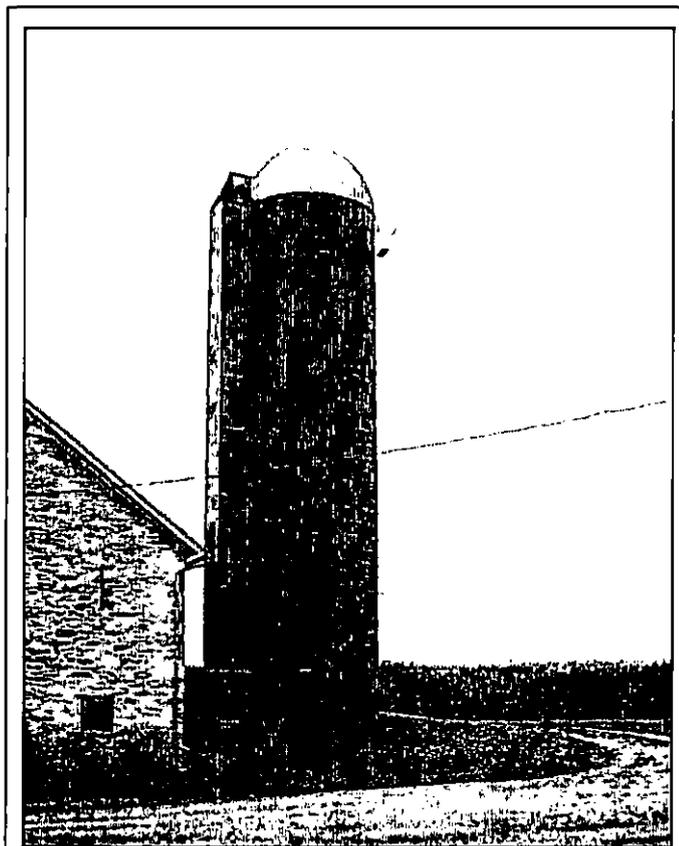
In the Great Valley, the earliest extant exterior silos documented in field study date from this 1900-1940 period.



Tile silo, Washington Township, Franklin County, c. 1930-1950. Site 055-WA-002.



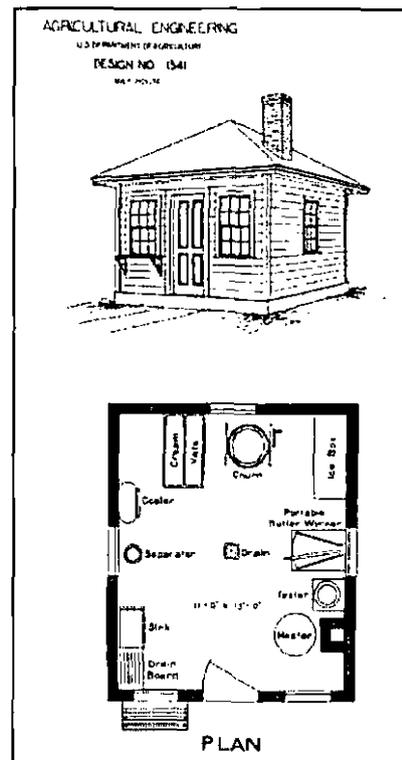
Metal silo, concrete stave silo, and poured concrete silo, Straban Township, Franklin County, c. 1940, 1950, 1970 respectively. Site 055-ST-003.



Tile silo, South Annville Township, Lebanon County, c. 1935. Site 075-SA-001.

Milk Houses, 1900-1940

Sanitation regulations resulted in important architectural changes. The milk house was a major new form on the early twentieth-century dairy farm. It wasn't a big building, but is an important reminder of the new role of the state and the agricultural establishment in agriculture. The state (meaning the government at any level) influenced the construction of milk houses in the first place, because during the Progressive and New Deal eras, legislatures and municipalities passed sanitary codes that required inspection not only of milk, but of dairy herds and milk production facilities.⁹⁰ New York City pioneered in these efforts, and also seems to have been more effective at enforcement than other areas. In Pennsylvania, according to Stevenson Fletcher, a very few municipalities had inspection laws starting in the late nineteenth and early twentieth centuries; however, enforcement was patchy. The first statewide dairy inspection law was passed in 1929, with a revision in 1933. This law provided for inspection of farm sanitary conditions, including facilities for sterilizing dairy equipment and milk houses for isolating milk.⁹¹ It is not clear how well these were enforced. These regulations were one facet of the assault that was launched on bovine tuberculosis and other diseases in this period, aiming at ensuring a fresh, uncontaminated milk supply. In order to market milk, increasingly farm producers had to comply with regulations that required them to install easily cleaned surfaces (like concrete) in barns, remove milk storage areas from dirt and odors (by building milk houses), cool milk, sterilize equipment, and the like. In the Great Valley, these regulations took effect over a protracted period. The milk house was one product of these new laws. In turn, its form and construction were influenced significantly by the agricultural establishment (meaning the complex that included state departments of agriculture, the land-grant university and

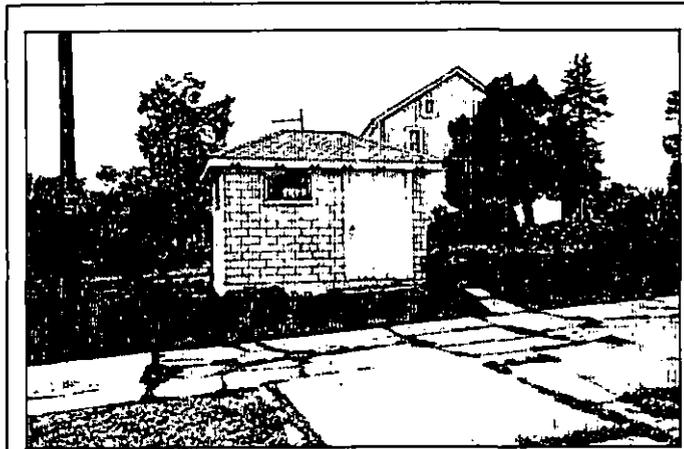


Milk House #1341, USDA design taken from: USDA Office of Cooperative Extension Work and Bureau of Public Roads Cooperation, *Farm Building and Equipment Plans and Information Series*, 1929.

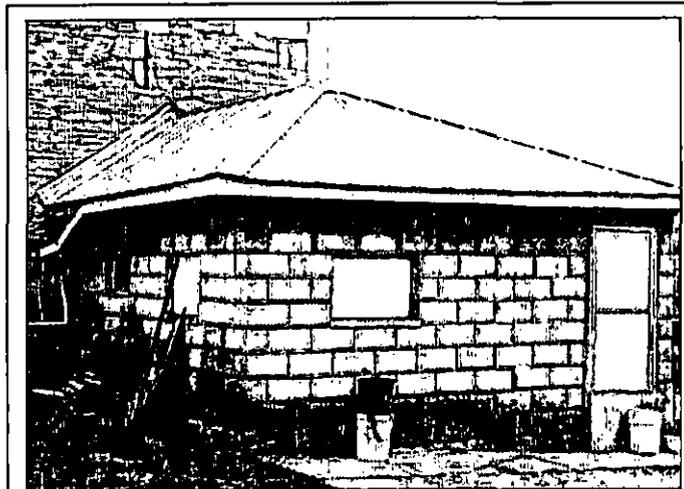
extension apparatus, and agribusinesses). This new element in the farm landscape, therefore, illustrates the growing influence of the “agricultural establishment” on everyday farming practices and landscapes. Agricultural extension agents regularly disseminated plans for milk houses. Likely, for every farmer who followed a plan exactly there were more who either copied his building, or who adapted the basic guidelines using available materials and expertise. The overall result was a new level of homogeneity and standardization.

Milk houses provided a place to store and cool fluid milk before it was transported to market; to store milk cans not in use; and to wash containers (and sometimes other equipment like separators). Plans offered by the USDA for farm milk houses typically gave dimensions ranging about 10 by 13 feet up to around 12 by 20 feet. Interior plans for a 10 by 13 milk house with ell (in one instance, “capacity 20 to 30 head market milk”) show a two-room plan with door leading to a wash room; milk room to one side, which contained a cooling tank and led to raised loading/unloading platforms and sunning racks, mounted on the outside. The ell contained a boiler room⁹² with its fuel supply, and back door. Larger milk houses had the same basic three spaces, only larger, and sometimes equipped with testers and separators. One example had a churn, butter worker, ripening vat, and refrigerator, and another had quarters for workers. Another small, 12 by 14, one-room milk house was designed for “butter making by hand” for 20 cows. It contained the same basic spaces, but not divided. The very smallest, at 7 by 9 feet, had a concrete foundation with a sunken vat for cooling cans of milk.⁹³ All of these plans had sloping floors with drains, and provision for ventilation and light. After about 1950, milk houses were sometimes altered to accommodate bulk tanks.

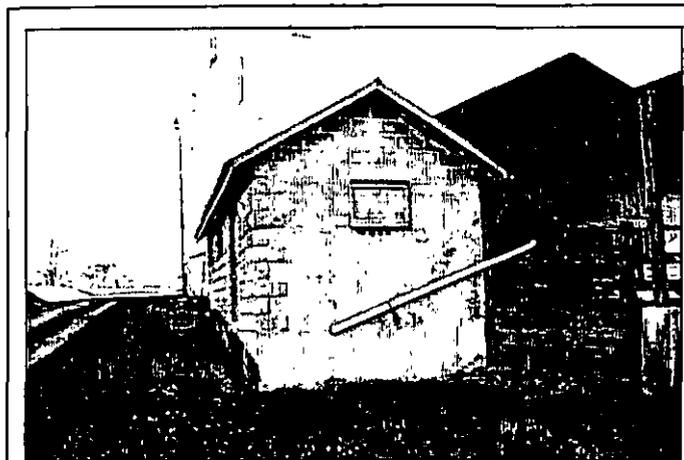
Following is a selection of milk houses documented in field study in the Great Valley.



Milk house, Jackson Township, Lebanon County, c. 1920-40.
Site 075-JA-009.



Beveled block milk house, North Cornwall Township,
Lebanon County, c. 1930-1940. Site 075-NC-002.



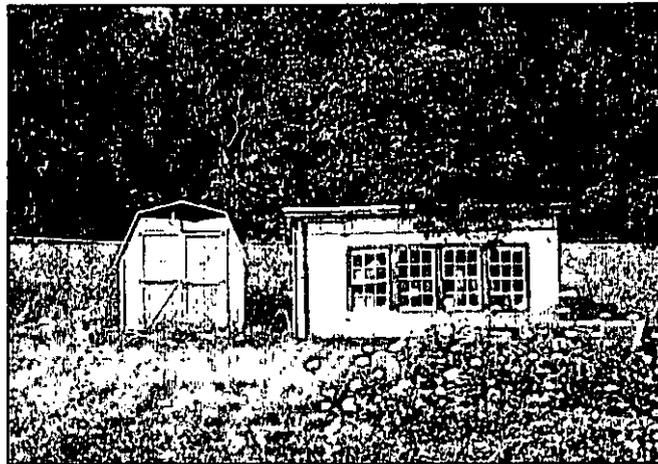
Milk house, Antrim Township, Franklin County, c. 1930. Site
055-AN-001.

Poultry Houses, 1900-1940

With the increasing importance of poultry in the farm economy came greater attention to poultry housing. Renovated barns accommodated poultry in some cases, but separate houses were also common. Poultry housing in the area tended to be frame, shed-roof buildings, usually one story, with south-facing windows. These sheltered both layers and broilers. The agricultural extension agents promoted designs distributed by the land-grant colleges. The 1926 report from the Dauphin County agricultural extension agent, for instance, described a demonstration poultry house built by the extension office:

Quite a few farmers were aided in the item of poultry house construction and one demonstration poultry house was built which we feel was typical of what a farm poultry house should be. Taking into consideration the item of economical construction, the use of the building in case poultry was dropped on the farm and it was patterned after the Missouri type house with the exception of more overhead room for storage, and the farmer can put in this poultry house all the feed, straw, and green feed needed for 300 hens for the Winter. This house has in addition electric lights, special mash feeding troughs and running water. The cost... per bird for housing in this house was \$2.25.⁹⁴

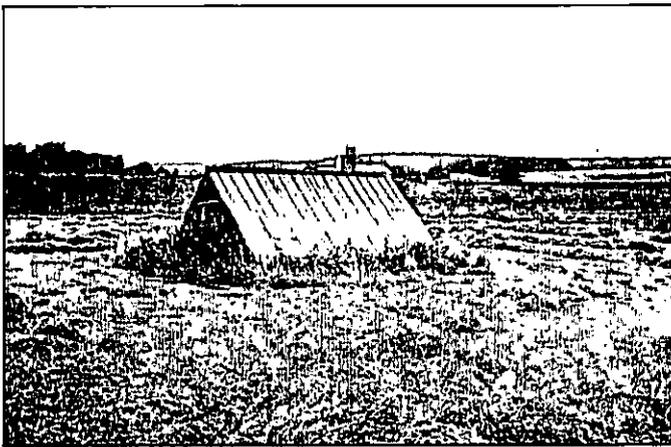
In this period, total confinement systems had not yet developed. On many farms, chickens were pastured at least part of the time, in what would today be called "free range" systems. Often poultry houses were designed to be movable, because it was recognized that the birds needed to be moved to fresh ground periodically, not only to get benefit of fresh plant growth and insect populations, but also to avoid the spread of disease. The shed-roof house on skids and the colony house were two types of movable poultry related buildings. Another specialized type of house was the "peep house," a small heated building that provided warm temporary shelter for newly hatched chicks.



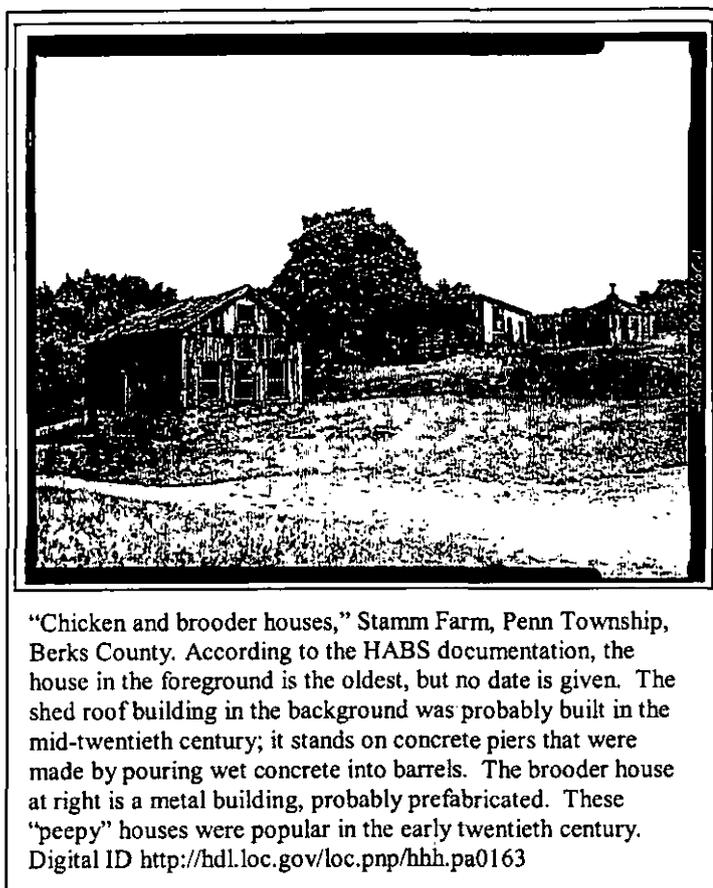
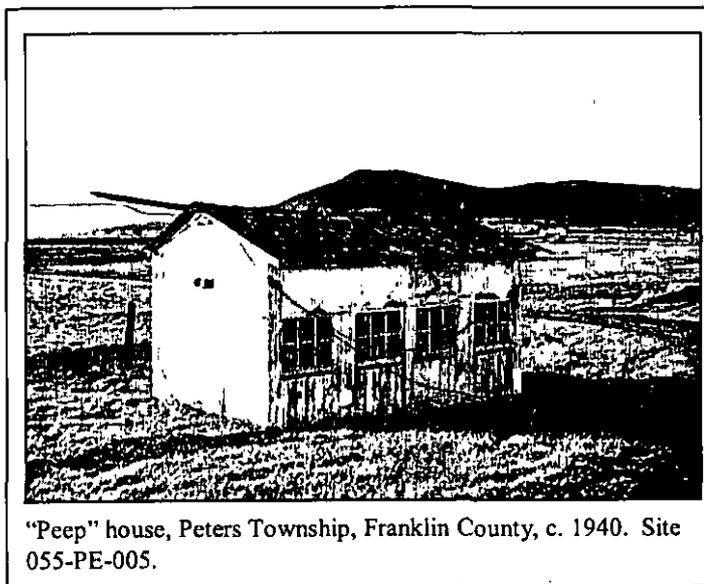
Poultry house, Bethel Township, Lebanon County, c. 1930.
Site 075-BE-001.



Poultry house, Heidelberg Township, Lebanon County, c. 1940.
Site 075-HE-001.



Colony house, South Annville Township, Lebanon County, date
unknown. Site 075-SA-004.

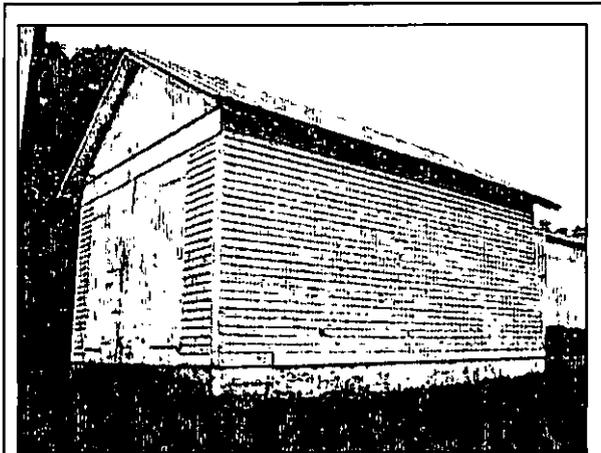


Corn Cribs, 1900-1940

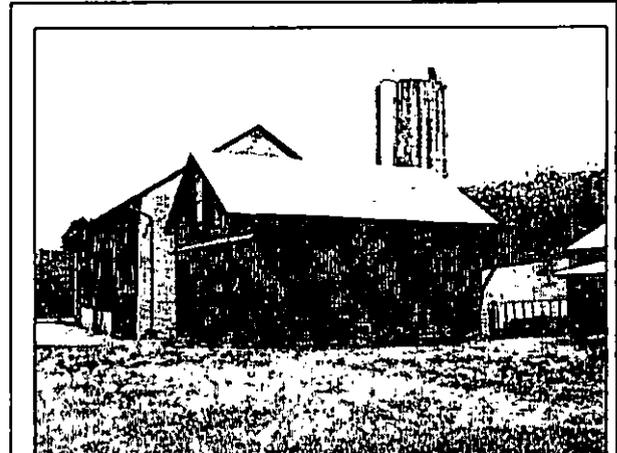
The corn crib continued to be an important storage building on Great Valley farms during this period. Often, as before, the crib was integrated into another structure, usually a machine shed.



Corn crib, Heidelberg Township, Lebanon County, c. 1940. A late example of canted sides. Site 075-HE-001.



Corn crib, Heidelberg Township, Lebanon County, c. 1940-45. Site 075-HE-005.

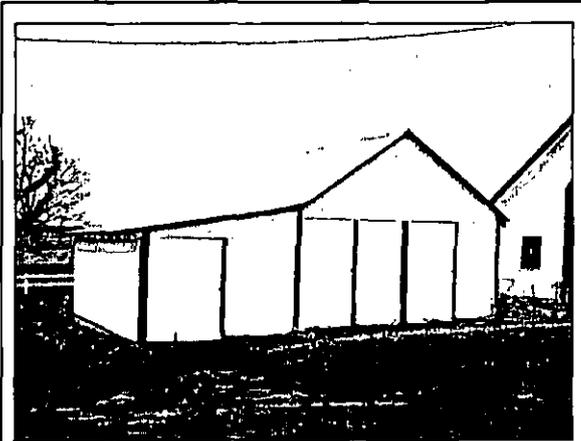


Corn crib, Mill Creek Township, Lebanon County, c. 1940-60. Site 075-MC-007.

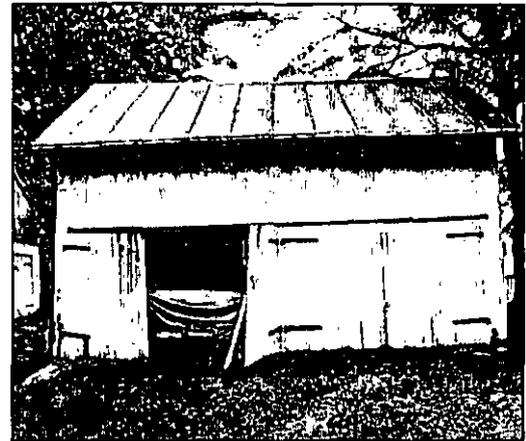
Garages, 1900-1940

Even by 1927 virtually every farm family in the Great Valley had at least one motor vehicle. These valuable machines needed protection. Often a pre-existing building was adapted for a garage, but early purpose-built garages also appear on quite a few farms documented in the Great Valley. Their architectural characteristics include small scale (one or two bays); siting near the house and on a driveway; materials such as concrete block, rock face concrete, and beaded board; large hinged doors (“garage” style doors are

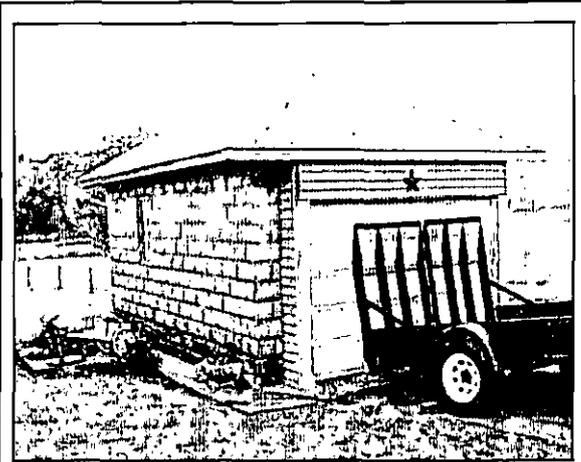
later insertions); and gabled, hipped, or pyramidal roof. Like its predecessor the carriage house, the garage tended to have a little more in the way of architectural finish or decorative materials than would a farm machine shed.



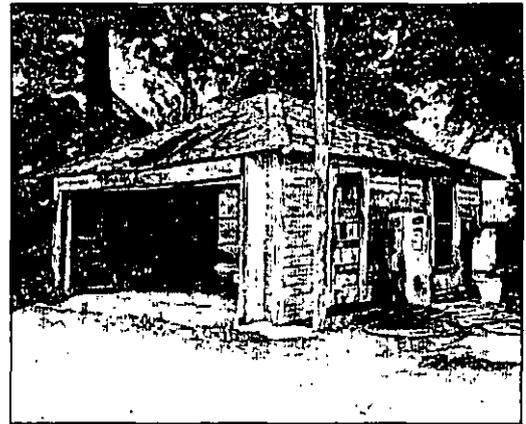
Garage, Washington Township, Franklin County, c. 1920-35. This building may have originally been a carriage house. Site 055-WA-003.



Garage, Heidelberg Township, Lebanon County, c. 1930-50.



Garage, Heidelberg Township, Lebanon County, c. 1920-40. The garage style door is a later addition. Site 075-HE-004.

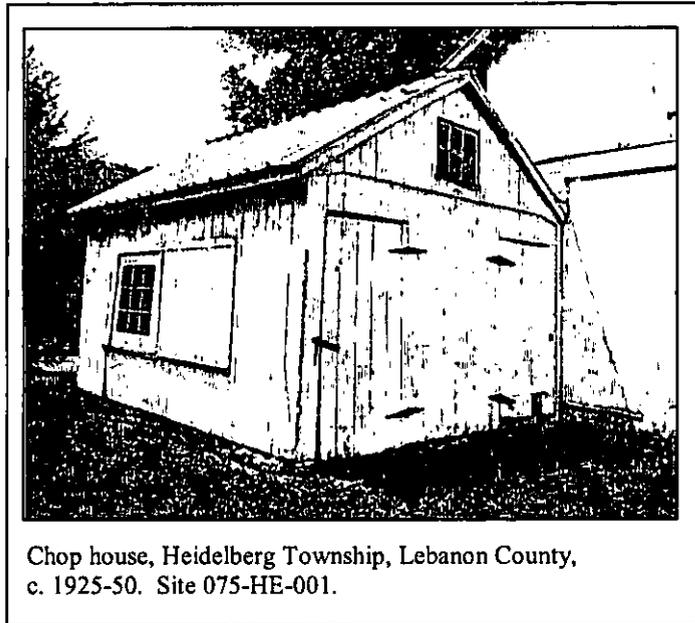


Garage, North Cornwall Township, Lebanon County, c. 1930-50. Site 075-NC-001.

