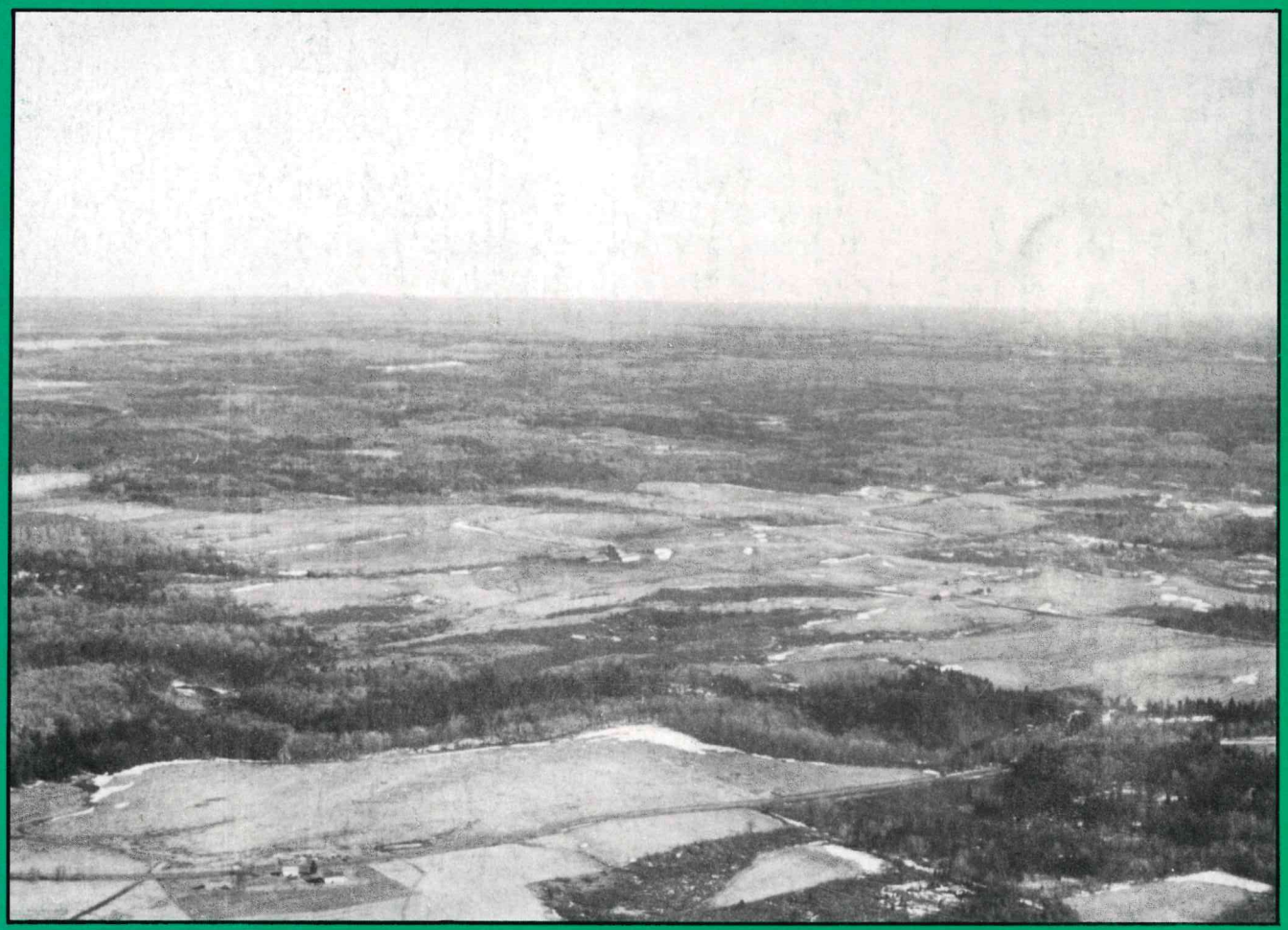
TUG HILL WORKING LANDS



Tug Hill Commission
Tug Hill Tomorrow, Inc.
December 1991

TUG HILL WORKING LANDS

prepared by

TUG HILL COMMISSION
in cooperation with
TUG HILL TOMORROW, INC.

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The Temporary State Commission on Tug Hill was created by state legislation in 1972 as a non-regulatory state agency to assist local governments in protecting and enhancing the Tug Hill region's natural resources, communities and economy.

Tug Hill Tomorrow, Inc., is a private, not-for-profit corporation created in 1990 to support educational programs, voluntary land protection, and community revitalization in the Tug Hill region.

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Keeping What We Cherish -- An Open Letter to Tug Hillers and Others Who Will Shape Tug Hill's Future.

Tug Hill is deep forests, rushing cold streams, heavy snows, remote country roads and trails, and rugged people wrestling a living from a land they love. We Tug Hillers want to keep it that way, while we provide for a prosperous, healthy future here for our children and their children.

Over the years, Tug Hillers have repeatedly said "keep it the way it is" through local action. "Keep it the way it is" means "keep what we value", not avoiding all change. What we value is control of our own destinies, and making a good living from land that is well used and cared for.

TUG HILL WORKING LANDS is prepared to help us all -- student, Tug Hill resident, Tug Hill visitor, state and local policy maker -- better understand Tug Hill and how we might "keep it the way it is" while also providing for a dynamic future in a changing world.

TUG HILL WORKING LANDS is not a plan for the region. That is the job of the region's people working cooperatively through their government. It also is not a comprehensive inventory of Tug Hill, or a cookbook for "saving" the region. It is a sampling of what Tug Hill is, and a sampling of actions that might be taken to provide for a good future.

We hope that it will be used in our town halls, at meetings of community groups, and, perhaps most of all, in our schools, to help the next generation of Tug Hillers realize what they will inherit, and how they will have to continue to be stewards.

