

**Chatham Keep Farming
Natural Resources and Open Space Team
FINAL Report
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I. Team Goals

- ❖ To document the Natural Resources and ecology of the Township of Chatham as they exist at the present time – and their relationship to the recent and geologic past.
- ❖ To generate data which documents the relationship of farming in the community to the current use and preservation of natural resources and open space.
- ❖ To educate both the farming and non-farming communities in Chatham regarding both of the above.

II. Background Information

There are 33,180 acres of land in the Township of Chatham. One hundred years ago about 10% of that acreage was in “woodland” and the remainder was being actively farmed – or constituted industrial, public (cemeteries, roads, commercial), or housing uses. Three hundred years ago the area, with few exceptions, was forested in Northeastern deciduous woodlands. Today, about one-half of the acreage is in woodlands and the remainder is either farmland or other “open space”. About 12% of the land is dedicated to “public” use or to housing and residential use.

III. Methodology

The Natural Resources and Open Space Team joined with the Economics Team in completing a survey of 20 farming operations in the Township, with an in-depth survey of 15 farm operators. Please see the Economics Team Report for additional details of how the survey was set up and performed.

The survey of 15 farm operators included 7,725 acres of land on 6 dairy farms, 3 produce farms, 2 sheep farms, 4 horse farms, and 3 “mixed livestock and other” farms. We believe that the survey covered operators who farm at least 80% of the agricultural land in the Township of Chatham.

IV. Survey Findings

Water Resources – Quantity and Quality

What water resources do you use on your farm?

- ❖ 8 use natural ponds – 16%
- ❖ 7 use manmade ponds – 14%
- ❖ 3 use surface water from streams – 6%
- ❖ 3 use springs – 6%
- ❖ 1 uses cisterns (collected rainwater) – 2%
- ❖ 27 use drilled wells – 55%

How do you use the water?

- ❖ 3 use the water for irrigation – 23%
- ❖ 6 use the water for watering stock – 46%
- ❖ 4 use the water for cleaning dairy milking areas – 31%

Anecdotal information indicates that dairy farmers use approximately 45 gallons of water per cow per day on average.

Do you believe that you have water quality problems?

- ❖ 6 of the farmers surveyed indicated that they did not have water quality issues in general
- ❖ Although all farmers answering the question indicated that their water quality was “OK” they mentioned the following issues: sulfur (2), calcium, iron, and PCB (1 – Valatie Kill).

Where are water supplies located with respect to pollution sources?

- ❖ 75% reported that the sources were “upstream” of pollution
- ❖ 25% reported sources “downstream” of pollution sources
- ❖ 3 farmers reported unused wells – sealed and capped

Do you utilize water conservation practices?

- ❖ Two-thirds of the farmers reporting indicated that they were using water conservation practices. Those practices included: use as little as possible; efficient irrigation practices; returning “wash water” to the barn for cleanup.

Observations:

- ❖ Water quality and quantity appears to be adequate for the farmers surveyed.
- ❖ Conservation practices are in-place, but could be improved.
- ❖ Farmers surveyed do not represent the full spectrum of water-users in the Township – and additional information about water quality and quantity needs to be collected – since ALL Town residents, save those in the Village of Chatham, supply their own water from either surface or underground sources. Anecdotal information continues to report both surface and groundwater contamination.

Solid Waste

What types of solid waste do you produce?

- ❖ Manure – 83%
- ❖ Paper – 25%
- ❖ Dead animals – 17%
- ❖ Farm machinery / trash – 33%

How do you manage your solid wastes?