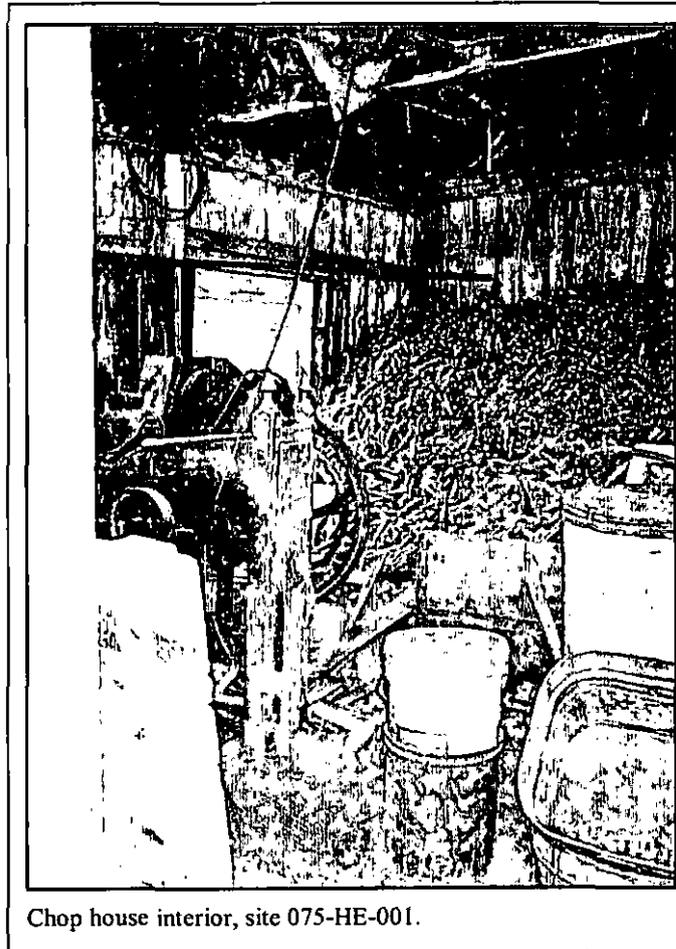
Less Common Outbuildings and Structures, 1900-1940

In field and archival research, other buildings and structures were encountered infrequently. They are not “representative” of farmstead architecture in the Great Valley in the sense of being typical buildings found on a majority of historic farmsteads. Yet they do illustrate important, region-wide trends in Great Valley agriculture in this period, so they are described here.

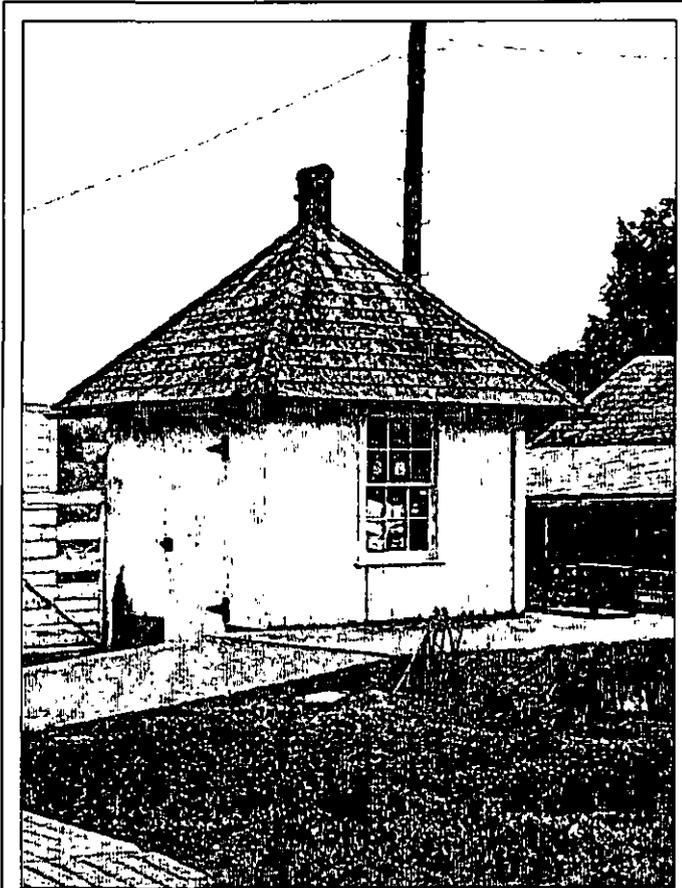
Chop house: A “chop house” was documented in Lebanon County. This was a small, frame gabled building with two gable-end hinged doors opening in opposite directions. The chop house was sited at the end of the barn’s gable-end shed-roof extension, at one corner of the barn yard. Here a hammer mill attached to a tractor belt chopped feed for the family’s dairy cows and steers. According to an interview with the current owner, the family kept dairy cows and sold milk to the Hershey Company; and they fed a dozen or so steers (oats, corn, wheat, barley, and hay) and sent them to the Lancaster Stockyards and to a local butcher. Corn cobs were chopped to provide litter for the several hundred chickens kept by the informant’s mother, who sold eggs to a traveling huckster. Though the chop house was an uncommon building, it related directly to important livestock enterprises in Great Valley agriculture of the time.



Chop house, Heidelberg Township, Lebanon County, c. 1925-50. Site 075-HE-001.



Pump House: On several farms, a well with pump was protected from the elements by a small building housing the pump itself and the well housing. Water for stock and humans was critical and so the pump house protected this important resource. Architecturally the pump house can be differentiated from other small outbuildings (milk houses, most notably) by its smaller size and by its location – dictated by the well’s site and not, as with milk houses, necessarily near the barn or roadside.

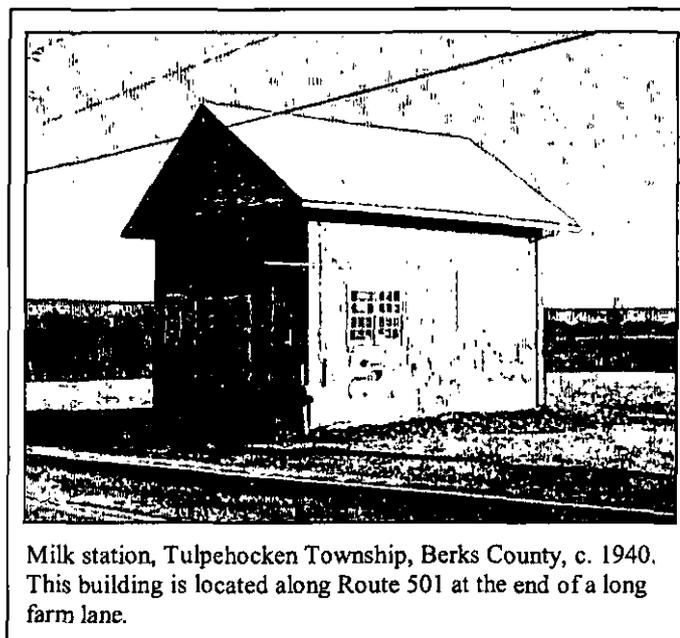
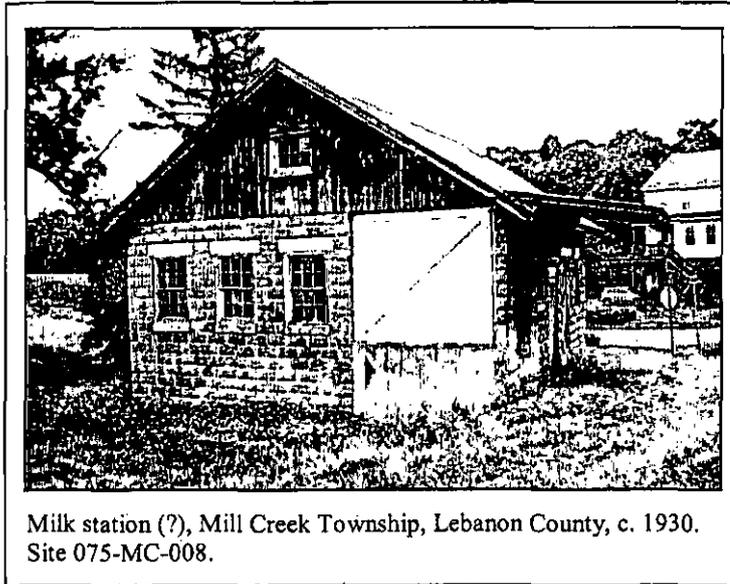


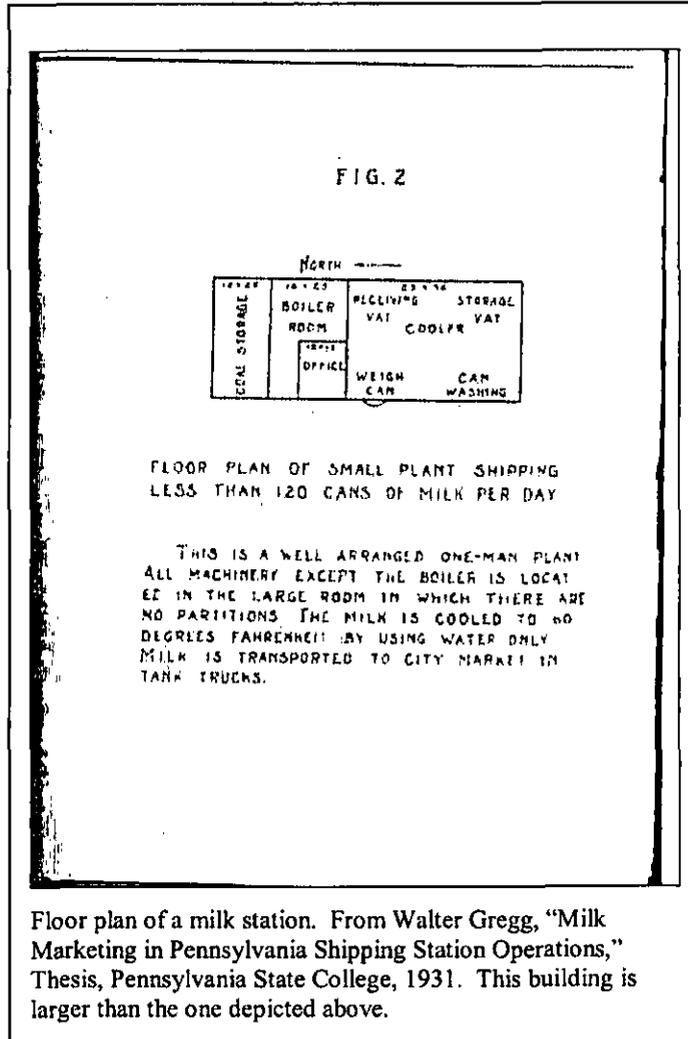
Pump house, South Annville Township, Lebanon County, c. 1930-40. Site 075-SA-004. This pump house function was given by someone familiar with the site. It sits on a concrete platform in the barn yard, about twenty-five feet from the barn forebay. This site also has a milk house, sited at the barn's gable end directly on the farm lane.



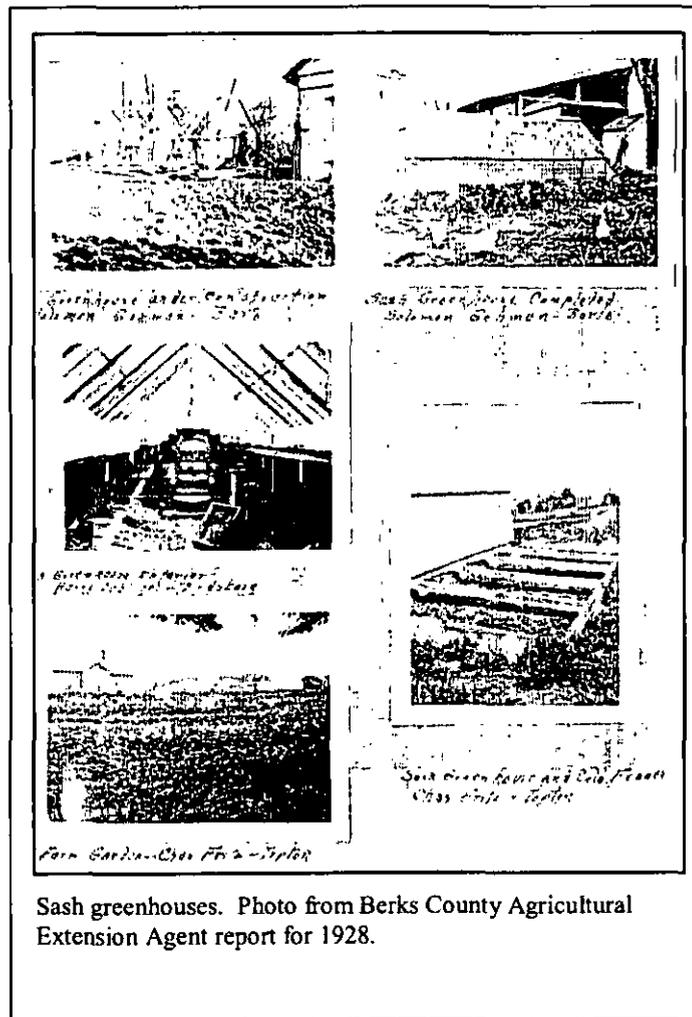
Pump house (foreground) and summer kitchen, Antrim Township, Franklin County, c. 1910-40. Note the small size, extended roof for added protection from the weather, and the location next to a summer kitchen.

Milk Station: Two sites (one in Berks and one in Lebanon County) had a building which has been tentatively identified as a milk station. A milk station was a building where farmers brought milk in cans. At the station it was weighed, tested, cooled, and held for shipment in refrigerated rail cars. The building depicted below had elevated receiving doors; ample light for work within; and a covered "pay" window where record keeping and paperwork could occur. A rail line once went past the building only a few yards away. State Route 501 runs past the Berks County station.

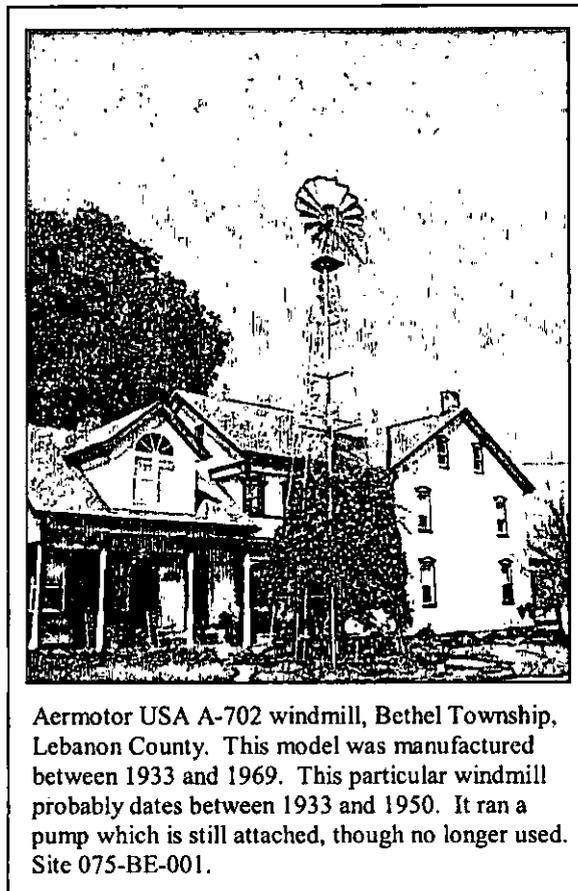
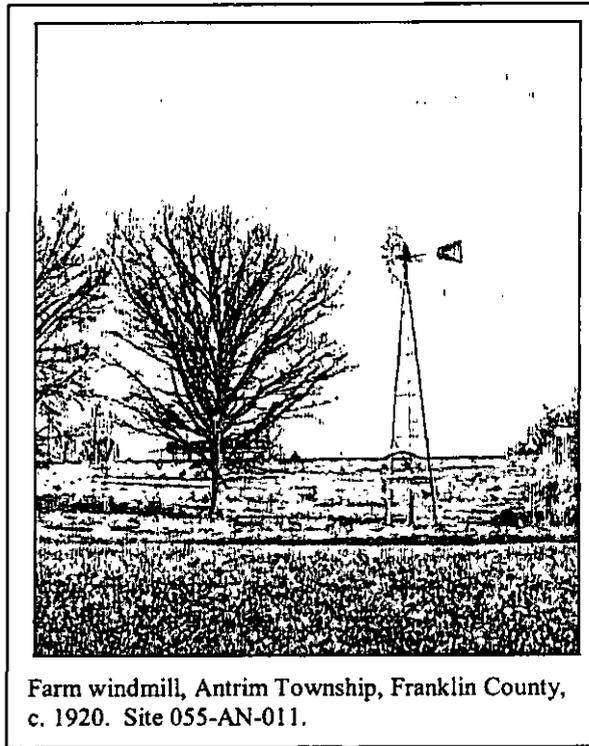




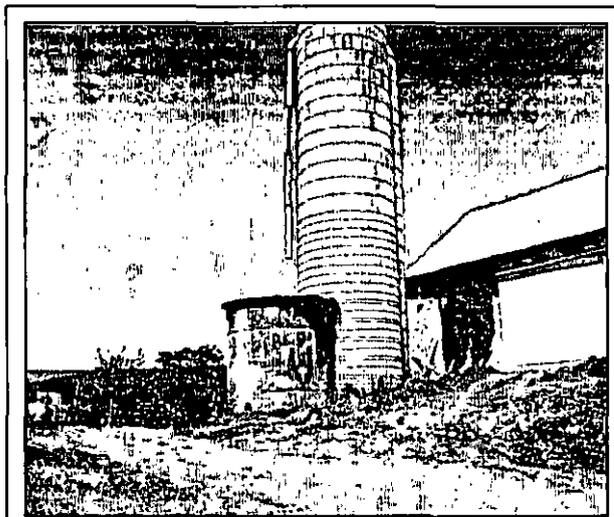
Sash greenhouse: The Agricultural Extension reports for Northampton, Berks, Dauphin, and Cumberland Counties all mentioned sash greenhouses in their reports, especially in the 1920s and 1930s. In Cumberland County, for example, the agent reported that a 10 by 30 "Plant growing house" had been erected on a farm owned by John Weitzel of Hampden Township. These small buildings would be used by truck farmers to raise vegetable plants from seed. They would have supported huckstering activity. None were documented in field study.



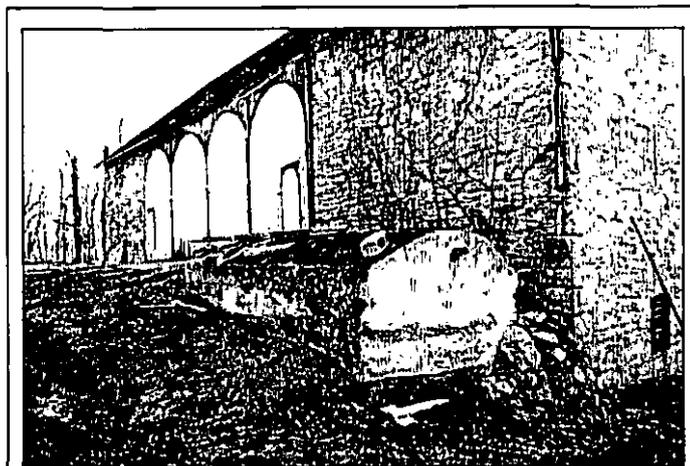
Windmill: Technical improvements in the late nineteenth century made windmills affordable on farms, and several twentieth century models were documented in field study. The farm windmill primarily provided power for such tasks as pumping water and running small equipment. Usually they were located near the house, but sometimes they were housed within the barn.



Cistern: Before electric-powered pumps provided running water, farm buildings were often equipped with cisterns designed to collect water runoff from a barn or house roof. Extant cisterns are not plentiful, nor are they always visible, but they do illustrate what probably was a common solution to obtaining water.



Cistern, North Newton Township, Cumberland County, date uncertain. Photograph by Susan Cabot.



Cistern, Antrim Township, Franklin County, early twentieth century. Site 055-AN-005.

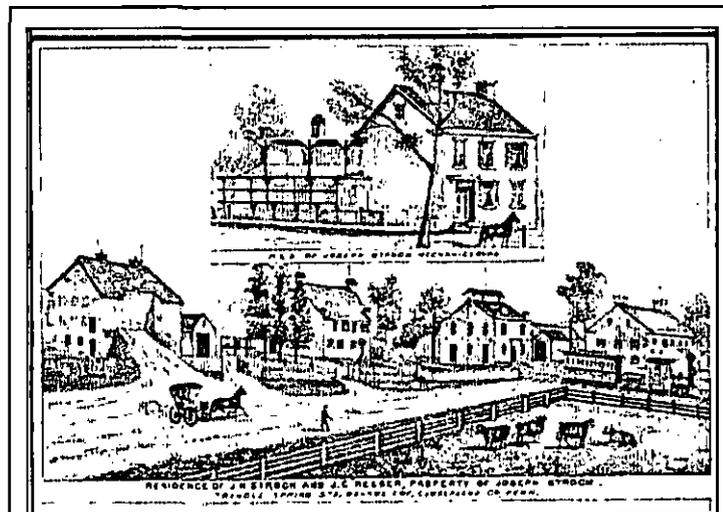
Landscape Features, 1900-1940

Farmstead landscaping: During this period, landscaping on the farmstead grounds began to receive more attention. Winslow Fegley's Berks County photos from the early twentieth century, for example, show houses and vegetable gardens surrounded by picket fences. Few if any of these fences survive, but some large evergreen and deciduous shade trees planted in this era still remain.⁹⁵ Lawns began to appear, further setting the

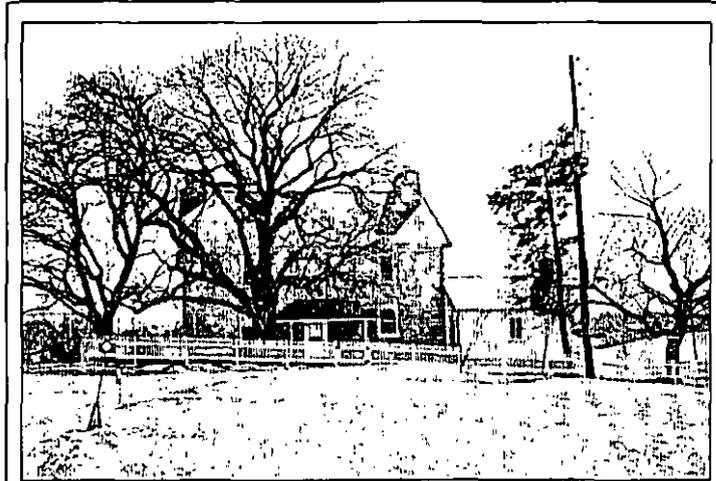
house apart from the other farmstead buildings. The traditional Pennsylvania German garden was organized into squares separated by boarded walks. These features are long gone.



Farm house with shade trees, Antrim Township, Franklin County. Date unknown. Site 055-AN-001.



Strock farm, Cumberland County, showing picket fence, farm lanes, yard trees. From Conway Wing, *History of Cumberland County, Pennsylvania* (Philadelphia, 1879), 221.



Farmhouse with shade trees and picket fence, Straban Township, Franklin County. The fence is new, but the trees are mature. Site 055-ST-003.

Allées: Two different sites documented in field study featured deliberately planted, equally spaced rows of trees on opposite sides of a farm lane. These “allées” created a distinctive landscape feature.



“Allee” of deciduous trees, Antrim Township, Franklin County, date unknown, but probably about 1940-50. Site 055-AN-008.



"Allee" of deciduous and evergreen trees, Antrim Township, Franklin County, date unknown, but at least some of these trees appear on the 1938 aerial. Site 055-AN-010.

Orchard: Despite the troubles facing fruit growers, orchards were still very common in the early twentieth century. Some sources note that fruit trees were planted along field boundaries and hedgerows. More visible on historic aerials and in the contemporary landscape is the traditional orchard planting of regularly spaced trees.