Sincerely,

James M. McMahon

James M. McMahon
Chairman

SUMMARY

A SPECIAL PLACE OF WORKING LANDS

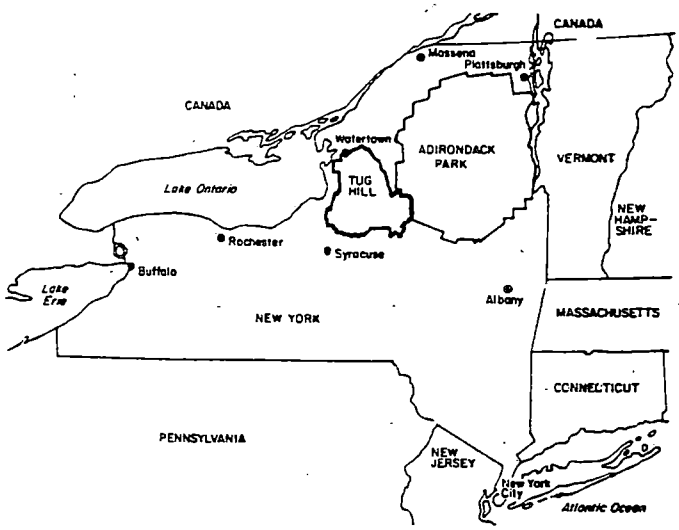
The Tug Hill region lies between Lake Ontario and the Adirondacks, Oneida Lake and the Black River. Larger than several states, its approximately 2,000 square miles comprise one of the most rural sections of New York State and the Northeast. A scattering of public lands covers a tenth of the region, with most of that land used extensively for timber production, hunting, and other recreation. The rest is forest, farms and homes privately owned, all of it working land that supports the region's way of life.

Its total population is just over 100,000, with most of that concentrated in villages around its edges. Its densely forested core of about 800 square miles is among New York's most remote areas, with a population of just a few thousand and few public roads.

While to some Tug Hill may appear to be just an empty space, it is alive with people making a living from a land they love, and with people enjoying a quiet visit, a secluded camp or a rousing outdoor adventure. It also is home to a wealth of wildlife, forests important to sustaining the region's economy and clean air, and pure waters that sustain people and industries within and beyond its borders.

Its incredible snowfall combined with extensive forests, clean streams and diverse wildlife, make it an important, though little known, recreation area for the state. Rich farm land along its northern edge and in the Black River Valley make it an important contributor to New York State's dairy industry.

In its size, remoteness, and environmental quality it is clearly one of New York State's most important and special areas.



The Tug Hill region lies between the Adirondack Park and Lake Ontario.

THE CHANCE OF LOSING WHAT IS SPECIAL

Tug Hill has seen threats to its remoteness and environmental quality, and the way of life they support, over the years. A century ago its forests were cut so heavily the essence of the region might have been lost. But the forests grew back, though changed. Two decades ago, recreational development posed the threat of breaking up the core forest, but the economy changed and the development plans were dropped.

More recently, threats such as waste disposal sites were proposed, which prompted a series of public forums held around the Tug Hill region during 1989. Over 300 citizens showed up at these forums to express their concern about the future of Tug Hill, and, in particular, it's water resources.

Tug Hill has worked as a region because many of its people could make a living from the land they owned. That could change, and soon. Changes in the national and international economies are challenging the farm and forest industries so important to the region. Increased development around the region's edges is slowly moving toward the core, and may lead to the break up of land and the fabric of communities if not properly guided. More urban areas increasingly perceive the core as an empty space suitable for waste disposal and other undesirable uses.

LOCAL ACTION TO "KEEP IT LIKE IT IS"

Tug Hillers are known for controlling their own destinies. When intensive recreational development threatened the core forest in the early 1970's, they called for creation of a state agency to help find ways to keep what they valued about Tug Hill's way of life and environment.

The Tug Hill Commission was created as a non-regulatory agency. To be sure any land use controls needed came from the grassroots level, the core towns of the region created what is now the Cooperative Tug Hill Council.

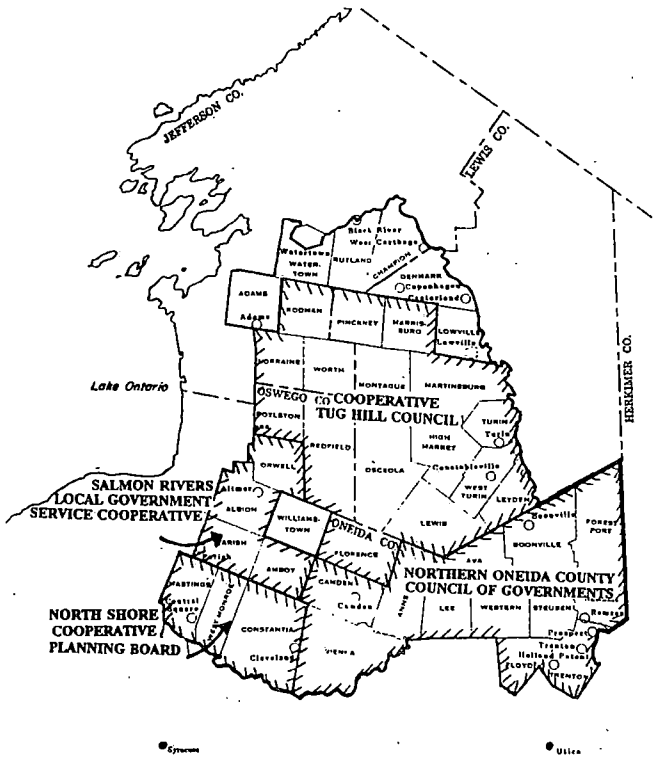
In following years, other cooperative planning boards and councils of governments arose in the region, and received support from the Tug Hill Commission. Today, as a result, most of even the least populated Tug Hill towns have land use controls and community improvement programs in place — but most agree these are not sufficient to insure the region's future.

After the 1989 forums, these councils expressed to the commission their concern that forces threatened to change the region profoundly if action was not taken soon — but as always, they made it clear that this action should be local.

A "SNAPSHOT" OF TUG HILL TODAY

Although Tug Hill is still a region that is rich in natural resources, the overall picture has changed in the past several decades.

About 117,000 acres of wetlands, nearly 4,000 miles of stream channel, three reservoirs and a virtually unlimited supply of groundwater combine to make water one of Tug Hill's most abundant and important resources. This supply of water



Cooperative planning boards and councils of governments have formed in the Tug Hill region with support from the Tug Hill Commission.

is used for recreation, generating electric power, and municipal and industrial water supplies. Remote headwater areas and pure groundwater supplies could be threatened by waste disposal sites and unregulated development.

Recent analysis of satellite imagery indicates that Tug Hill's forests are expanding. The rise in acreage of Tug Hill's forests helps to support the forest industry which is an integral part of the economy of the region. This increase is due mainly to the natural succession of abandoned farmlands to brush and then forests. But, even with the increase in forest cover, there is the threat of fragmentation which could take large amounts of forested land out of production.

The farming scene has also changed. Small, subsistence farms have consolidated into larger, more commercial farms, mainly dairy. In addition, farms on the marginal lands in the transition area have been abandoned, with a concentration of farms on the better lands of the Black River Valley. Economic factors, such as decreasing milk prices, are continuing to force Tug Hill farms out of business.