- ❖ Recycle – 33%
- ❖ Dump – 25%
- ❖ Give away – 8%
- ❖ Spread or compost – 92%
- ❖ Burn – 17%

Observations:

- ❖ Manure is the major “issue” for most farmers – especially dairy farmers who produce about the same volume of manure as they sell in milk – 17 million gallons per year.
- ❖ All farmers recycle manure by spreading back onto their fields. Three farmers indicated a need for manure storage – especially during the January-April months – but most spread daily. Storage facilities (with methane recovery for energy) would reduce surface runoff – but are more expensive than most farmers can currently afford.
- ❖ It is common to burn paper and cardboard trash, and to recycle household trash. Farm machinery and “construction debris” are often disposed of in landfills on the farmer’s property.
- ❖ Of the farmers who responded, none felt that solid waste disposal and recycling was a “major problem”.

Soil Conservation

Is erosion and soil loss an issue on your farm?

- ❖ 75% reported that erosion is not a problem
- ❖ 25% reported that erosion is an issue
- ❖ All of those responding “yes” indicated that surface stream erosion of tillable land was a problem – and that existing regulations made it difficult to manage stream erosion in an adequate way.

What kinds of conservation practices do you use in farming?

- ❖ 14% use conservation tillage
- ❖ 22% use contour plowing with buffer strips
- ❖ 22% use contour plowing only
- ❖ 14% use conservation strip farming
- ❖ 14% use no conservation tillage practices
- ❖ 14% report “other” conservation practices (cover crops)

Do you participate in State or Federal Land Management programs?

- ❖ 22% reported participation in Land or Soil Conservation programs
- ❖ 7% reported participation in Water Conservation programs
- ❖ 7% participate in Forestry programs
- ❖ 64% reported that they are not currently enrolled in programs

Observations:

- ❖ There has been some resistance to “conservation tillage” practices in the past – but those who use it see the benefits.
- ❖ Federal (USDA Soil & Water Conservation) programs are available to provide matching funds for buffer strips between crops (usually corn) and around wetlands and stream areas. These strips reduce the amount of runoff from manure spread in the “off season”.
- ❖ Erosion from grass and alfalfa crops is unusual – corn is more of an issue – and some produce farmers report planting a “cover crop” during the winter on their fields.
- ❖ Assistance in discovering and applying for programs that provide funds would be of great benefit to the farmers and would greatly increase conservation practices. This service does not appear to be available from the Agricultural Extension Services.

Chemical, Herbicide, and Pesticide Use

What types of chemicals do you use and who applies them?

- ❖ Commercial fertilizers – 17%
- ❖ Organic fertilizers – 24%
- ❖ Pesticides – 14%
- ❖ Herbicides – 17%
- ❖ None used – 28%

Most farmers recycle manure to their fields by spreading if it is available. Of those responding, five indicated that they contract a service to apply the FIFRA pesticides and herbicides – two reported that they apply their own. Certifications and training are required, and all farmers report that they are in compliance with Federal and State Regulations.

Describe your usage of pesticides and herbicides:

- ❖ 27% reported no pesticide use and 42% reported no herbicide use
- ❖ 63% apply pesticides and 42% apply herbicides “sparingly”
- ❖ 9% apply pesticides on a fixed schedule as do 17% for herbicides

Wildlife and Ecology Management

How do you manage wildlife in your normal farming activities?

- ❖ 6% report that wildlife management is “important” and encouraged
- ❖ 18% report that wildlife habitat is included in their farming practice
- ❖ 35% encourage hunting on their land and manage for it
- ❖ 35% “appreciate wildlife” but undertake no active management
- ❖ 6% report no management of wildlife
- ❖ All but one of the farms surveyed allow access for hunting

What is the extent of wildlife damage to your farm or crops?

- ❖ 7% report past damage which has been controlled or corrected
- ❖ 64% report that damage is insignificant or not important
- ❖ 14% report that they hunt or deter animals when necessary
- ❖ 14% report that wildlife is a consistent threat to profitability

Observations:

- ❖ Most farmers are interested in wildlife, understand their place in the ecology, and encourage “good practices” in managing wildlife habitat.
- ❖ Those who report damage from wildlife cite deer, raccoon, and turkeys eating crops, geese in spring cornfields, and coyotes threatening young livestock.