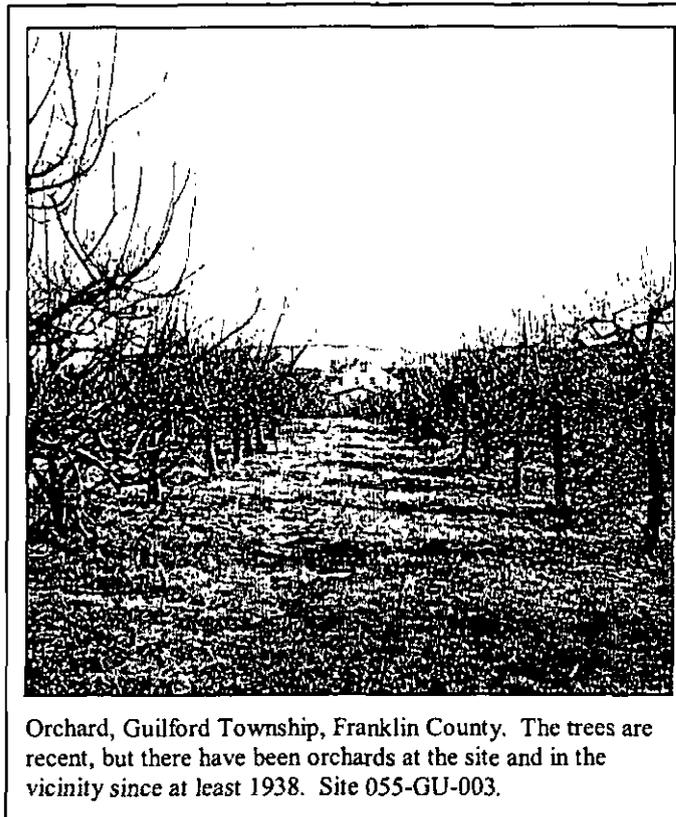
*Raspberries - Eleven Acres
Geo. Falweiler, Kempton*

some year later at the nearest "Y and W"
Representatives of the
YAWMANSON FIRM
WILKES BARRE, PA.
BROADWAY, 13th FLOOR
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301 #2

Orchard planting (lower right), 1939 Berks County agricultural extension report.



Orchard, Guilford Township, Franklin County. The trees are recent, but there have been orchards at the site and in the vicinity since at least 1938. Site 055-GU-003.



Tatamy, Forks Township, Northampton County, PA, 1938 aerial. Large and small orchards are scattered throughout the area, but they are most numerous in the lower right quadrant of the photo.

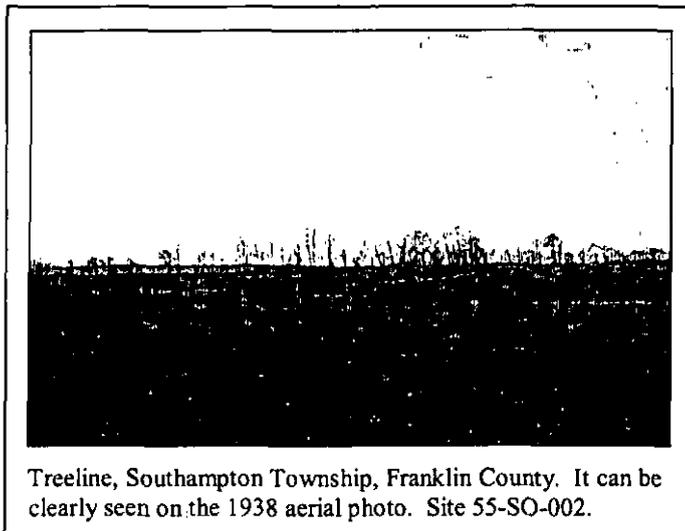
Field patterns: Pasture and woodlots took up a small percentage of farm land in the Great Valley. Larger scale farm machinery sometimes occasioned the removal of field boundaries and consolidation of smaller fields into a single large one. Crop rotation systems still dictated multiple small polygonal fields, divided by hedgerows, fences, or treelines. Though the agricultural extension agents frequently discussed contour plowing and strip cropping during this period, the aerials show almost no evidence for contour plowing. Neither is there much evidence for strip cropping; though many long, narrow strips appear, they are not repeated. This suggests that they were part of traditional

rotations rather than some systematic plan for strip cropping. Treelines were prominent in the Great Valley as dividing devices between the crazy quilt of open fields.

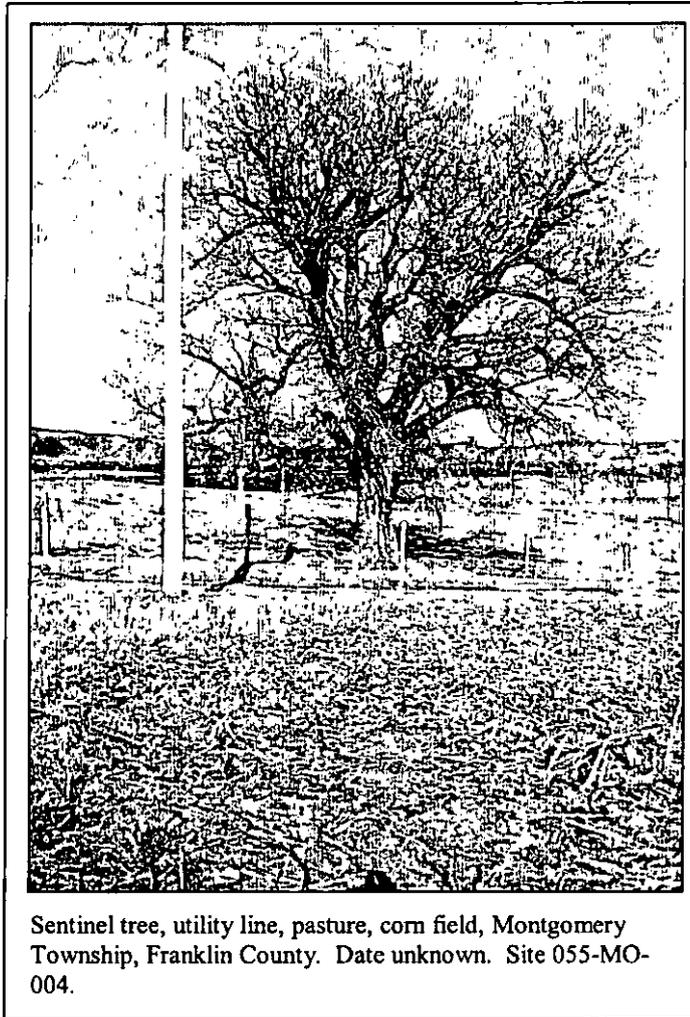
Farm forestry: the agricultural extension reports of the period for Berks County mention very extensive forest plantings using seedlings provided by the Pennsylvania Department of Forestry. In 1933 the Berks County agent wrote that "The seedlings planted since 1921 "cover about 6,000 of the 25,000 waste acres reported in the census of 1920...This year 97 planters set out about 1/4 of a million seedlings secured from the state." In 1939, he noted that "the state record shows 531,900 seedlings sent to the County this year, of which number 290,000 were planted on farm woodlots, by 108 planters, and 241,900 on water sheds and game reserves, planted by 10 planters." The accumulated impact of these plantings must have been significant, unless drought killed many trees. Possibly these plantings were not in the most level areas of the Great Valley, but they definitely were within the boundaries of Great Valley counties.



Treeline and "sentinel" tree, Montgomery Township, Franklin County. The treeline and lone tree can be clearly seen on the 1938 aerial photo. Site 055-MO-002.

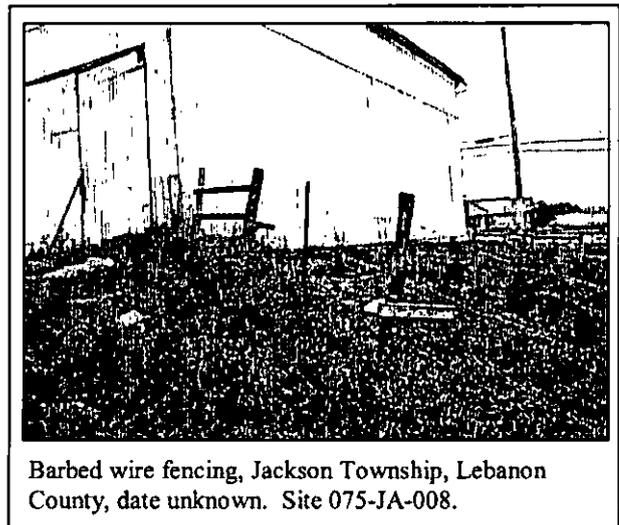


Treeline, Southampton Township, Franklin County. It can be clearly seen on the 1938 aerial photo. Site 55-SO-002.



Utility lines were a new landscape feature in the rural Great Valley.

Fencing: Barbed wire came into use toward the end of the nineteenth century and still can be found in the Great Valley. Fegley's photos show that wood "worm" and board-and-rail fences were still used in the early twentieth century, but these do not remain in the landscape.



1940-1960: Specialization, Petroleum-Based Production, and Off-Farm Labor

A relentless cost-price squeeze during and after World War II shaped many farming trends. Competition intensified within a global marketplace. Urban sprawl exacerbated stresses on farms. The decline in farm numbers and increase in average farm size both accelerated. Farming rapidly became more capital intensive, large-scale, mechanized, science-driven, petroleum dependent, and specialized. Diversity of production and processes declined. Consumption replaced investment of time and labor for household *food production*. *Off-farm work continued to play an important role in the farm economy.*

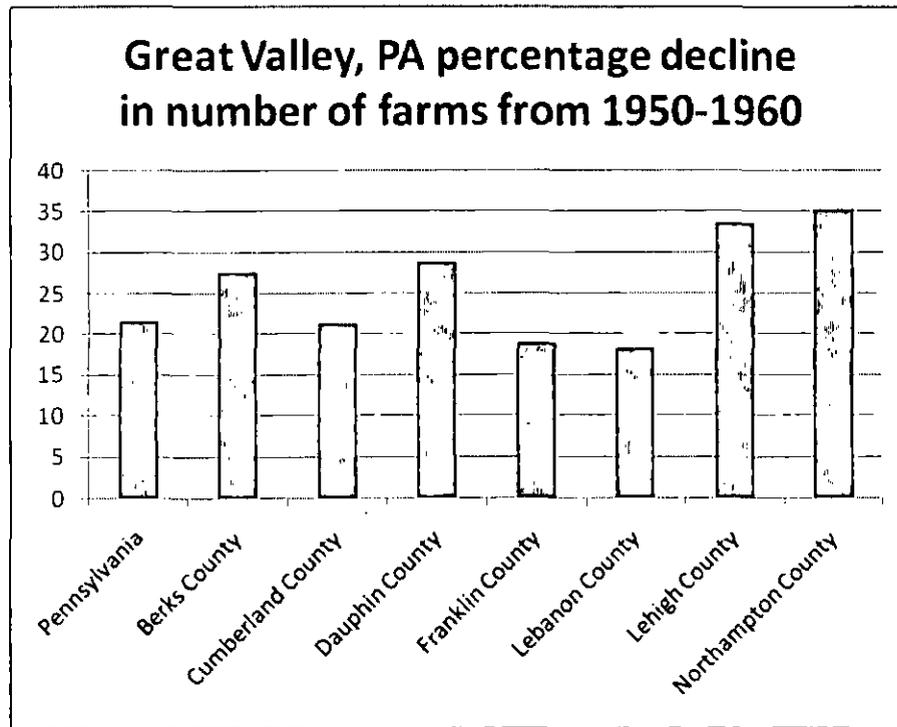
Products, 1940-1960

The Second World War period brought fundamental changes to farming in the Great Valley. The agricultural extension agent annual reports give a picture of the key changes. Capital investments rose rapidly for cattle, feed, equipment, fertilizer, pesticides, sanitation equipment, and labor. Expenses rose as milk companies switched to bulk tanks and sanitation regulations tightened. The Berks County agricultural extension agent wrote in 1959: "Economically the dairy industry in Berks County is the highest source of farm income...Pipe line milkers, loose housing, milking parlors, bulk milk tanks, automatic gutter cleaners, and silo unloaders enable one man to take care of more animals and produce a better quality product than ever before." Purebred livestock, artificial insemination, hybrid crops, and petroleum derived fuel, plastics, fertilizers, and pesticides all boosted productivity, but raised costs. Meanwhile prices for farm commodities did not keep pace. Indeed, with productivity rising so rapidly, surpluses accumulated and prices sometimes even dropped. This cost-price squeeze forced out all but the biggest and best capitalized farms. As the Northampton County agricultural extension agent explained in 1959: "Lower farm prices for farm products has produced a very tight cost squeeze for the farmers. A definite trend toward the operation of larger units either owned or leased is continually underway. This trend necessitates more careful planning and better over-all farm management."⁹⁶

These trends occurred everywhere. Indeed, a hallmark of the post 1940 Great Valley agricultural economy is the extent to which it was so much more shaped by forces beyond the local or regional scale. Of course, farming had never been completely local; after all, Great Valley farmers had been eager to sell on the global market already in colonial days. The change was not in the fact of global impact, but in the proportion and extent of it. The economic environment for mid-twentieth century agriculture challenged the viability of small scale diversified regionally oriented farms. Great Valley fruit and vegetable growers struggled to compete with inexpensive produce trucked in from California and the Pacific Northwest. Dairying was still geographically constrained to some extent, but even so the “milk sheds” were larger than before and milk prices low because of overproduction. Poultry farming faced stiff competition from the rapidly developing Delmarva peninsula and Lancaster County.

In the Great Valley, urban and suburban development exacerbated challenges posed for agriculture. In 1958 the Cumberland County home economics extension agent noted that “Cumberland County is fast moving from a rural county to an urbanized one.” The Berks home economics agent lamented that there “Many farming areas are becoming suburban housing developments.” The pressure was not as great as in the immediate vicinity of Philadelphia, but it was still perceptible.

All of these factors combined to result in a steady drop in farm numbers. In Berks County, for example, there were 4,337 farms in 1950 and just 3,138 in 1960 – a 28 percent decline in a single decade. Because of their relative isolation, Franklin and Lebanon Counties were less hard hit than the others; suburbanization in the Allentown/Bethlehem/Easton and Reading areas was probably greater. Even Cumberland (despite the home economists’s statement) had not yet become suburban Harrisburg.



As farm numbers dwindled, the remaining farms specialized more heavily. The percentage of income from dairy cattle rose during the 1950s, in many cases to over half. This was true throughout the Great Valley. The postwar period witnessed the final dominance of the Holstein cow, perpetuated through artificial insemination. All but the prize bulls were redundant now.

By 1960 poultry farming was a much larger scale business than it had been before, and in most Great Valley counties (for example Northampton) it accounted for the second greatest portion of farm income and (in many individual instances) the top income generator.

Swine production continued in the Great Valley. There seems to have been a geographic differentiation within the valley; in Cumberland, Franklin, and Dauphin Counties in 1960 the average farm had ten or more hogs, while further east the numbers had declined markedly, down to only supplying household needs. Where swine were still produced, it seems that neighbors, local butchers, or farmers' markets were being replaced by packing houses and large-scale auction organizations. For example, the Cumberland county agent noted in 1960 that "the swine industry is on the increase in the county, due to demand of

packers for local fed animals, and due to the feeder pig sales started in the State within the last few years. Increased requests were answered on farrowing house and other swine building construction.”

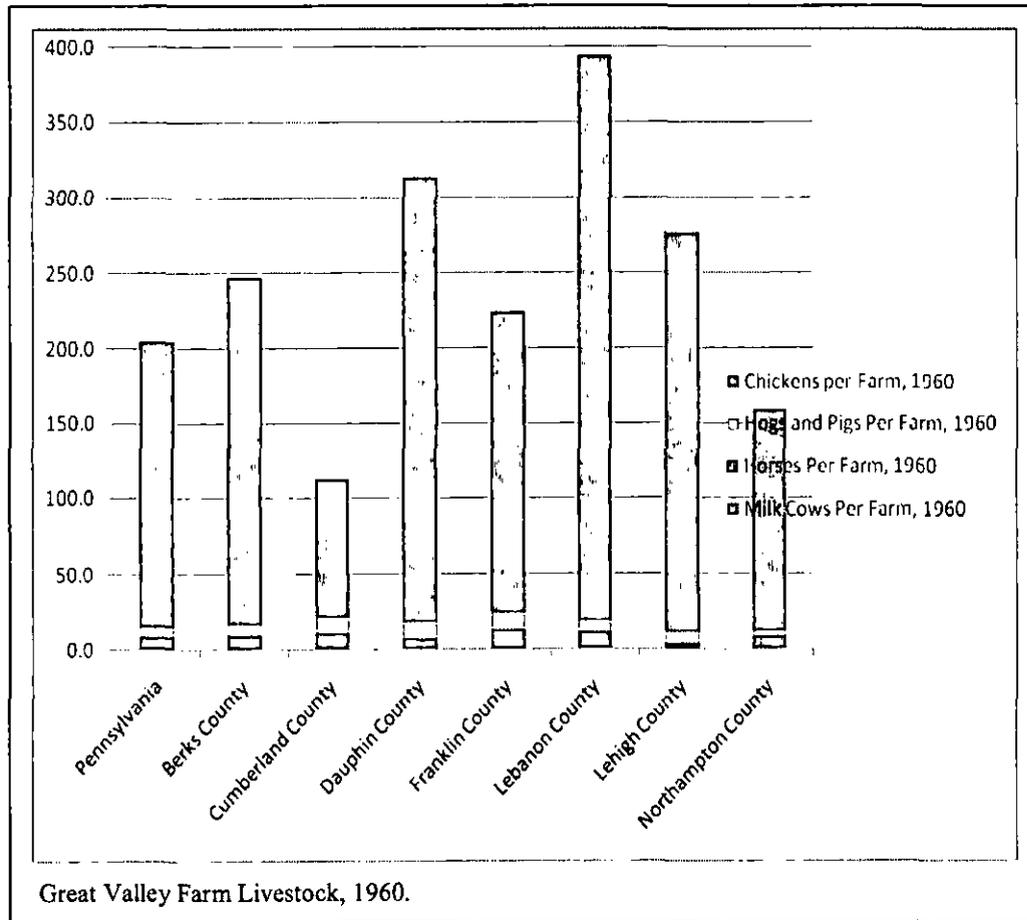
The horse was now disappearing quickly. Even so, many farms still had horses. On average in 1960 most Great Valley counties had between .3 and .6 horses per farm, so it seems reasonable to assume that every second or third farm still had a team.

Crop farming – now mainly wheat, hay, and corn – was still important, especially west of the Susquehanna. Hay and corn were still fed on the farm, mainly to dairy cows. The old crop-and-livestock cycle was fraying, though. Per-farm acreage of wheat, oats, and minor grains had dropped drastically since 1927, while corn and hay increased. More and more feed and fertilizer were being purchased from off the farm.

During a brief period in the Second World War era, cannery crops were intensively produced. However, as the national and global transport grid delivered vegetables from afar, Great Valley truck farmers ironically found it difficult to compete, and by the mid-1950s this activity waned.

Family subsistence activity diminished. Families still kept gardens, butchered, and sold produce in local markets; but purchased food accounted for a higher proportion of the diet. Home canning did not disappear overnight but slowly declined. Freezing home grown foods became popular.

The net effect of these trends was to change the face of farming. It was no less complex than before, but required quite different types of expertise. In place of a broad general knowledge, farm operators needed more technical knowledge about fewer products, and they had to have sophisticated financial skills.



Labor and Land Tenure, 1940-1960

In the Great Valley between 1940 and 1960, the percentage of farms reporting hiring labor fluctuated. Census respondents were asked if they hired labor in the week preceding the enumeration, so seasonal variations would distort the figures on an annual basis. In any case, no more than a third of farms reported hiring labor, so it seems reasonable to conclude that only a minority of farms used hired workers, and that labor was mainly hired on a short-term basis rather than by the year.

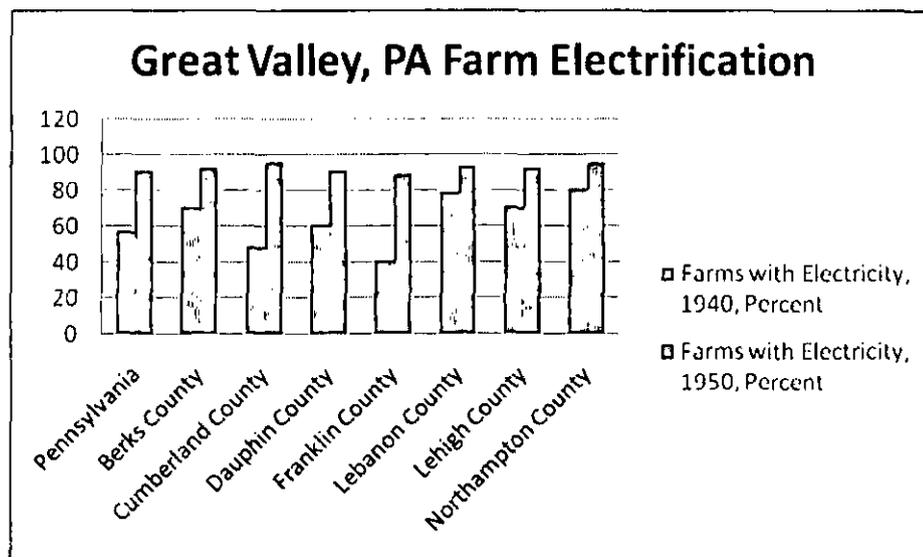
During and immediately after the Second World War, farm labor shortages were acute in the Great Valley. Farm labor needs were filled through improvisation. High school students, Conscientious Objectors, Prisoners of War, "independent migratory workers," migrants from the Bahamas and Jamaica on government-sponsored programs, Puerto

Ricans, and even “vacationists” worked on Great Valley farms. They harvested potatoes, picked fruit, ran farm machinery, and performed other farm chores.

Most work was still done by the farm family. During the war, household labor patterns changed, as teenaged girls filled in for their absent brothers and fathers by driving tractors and operating farm machinery. The Berks County home economics extension agent noted in 1945: “The problems of rural families were quite similar all over the county. A shortage of farm help meant that the farm women and girls were needed to assist with outside work in the field and barn. Nearly all the farm family vegetable plots are part of the homemakers’ responsibilities but with the shortage of labor, more women assumed the jobs in connection with: 1. Raising Poultry 2. Caring for the Dairy Herds. This meant longer hours outside the home and less time for the usual tasks of homemaking.”

An important aspect of the rural economy during this period was off-farm labor by farm operators. Between 1940 and 1960 the percentage of farm operators who reported working off the farm fluctuated quite a bit, from around a third to as much as half. Some of the swings may be attributed to changes in information-collecting; in 1960 sampling techniques may have been skewed toward larger-scale commercial farms. This would under-report for the very farms on which off-farm labor was most crucial. As well, it is important to note that the statistics may underestimate the impact of off-farm labor because they tally employment by farm *operators*, and usually this meant the male household head. Yet, women’s employment was increasing during the postwar years and ultimately would come to play a big role in supporting farm household income. For example, in 1952 the Cumberland County home economics extension agent noted extensive off-farm labor by women in her constituency. The Berks County home economics extension agent noted in her 1956 report that “Small knitting mills, shirt factories, etc. have sprung up and both rural and farm women have gone to work. It is not unusual for a farm woman to work the 6 to 2 shift, then go home and do her housework and help with the farm chores.” No quantitative data on farm women’s off-farm labor were available until much later.

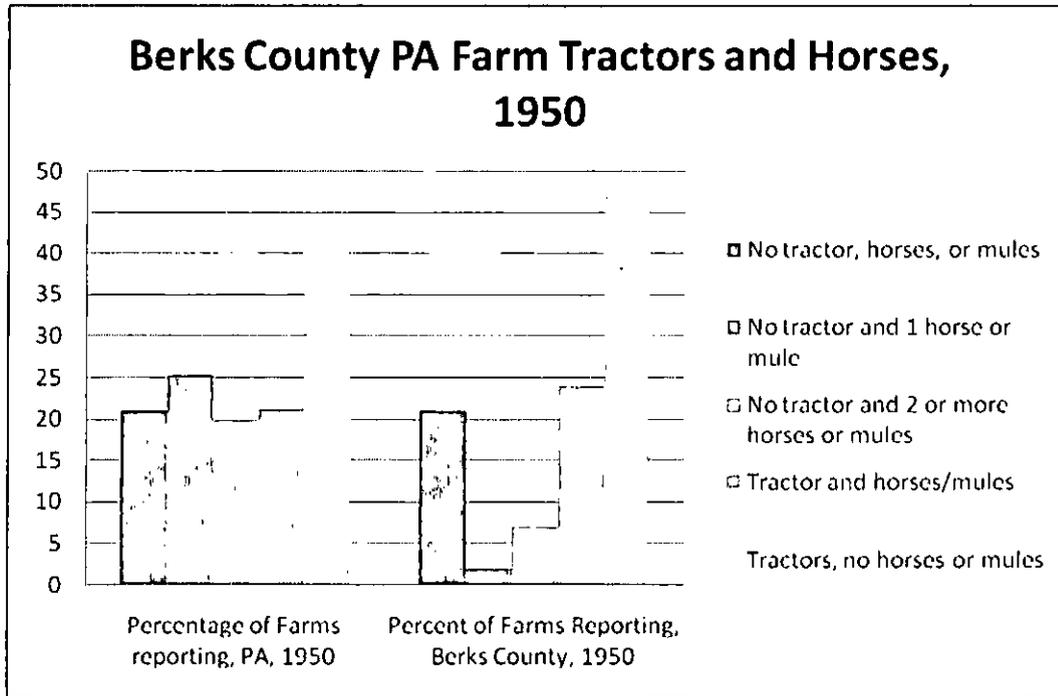
All in all, there was an unmistakable trend for households to supplement farm income with off-farm employment. Off-farm labor continued a longstanding tradition of combining farming with other income-generating activities; commuting and working for wages differentiated it from earlier artisan or trading activity.