Because of the variety of habitat types, Tug Hill is home for an abundant and diverse wildlife population. In addition, a preliminary study by the New

York Natural Heritage Program has identified over 32 plants and nine animals found in this region which are extremely rare in New York State. They also identified twelve potentially significant natural areas, none of which are currently protected. These sites could be unknowingly destroyed by a variety of activities.

Recreational activity on Tug Hill has increased in the past two decades. The most notable increases are in winter activities including snowmobiling and cross-country skiing. Hunting, fishing, hiking and bicycling are also very popular. But, with the limited amount of public land (12%, both state and county), the availability of private land for outdoor recreation pursuits is critical. Without more permanent arrangements to secure access and trails, many areas may become closed to public use.

POSSIBLE ACTIONS TO PROTECT TUG HILL

Tug Hillers believe strongly that any action to retain the region's rural and remote character should be local action, or action approved by local governments with active public involvement.

The following sorts of actions, primarily taken at a local level, could play a key role in "keeping Tug Hill the way it is" while dynamically adapting to a changing world. They represent a set of actions that "could" be taken, though many have already been started through local initiative.

Multi-Town Planning To Accommodate Growth

Tug Hill towns, joined together through intermunicipal agreements as councils of governments recognized under exisiting New York State law, could prepare goals for future growth for their entire area.

These goals for the future could serve as a guide for updating individual town land use controls, plans, and actions for retaining the quality of natural resources and the livability of towns, villages and hamlets.

These goal statements could be adopted town by town. Actions to implement the goals could be taken by individual towns. The goal statements could also suggest criteria for identifying those "special areas" most important to retaining the area's environment, character, and economy, and standards for protecting those areas.

Special areas, for example, could include significant wildlife areas, headwaters of major streams, major stream corridors and gorges (known on Tug Hill as "gulfs"), and large blocks of forest land important to Tug Hill's economy.

This sort of approach is already being taken by towns in the core of the region. The Cooperative Tug Hill Council, representing Tug Hill's 15 most rural towns, has prepared a "Planning Accord for Tug Hill" that, once approved by all member towns, could serve as a guide for future development of their area. The "Accord" will be accompanied by a list of suggested natural resources of significance to the entire 15-town area, and a list of suggested guidelines for protection of those most significant resources.

Such a multi-town statement of goals could have the added benefit of putting state agencies on notice as to what future these towns see. For example, "special areas" identified by towns could serve as a list of highest priority areas for state action to protect resources through tools such as the state's open space protection plan.

Voluntary Private Land Protection

Private land ownership and stewardship over the years has been the factor most important in keeping those natural resource qualities valued most by Tug Hillers. Combined with the powerful natural factors of soils, cold and heavy precipitation, private land ownership has played a key role in keeping Tug Hill a rural and remote place ideally suited for pure water supply, hunting, fishing, logging, recreation, farming and rural hamlets and villages. Retaining this active stewardship of private lands is essential to retaining the region's character into the future. Fair property taxation, education, good local land use planning, and good markets for the products of the region's natural lands are some of the actions important to continuing this stewardship.

Another new tool to encourage voluntary, private land stewardship is the conservation easement. It allows the private land owner to voluntarily sell or donate (for tax benefit) the development value of a piece of farm or forest land. The land owner can retain the right to farm, log, hunt, lease or other-

wise use the land so long as it is not subdivided or developed beyond what is allowed for in the conservation easement.

Conservation easements have been little used on Tug Hill or most of New York State, but are likely to get increasing attention as the state encourages use of the tool and as land owners seek ways to retain the natural quality of lands they value as they reduce their costs of holding that land.

Land Tax Relief

To aid in retaining Tug Hill's rural and remote character, state law could be changed so that when a conservation easement is purchased by the state, the state would pay a share of the local land taxes proportional to the value of the development rights removed from the land. This is now the law in the Adirondack and Catskill Parks.

In a similar way, state law could be changed so that the state would pay land taxes for all purposes on the undeveloped value of any open lands it owned, as is now the case for Adirondack and Catskill forest preserve lands.

State law could also be changed to provide reimbursement to local taxing jurisdictions for any forest lands provided a partial tax exemption under existing state law.

While each of these three measures would represent a significant change in state policy, such are necessary if the productive use of private open lands – the essence of Tug Hill – is to survive today's economic pressures.

Education

"Keeping Tug Hill the way it is" will require additional efforts to make residents, visitors, and decision makers aware of Tug Hill and its qualities.

Programs that range from incorporating natural resource information specific to Tug Hill into school curricula, to adult education about the region's cultural and natural heritage, to information for visitors and decision makers about what makes Tug Hill special, could all play important roles in leading to informed decisions about the future of the region, and in continuing to create informed future leaders of the region.

Several groups now address parts of this educational need, but few with a specific focus on Tug Hill. Exceptions include Tug Hill Resources – Investment for Tomorrow (THRIFT), a forest land owners group that tries to get good information on the stewardship of natural resources into the hands of land owners, and Tug Hill Tomorrow, Inc., a new not-for-profit specifically organized to support education about the region and to serve as a recipient of conservation easements not held by the state or a local municipality.

Farm and Forest Products

Good markets for the farm and forest products of the region are an important part of keeping Tug Hill lands in productive use.

While such good markets are largely shaped by national and international economic trends and the entrepreneurship of local business people, local actions can be taken to support local businesses trying to develop new products and enter new markets.

In addition to helping keep farm and forest land in productive use, successful efforts in this regard create additional jobs, help keep talented and young people in the region, and add to the value of products produced in the region.



Photo by THC

The forest industry is a vital component of Tug Hill's economy.



Photo by THC

Seasonal use designation of some Tug Hill roads is one option to keep road costs down.

Country Roads and Reduced Road Costs

A key aspect of Tug Hill's character is undeveloped, scenic, country roads, and the absence of public roads in its core region. Roads are also the biggest financial burden for many Tug Hill towns.

Multi-town plans could include suggestions for member towns on how to retain the character of scenic roads that could be kept that way through joint action. They also could include suggestions for areas where new roads should not be constructed, and where existing roads should be abandoned or partially abandoned.

Finally, state law could be changed to allow towns to identify limited or seasonal use roads that could be eligible for maintenance at lower than normal standards. Such lower standards would not preclude use of these roads by logging trucks operating in compliance with state law.