General Observations:

- ❖ Farmers are generally good managers of their land and the natural habitats which surround it. They understand the need for ecological balance and appreciate the diversity of their surroundings – because they work in and with it on a daily basis.
- ❖ Wetlands are reported on about half of the farms surveyed – but we suspect that all of the farms contain wetlands of one size or the other. Only larger wetlands are “protected” by the State.
- ❖ Fortunately most wetlands in farming areas are managed well because they simply cannot be farmed with heavy equipment.
- ❖ Farming “concerns” listed include the following:
 - Water well issues (2 reports of dry wells in the past five years)
 - Pesticide and fertilizer storage/handling – 2 reports, no detail.
 - Petroleum storage – 3 farms
 - Livestock waste management – 2 report issues in the winter
 - Livestock carcass disposal – 2 farmers are concerned
 - Odor is reported as a neighbor issue for one farm.
 - 5 farms report “none of the above” as issues or complaints.
- ❖ 75% of farmers surveyed report that they have recently considered changing their farming practices. Changes considered include:
 - Changing stock or product
 - Adding value through cheese or “creamery” processing locally
 - Methane production from manure and energy recovery
- ❖ Most farmers respond that their relationships with neighbors are “good” and they generally consider their neighbors’ needs in their farming practices. They agree that education of those unfamiliar with farming would be helpful in getting neighbors to understand why they do what they do when they do it.
- ❖ When asked what would help make their farms more successful they said:
 - Facilitating applications for government programs and funding
 - More sales outlets locally
 - Better distribution systems for produce
 - Higher milk prices
- ❖ When asked what barriers are hindering their profitability they said:
 - High taxes
 - High cost of land
 - Lack of local markets
 - Lack of good help (labor) and inability to pay competitively
 - Fluctuating milk prices (inability to plan long-term)
 - Inadequate manure handling methods and systems
 - Farm is too small – too costly to expand
 - Lack of operating capital
 - Rocky New England soils
 - City people
 - Loss of good agricultural land to housing development

Topography

Note: corresponding maps may be accessed by clicking “maps” on the menu.

The structure of high, bedrock ridges to the East and North, and the glacial ridges and valleys to the West and South dominate the topography of the Town of Chatham. Dipping steeply to the East and striking about 10 degrees West of North, the Cambrian and Ordovician bedrock of shale, slate, and greywacke create sharp ridges in stronger rocks and deep valleys in weaker rocks – all running nearly due North-South.

A thin veneer of glacial till overlying these rocks in the East gradually thickens towards the outwash glacial deposits of the deeper valleys to the West and South. Steeper, higher, rocky slopes of the East and North give way to the flatter, more gravel and till-covered, glacial floodplains of the West and South of the Township.

Like caterpillars crawling north, the glacial outwash structures and deep valleys in softer bedrock all line up north-south, dominating the topographic scenery. Soil types dictate the differences in the forested eastern and northern areas from the more fertile and less-wooded western side. Wetlands, many of them quite small, serve as ecological diversity shelters and create the fertile soils of the future. It is an ecology that has been in balance with itself for hundreds (if not thousands) of years.

Generally better farmlands are found in the valleys of the West and South of the Township. These areas also have a better, higher-quality groundwater availability.

Small wetlands are found throughout the area, and rock walls are a common testament to the more prominent farming of the land in the past. About half of the 33,180 acres in the Town of Chatham are forested – again mostly in the Eastern and Northern sections – where farming is less prevalent.

Bedrock Geology

Note: corresponding maps may be accessed by clicking “maps” on the menu.

The bedrock geology of our area consists of Ordovician shales, slates, greywacke (muck rock), scattered with a few limestones in the younger beds to the east. These 500-million year old rocks were overthrust by even older rocks from the upper Cambrian and lower Ordovician during the building of the Taconic Mountains, the predecessor of the Alleghany – whose sediments came from the previous mountain-building sequence.