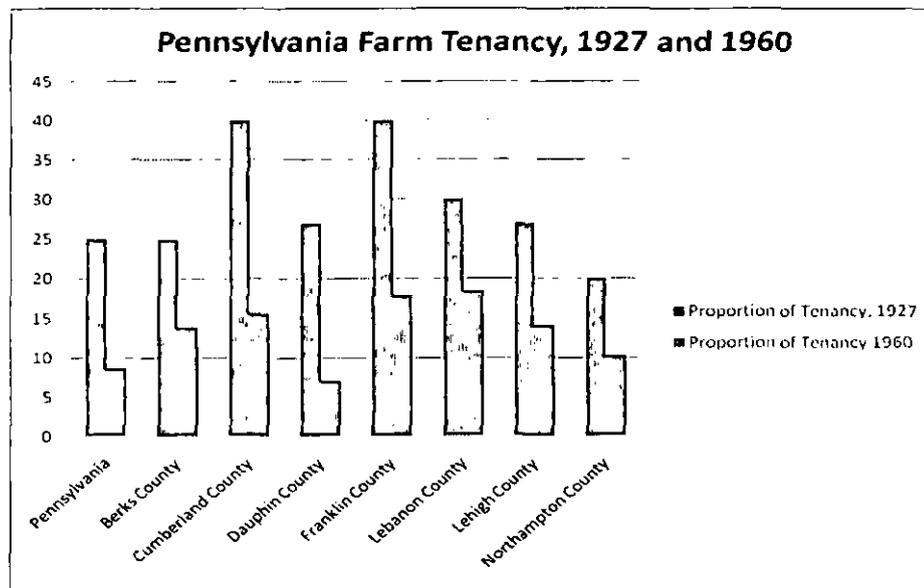
Labor-saving technologies were much more common than before 1940. Electrification approached one hundred percent. Indoor plumbing, home freezers, and other appliances became much more common. Scholars have debated the relationship of farm women to the new technologies. Katherine Jellison, for example, has argued that farm women resisted the agricultural establishment's attempts to promote an urban middle-class gender model.⁹⁷ Others have argued that "domestic" technology created labor rather than saving it. On a raw, day to day level, though, basic amenities like running water and electric lighting indisputably saved both time and physical effort for all rural household members.

The fossil-fuel revolution was now in full swing. Numerous new farm machines rapidly reduced the need for human or animal muscle power. Even so, adoption was uneven. The chart below shows 1950 patterns in one county – Berks, the Great Valley county with the largest number of farms. Notably, a fifth of farms lacked either tractors *or* horses. Presumably these were mostly small or part-time operations. Berks County farms were more highly mechanized than in the state as a whole; over 45 percent had

dispensed altogether with draft animals. Yet another 25 percent combined tractor power with animal power. In a telling move, though, by 1960 the agricultural census no longer linked questions about horse numbers with tallies of tractors.



Farm tenure patterns had changed significantly. Tenancy rates had fallen from previous highs, both in the Great Valley and throughout the state. Likely the general drop in tenancy was because the “agricultural ladder” – the series of steps from farm hand to tenant to owner – had broken down. Thus a decline in tenancy is not necessarily a positive sign; it means that one means of access to land was closed off.⁹⁸ In the Great Valley, another factor may have been that the traditional system of kinship-based share tenancy did not work well with increased capital requirements and a shift away from reliance on crops.



Buildings and landscapes, 1940-1960

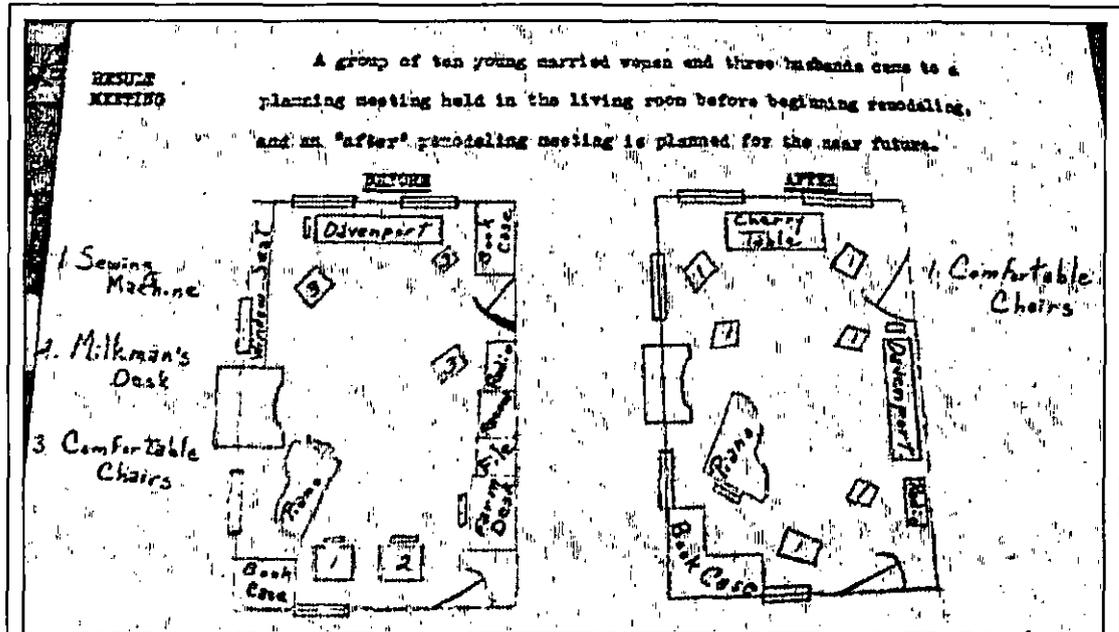
Houses, 1940-1960

Few new farm houses built during this period were documented in field study.⁹⁹ After building supply shortages eased, home economics extension specialists chronicled a wave of renovation activities. In 1944, for example, the agent in Northampton reported that "Four result kitchens have been carried on during the past year, three of which are completed and the fourth in the process of completion. Mrs. Vernon Hester made plans for remodeling her kitchen in 1948. Because at that time the money was needed for other purposes, the kitchen plans were shelved. Again this year Mrs. Hester began working on plans for her kitchen and carried through. Improvements included hot and cold water in the kitchen, sink, new cupboards, new gas stove, new linoleum, heating unit, a lavatory, and improved lighting at work centers." A Mrs. Whitaker installed an electric stove, moved her refrigerator from dining room to kitchen, and put down new linoleum. Mrs. Weidman at Stone Church got a new sink, new counter space, and rewiring for electricity. Painters from town painting the house said "Your kitchen is nicer than they have in towns."¹⁰⁰ Extension specialists worked with these projects, but probably many other similar ones were being undertaken.

The Northampton home economics report for 1945 contained valuable information about rural housing. It is not clear whether these conditions were typical, but the results are

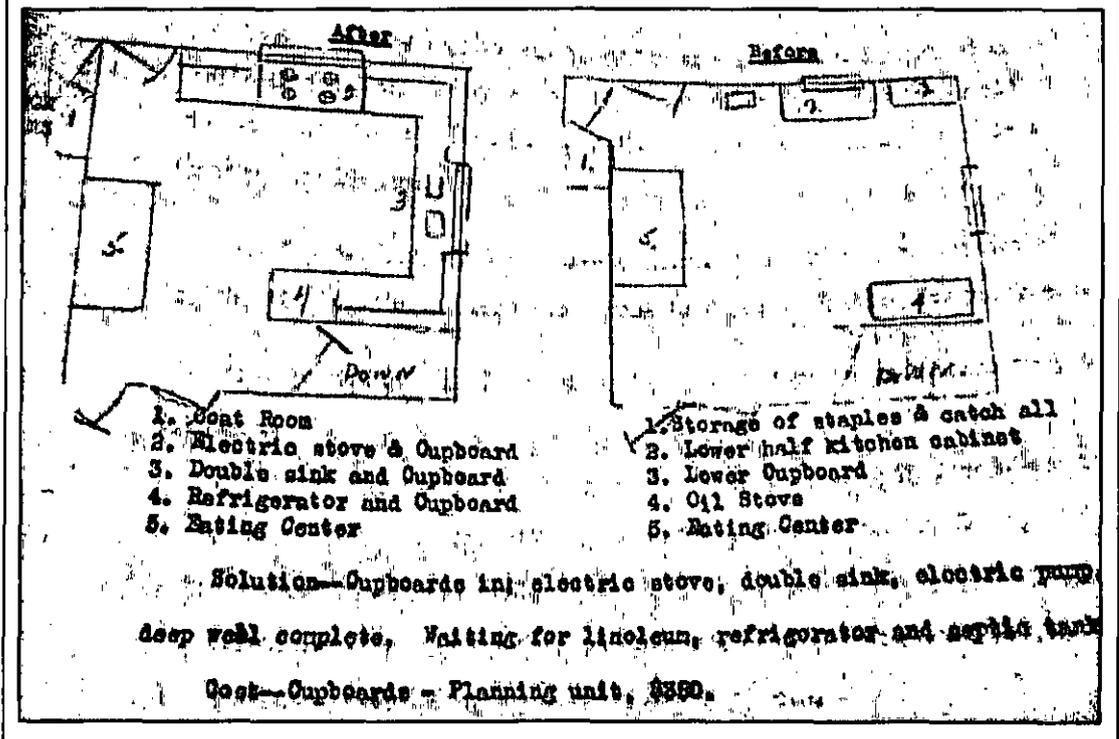
notable nonetheless, because even at this late date a survey in a fairly prosperous Great Valley township showed that many families still cooked and heated with wood, and some even lacked hot running water.

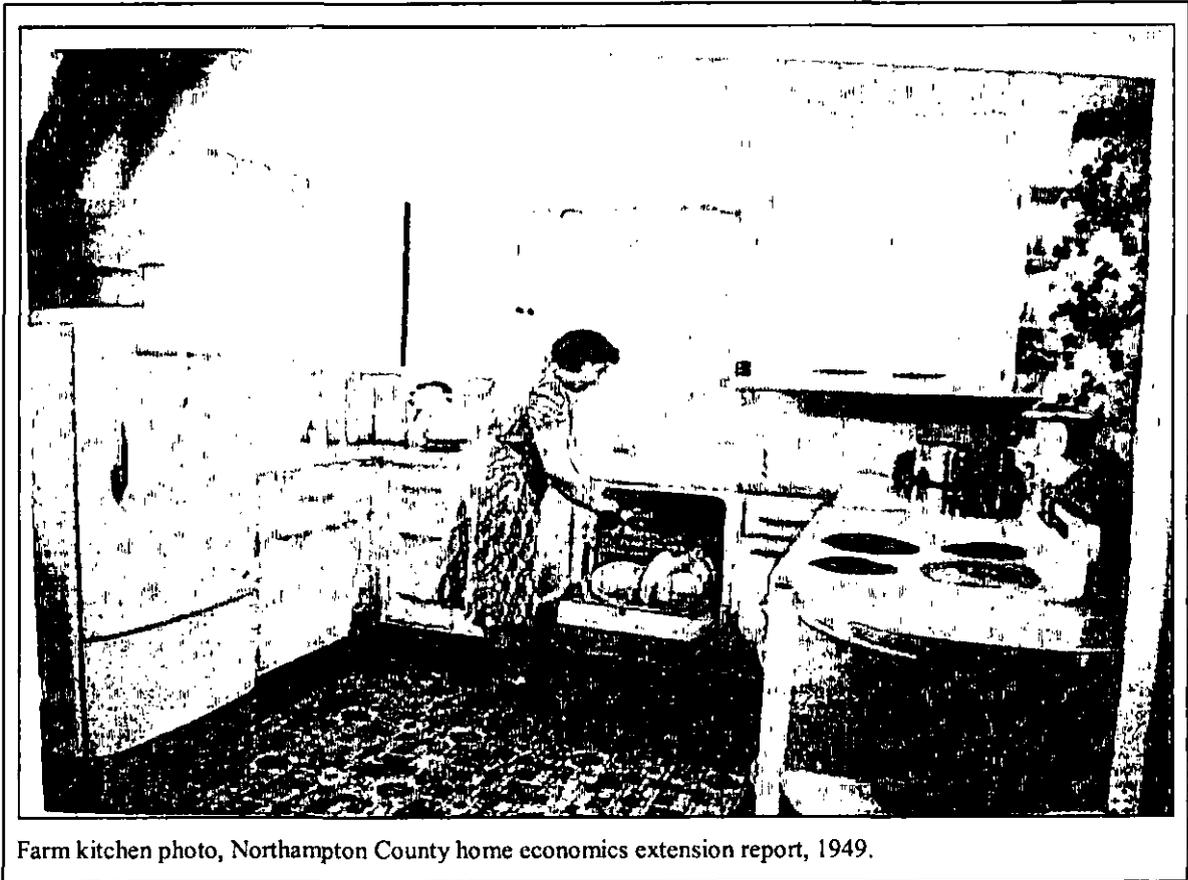
A summary of the 25 kitchens [surveyed in Mt Bethel] shows that the average family...consists of four people living in six rooms. The average kitchen has three windows and four doors. Seventeen families have built-in cabinets in their kitchens, 18 have electric refrigerators. Fifteen homemakers work on kitchen tables while 9 on cabinets. Eight women cook with coal, one with oil, three with bottle gas, while six use electricity. The rest use combinations of wood and coal. The families are evenly divided on kitchens and dining rooms. Twelve have kitchens and dining rooms together, while 13 use separate rooms. Only four homemakers take care of milk equipment in the kitchen. The other 20 have special milk houses. Only nine families do the family wash in the kitchen, the remaining 15 have laundry rooms. Twelve women can sit when they work because they have kitchen stools. The nine others do not have stools. There is lots of carrying of wood and ashes because 13 use stoves only, while 12 have a furnace. In most of the homes, the water does the running because 19 have running water under pressure and 5 have pitcher pumps at the sink, while 24 have kitchen sinks. Fifteen get their water from a drilled well and have a good supply while nine have cisterns and must use water carefully during dry spells. Running hot water is a joy in 16 homes. Nineteen families' homes are lighted with electric from the power plant. Five use gasoline and kerosene, while one uses kerosene.¹⁰¹



Above: Living room designs, 1945. Note that the "after" (approved) design has eliminated the farm record center and desk, and the milkman's desk, thus removing "farm" and finance-related spaces and making the room more "domestic."

Below: Kitchen designs, 1949. Modern appliances and counter spaces are new, but the "eating center" remained.





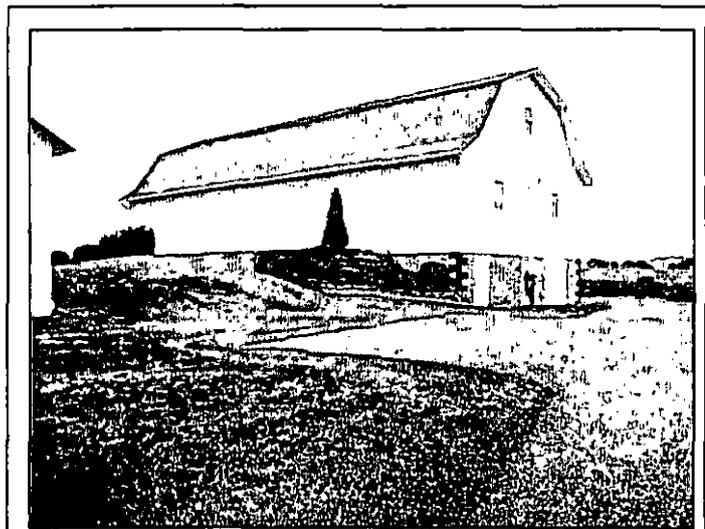
In Lebanon County, the percentages weren't too different; 95 percent had electricity, just over half had telephones, 70 percent had running water, and only 60 percent had bathrooms.¹⁰²

Barns, 1940-1960

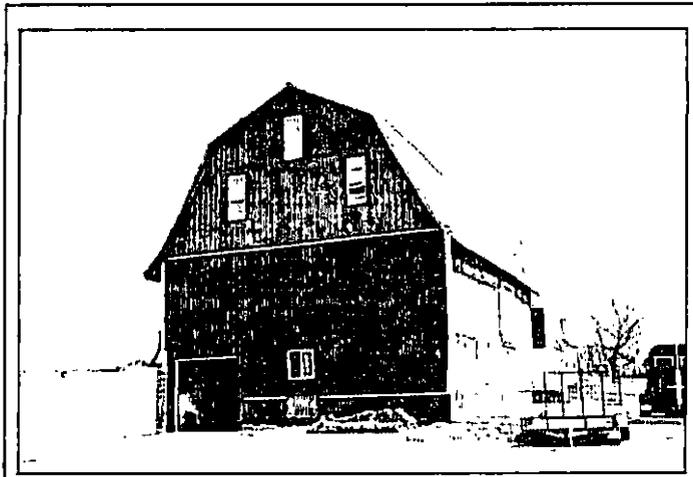
Adaptations to earlier Pennsylvania forebay bank barns continued in this period. Poultry adaptations continued to be made. Typical dairy modifications include cementing floors; substituting metal stanchions in lengthwise rows for crosswise wooden stalls; separating pigs, horses, and cows more carefully; installing rows of windows in the basement wall; and installing ventilation systems. In Dauphin County, for example, the 1950 agricultural extension agent report mentioned creating "maternity stalls" in barns, to prevent spread of infection to newborns. Some were installed where bulls used to be, now that artificial insemination rendered them redundant.

In surveyed properties, the most common barn built new in this period was the stable barn. A stable barn is a type of twentieth century barn whose essential characteristics consist of ground-level stabling, usually in the form of stanchions for dairy cattle, accessed by a gable end opening and separated by a lengthwise aisle, and served by ample hay upper-level storage space created by a round or "Gothic" roof, or a gambrel roof. The barns are well-lighted with rows of windows along each eaves side. Usually they are built with twentieth century materials; rock face concrete block, cement block, and wood balloon framing are especially common. The original flooring is usually concrete as well. They were popularized through the national agricultural press, agricultural extension publications, and even commercial catalogues from companies like Sears, Roebuck and the James Manufacturing Company in Wisconsin. These barns, notably the bigger examples, reflect large scale dairy production, and a break from traditional forms and materials. The larger examples accommodated not only bigger herds, but larger Holstein cows and the huge amounts of feed they required. The twentieth century stable barn also represent a response to stepped-up state regulation of the dairy industry, which mandated (among other things) ample light, easily cleaned surfaces, no manure basement, and ventilation for dairy cows.

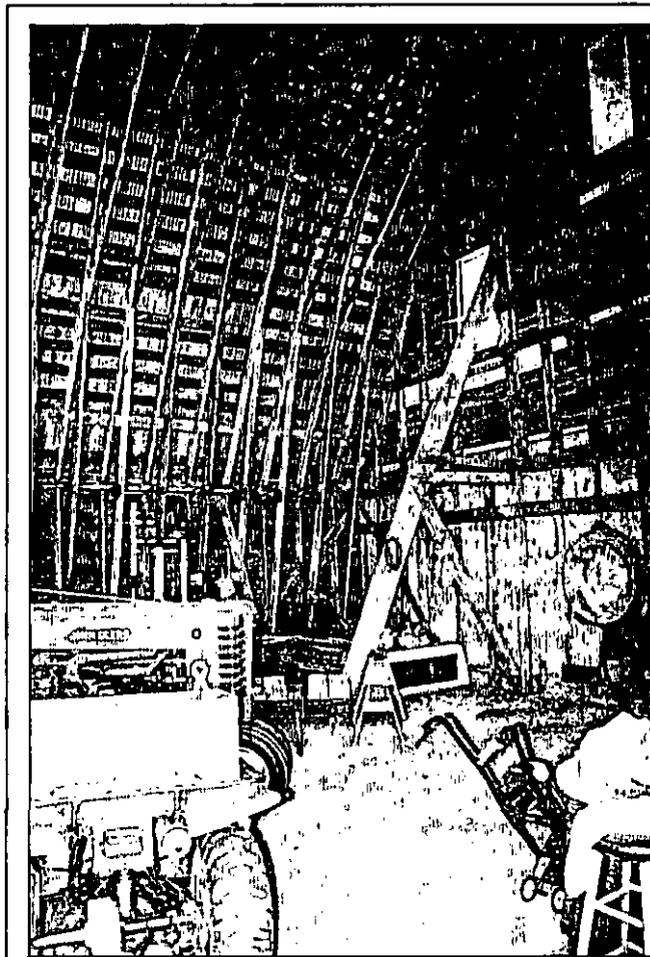
Stable barns made their initial appearance in the early twentieth century, but documented examples in the Great Valley tend to date after 1940. As elsewhere, the stable barn in the Great Valley reflects greater specialization in dairying, new construction technologies and building materials, and state regulation.



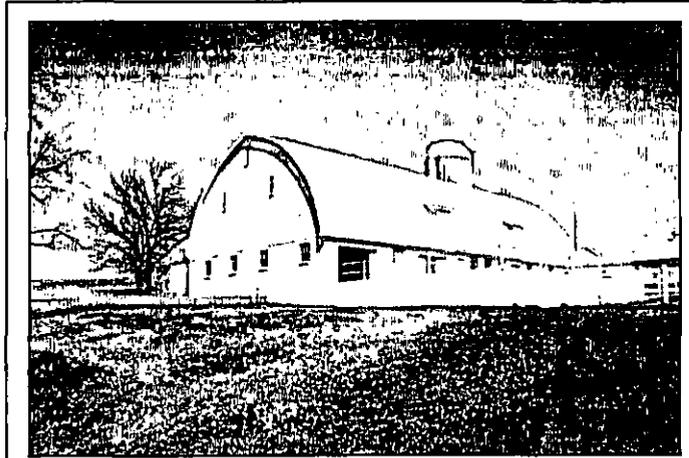
Pennsylvania barn transformed into a gambrel-roof stable barn, South Annville Township, Lebanon County. Original construction probably c. 1850; modified in the mid-twentieth century. Site 075-SA-002.



Stable barn, Lurgan Township, Franklin County, c. 1950. Site 055-LU-001.

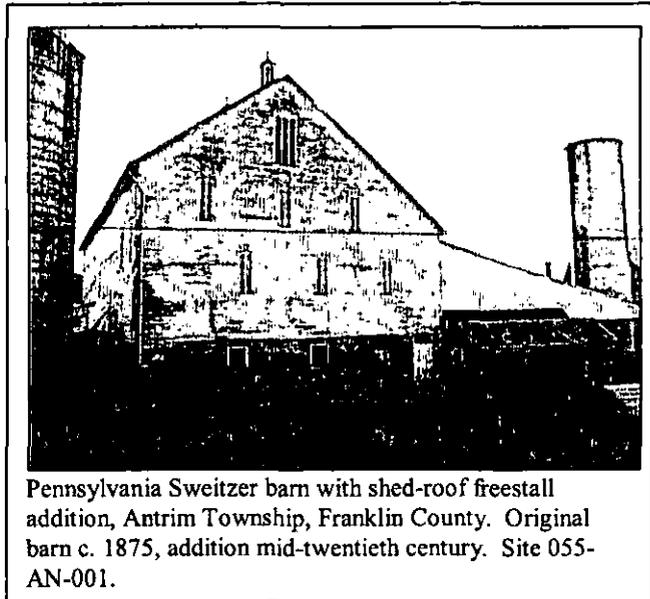


Interior framing, barn at site 055-LU-001. Note the light, short members and lack of posts.



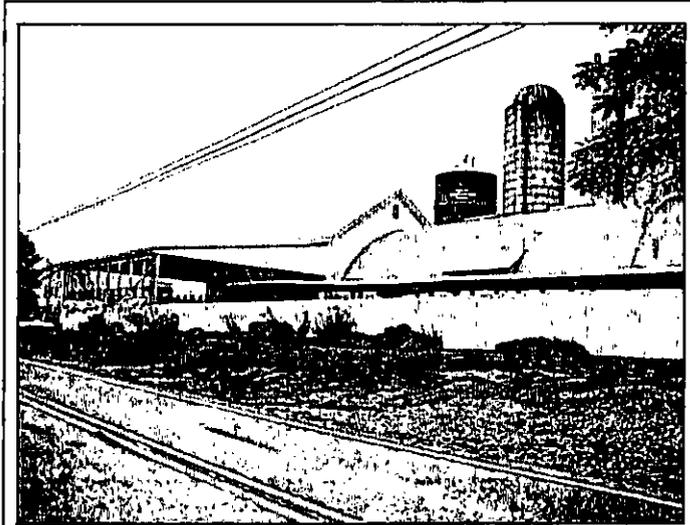
Stable barn, Straban Township, Franklin County, mid- to late twentieth century barn built on earlier stone foundation. This barn retains the barnyard wall characteristic of the Pennsylvania forebay barn, only it is built of concrete block and metal pipe. Site 055-ST-003.