Enhanced Community Development

While special area identification and multi-town plans would in many ways limit development in certain places, retaining healthy economies in Tug Hill towns will necessitate that villages and hamlets work to retain their vitality. These are the places where desired growth would be encouraged in accordance with local plans.

To assist in this, multi-town plans could encourage use by member towns of a variety of land use techniques that encourage keeping lands open and direct housing and other development to areas best suited for it. Communities could be assisted in actions to keep housing, water and other services, hamlets and commercial sectors vital, attractive and growing.

Recreational Trails

Tug Hill's potential for recreation is only hinted at by current use. That potential could be met in a manner that does not jeopardize environmental quality or the region's tranquility by the careful development of long-distance recreational trails, perhaps secured for the future through conservation easements.

Multi-town plans, and coordination between those plans, could help in a cooperative effort of communities, private landowners, and trail users to develop a network of trails for snowmobiling, skiing, hiking and biking throughout the region.

ROLE FOR A REGIONAL COMMISSION AND REGIONAL NOT-FOR-PROFIT

Providing technical, planning, development and financial assistance to cooperating towns of the region has been a function of the Tug Hill Commission for nearly 19 years. To help Tug Hill communities in new approaches to retain their character while providing opportunities for compatible development, the Tug Hill Commission could continue to provide the kinds of assistance it has in the past.

In addition to providing this assistance, the commission could play a key role in coordinating special area protection, recreational development, community development, and road abandonment projects that cross council of government boundaries.

The commission could also play a key role, as it has in the past, in helping not-for-profit corporations and land trusts work on projects to retain the region's character and to foster community development compatible with the region. One such example is the work the commission has already done to help in the incorporation and start-up of Tug Hill Tomorrow, Inc. in support of that not-for-profit's plans to raise awareness of Tug Hill's specialness through voluntary protection of lands and educational programs.

CRISIS OR OPPORTUNITY?

The forces that now threaten to change what Tug Hillers value about their region are dispersed and pervasive. Unlike the heavy cutting of the region's forests in the last century and the potential for large scale subdivision of the core forest in the 1970's, today's agents of change are more subtle, and a crisis not as apparent. However, enough concern about Tug Hill's clean waters and unbroken forests exists to motivate over 300 residents to attend the 1989 forums and express those concerns.

A crisis might arise from failure to act on the many opportunities that exist today to protect Tug Hill's resources. Tug Hill's citizens appear ready for action. The State may be more ready today than ever before to listen to locally-based approaches to protecting a region. New tools, like the conservation easement, provide new opportunities to protect lands and keep them in private ownership, and the cost may never be lower.

The opportunities to take actions that significantly help achieve the goal of "keeping it the way it is" and securing the region's future may never be greater.

TUG HILL, LANDS THAT WORK

For all their remoteness, Tug Hill lands have provided livelihoods to thousands for generations. Tug Hill has been, and is, home to loggers, farmers, sawyers and hunters. These are lands that work—lands that provide food, fiber and water, to those that live here, and to those who neighbor the region.

RURAL AND REMOTE

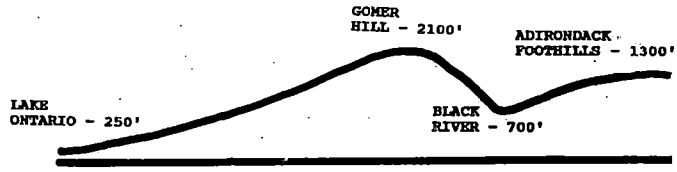
Tug Hill's more than 2,000 square miles appears a small part of New York State. At a glance, it appears insignificant sitting between the massive Adirondacks and the sweep of Lake Ontario. Yet it is bigger than the entire state of Delaware—and is far more rural than that farming state.

Tug Hill can be defined in many ways. Many longtime residents think of Tug Hill as the nearly roadless, forested core of the region. Its extent as described in state law encompasses 41 towns and 21 villages. With this definition, New York State included the towns of the forested core along with the rural towns that border Oneida Lake, Utica, and Watertown, and some of the farm towns along the Black River. The communities that comprise the region include westernmost Lewis County, and the most rural and remote sections of Oneida, Oswego and Jefferson Counties.

ROCK AND SOIL, WATER AND WEATHER

The rocks that underlie Tug Hill help define the region. They tip up from the west at Lake Ontario, to the east where bold escarpments overlook the Black River Valley and the western foothills of the Adirondacks.

These rocks, mostly shales and sandstones that are rocks created from the compression of sediments deposited in water, had their origin millions of years ago in mountains to the east, the Taconics. Millions of years ago, the Taconic Mountains were a major mountain range. Soil and rock eroded from the Taconics were washed westward into a shallow sea that covered much of central New York State.



This profile of terrain from Lake Ontario east to the Adirondacks shows Tug Hill's gentle rise to its summit and steep drop to the Black River.

Sediment accumulating in the shallow sea created limestones. On top of the limestone, shale and siltstone was deposited, and then capped with sandstone. The sandstone, resistant to erosion and deposited on top of the other rock, today forms a "capstone" for much of Tug Hill.

In the millennia following the deposit of these rocks, they were tipped up on the east by the rise of the Adirondacks. Erosion in the Black River

and Mohawk Valleys served to cut off Tug Hill from similar, neighboring rock. This uplift and erosion came to separate Tug Hill from neighboring lowlands, and led to its popular naming as a "plateau", though in a strict sense it is not. These forces created Tug Hill's characteristic gentle western slopes, from Lake Ontario (at about 250 feet) rising up to the 2,000-foot elevations of its eastern escarpment.

In more recent geologic time, the last tens of thousands of years, Tug Hill was further shaped by the power of glaciers and water. Glaciers scraped clean ancient soils and left behind glacial "till" soils noted for their low productivity and poor drainage—a poor legacy to struggling farmers and loggers of the nineteenth and twentieth centuries.

Rapidly flowing water, from the melt of the glaciers, helped carve the deep gorges, known as "gulfs", that are characteristic of the region. But Tug Hill's relative levelness and poorly drained soils have meant the marshes and swamps are as characteristic of the region as are the gulfs. Its richness of wetlands and heavy precipitation make pure water the region's most likely treasure.