Strikes are about 10-degrees west of north with steep dips (some overturning and folding exists) of 80 degrees or so. Subsequent heating, pressures, and burial led to the partial metamorphosis and the strong joint fracture system filled with either white calcite or beautiful, white quartz. Water is common and abundant in the fracture systems – but is often loaded with minerals including calcium, iron, and sulfides from pyrite weathering.

Good exposures can be found along Interstate 90 from Valatie Kill to Canaan – where the road cuts almost directly across the dip – and many other places in the north and east of the Township. Fossils are rare – partly due to the metamorphic impacts and the fact that most fossils of this age were soft and gentle. Shellfish of various types can be found in the limestones – with higher probabilities further to the eastern (younger) rocks.

Surficial (Glacial) Geology

Note: corresponding maps may be accessed by clicking “maps” on the menu.

The “surficial geology” of the township consists of a usually thin, but sometime thick, layer of glacial goo called “till” or “ground moraine”. This glacial till was laid down by monstrous (5000’ plus) continental glaciers moving from north to south at speeds of up to 200 feet per day. From 12 to 25 thousand years ago, the most recent continental glaciers ground down the bedrock, molded the topography, transported huge boulders 1000’s of miles, and deposited the future soils that we now work.

Kame deposits (sands and gravels usually in pits formed by melting blocks of ice) are common along the waterways of the Kinderhook, Valatie, Indian, and Stony Kills. Those waterways (along with the Hudson River) also contain outwash gravels (which are the area’s only true aquifers) as well as valuable alluvial deposits along the floodplains – all created by the tremendous volumes of water moving south from the melting glaciers. It is here that the most productive soils are located.

The glaciers grind bedrock as they advance and gush water to the south as they melt. The softer layers of bedrock (also aligned north-south) are more eroded and form narrow north-south valleys between the more durable ridges. This is the most significant impact of them all on topography – leading to the “caterpillars crawling south” appearance of the entire township. Some are bedrock ridges, some outwash deposits (drumlins) – but both are aligned with each other.

Soils and Farmland

Note: corresponding maps may be accessed by clicking “maps” on the menu.

Soils are developed on the glacial till veneer spread by the glaciers. This till is a mixture of many grain sizes – consisting of “mud” (clay) to giant boulders of granite carried from somewhere north of Hudson Bay. It is relatively poor and acidic (pyrite and sulfates) in the rocky areas – but can be very productive in and near the valley areas. It is illustrative to note that many of the soil types end with the word “muck”.

Rock walls are common in the entire township of Chatham – the result not of farmers wanting to mark their boundaries so much as to simply get a plow through the field by removing enough rocks to the edges. Pastures, where the soil is particularly poor, leads to corn, hay, and grasses on the slopes to soybeans and grain corn in the river valleys. Generally soils developed in the flat valleys of the Southeast are more productive and better-drained for farming purposes.

Water and Wetland Resources

Note: corresponding maps may be accessed by clicking “maps” on the menu.

The waterways, ponds, lakes, and wetlands provide the most recent and, perhaps, the most obvious source of topographic changes in the township. Contained completely within the Kinderhook Creek drainage, the streams are responsible for moving rock and soil downstream – mostly to the southwest. Indian Creek – Kline Kill, Stony Kill, Valatie Kill, and many other smaller streams eventually find the Kinderhook on their way towards the Hudson River.

Wetlands are common, but those large enough to be protected by the NYDEC regulations are relatively few in comparison. Since bog lands (for the most part) cannot be farmed, they are therefore protected – at least at this point. They serve many purposes, among them: water flow buffer during storms, ecologic reserves for diverse critters, building of new “bottom land” soils, sinks for carbon, and aesthetic beauty.

Water quantity is abundant both on the surface and below it. Wells are mostly of good quality, with some iron and sulfate issues in the east and north. Outwash gravels in the river bottoms provide a significant source of high-quality water. Most streams can and do provide adequate habitat – but sustained trout fisheries are supplemented with stocking. Pesticides and fertilizer (manure) runoff always pose potential problems.