Another type to appear after World War II was the freestall barn. Research at the University of Wisconsin in the early 1950s showed that cattle actually did better in these open, light structures than when they were confined in conventional stanchion arrangements. Newer free stall barns in the Great Valley are independent



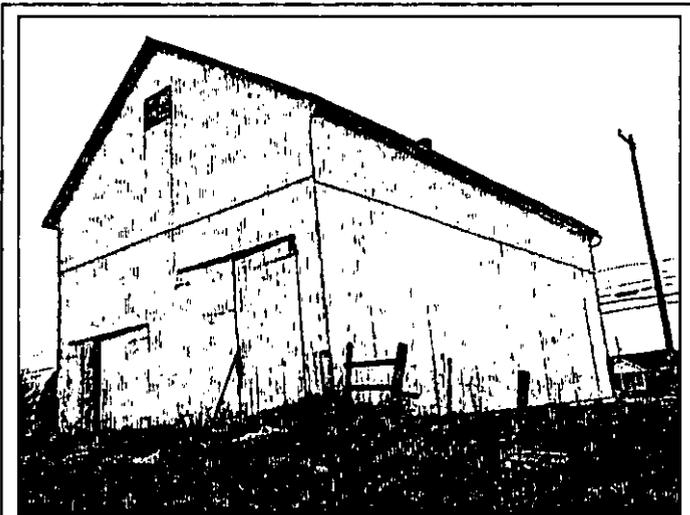
Pennsylvania Sweitzer barn with shed-roof freestall addition, Antrim Township, Franklin County. Original barn c. 1875, addition mid-twentieth century. Site 055-AN-001.

structures, often metal, which date after 1960, but a few free stall additions were made to existing barns. They tend to be simple, open shed roof pole-built structures, usually placed on the forebay side.



Pennsylvania barn with shed-roof loafing area addition and rainbow-roof stable barn addition, Mill Creek Township, Lebanon County, nineteenth century original with mid-twentieth century modifications. Site 075-MC-006.

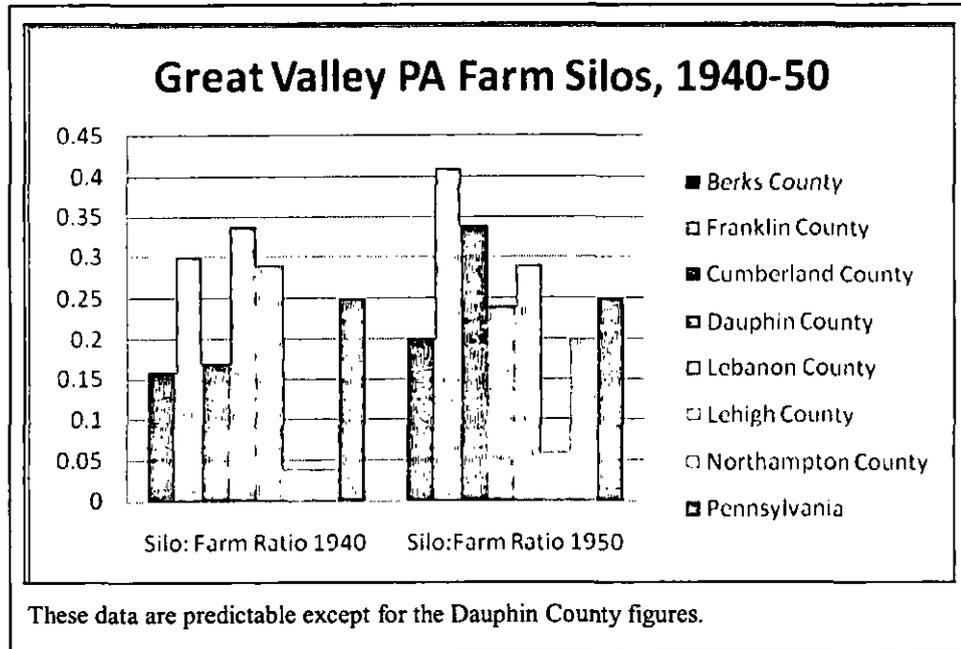
In the mid-twentieth century tobacco growing came to parts of Lebanon County. Tobacco barns in Lebanon County are later than those in Lancaster County because of this timing. Though the materials were contemporary (narrow vertical board, balloon framing, concrete-block foundations, metal cased windows, etc.), the form kept to nineteenth century precedents. That is, these were banked buildings with the signature slatted siding. Inside there were tiers of lath in the upper level where tobacco was hung, and a basement level where stripping and packing occurred.

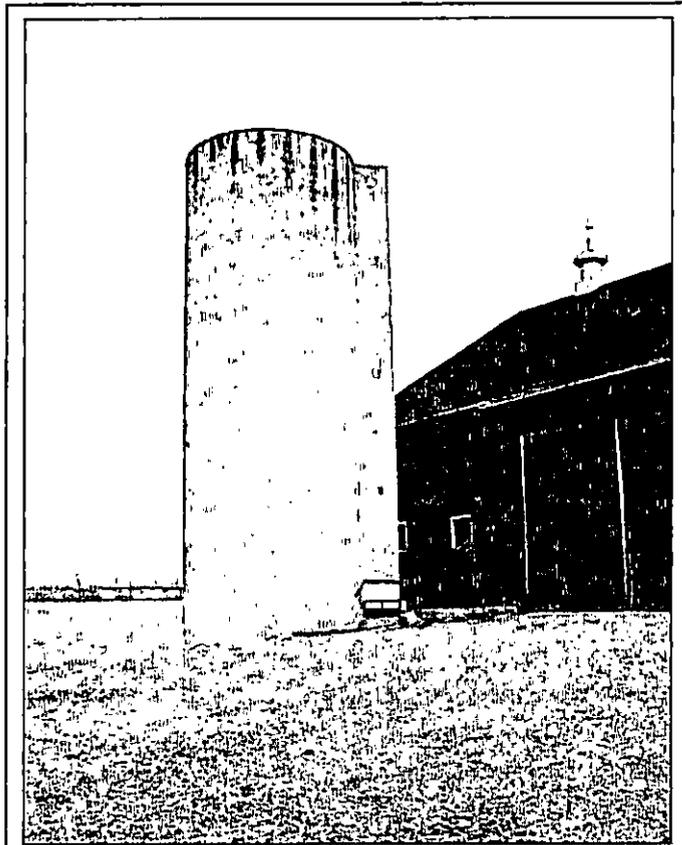


Tobacco barn, Jackson Township, Lebanon County, c. 1960. Site 075-JA-008.

Silos, 1940-1960

As dairying became more important in the Great Valley, more silos appeared. Concrete-stave and poured-concrete silos were the most common types in this period. The agricultural extension reports mention trench silos, but the census data show that these were uncommon.





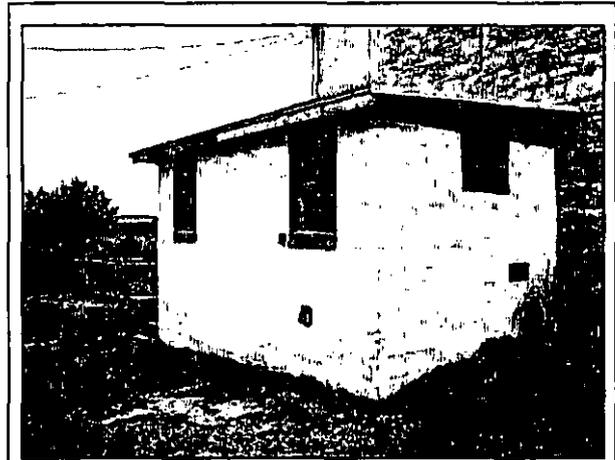
Concrete block silo, Peters Township, Franklin County, mid-twentieth century. Site 055-PE-003.



Three types of silo: from left to right, concrete stave, poured concrete, concrete stave, and Harvestore. The concrete stave silos are probably mid-twentieth century and the others more recent. Mill Creek Township, Lebanon County. Site 075-MC-006.

Milk Houses, 1940-1960

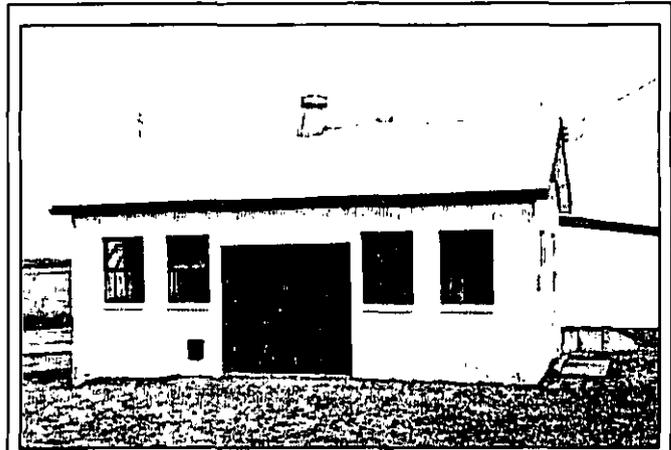
With more dairying came more milk houses. Milk houses are difficult to date; mid-twentieth century ones probably tend to be built of concrete block and are a little larger than earlier ones.



Milk house, South Annville Township, Lebanon County, mid-twentieth century. Site 075-SA-001.

Milking Parlors, 1940-1960

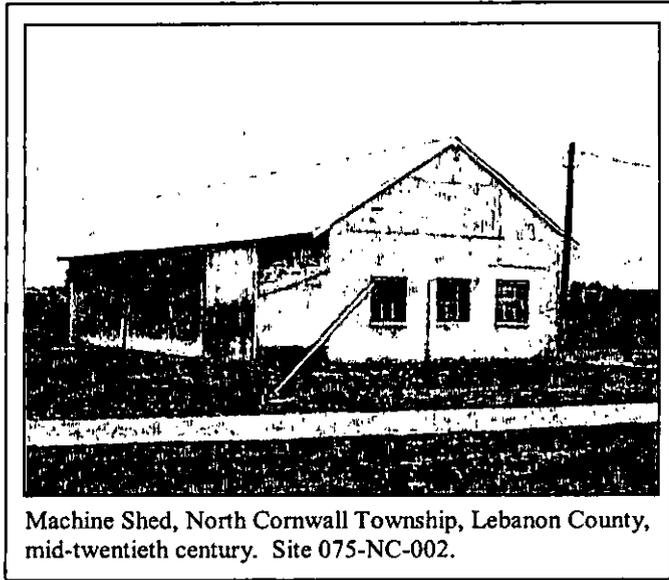
With the new freestall animal shelter practices, a separate milking parlor was often used. The cows stayed in their freestall area and at milking time they walked to the milking parlor in groups, then returned to the stalls. Milking parlors tend to be small, one-story buildings sited near the barn, equipped with 8 to 12 milking stations.



Milking parlor, Peters Township, Franklin County, mid-twentieth century. Site 055-PE-002.

Machine Sheds, 1940-1960

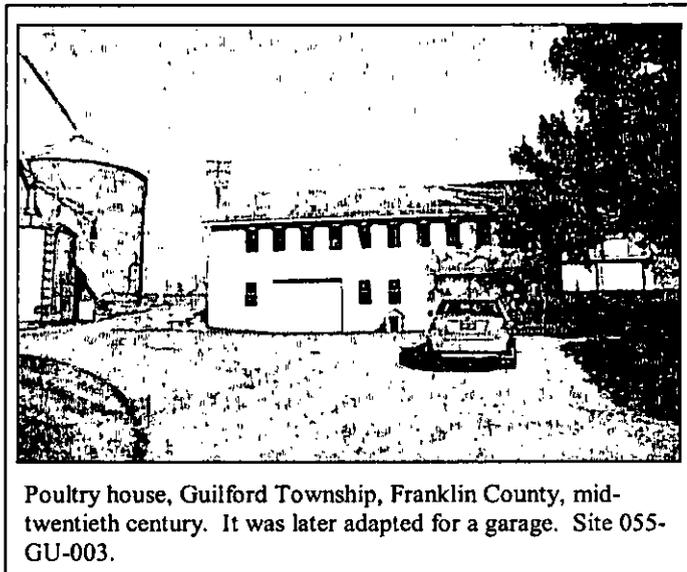
New machine sheds continued to be built in this era of expansion. They tended to be larger than prewar ones, and to be built of concrete block or pole construction oftener than frame.



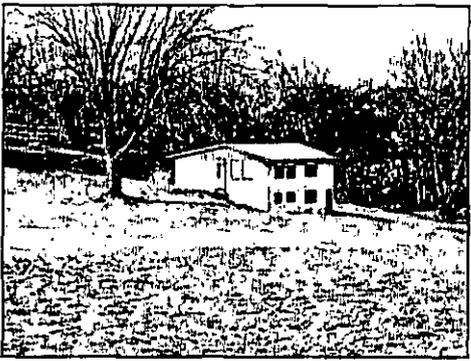
Machine Shed, North Cornwall Township, Lebanon County, mid-twentieth century. Site 075-NC-002.

Poultry Houses, 1940-1960

In keeping with its greater role in the farming economy, the postwar poultry house was bigger than its predecessor. Often poultry houses from this period would be more than one story. As before, barns were adapted for poultry; one Dauphin County farmer renovated his bank barn in 1947 to house 4,000 birds.¹⁰³



Poultry house, Guilford Township, Franklin County, mid-twentieth century. It was later adapted for a garage. Site 055-GU-003.



Poultry house, Montgomery Township,
Franklin County, mid-twentieth century.
Site 055-MO-005.



Poultry house, Jackson Township, Lebanon County,
mid-twentieth century. The building has since been
turned into a workshop. Site 075-JA-005.

Pigsties, 1940-1960

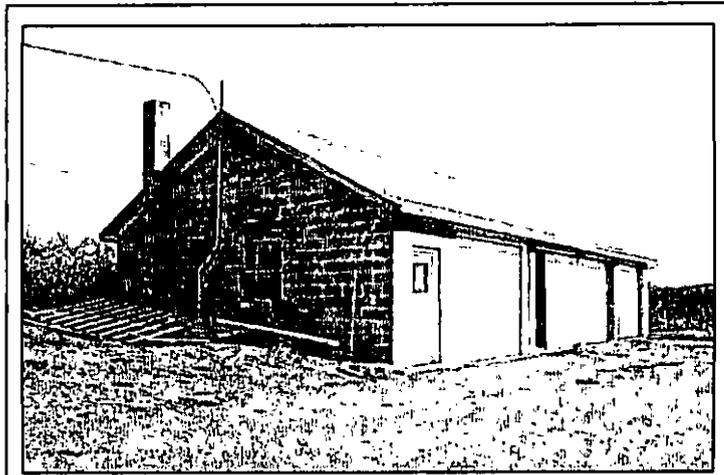
Since swine continued in a modestly important role in the Great Valley, new pigsties continued to be built. Their form, proportions, and size was not too different from those of earlier pigsties, but they can be distinguished by materials: narrow or beaded board; balloon framing; concrete foundations.



Pigsty, Antrim Township, Franklin County, c. 1950.
Site 055-AN-010.

Garages, 1940-1960

Garages and machine sheds are difficult to differentiate, but garages probably tend to be built of more durable materials, and to be enclosed on all sides; machine sheds are often open on one or more sides.



Garage, Guilford Township, Franklin County, mid-twentieth century. Site 055-GU-003.

Landscape Features, 1940-1960

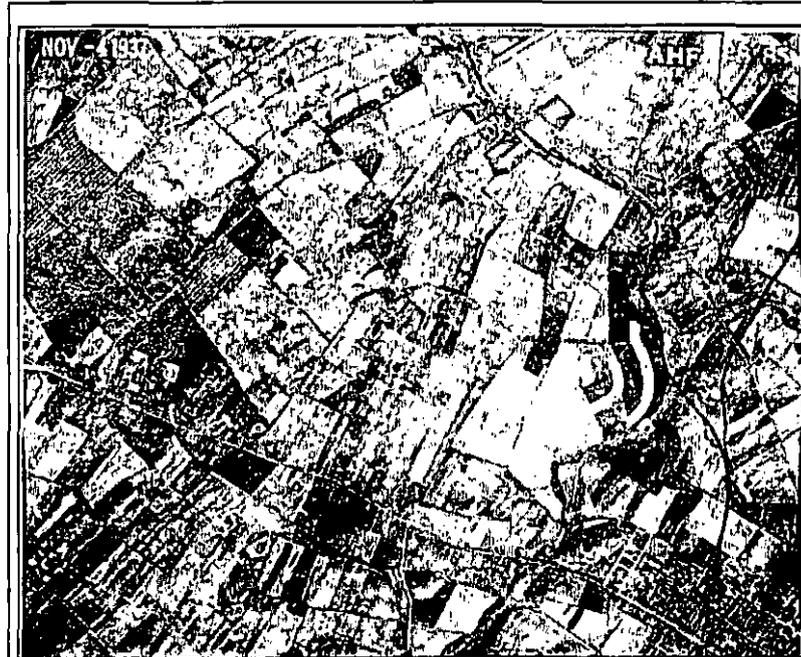
Contour plowing and strip cropping were widely instituted during this period. The two aerial photos from Franklin County show the changes especially clearly. In some areas (for instance the crop strips on the right of the 1957 photo) fields were consolidated and treelines eliminated, probably to accommodate larger machinery. However, many features from 1937 remain in 1957, including orchards, crop fields, treelines, and woodlots.

Ponds were much mentioned in the agricultural extension reports after the war. The Northampton County extension agent, for example, claimed that 200 farm ponds were built in 1955 alone. The pond boom was attributed to the availability of heavy excavating equipment; insurance price discounts for farms with ponds; new interest in recreation; and the need for water to irrigate, especially cannery and truck crops. Water for mixing sprays was also needed.

Dynamited ditches for drainage were mentioned in the agricultural extension reports, but it is not clear that these were created in any great numbers. The blasting spectacle drew crowds.

Crop fields, pasture, woodlot, and hay land were still the main farm land uses.

Concern began to rise about loss of farmland during this period. Suburban development begins to appear on period aerials in some places.



Northwest of Waynesboro, Franklin County, 1937



Northwest of Waynesboro, Franklin County, 1957.

Natural Resources Geographic Information System

d

Public Map

tools **AskRegis** **Start Over**

Surveyed Areas

History

● Bridge - point

■ Bridge - poly

▲ Undetermined

□ Undetermined - poly

▲ NHL

□ NHL - poly

▲ Listed

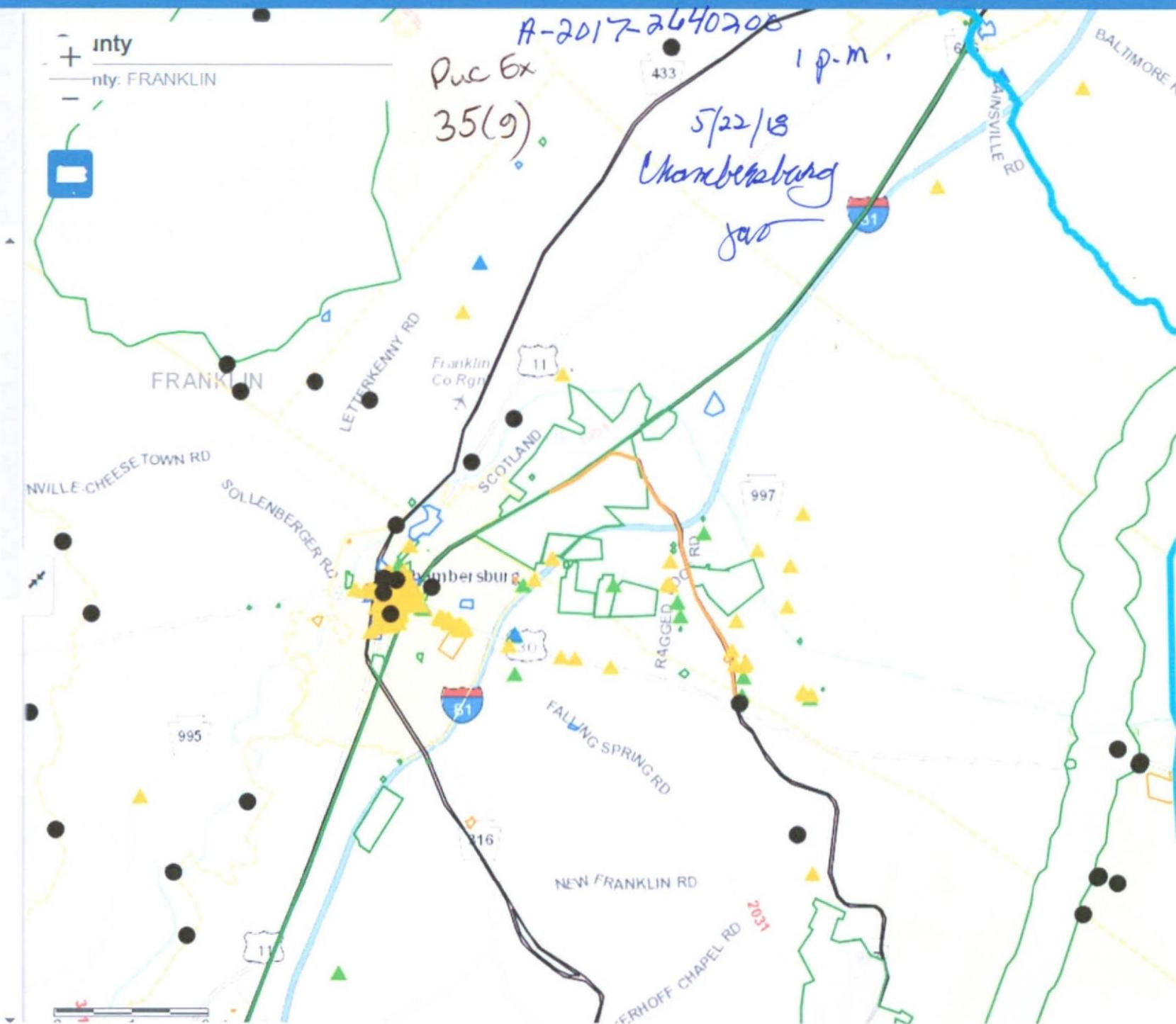
□ Listed - poly

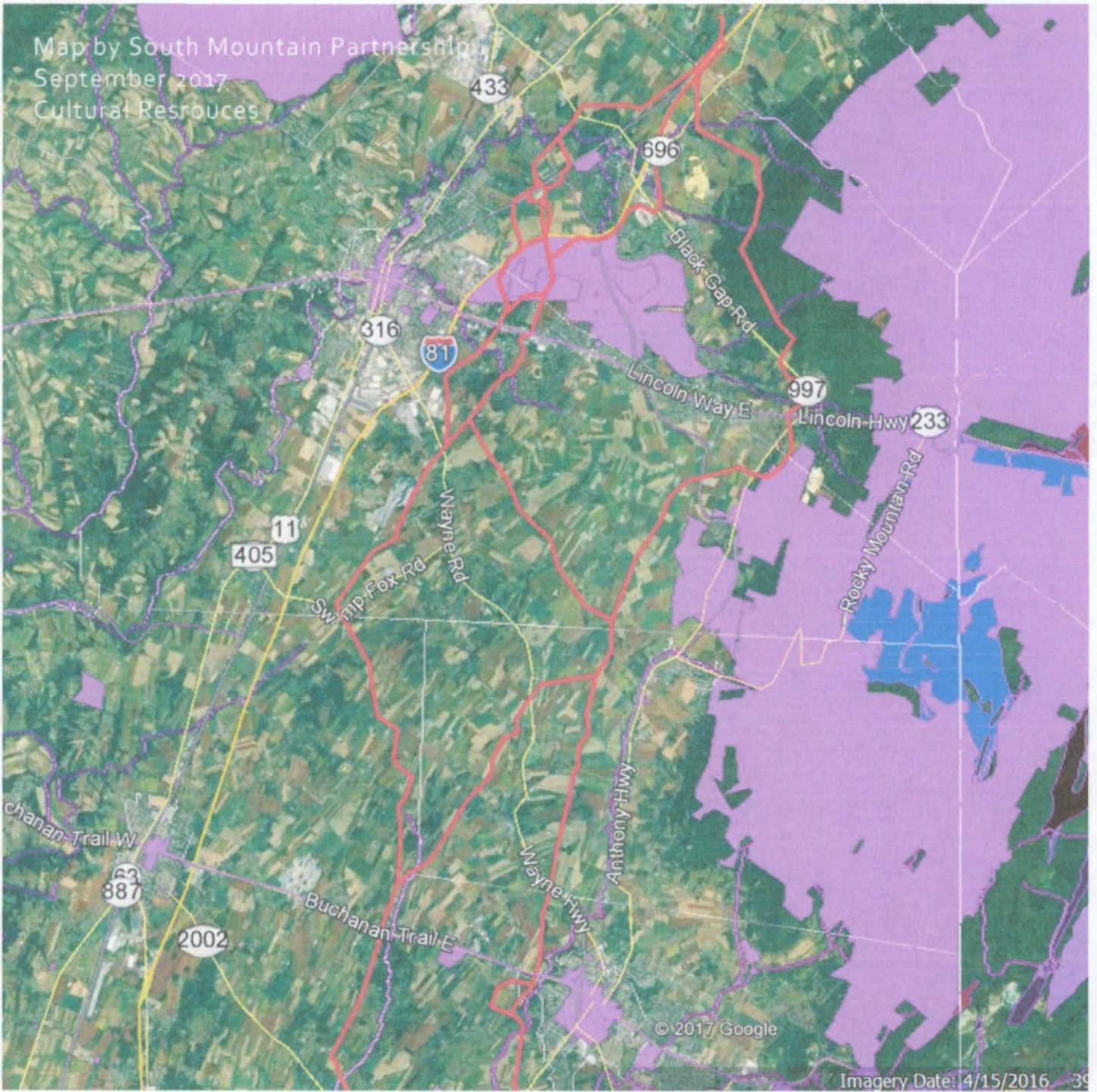
▲ Eligible

□ Eligible - poly

▲ Ineligible

□ Ineligible - poly





A-2017-2640200
 PUC Ex. 35(h)
 5/15/22 1 p.m.
 Chambersburg
 Jarr



Pennsylvania State Historic Preservation Office

PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

February 6, 2018

Burns McDonnell
Attn: Andrew Gottsfield and Brandy Harris
9400 Ward Parkway
Kansas City, MO 64114

PUC Ex 35(i)
A-2017-2640200
5/22/18
Chambersburg

Re: ER 2017-1949-055-E – PUC: Proposed Ringgold to Rice 230-kV Transmission Line, Franklin County

Jan

1 P.M.

Dear Mr. Gottsfield and Ms. Harris:

Thank you for submitting information concerning the above referenced project. The Pennsylvania State Historic Preservation Office (PA SHPO) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources. Our comments are as follows:

Above Ground Resources

A preliminary Review of this project indicates that there may be National Register-eligible historic buildings, structures, districts, and objects in the project area. In order to facilitate the review process, project planners must conduct surveys to identify these resources (both previously identified and newly identified) before final plans are developed. For any new proposed structures/lines and/or those proposed structures that will increase in height above 20' from the existing average, please consult our *Guidelines for Projects with Potential Visual Effects in Pennsylvania* (September 2014) available from the "Forms and Guidance" page on our website: <http://www.phmc.pa.gov/Preservation> for instructions, including delineating an Area of Potential Effects, identifying historic properties, and assessing effects.