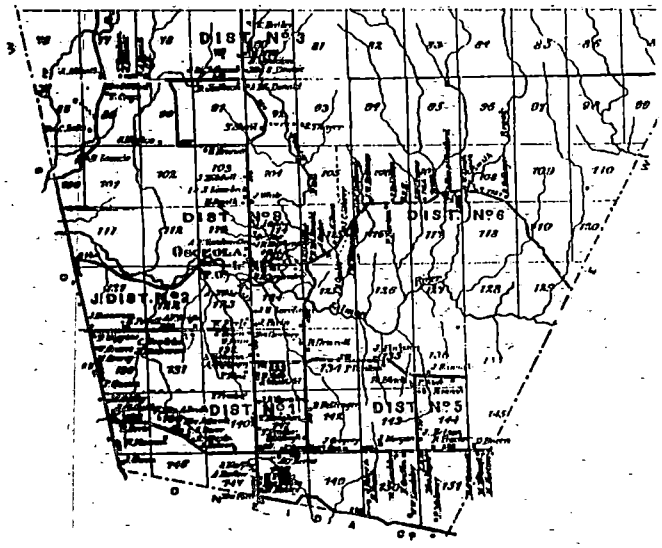
The uplift that created Tug Hill adds to its wealth of water. Located "downwind" of Lake Ontario, the winds that usually sweep Tug Hill from the west often are laden with rain or snow, making the region New York's snowiest and rainiest.

SETTLEMENT AND CHANGE

Poor soils, poor drainage, heavy rains and snows, have conspired over time to always keep Tug Hill little populated.

We know little of Tug Hill's use by native Americans, but it is likely that it was a place occasionally visited rather than occupied year-round, as was true of the Adirondacks. We know most about the Iroquois, the most recent native American's to live near and occasionally use Tug Hill.

After the American Revolution, much of Tug Hill's "empty" lands were taken from the Iroquois and sold in vast tracts, to wealthy merchants who in turn sold smaller parcels to settlers. Settlement of Tug Hill was in high gear by the mid-1800's as the building of the Erie and Black River canals and railroads brought people and commerce to the region.



In the 1870's towns like Osceola were more developed than today, with schools, cheese factories and scattered homes.

Early settlers logged the land, shipping spruce, hemlock and pine to the growing cities of New York State. They also established small dairy farms, shipping cheese to the cities. By 1870, the region's population peaked at about 80,000—a peak not to be matched for a century.

The drop in population after 1870 reflected Tug Hill's harsh realities—long winters and poor soils—and the nation's shifting and growing economy. Paper mills, other industry and farming concentrated along the Black River, and drew settlers back down off the Hill's struggling farms and hamlets. The populations of towns in the center of Tug Hill dropped as small sawmills and one-room school houses were abandoned. Country roads alive with homesteads became the little-used back roads now so common to the core.

WATER, JOBS, RECREATION

Through some 70 years of declining population (1870 to 1950), the lands of the Hill continued to be worked. Logging, hunting, fishing, trapping, and farming continued to shape the region's way of life. After the depression and World War II, America's growing economy and increased mobility meant more people could have a hunting camp on Tug Hill, or could commute to a job in a city or village near the region.

By 1970, the region's population had once again surpassed 80,000. This resurgence also brought inevitable change. It also brought a realization that it would take work to retain what was most valued in the region— productive lands that provided clean water, hunting, fishing and jobs based in farming and forestry.



Photo by THC

Farming remains an important part of Tug Hill's economy.

Today, the region's population is about 100,000, and more change is apparent. Property taxes and a global economy may lead to the break-up of the private forest and farm land holdings that keep its lands in productive use. A state and nation strapped with problems of waste disposal look to "empty" places, often without thought of the value of these lands to supply water, jobs, and recreation.

Tug Hill communities recognize the values of their lands in supplying these valuable resources and opportunities. Banded together in multi-town councils of governments, these communities are working on ways to retain Tug Hill's clean water, jobs, and hunting, fishing and other recreation opportunities, while also providing liveable villages and decent housing and public services—"Keeping Tug Hill the Way It Is".

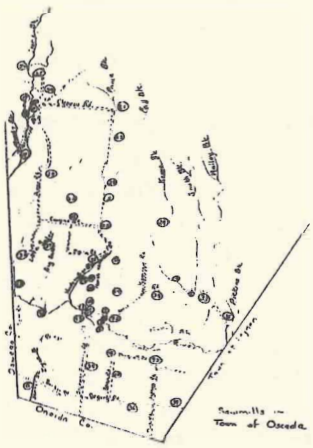
RECOGNITION

Just as Tug Hill residents and visitors recognize the value of the region, others have recognized its significance and the threats to that significance.

New York State gave formal recognition to the region and the need to protect its natural resources and economy in 1972. Since then, Tug Hill has been recognized as part of the "northern highlands" ecological zone by the U.S. Environmental Protection Agency, and as a separate ecological unit, the "Tug Hill Plateau", by the U.S. Soil Conservation Service.

Most recently, the region has been recognized as an important component of the nation's "Northern Forest Lands" in a report of the U.S. Forest Service. The New York State Commission on the Adirondacks in the Twenty-first Century noted the importance of Tug Hill to the Adirondacks for its wildlife habitat values and opportunities for recreational links to the Adirondacks.

Each of these forms of recognition of the region reaffirm something already realized by those who know the region—the productive use of its natural resources are key to its future. Its resources should not be taken out of productive use by misuse and pollution. Its resources should not be set aside unused. Tug Hill's working lands should continue to be just that.



Sawmills and Oar Shops

1. Warren Andrews Mill - one mile down Salmon River
2. William Roberts Mill - on Salmon River where Fall Brook enters
3. Gibbs Mill - later Ben Jackson, then John and Chas. Stuper - on Stone's Pond
4. Williams and Jackson Mill - 1880, later Cowles Mill
5. Oscar Dwyer Oar Shop - on East Road (Osceola - West Layden Road)
6. Orrao Sawmill - later Overcracker (Water Power Mill) - about 3 miles on East Road
7. Whitford Mill - later Reese Whitford
8. Widow Compton Mill - on Fall Brook - across from Clark's
10. Elmer Durst Mill - south end of town
11. Elmer Durst Mill - north end of town
12. Clarence Clemens Mill - north end of town
13. Chris John Shingle Mill - on Vanduwalker Brook
14. Harden Mill - on Fall Brook
15. Dan Comins Mill - south corner of town
16. Dan Comins Mill - central part of town
17. Dan Comins Mill - north end of town
18. Albert Brockway Mill - used a mulley saw, or slow worker
19. Bob Aloun Mill - on Muddy Brook not far from the Redfield line
20. Ike Stedman Mill - on Stony Brook
21. William Colvin Mill - on Prince Brook
22. William Colvin Mill - south of 21 (behind his house)
23. Charles Rowell Mill - on Rowell's corner
24. Jackson Mill - north of Stone's Pond
25. Earl Rowell Mill - north end of town
26. Earl Rowell Mill - central part of town
27. Eri Beebee Mill - on Little Baker
28. Kimber Mill - back of Potter Place
29. H. Magee - Lot 81
30. Justus Keeney Mill - north end of town
31. W.H. Payne - our shop at the foot of Mitchel Hill
32. Charles Payne Mill - on Payne Hill
33. Blount Sawmill - on Smith Brook
34. Charles Stupor Mill - on Osceola - Florence Road
35. LaTray Mill - on Pickins Brook
36. Amos Barkley Mill - south end of town, on Gregory Road
37. Harold Burgee Mill - in village
38. Harold Burgee Mill - on West Layden Road
39. Phil Brown Mill - southeast end of town
40. Hemingway Mill - on Injun Brook
41. Dan Driscoll Mill - on Driscoll Road and Bown Road
42. Homer Chase Mill - on Driscoll Road
43. Sam Griffith Mill - at the foot of Salmon River Hill
44. Dan Thurston Mill - in village
45. Andrew Clemens Mill - in village
46. Seth Bullock Mill - later James Adams - on the East Road
47. Martin DuBois (oar shop) - on North Road where Reynold's family live
48. James Adams Mill - on Ryan Road