Archaeological Resources

As noted in your correspondence dated January 10, 2018, there are three recorded archaeological sites (P.A.S.S #'s 36FR0001, 36FR0078, 36FR0337) located within the Direct APE for this project. We agree with the recommendation that the project be designed to avoid direct impacts to these sites. If these sites cannot be avoided, in our opinion, Phase I archaeological survey should be conducted to relocate and sample these sites, and additional Phase II archaeological testing may be necessary to assess the eligibility of these resources for listing in the National Register of Historic Places. Avoidance plans or archaeological mitigation plans should be developed for any resources determined to be National Register-eligible.

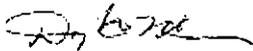
Your correspondence of January 10, 2018 also notes the presence of both prehistoric and historic high-probability areas within the Direct APE for this project. In our opinion, Phase I archaeological survey should be conducted in all high-probability areas to be affected by project-related ground disturbing activities. Additional Phase II archaeological testing may be

Page Two
Mr. Gottsfield/Ms. Harris
ER 2017-1949-055-E
February 6, 2018

necessary to assess the National Register-eligibility of any newly discovered archaeological resources. Avoidance plans or archaeological mitigation plans should be developed for any newly discovered resources determined to be National Register-eligible.

If you need further information concerning above ground resources, please contact Emma Diehl at emdiehl@pa.gov or (717) 787-9121. If you need further information concerning archaeological resources, please contact Mark Shaffer at mshaffer@pa.gov or (717) 783-9900.

Sincerely,



Douglas C. McLearn, Chief
Division of Archaeology &
Protection



Pennsylvania State Historic Preservation Office

PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

February 8, 2018

Burns McDonnell
Attn: Andrew Gottsfield and Brandy Harris
9400 Ward Parkway
Kansas City, MO 64114

PUC 61-35(j)
A-2017-2446200
5/22/18
Chambersburg

John

Re: ER 2017-1950-133-B – PUC: Proposed Conastone to Furnace Run 230-kV Transmission Line, Lower Chanceford and Fawn Townships, York County

1 P.M.

Dear Mr. Gottsfield and Ms. Harris:

Thank you for submitting information concerning the above referenced project. The Pennsylvania State Historic Preservation Office (PA SHPO) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources. Our comments are as follows:

Above Ground Resources

A preliminary review of this project indicates that there may be National Register-eligible historic buildings, structures, districts, and objects in the project area. In order to facilitate the review process, project planners must conduct surveys to identify these resources (both previously identified and newly identified) before final plans are developed. For any new proposed structures/lines and/or those proposed structures that will increase in height above 20' from the existing average, please consult our *Guidelines for Projects with Potential Visual Effects in Pennsylvania* (September 2014) available from the "Forms and Guidance" page on our website: <http://www.phmc.pa.gov/Preservation> for instructions, including delineating an Area of Potential Effects, Identifying historic properties, and assessing effects.

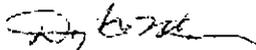
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Page Two
Mr. Gottsfield/Ms. Harris
ER 2017-1950-133-B
February 8, 2017

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Sincerely,



Douglas C. McLearn, Chief
Division of Archaeology &
Protection

PUC 6x. 35(k)

A-2017-2440200

5/22/18

Chamberburg

Guidelines for Projects with Potential Visual Effects in Pennsylvania

September 2014

1 P.M. Jan

The Pennsylvania State Historic Preservation Office (PA SHPO) has developed guidance for the identification and assessment of effects of proposed transmission towers, cell towers, wind turbines, highways, and new construction on historic buildings, structures, and landscapes. Under Section 106 and the State History Code, it is the role of our office to provide comments on the effects a project may have on historic properties. Some effects, such as demolition of a historic property or disturbance of an archaeological site, can be easily evaluated and determined to be adverse. However, assessing the impact of visual changes is often more subjective and may require more in depth evaluation and discussion.

The purpose of this document is to outline the process necessary for the identification of those resources where the introduction of new visual elements would diminish integrity, thereby significance and a property's National Register eligibility. Guidelines for the assessment of adverse visual effects are also included.

Avoidance of adverse visual effects on historic properties is the recommended course of action for projects. If adverse effects cannot be avoided, then it is necessary to work to minimize adverse visual effects through changes to the project's location, scale, or design. If the adverse visual effects cannot be avoided or minimized, then it may be necessary to mitigate to compensate for the loss of integrity.

Integrity and Significance

Integrity is critical to the ability of a property to convey its historic significance. Therefore, when developing a survey, properties in the APE should be considered in light of the criteria for significance and aspects of integrity for which they are significant. Evaluation of whether the introduction of a new feature will adversely affect a property's aspects of integrity is critical.

Questions to be asked include:

- Is setting a character defining feature of the resource?
- Will the project introduce new features into the setting?
- Will the project remove existing features from the setting?
- Would the introduction of new features or the removal of old features in the setting of this property affect its integrity? If so, which aspects?
- Would changes to the identified aspects of integrity affect the ability of the property to convey its significance?

In assessing visual effects for historic properties, the criteria for significance and the aspects of integrity provide a fairly qualitative method for determining visual effects on historic properties. For example, integrity of setting is critical to a farm's (farm complex and associated lands) ability to convey its agricultural significance. The introduction of a tower in the view shed of the farmstead or the removal of associated landscape features, such as tree lines, woodlots, or field patterns, could alter integrity of setting and feeling. However, if the setting of a property is not critical to understanding its significance (resources significant for architecture alone), then the introduction of a new visual feature or removal of surrounding features may not diminish the integrity of the property.

Identification of Historic Properties

This step of the Section 106 process begins with a Phase I or identification level survey. This includes sufficient field work and background research to delineate the Area of Potential Effect (APE) and identify resources previously evaluated for National Register eligibility as well as those that meet the 50-year-age consideration within the APE.

1) Delineation of APE

The delineation of the APE should take into account the view shed or those areas from which the project may be visible. For example, a tower or power line may not be located on a property but it could introduce new features into the landscape, thereby affecting a property's relationship to its setting, which may include surrounding features as well as view sheds. The APE is based on a project's potential to effect above or below ground resources. Therefore, it is critical that the identification report include a well developed project description with sufficient illustrations to justify the APE that is delineated. An initial APE should be delineated broadly and then refined based on site conditions, as outlined below.

Initial APE

Transmission Lines

If the proposed line will be constructed within the existing ROW and there are no new areas of vegetation proposed for clearing outside of the existing maintained ROW and there will be no substantial increase in tower height (<10% or 20' increase, whichever is greater), the initial APE will include those resources that are within and adjacent to the existing ROW.

If the proposed line to be constructed within the existing ROW and new areas of vegetation will be cleared outside the existing maintained ROW, the initial APE will consist of all resources that are within 0.5 miles on either side of the existing ROW.

If the proposed line to be constructed within a new ROW, the initial APE will consist of all resources that are within 0.5 miles on either side of the existing ROW.

Cell Towers

Two Nationwide Programmatic Agreements define the APE for visual effects for the construction of new cell towers and collocation of antennas on non-tower structures:

https://apps.fcc.gov/edocs_public/attachmatch/FCC-04-222A3.pdf

<http://wireless.fcc.gov/releases/da010691a.pdf>

For new cell tower construction:

- If the proposed new tower is 200 feet or less, the APE is one half mile from the tower site.
- If the proposed new tower is more than 200 feet but less than 400 feet, the APE is $\frac{3}{4}$ mile from the tower site.
- If the proposed new tower is more than 400 feet, the APE is 1 $\frac{1}{2}$ miles from the tower site.

For collocations on existing buildings or structures the APE is 250 feet from the tower location.

An alternative APE can be determined upon agreement between the FCC applicant and the PA SHPO.

Wind Towers

The initial APE for wind turbine towers will be 5 miles.

Refined APE

The initial APE can be refined through an examination of topography, changes in elevation and vegetative cover, using GIS based modeling, to include only the anticipated extent to which a project may be visible from. The refined APE should be checked during the field survey and justified and fully documented in the identification report. As vegetative cover can change, the report should include meta-data on the date of the vegetative cover information used for the GIS analysis.

2) Background Research

Once the APE has been established, it is necessary to conduct sufficient background research to determine the nature and extent of previously identified historic resources within the boundary. This begins with an examination of Pennsylvania's online resource

database, CRGIS, and survey files available at the PA SHPO office in Harrisburg. In addition, topographic maps and aerial photography should be reviewed to identify areas of high archaeological site potential within the APE. If the APE includes agricultural properties, the Pennsylvania Agricultural Context should be consulted to determine what types of properties can be anticipated within the APE. In addition, in those locations where the APE includes contiguous farmsteads and surrounding open space, current and historic aerials should be compared to determine if there is the potential for a rural historic district.

3) Identification/Reconnaissance Report

a. Research Design

The methodology should justify the APE boundary and outline the background research and field survey methods. Recommendations for future survey efforts should be based on the potential of the project to affect the significance of identified property types.

Typical examples of projects and resources that could be affected by associated changes in setting include:

- Historic farms with associated woodlots, hedgerows, stone walls, and/or field patterns that would be affected by clear cutting in order to provide a transmission line right of way.
- Rural historic districts that would be affected by the location of a transmission line through the associated landscape.
- A twentieth-century estate designed to take advantage of prominent view sheds of a ridge line on which a wind tower is proposed.

b. Survey Results

The Abbreviated Historic Resource Survey Form should be used for initial identification of those resources 50 years in age or older that would be potentially affected by the introduction of the project.

A table of properties in the APE should be provided. The table should include name of property, address, previous survey documentation (including determinations of eligibility), and surveyor recommendations for future survey work.

c. Mapping and Illustrations

All mapping and illustrations must be of high quality and in color, of readable scale, and should include sources and dates. At a minimum, the following should be included to convey the project's potential to affect historic properties:

- Project location and APE boundary, shown on a 7.5 minute USGS quadrangle
- Aerial mapping showing the location of the proposed towers
- Aerial mapping with all 50-year-old resources within the APE, showing the relationship of the resources to the project
- Photographs and mapping of previously identified resources including rural historic districts
- Pictures of the APE showing view sheds to and from National Register listed and eligible resources and those areas where changes in the landscape will occur (tree cutting, access roads)
- Illustrations of the type, size, and scale of the proposed towers

The results of the identification/reconnaissance report should be reviewed and discussed with PA SHPO staff prior to the evaluation investigation. PA SHPO staff will work with the agency or their applicant to determine which properties require documentation beyond the Abbreviated Historic Resource Survey Form as well as the application of appropriate historic contexts.

For projects where there are relatively few resources that would be affected by a project, it may be possible to present the APE and document and evaluate National Register eligibility of resources in one submission rather than preparing separate identification/reconnaissance and evaluation/intensive survey reports.

Evaluation of Historic Properties

Properties identified as warranting further survey because of the potential of the project to affect their significance should be documented and assessed for National Register eligibility on the Historic Resource Survey Form (see *Guidelines for Architectural Investigations in Pennsylvania* (2014) for further guidance). The Pennsylvania Agricultural Context should be consulted in the assessment of eligibility of agricultural properties. Documentation should include a discussion of those landscape features or view sheds that are critical to the ability of a property to convey its historic significance.

Assessment of Effect

For those resources identified as eligible for listing in the National Register, the impact of the project should be assessed. If it is determined in consultation with PA SHPO that the proposed project will significantly and negatively impact a historic property, the agency should propose measures for avoiding or minimizing the effect. Avoidance of adverse effects on historic

properties is the recommended course of action for projects. If properties cannot be avoided, then it is necessary to consult with the PA SHPO and other consulting parties to minimize adverse effects through changes to the project's location, scale, or design

In assessing the potential effects of a project on historic properties, the criteria for significance and the aspects of integrity are factors that require evaluation. Assessments of effect should present the following information:

- Detailed project description
- Property's historic significance. It is necessary to understand the property's historic significance and integrity in order to evaluate the project's effects on the property's eligibility for listing in the National Register of Historic Places. The focus of the analysis should be consideration of setting.
- Brief physical description of the property with a focus on natural topography, setting, and man-made or natural features that enhance a historic property's significance and integrity. This should also include a discussion of the nature and quality of the view to and from the historic property. For example, specific viewsheds that enable the property to convey its significance should be noted.
- Assessment of physical effects. This assessment should focus on how the project will affect those physical features that convey the significance and integrity of the historic property.
- Assessment of visual effects. The historic property's relationship to its setting, which may include surrounding features and open space, should be taken into account. This includes the view from the historic property as well as the view toward a historic property.

Findings of effect should be justified through relevant illustrations, all of high quality and color, with mapping at a scale that is readable and source data identified

- For each identified property, aerial photographs showing the boundaries of the property, location of primary and secondary resources, and landscape features should be provided. The aerial photograph should also show the location and direction of ground photographs, a depiction of line of site and distance from the resource to the project. The date of the aerial photograph should be noted.
- Photographs should include views from the entire property, including secondary resources and historic landscape features, not just the primary resource. Panoramic photographs or photograph montages are especially useful to visual analysis.

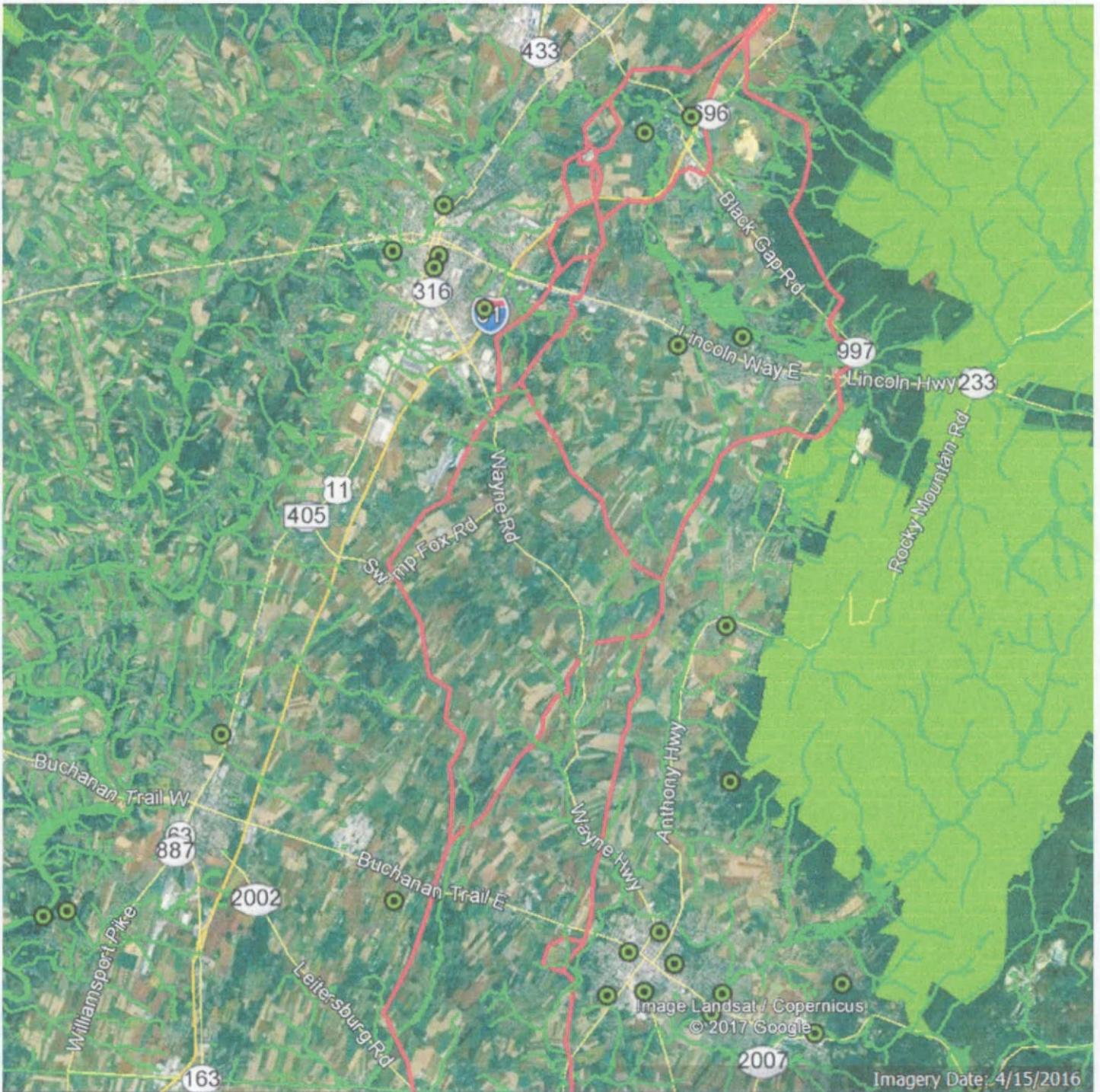
- Plans of proposed and existing (if applicable) designs, including elevations.
- For those projects introducing new features or towers that will be substantially taller (>10% or 20' increase) within the view shed of a historic property, photosimulations of the new tower are warranted.

Adverse Visual Effects

In general, a project can be considered to have an adverse visual effect to a historic property if it diminishes the integrity of the resource to the point that it can no longer convey its historic significance. Examples of potential adverse effects include:

- Elimination of open space or a scenic view that is critical to the ability of a property to convey its historic significance.
- Elimination of a sufficient number of small scale features (fence rows, tree lines, field patterns, etc.) that a property can no longer convey its historic use and significance.
- Introduction of a visual element that is incompatible, out of scale, detracts, or is out of character with the setting of a property or district.
- Blocking or intruding on a scenic view or blocking the view from one historic property to another.

If adverse effects cannot be avoided or minimized, then it may be necessary to mitigate to compensate for the loss of integrity, also in consultation with the PA SHPO and other consulting parties. Projects subject to Section 106 of the NHPA review require execution of a Memorandum of Agreement by the Federal agency, PA SHPO, the project applicant, and any consulting parties in order to address the adverse effect of the project.



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PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

MAY 30 2018 1 P.M.

Future Forward:

Comprehensive Plan Summary

RECEIVED

A comprehensive plan shows that people are invested in managing their future and moving forward in a positive way. Hundreds of people participated in the preparation of Franklin County's Comprehensive Plan by sharing their vision for the future of the county. Franklin County residents and business owners are passionate and care about their community. Their aspirations are translated into a series of goals and recommendations that will help the county build on its assets and strengths. It is a long-term roadmap for growth—a guide for decisions and actions by local government officials in shaping the future of their community.

A number of characteristics are valued and integral to resident and business life in Franklin County. These assets include accessibility, economic stability, agricultural and woodland landscapes, natural features and history.

This comprehensive plan outlines a series of recommendations that will protect those valued assets and enable the county to enhance connections and collaboration among its physical, social and fiscal resources.

The Essentials are identified actions that have the greatest potential for producing the most significant impacts on the county's future vitality and character. These actions function as catalysts to promote community, health and vibrancy. The Essentials are identified as key actions for implementation that trigger or lead to the implementation of other actions.

The Essentials produce visible indications of change—being the actions that the public sees—and where appropriate, aim to stimulate the private-sector to make their own investments within the communities. Thematically, the Essentials embodied in each section relate to and are framed out to be a realistic action that can be initiated within the next decade in order to spark subsequent actions.

Forward Thinking: Outreach and Cooperation

This comprehensive plan update reinforces the most important aspect of the county's future planning efforts: its role as facilitator. Continuing dialogue and sharing ideas is essential to both county and municipal success. In its role as facilitator, the county is poised to be a driver in conducting outreach and fostering a cooperative environment that addresses solutions for regional scale problems.



Outreach and Cooperation Goal: Engage in outreach, education, communication and cooperation within the county

Strategies outlined to help meet this goal include:

- Promote the Franklin County Planning Department's role as a facilitator and orchestrator of municipal cooperation and as a clearinghouse of information, knowledge and contacts.
- Proactively encourage municipalities to work with the county to find solutions for regional-scale issues; strengthen the dialogue between local, county and state governments while reinforcing the successes of county planning, municipal and private-sector partnerships.
- Determine how the county may further its partnerships with neighboring counties.
- Provide sufficient levels of staffing within the county Planning Department to assist in facilitating education and outreach efforts as well as assisting in the implementation of multi-municipal initiatives as needed.
- Coordinate with public and private sector entities to promote the benefits of coordinated planning and public health.
- Evaluate the applicability and potential impacts of creating Official Maps.

*Essential Action:
Launch the County
Planning Department's
Resource Center*



Looking Forward: Land Use and Housing

A comprehensive plan is commonly rooted in land use and housing strategies. The 1999 comprehensive plan established a series of principles that will remain important into the next decade. A number of goals that were identified in the 1999 plan were able to be achieved. The Recreation Plan, Greenway and Open Space Plan and the Natural Areas Inventory were identified as necessary projects in meeting the goal of preserving open space and natural resources and all have been accomplished. These initiatives remain a pertinent component of this update.



Land Use and Housing Goal: *Foster the continued livability and success of urban communities and of communities embedded within the rural landscape.*

Strategies outlined to help meet this goal include:

- Champion for local land use controls that promote balanced growth and conservation.
- Promote conservation of quality farmland and prime agricultural soils.
- Support revitalization of core communities.
- Work with landowners to ensure prompt and sufficient reforestation of woodlands that have been timbered.
- Encourage home-ownership.

Essential Action:

Advocate for responsive, compatible land use decisions



Foster Forward: Resource Management

Many studies document that Franklin County is rich in resources that will continue to shape its future as a haven for those interested in conservation, recreation, and history. Sustaining and enhancing natural, scenic, and historic resources will benefit current and future generations.

Agricultural resources are important to the county. Agriculture is the economic base, the visual character and one of the driving cultural forces in Franklin County. Generations of farmers have sustained a diverse agricultural economy that helps define Franklin County's character.



Resource Management Goal: Facilitate the protection and promotion of the county's rich natural resources, recreation opportunities and history.

Strategies outlined to help meet this goal include:

- *Continue funding of agriculture preservation initiatives.*
- *Support preservation of sensitive natural resources.*
- *Encourage strategies and/or policies that emphasize conservation of existing county character: small towns, rural areas and positive, memorable views.*

Essential Action:

Celebrate why the county's unique assets are essential to its long-term vitality



Fast Forward: Economic Development

The county's agricultural history and its position within south-central Pennsylvania enable its residents and businesses to continue growing with positive success. Franklin County is strategically located along a major transportation corridor and features a high quality of life and a beautiful setting for employees. The county should continue to work with the Franklin County Area Development Corporation (FCADC) to promote local and regional-scale economic development opportunities. As the county's population and employment base are anticipated to increase, there will be a need for office space, worker housing, and amenities to attract new residents to the area.

The county can serve a pivotal role in encouraging and/or facilitating discussions among municipalities, the FCADC, prospective businesses, school districts and others to promote coordinated planning and policy decisions.

Conservation and the appropriate use of the county's natural and agricultural assets are central to its economic success. Important agricultural soils and woodlands support key sectors of the county's economy.



Economic Development Goal: Promote economic opportunities while retaining agriculture and community character.

Strategies outlined to help meet this goal include:

- Continue to cooperate with the Franklin County Area Development Corporation in implementing a comprehensive county-wide economic development strategy and continue to encourage multi-municipal planning.
- Continue to emphasize agriculture and its supporting industries as identifying characteristics in the stability of the county's future.
- Work to facilitate and encourage business, industry and manufacturing in the county.
- Foster a quality of life attractive to a plentiful, skilled workforce.
- Continue to develop and implement fiscally responsible budgets that balance needed public services with available funding levels.
- Encourage tourism-oriented initiatives.

Essential Action:

Expand and reinforce how the county's technical planning tools contribute to economic development efforts

Moving Forward: Transportation and Infrastructure

Throughout the comprehensive planning process, recurring discussion focused on how future development patterns can be supported in a sustainable system of infrastructure.



Transportation and Infrastructure Goal: Use a balanced approach in the development of transportation, infrastructure, and energy systems.

Strategies outlined to help meet this goal include:

- Encourage future development and growth to align with existing development and in areas where transportation and infrastructure expansion are invested.
- Enhance pedestrian-bicycle connectivity.
- Support efforts for renewable energy projects or encourage use of renewable energy.

Essential Action:
Promote multi-municipal and region-based transportation and infrastructure enhancements

Next Steps

From the sense of place to high employment rates, people love Franklin County for its ability to provide what they want as well as what they need. By choosing to plan carefully for and guide future development, Franklin County will grow by choice—not by chance—improving its ability to retain the assets that people value and implementing improvements in areas that need to be strengthened.

Everyone involved in this plan—from residents who participated in public meetings to elected officials who spent time guiding the process—are contributing to moving Franklin County forward.

What We Heard: Public Input

In order to gain local knowledge and input, a public outreach component was included as an integral part of the planning efforts for the Franklin County Comprehensive Plan. Public input was gathered through several different means, with the chief efforts being Steering Committee meetings, Focus Group meetings, a series of Regional Workshops and two public meetings. This offered the representatives and citizens of Franklin County opportunity to contribute to the plan's development.

Steering Committee meetings were held throughout the planning process with representatives from the county. These took place to establish visions and goals for this planning effort. Committee members also identified key opportunities and strategies for the future of the county. At Regional Workshops, the importance of regional

connections and unique characteristics was emphasized, primarily the regional economic differences across the county. Focus Group meetings were also held throughout the planning process to address specific issues and topics.

Public input was taken in the form of map marking and comments through discussions between citizens, consultant staff and Franklin County Planning Department representatives.

Public Input Events and Opportunities

Kick-Off Meeting	11/10/10
Steering Committee Meeting	1/14/11
Steering Committee Meeting	2/11/11
Steering Committee Meeting	4/8/11
Focus Group Meeting	4/14/11
Focus Group Meeting	4/15/11
Public Meeting	6/9/11
Steering Committee Meeting	6/10/11
Focus Group Meeting	6/10/11
Regional Workshops (3 public meetings)	7/25/11
Steering Committee Meeting	8/12/11
Commissioners' Public Meeting	4/10/12

Kick-Off Meeting

A Kick-Off meeting was held to start gathering input and begin raising awareness about the planning process. Questions, concerns and desires were expressed by attendees. A wide variety of topics were addressed during the meeting. Highlights of the participants' comments and questions are as follows:

Vision and Sense of Place

- History
- Farmland/agriculture
- Diverse economic development
- Efficient ample transportation
- Rural small towns
- Green Open Space/Parks
- Quality
- Water supply/quality
- Location
- Strip developments
- Sense of small town and community cohesiveness is important
- Culture/civility of life/quality of life
- How can we preserve the quality of life while growing?
- How can we preserve vitality of resources?
- How do we sustain our work ethic?
- How do we balance regulation against property rights?

Outreach and Cooperation

- Public may be suspicious of improvements especially if they could raise taxes
- How can we balance regulation with proper rights?
- How do we implement the Comprehensive Plan?
- Where do we want to be in 2020?
- How can we enhance multi-municipal planning?
- What are ways that the municipalities can immediately cooperate more efficiently to best reach the end goals established within the Comprehensive Plan?

Land Use and Housing

- What can we do to preserve the rural heritage of the area?
- How can we best manage the cost of living (mortgage, rent, utilities)?
- How do we balance regulation against property rights?
- How can we best manage the future of land preservation with economic diversification?
- Can we build up instead of building out – remove height restrictions?
- How can we preserve farmland?

Resource Management

- The most important resources to protect
 - Water: quality, supply watersheds
 - Agriculture: good soils, expertise, farmland
 - Forests
 - Green space, natural resources and outdoor recreation
 - Historic resources (including industrial)
- How can the rural heritage of the county be preserved?
- How do we fund/support our green space?
- How do we protect the natural resources?
- How do we efficiently coordinate services and the use of resources?
- How can we establish a tax structure for preserving green spaces?

Economic Development

- How can we effectively balance growth, including the necessary expansion of infrastructure?
- How can we balance new jobs while maintaining the area's work ethic and rural heritage?
- Where should development occur?
- Are there specific areas better suited for development?
- How do we envision our economic future, both in agriculture and industry?
- How do we say 'No' to growth we may not want?
- How do we finance all of the growth?
- Creation of jobs and better access?
- How can we keep agriculture profitable?
- Varied/many opportunities for prosperity congestion
- How can we create better access to, and then improve performance of schools/businesses?

Economic Development

- It can be difficult for young people to stay in the area
- Education is a challenge in some parts of the county
- There needs to be more focus on technical education and training
- Chesapeake Bay watershed regulations make development difficult and will continue to influence the county into the future
- Is there enough water/water infrastructure to support additional growth?
- Franklin County should not become a bedroom community; needs economic development
- There is difficulty in attracting the creative class
- There is no mechanism in place to drive downtown development
- The work force in the county is high quality but too small
- Strip malls and chain stores are not the right kind of development for this community

Transportation and Infrastructure

- No mass transit in urban areas
- Sewer and water service can be used to control growth
- Traffic on I-81 is terrible; the road should be widened
- Current road system is maxed out
- Are there systems or infrastructure that can be combined to realize efficiencies?
- Road interconnectivity needs to be increased

Public Meetings and Regional Workshops

Two well-attended public meetings were held during the planning process. Input was gathered from a broad cross-section of the public on the future vision and highest priorities for Franklin County. Regional workshops were held to gain an understanding of the varying natural and socio-economic landscapes in the county. A wide variety of topics were addressed during the meeting. Highlights of the participants' comments and questions are as follows:

Vision and Sense of Place

- Beautiful landscape and rich history
- Core communities anchor the county
- Great natural resources

-
- Recreation
 - Local food
 - Losing community character: cultural institution
 - Love your local landscape
 - Threats to quality of life/desirability in county:
 - School system \$ and quality of education
 - Viability of community scale ag/forestry
 - Land prices
 - Production in systems pressures
 - Loss of tourism trade
 - Water supply availability and competing demand for availability
 - National policies effect on local
 - Immigration policies

Outreach and Cooperation

- Cost effectiveness of municipal services needs to be maintained
- Visitors Bureau
- Healthy living should be a priority
- Education of history, culture and ecology – significance of Franklin county
- Quantitative history of the county
- Deeper communities - support institutions that bring people together
- History for tourism sake
- School district financial stability

Land Use and Housing

- Core communities as the gateways to public open space areas
- Consideration for land uses downtowns
- Promoting healthy communities
- Safe revitalized downtowns

Resource Management

- Changes in agricultural practices may change the landscape
- Camping and outdoor recreation
- Trailheads in core communities; reaching into the public forests and parks
- Recreation – big and local
- Trails locally and trails connecting regional destinations

Economic Development

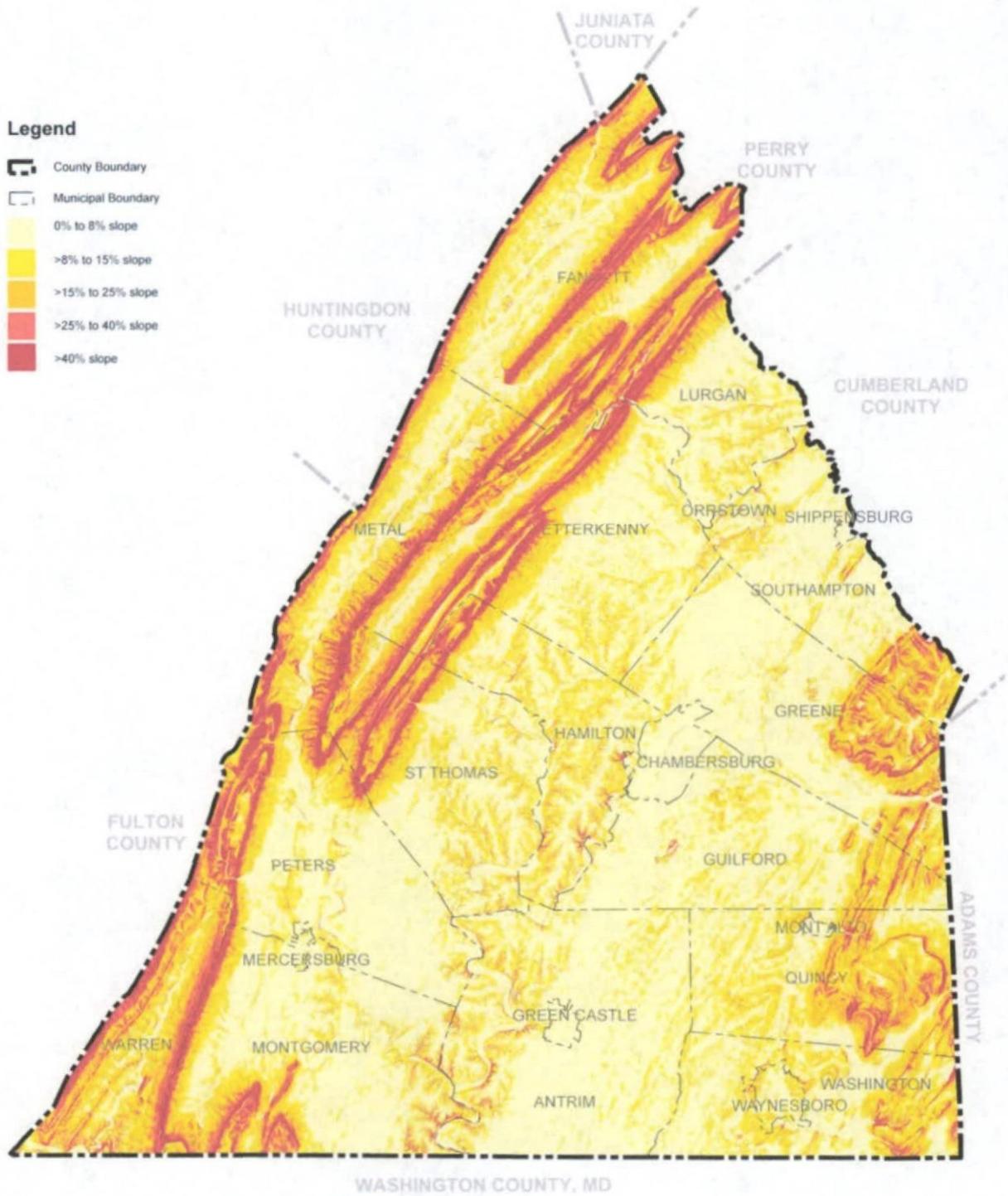
- Educational assets are important
- Grocery store/pharmacy – 24 hour
- Long-term viability of agriculture as the economic engine
- Need more “real jobs”
- Leverage Norfolk Southern
- Alternative energy - jobs economic development opportunities
- Value added jobs – maintain a focus on local
- Increase in chain retail
- Capacity of park usage for tourism
 - Local vs. DC/MD audience
 - Desire to make connections
 - Other gateway trail heads to connect locally
 - Town to town non-motorized trail corridor

Transportation and Infrastructure

- Transportation –great
- Bike route toolbox
 - Non-motorized linkages
 - Between core communities and recreational areas
- Threat to quality of life - water quality and quantity
- Train - county transit
- Leverage Norfolk Southern
- Strategic location of county connection to longer areas /metros
- Transportation access to larger areas
- Rt. 16 traffic increases difficulty in getting bike/pedestrian trails
- Bypass could kill downtowns
- Well connected to large metro regions

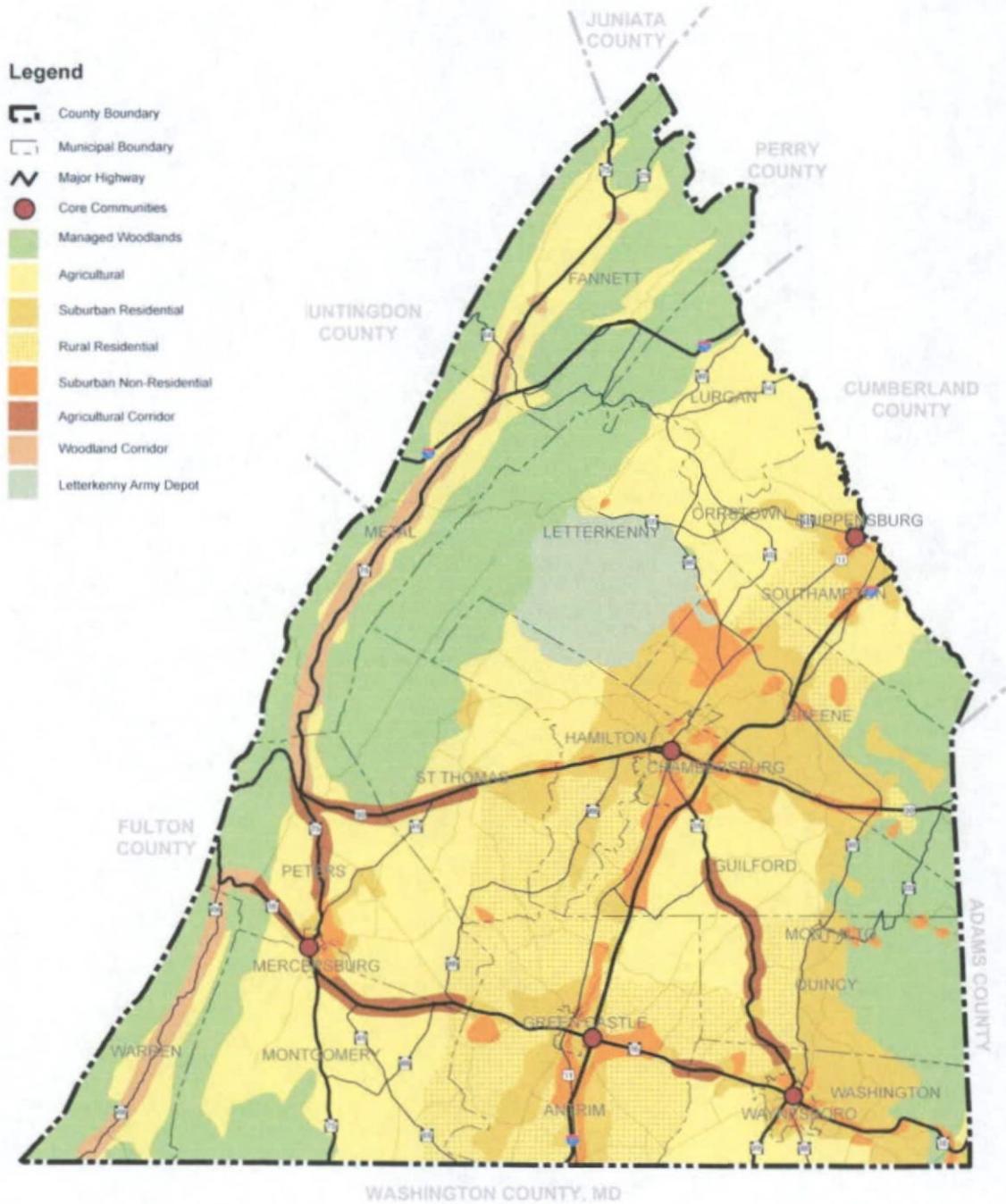
Summary

The information gathered as part of all public input events and opportunities was used by the planning team to better understand public preferences and inform the development of the final comprehensive plan. The input was considered along with periodic feedback from planning department staff, planning commission members and consultant input. There will be additional opportunities for the public to participate in this comprehensive plan over the next decade and beyond as recommendations are implemented and the county moves toward its goals. Information is always available at www.co.franklin.pa.us.



Franklin County Slope Analysis, 2010

Future Land Use and Housing Plan: Build-out



Foster Forward: Resource Management

**Going forward,
we need to
advance
conservation and
continue funding
agriculture
preservation
initiatives.**

Many studies document that Franklin County is rich in resources that will continue to shape its future as a haven for those interested in conservation, recreation, and history. Sustaining and enhancing natural, scenic, and historic resources will benefit current and future generations.

Agricultural resources are important to the county. Agriculture is the economic base, the visual character and one of the driving cultural forces in Franklin County. Generations of farmers have sustained a diverse agricultural economy that helps define Franklin County's character. Preserving resources for agriculture helps to ensure that the agricultural rhythm of the county will remain an important force well into the future.





Resource Management Goal:
Facilitate the protection and promotion of the county's rich natural resources, recreation opportunities and history.

Strategy: *Continue funding of agriculture preservation initiatives.*

A primary aim of these initiatives should be raising and allocating funds for agriculture preservation. The county should expand its collaborative relationships with the Farmland Preservation Program, Central PA Conservancy, Franklin County Conservation District, and others to collectively promote the continued support of agriculture preservation.

Strategy: *Support preservation of sensitive natural resources.*

Greenways or open space corridors are critical to sustaining the integrity of natural systems. Franklin County has a strong legacy of planning to maintain and strengthen its green infrastructure resources.

An essential component of a healthy, natural resource system is the protection and conservation of water quality and supply. High-quality water resources are vital to ensuring a healthy community, sustainable economy and continued existence of plant and animal species. As the agricultural landscape is likely a critical component of this effort, it is recommended that the stakeholders collaborating on agriculture preservation also be at the table to promote preservation of other sensitive natural resources.

Essential Action:
Celebrate why the county's unique assets are essential to its long-term vitality.

Pilot Project: Establish an annual campaign that highlights the value of identified natural resources, recreation resources and historical features and how the assets contribute to future successes in the county.

Aim to Achieve: More than just a simple recognition, this Celebrated Features campaign is aimed to encourage dialogue and collaboration among groups and individuals throughout the county that lasts all year long. The initiative seeks to tie how conservation, improvement and/or enhancement of identified assets are essential to furthering economic wellbeing, cultural appreciation and healthy communities. The initiative also seeks to bring awareness (planning and otherwise) of these commonly shared resources to residents of all ages and businesses throughout the county.

How to Get There: Determine a featured unique asset each year that encompasses one or more of the resources in the county: natural, recreation and/or history. Example for the coming year could be “Year of the Civil War Trails Network” (Natural, Recreation and History). Rally related stakeholders around the cause and determine how each of the partners can be part of sharing the message. Engage artists and school-age children in developing print, electronic and spoken media to convey how features throughout the county fit within the identified asset(s). Integrate outcomes into county outreach and encourage the business community to participate in the celebration.

Partners to Put in Motion: Franklin County Planning Department, Tourism Bureau, Franklin County Historical Society, community groups, County Conservation District, PA Department of Conservation and Natural Resources, Pennsylvania Historic and Museum Commission, artists, school districts, and other related stakeholders/interest groups.

Strategy: Encourage strategies and/or policies that emphasize conservation of existing county character: small towns, rural areas and positive, memorable views

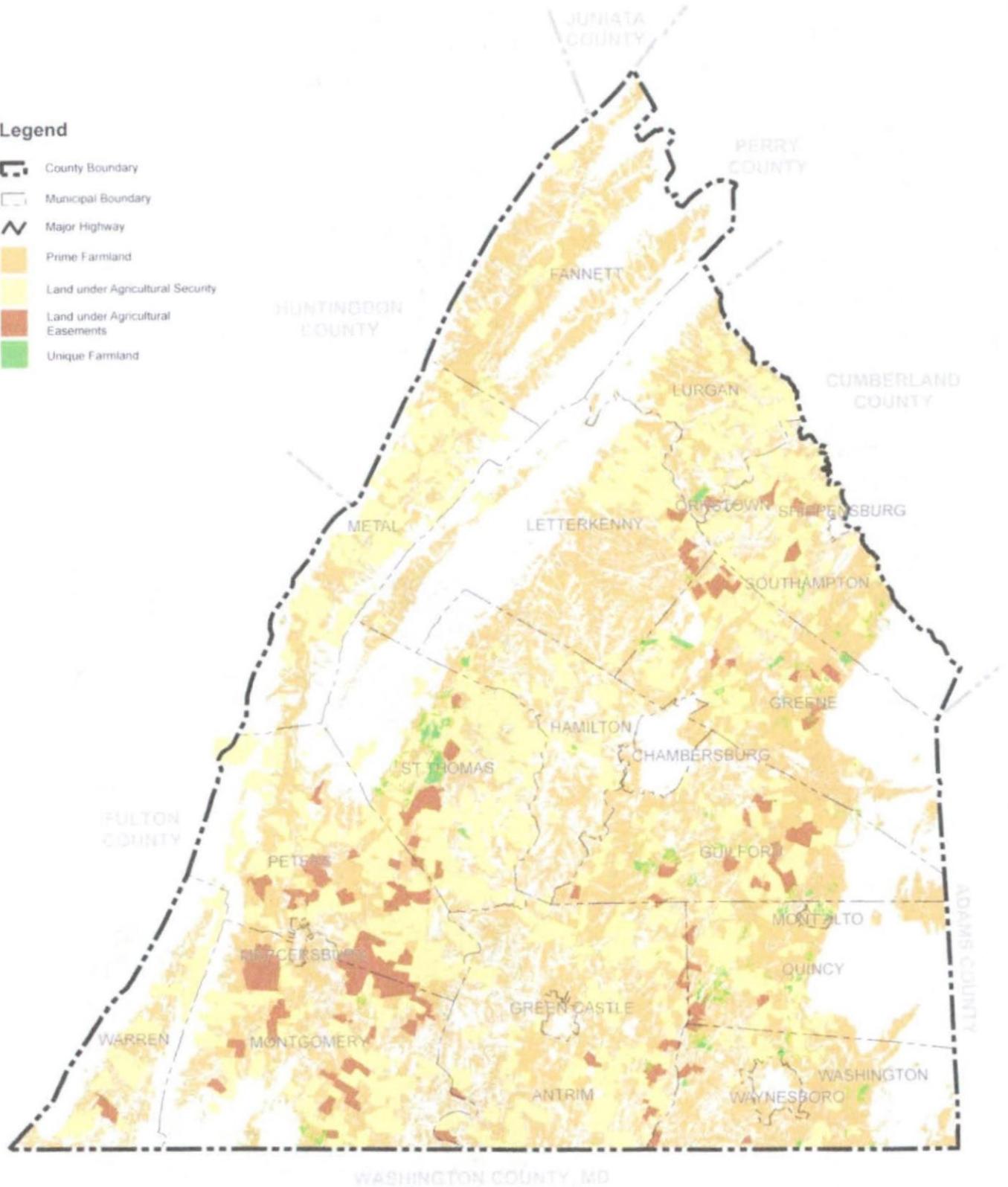
The county should bolster its work within its own departments, with municipalities and forging relationships with the private sector to highlight the significance of environmental resource conservation, history and recreation as related to economics and tourism. The on-going creation of economic and tourism-related opportunities will continue to strengthen the value to both the county’s natural and built landscapes.