The large number of sawmills and oarshops scattered throughout Osceola in the mid-1800's emphasizes the importance of the forests then as they are now.

THE RISING FOREST

The forest of Tug Hill, towering over the valley of the Black River to the east and the shores of Lake Ontario to the west, is a great provider to the people of Tug Hill and beyond. This remote forest serves a variety of needs of the people of the region, and people who live outside Tug Hill.

It is a provider of fuel for woodstoves in the cold of the winter, and a supplier of quality lumber for furniture and pulp for paper. It is a playground for enjoying snowmobiling and skiing, and a vast hunting ground, home to white-tailed deer, ruffed grouse, and snowshoe hare. The forest protects the quality of the water flowing from Tug Hill through roughly 4000 miles of stream channel. The acreage of valuable forest on Tug Hill is rising with abandoned farms reverting back to forest cover. The varied purposes the forest serves add up to a forest worthy of recognition and appreciation.

THE CHANGING FOREST

The present-day forest has seen many changes over time and is quite different from the original forest that grew after the retreat of the glaciers. Wind, fire, disease, and floods were the early influences that altered the landscape, followed by man and his machinery.

The forces imposed on the original forest of spruce and fir have caused it to evolve into the largely hardwood forest of today.

We have to guess at the early native American use of Tug Hill. Its harsh climate and limited archeological evidence suggest use was seasonal. But certainly native Americans traveled and hunted Tug Hill some, and were an early influence on the forest.



CD

Sugar maple



CD

Red spruce

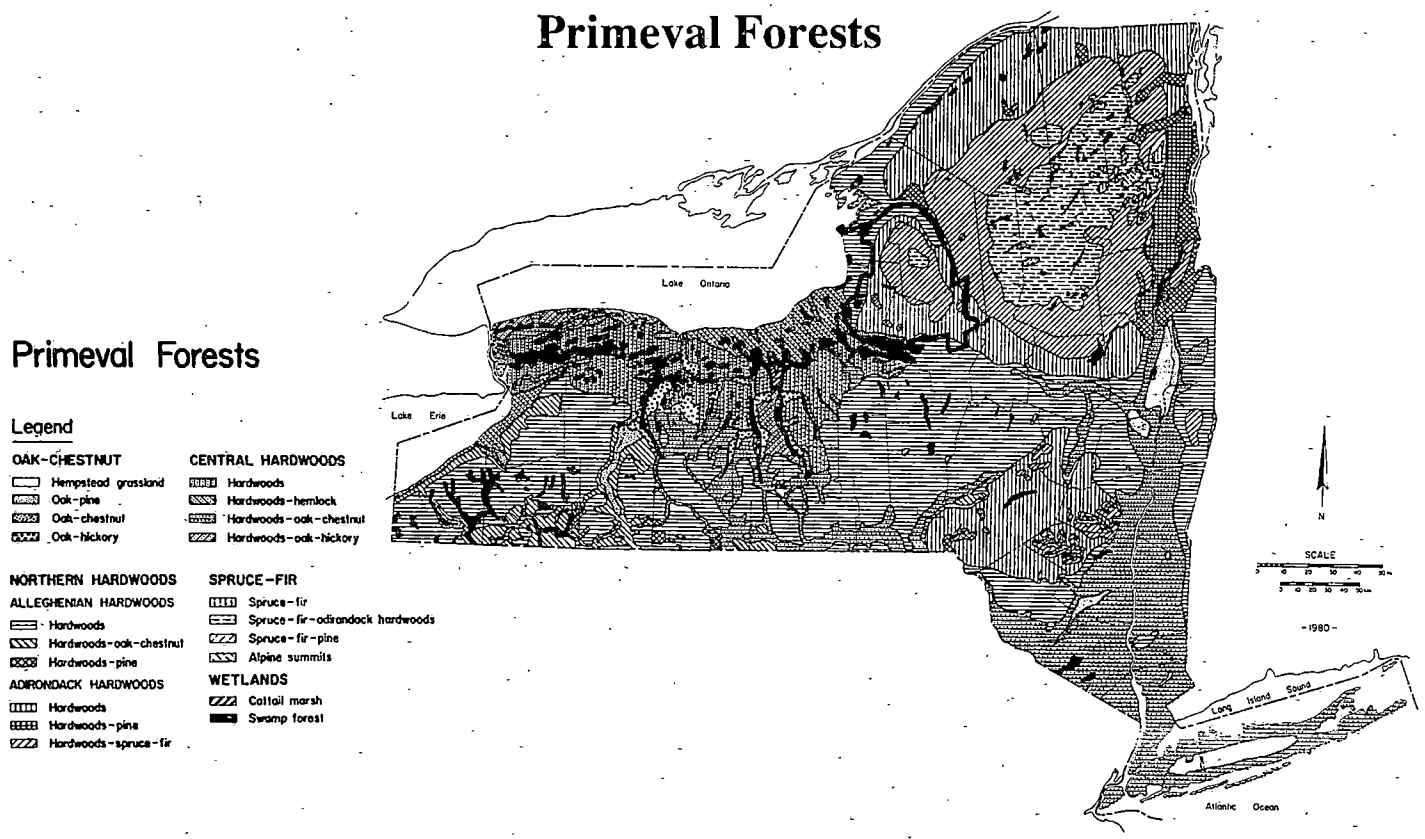
In the early 1800's, European settlers came with their axes and saws. They cleared the forest for small-scale farming, wood products, and settlements. Larger areas were later cleared by Irish, German and Polish immigrants as each tried their hand at farming the land. Many of the farmers soon discovered that much of the land of Tug Hill was generally not suited for farming. The climate was harsh and the soils were poor.

With the mechanization of farming in the early 1900's, tractors replaced horses and farming on marginal lands became less profitable. The land was either left idle to revert back to forest or was reforested by the state, generally in plantations of pine, spruce or other conifers.

Lands that were not cleared for agriculture were logged for timber products. In the late 1800's, Tug Hill and the Adirondacks had become the center of New York State's logging industry. Pulp and paper industries, sawmills and furniture manufacturers set up shop in the Tug Hill region to be close to the source of timber.

As the original spruce and fir forest was depleted, hardwood forest grew in its place. The northern hardwood forest is dominated by sugar and red maple, along with American beech and yellow birch and scattered spruce and fir. Although hardwood regeneration dominates on Tug Hill, spruce and fir regenerate where conditions and harvesting encourage it. Loggers have noted spruce-fir reestablishing in abandoned farm areas of the upland core. These spruce-fir regeneration areas may become very important to Tug Hill because of the demand for these tree species by nearby pulp and paper manufacturers.

Primeval Forests



The original forests of Tug Hill were composed largely of spruce-fir and northern hardwoods.

TODAY'S FOREST

Most of Tug Hill today is heavily wooded, with nearly two-thirds of the land in forest and brush, according to a recent analysis of satellite imagery and aerial photographs. The satellite image on the following page shows the extent of forest cover in the region in comparison to surrounding developed areas. There is an increase in total forest cover compared to an analysis that was completed for the region nearly 20 years ago. This is not surprising considering the number of abandoned farms left to follow natural succession into forest, and is consistent with what is happening in other parts of the northeast.

The present day forest of Tug Hill is dominated by northern hardwoods. The upland core forest and the Oneida Lake forest are the two largest blocks of relatively unbroken forested land on Tug Hill. The upland core is dominated by maples, American beech and yellow birch, mixed with spruce-fir and hemlock. Encircling the core forest, there is successional forest made up of hardwood species overtaking the abandoned agricultural fields and cutover areas, as well as coniferous plantations.



CD
Eastern hemlock

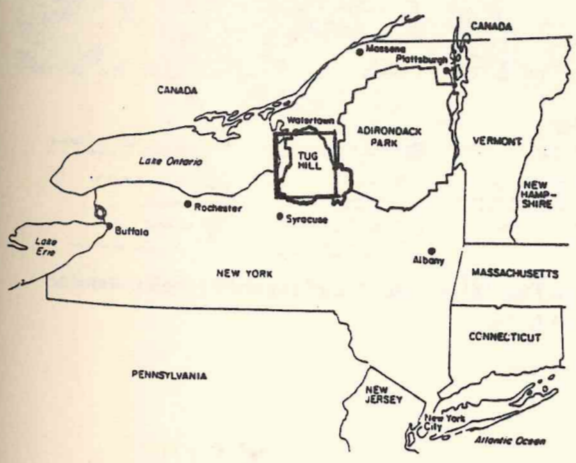


CD
American beach

Maples also dominate Oneida Lake forest, but unlike the upland core, there is a high concentration of black cherry, eastern hemlock and white pine. The depressions between the drumlins of this area harbor forested wetlands dominated by red maple.

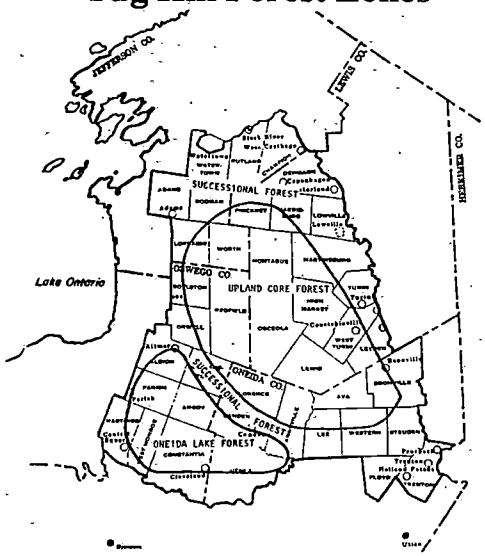
Though most of Tug Hill is deciduous woods (hardwood trees that lose their leaves in the fall such as maple, beech and birch), about one-quarter of the forest land is coniferous forest (coniferous trees have cones, such as pine and spruce). The natural coniferous forests, made up of red spruce, balsam fir, hemlock and white pine, are found around the rims of deep gorges and ravines, in the higher elevations of the upland core area, and in swampy woods. Much of the state-owned land has been reforested as coniferous plantations. In the state reforestation areas, the forest plantations are mostly white pine, red pine, Austrian pine, jack pine, Scotch pine, Norway spruce, white spruce, and European larch.





Satellite imagery of the Tug Hill region shows the concentration of forest cover in the upland core area and north of Oneida Lake, compared to the surrounding relatively developed areas.

Tug Hill Forest Zones



THE FOREST SOILS

Forest abounds on Tug Hill in spite of its soils being considered only "fair" by foresters. Most of the soils on Tug Hill are either wet, stony, shallow, too sandy or on steep slopes, limiting the growth rate of trees. In some areas, like the upland core, soils are so wet that the trees may actually grow better in times of drought. Despite the poor soils, the large blocks of forested land make this a key resource for the region.

OWNERS AND MANAGERS OF THE FOREST

The Tug Hill forest is largely in private ownership, with only about twelve percent of the land, or 154,200 acres, in public ownership (state, county and local government ownership). Much of the upland core area, nearly 75,000 acres, is commercial forest land owned by forest products industries including Lyons Falls Pulp and Paper, producing paper; Cortland Wood Products, producing pallets and related products; and several firewood operations. Most of the balance of the upland core forest is owned by individuals in parcels of several hundred acres (see Tug Hill Forest Resources and Forest Industry map).

Forest ownership outside the upland core is divided among the state, non-industrial private landowners, and some industrial owners. The largest of the industry-owned land in this area, with nearly 10,000 acres, is Harden Furniture, producers of top quality furniture. This diversity of ownership, use, and forest products provides a strong base for the region's economy.