Agricultural Resources

Legend

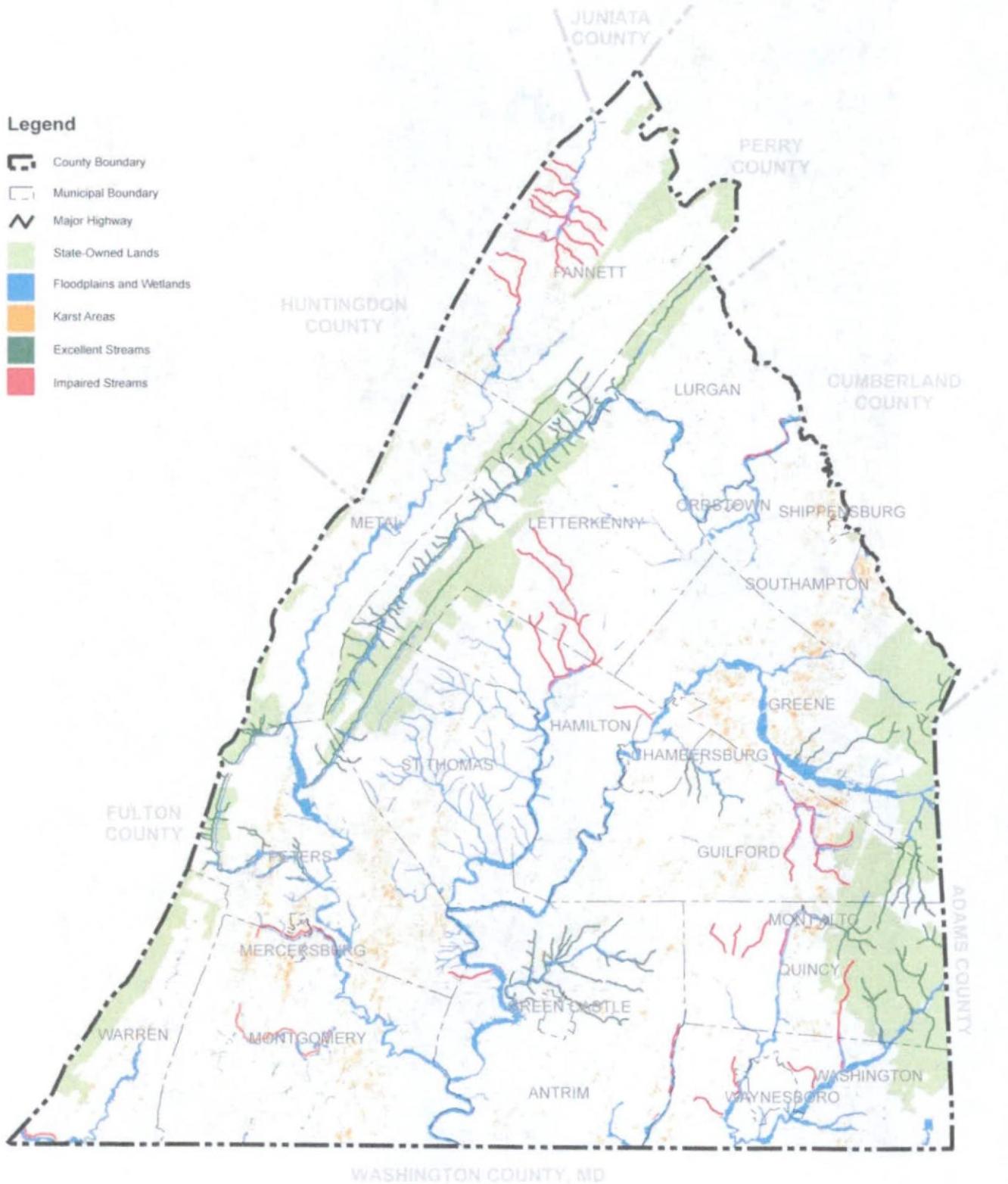
-  County Boundary
-  Municipal Boundary
-  Major Highway
-  Prime Farmland
-  Land under Agricultural Security
-  Land under Agricultural Easements
-  Unique Farmland

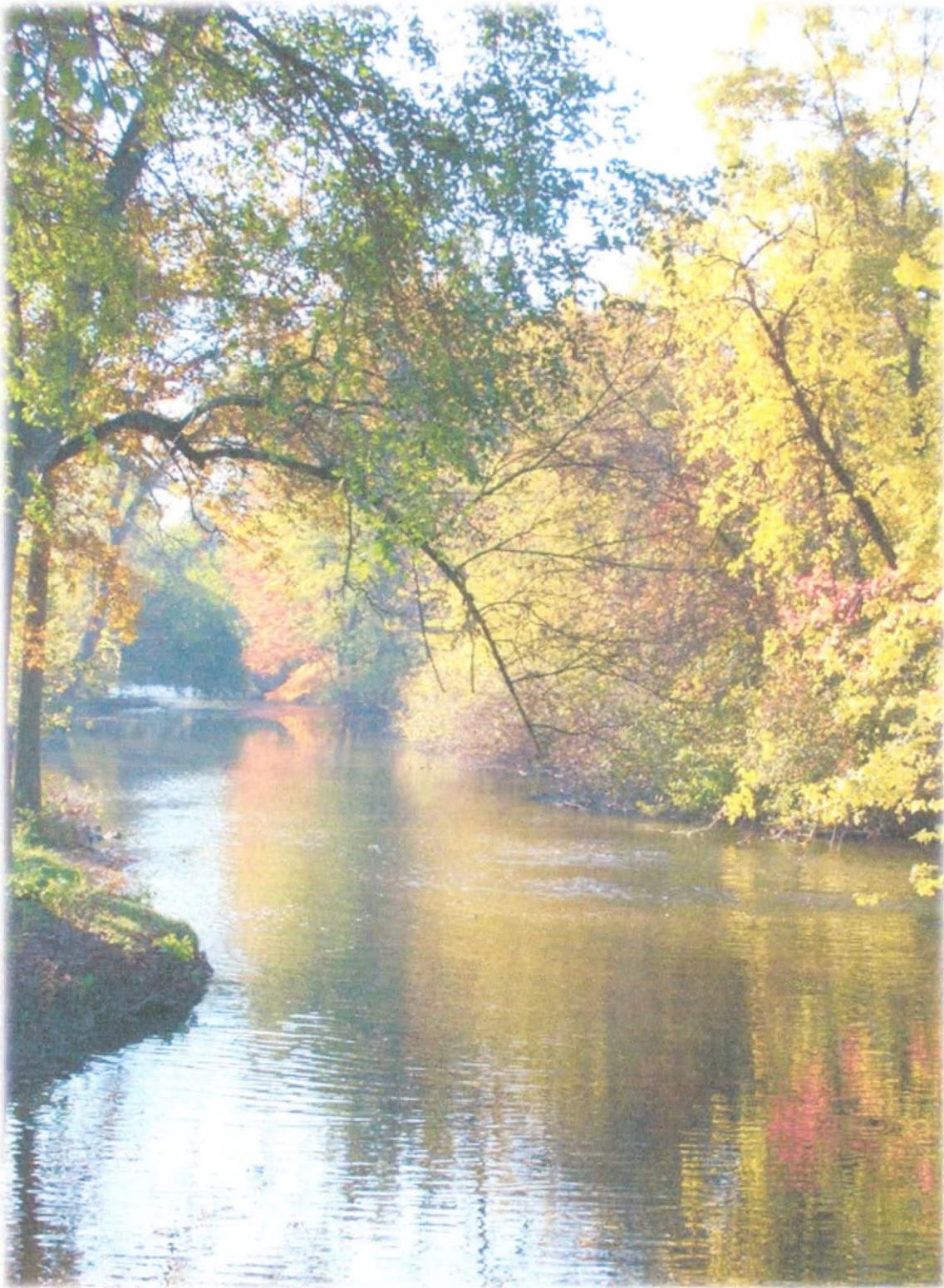


Natural Resources

Legend

-  County Boundary
-  Municipal Boundary
-  Major Highway
-  State-Owned Lands
-  Floodplains and Wetlands
-  Karst Areas
-  Excellent Streams
-  Impaired Streams





Fast Forward: Economic Development

**Going forward,
we need to**
embrace and
provide economic
development
opportunities.



The county's agricultural history and its position within south-central Pennsylvania enable its residents and businesses to continue growing with positive success. Franklin County is strategically located along a major transportation corridor and features a high quality of life and a beautiful setting for employees. The county should continue to work with the Franklin County Area Development Corporation (FCADC) to promote local and regional-scale economic development opportunities. As the county's population and employment base are anticipated to increase, there will be a need for office space, housing for employees, and amenities to attract them to the area. The county can serve a pivotal role in encouraging and/or facilitating discussions among municipalities, the FCADC, prospective businesses, school districts and others to promote coordinated planning and policy decisions. Conservation and the appropriate use of the county's natural and agricultural assets are central to its economic success. Important agricultural soils and woodlands support key sectors of the county's economy.





Economic Development Goal:
Promote economic opportunities while retaining agriculture and community character.

Strategy: Continue cooperation with the Franklin County Area Development Corporation in implementing a comprehensive county-wide economic development strategy and continue to encourage multi-municipal planning.

Municipalities with zoning in the county have provided for a significant amount of land suitable for future non-residential development. In working with FCADC and the communities, the county can encourage coordinated decision making that thoughtfully reflects the overall goals and capacities of land use, transportation, infrastructure and natural resources. The county should work to ensure that there is an inventory of appropriately located land available for economic development.

Strategy: Continue to emphasize agriculture and its supporting industries as identifying characteristics and the stability of the county's future.

Agricultural soils and woodlands support key sectors of the county's economy. Maintaining these assets will allow this important economic sector to remain strong into the future.

Essential Action:

Expand and reinforce how the county's technical planning tools contribute to economic development efforts

Pilot Project: Integrate measurable quality of life indicators and other data into the mapping and information that the county provides in order to further assist others as they recruit, maintain and nurture employment opportunities throughout the county.

Aim to Achieve: Illustrate up-to-date patterns and trends that are relevant to different industries from manufacturing to agriculture.

How to Get There: Outline the types of issues and concerns that would impact potential developments (e.g. commuter patterns for industrial development; stream quality for agricultural development, etc.). Determine how this information can be presented visually and through text to clearly communicate the county's assets and strengths to potential investors. Seek feedback from and collaboration with other departments to refine and strengthen the quality of the information and its presentation.

Partners to Put in Motion: Franklin County Planning Department, Franklin County Area Development Corporation, Chambers of Commerce and Downtown organizations.



Strategy: *Work to facilitate and encourage business, industry and manufacturing in the county.*

Cooperatively evaluate ordinances and land use controls regarding industrial, manufacturing and commercial locations. Ensure land use policies are amenable to a full range of manufacturing and logistics-related industries.



Encourage education within current industries to meet ongoing technologic employment needs within the county. Work with educational institutions to ensure that local students are ready to enter the local workforce.

Promote redevelopment and enhance business growth in the business parks throughout the county.



Strategy: *Foster a quality of life attractive to a plentiful, skilled workforce.*

Recommendations throughout the comprehensive plan are geared to fostering a desirable quality of life. In addition to policies, the county should work with institutions in the public sector and private sector (including school districts) to encourage training within current industries to meet ongoing technologic employment needs within the county.



Strategy: *Continue to develop and implement fiscally responsible budgets that balance needed public services with available funding levels.*

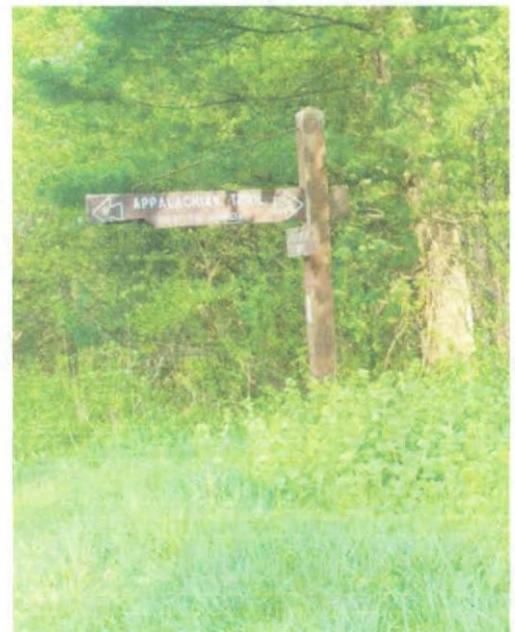
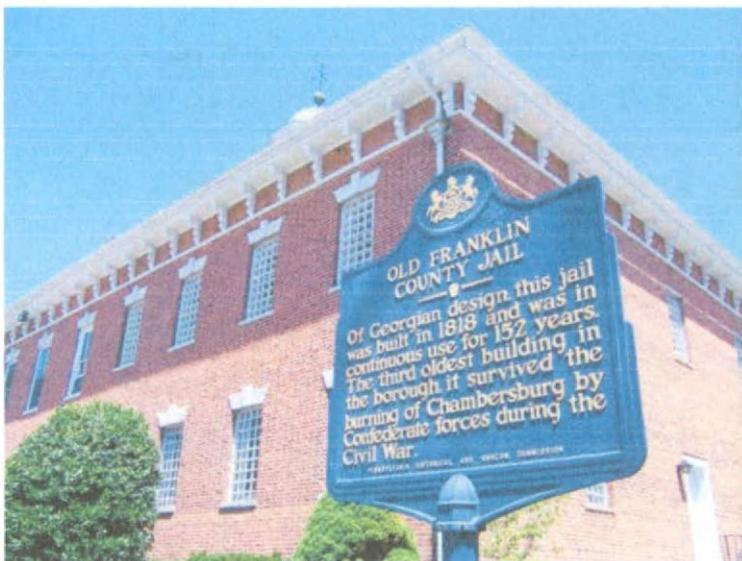
Picture It

By keeping costs down, Franklin County can remain competitive in attracting businesses that are a good match for the area. The county should continue to work with public service agencies and municipalities to evaluate the efficiency and needs of services.

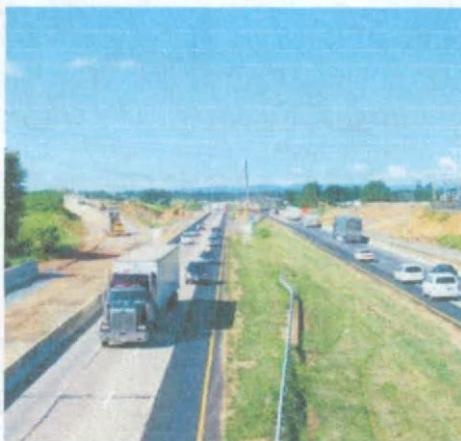
Strategy: Encourage tourism-oriented initiatives.

Hospitality and tourism are industries that are based on local assets. Continued promotion of local tourism and associated business activity tied to the county's natural and cultural assets is critical to future growth and success. This will also serve to showcase the county's assets for potential new businesses.

Civil War-based, history-oriented as well as agricultural-focused tourism are important elements of Franklin County's cultural fabric. Continuation of these kinds of tourism activities should be encouraged and supported.



Going forward, we need to promote balanced growth with transportation and infrastructure investments.



Moving Forward: **Transportation and Infrastructure**

Throughout the comprehensive planning process, recurring discussion focused on how future development patterns can be supported in a sustainable system of infrastructure.

Long Range Transportation Plan

The Franklin County Rural Planning Organization (RPO) was established in May of 2009 to guide decision-making for transportation planning and programming activities in the county. The RPO is responsible for developing a unified planning work program, preparing a Long Range Transportation Plan (LRTP) and managing the transportation improvement program (TIP). The LRTP is the county's guiding document for making transportation decisions that will influence and impact the region's future.

The RPO and the county utilize the LRTP to enhance the transportation system to provide for an efficient movement of people and goods, and to analyze the potential impacts to our community, economy, and the environment. The LRTP serves two purposes. The LRTP serves as the guiding document for decision making for the Franklin County RPO. Additionally, it serves as the transportation element of the Franklin County Comprehensive Plan. The LRTP addresses all modes of transportation including highway, rail,

Picture It

aviation, and non-motorized modes and the eight federal planning factors that were established by the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), the federal transportation authorization passed in 2005.

As the transportation element of the county's Comprehensive Plan, the LRTP also addresses the requirements of the Pennsylvania Municipalities Code (MPC). Article III of the MPC states that the comprehensive plan shall include, "a plan for the movement of people and goods, which may include expressways, highways, local street systems, parking facilities, pedestrian and bikeway systems, public transit routes, terminals, airfields, port facilities, railroad facilities and other similar facilities or uses."

The Franklin County LRTP is developed with the following eight planning factors in mind.

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
2. Increase the safety of the transportation system for motorized and non-motorized users.
3. Increase the security of the transportation system for motorized and non-motorized users.
4. Increase the accessibility and mobility options available to people and for freight.



Essential Action:

Promote multi-municipal and region-based transportation and infrastructure enhancements

Pilot Project: Develop and implement criteria and a ranking system associated with the allocation of project funding.

Aim to Achieve: Support broader-scale transportation and infrastructure planning efforts that are consistent with strategies throughout the comprehensive plan

How to Get There: Outline criteria (e.g. sprawl index) to further administer the distribution of monies for local and regional-scale projects. Evaluate proposed projects using the criteria in context of the comprehensive plan to ensure that funded projects are in line with the county's vision for broad-scale transportation and infrastructure planning. Seek feedback on criteria and finalize the ranking system. Assess potential project funding using the criteria to determine compatibility with the county's vision.

Partners to Put in Motion: Franklin County Planning Department, RPO, municipal authorities and municipalities.

5. Protect and enhance the environment, promote energy conservation and improved quality of life.
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
7. Promote efficient system management and operation.
8. Emphasize the preservation of the existing transportation system.

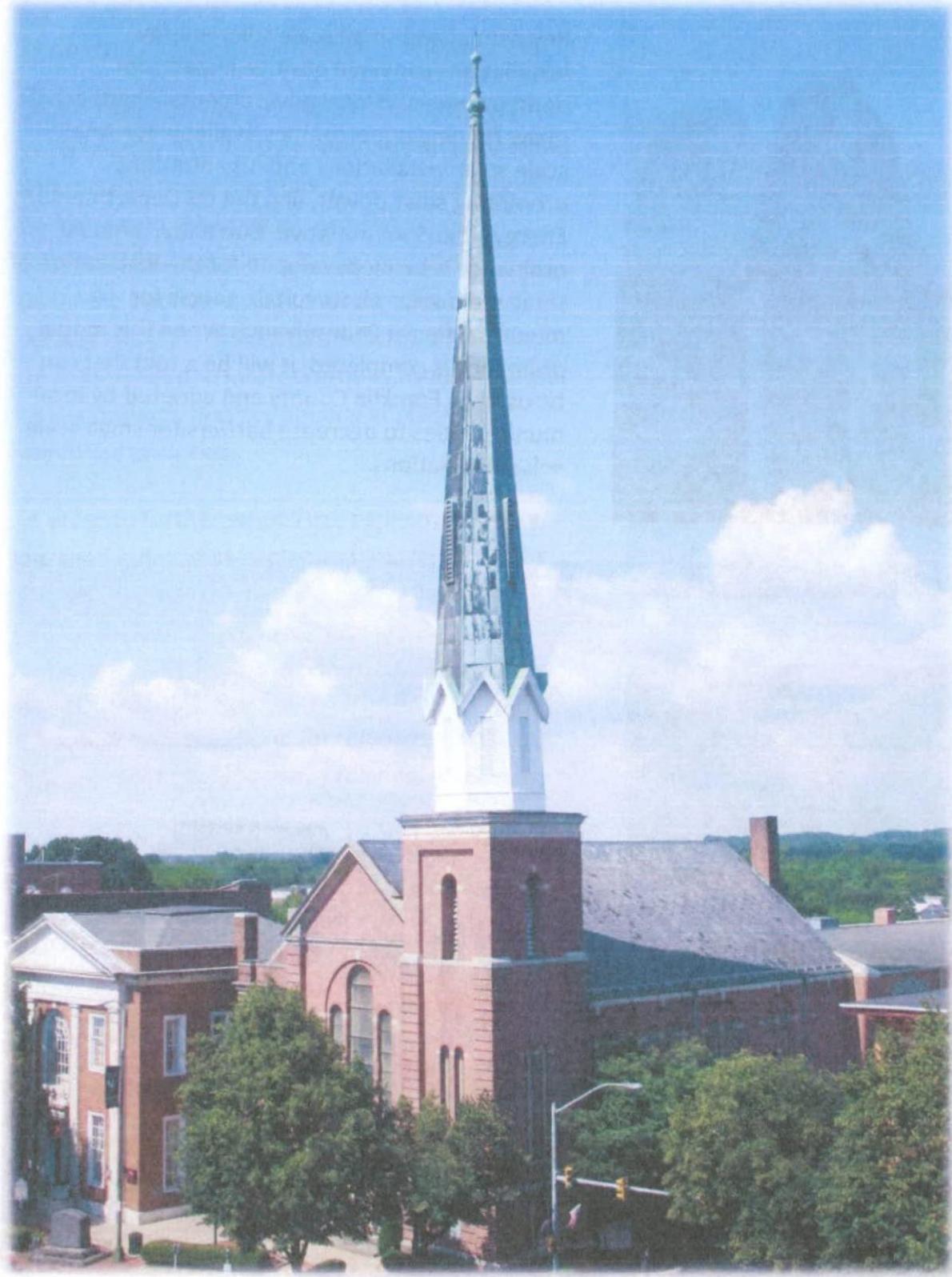


Transportation and Infrastructure

Goal: *Use a balanced approach in the development of transportation, infrastructure, and energy systems.*

Strategy: *Encourage future development and growth to align with existing development and in areas where transportation and infrastructure expansion are invested.*

Infrastructure providers have encountered numerous financial, physical and policy challenges in recent years in response to mandated system improvements. Because all three of these "costs" have revolved around required upgrades, there has understandably been limited focus on expansion of sewer and water needs to accommodate future growth. As opportunities continue to move forward and consensus is built, the county can be a resource for municipalities and municipal authorities in the pursuit of larger-scale infrastructure coordination.



Taking Stock:

Identifying today's resources

The planning goals and strategies outlined as part of the comprehensive plan are borne from the resources that exist in the county today. A series of characteristics and impacts were evaluated in the initial stages of planning to determine the

applicability of policy and project recommendations.

Taking Stock serves to identify the specific patterns of these characteristics and their consideration during the planning process. Additional mapping and analyses were prepared examining physical patterns, socio-economic trends and the capacity for growth in the county.



Franklin County Transportation Network Map, 2005

**Comments from Parcel Owners #1070
on Transource Project in Franklin County, PA**

4
PUC 36
A-2017-2640208
5/22/18
Chambersburg
Jan

These comments are in reference to the property located at 4429 Altenwald Road, Waynesboro, PA. The Transource Project is not a needs based project. It is a cost-based project so it should not take advantage of landowners who get no benefit from the destruction of their property. Transource should be required to spend additional money to cooperate with the landowner's desires for routing. For instance if a change in the route would require adding towers, then Transource should be required to do that to satisfy the landowner's needs even though it cost them additional money. We gave them access to come onto our property with a request for a slight change in the route so that it would not cross our property right down the middle. We requested that they stay at one end of our property which we feel was a very generous move on our part to allow them access at all. They have ignored that request stating a cost to the project. They should not be permitted to be rigid with the landowners that get no value from the project. If that causes the project to be economically not viable then it is not economically viable. It is not a demand based project.

They should have traveled the existing powerline route to the maximum extent possible rather than deviating for ease. It impacts at least 2 lots, perhaps 3 that we have been planning to sub divide for years for our children to use as house lots. This alone has a lost value of approximately \$120,000.00. That doesn't even include the lost value to the existing house and land. View shed is one of the appeals of our property. A powerline does nothing but detract from the view shed and devalues the property tremendously.

Mike Frederick
1218 Golden West Way
Lusby, MD 20657
410-251-9230

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU
MAY 30 2018
RECEIVED

Tammy Salter
Rod Salter
2509 Country Road
Chambersburg, PA 17202
717-267-2413

Tammy Salter
Rod Salter

Comments from Parcel Owners #1070
on Transocean Project in Franklin County, VA

Handwritten notes and signatures in the top left corner, including a date that appears to be 10/1/10.

The first paragraph discusses the impact of the project on the property, mentioning the need for a permit and the potential for environmental damage. It notes that the project is located in a sensitive area and that the proposed activities could have significant effects on the surrounding environment. The text also mentions the need for a detailed study to be conducted before any work begins.

The second paragraph continues the discussion, focusing on the specific concerns of the parcel owners. It mentions the potential for noise, dust, and other disturbances that could affect the quality of life in the area. The text also expresses concern about the potential for long-term environmental damage and the need for strict oversight and monitoring throughout the project.

Handwritten signature or initials in the middle of the page.

Tommy Saffer
1118 Linden Wood Way
Lynchburg, VA 24002
434-961-1111

Tommy Saffer
1118 Linden Wood Way
Lynchburg, VA 24002
434-961-1111