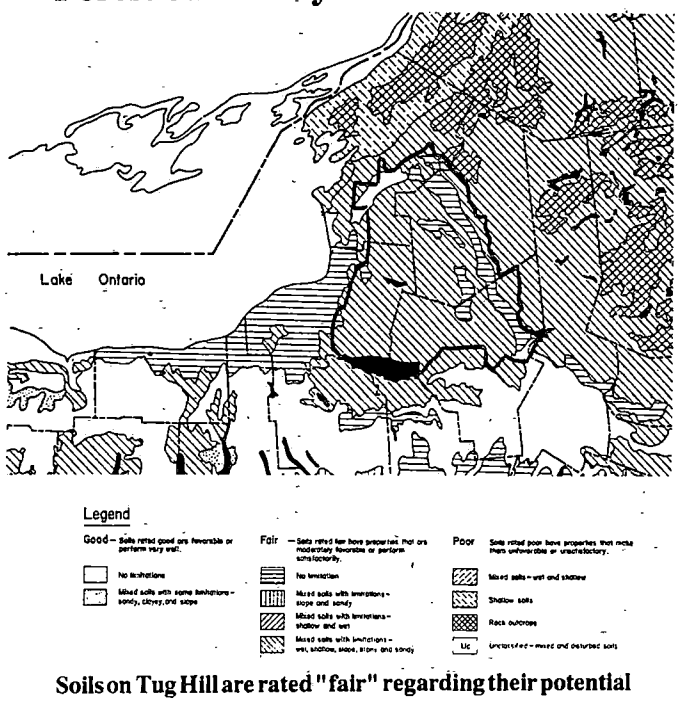
The ownership pattern of Tug Hill, with the majority of forest land privately owned and managed, differs from the neighboring Adirondacks where nearly half of the land is owned by the state and classified as "forever wild" Forest Preserve.

Management objectives differ among Tug Hill landowners. Industrial landowners generally manage in order to sustain a crop of sawtimber and pulpwood, and harvest on a large scale and on a set schedule. The main goal of the industrial forest owner is to supply wood to their mills and to ensure a continued harvest.

The large parcels of forested land owned by industry provide a reserve stock available for harvest. Many of the industrial forest owners have mills in the area, in particular, paper mills and sawmills, that are supplied by the forests of Tug Hill.

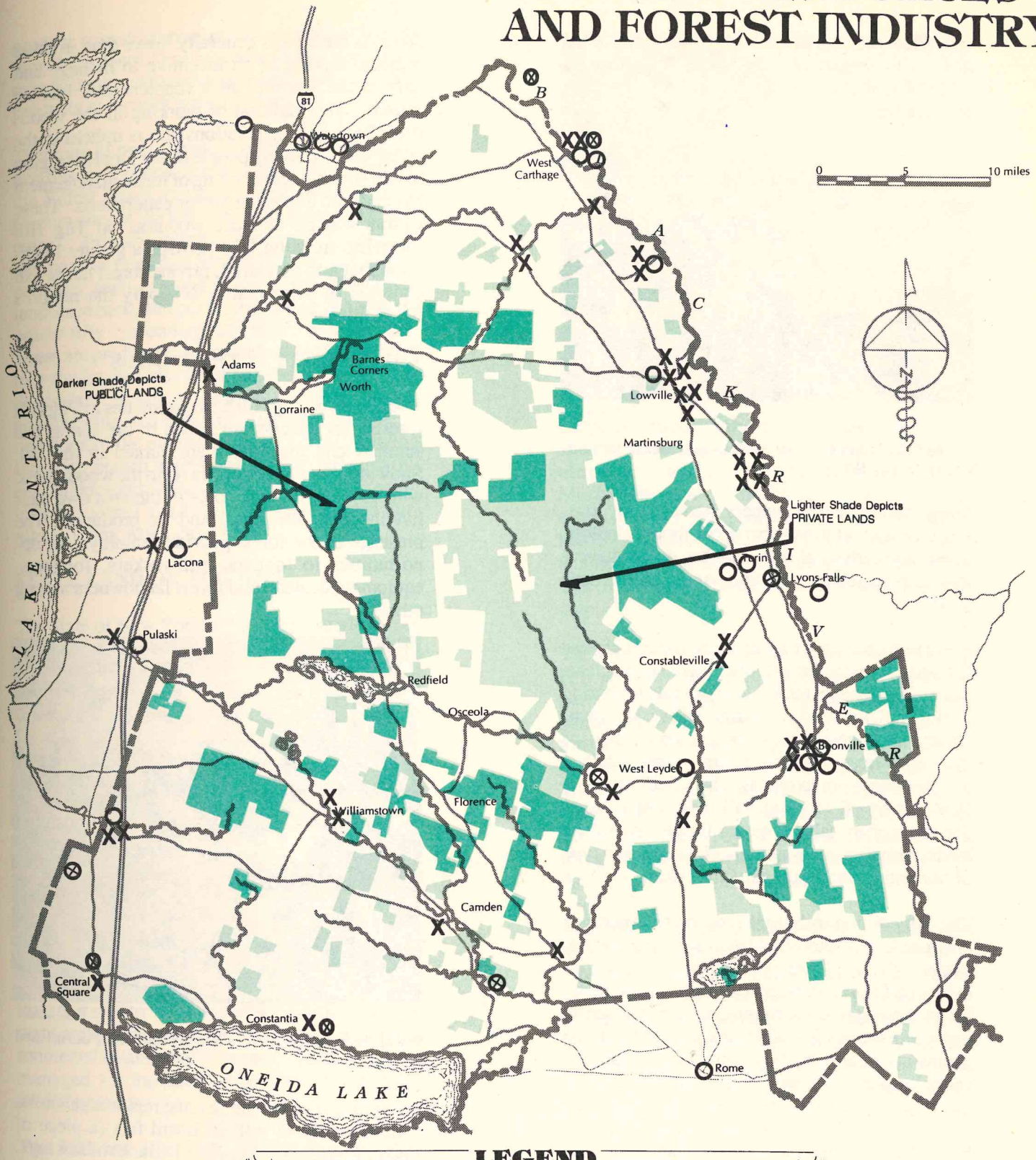
Industrial forest land is often leased to sportsmen's organizations for recreation purposes, particularly hunting and fishing. The money generated from leasing the land serves to offset the land taxes paid by the industries.

Forest Suitability of Soil Associations



Soils on Tug Hill are rated "fair" regarding their potential to grow trees.

TUG HILL FOREST RESOURCES AND FOREST INDUSTRY



LEGEND

- Large Land Holding
- × Primary Wood-using Industry
- ○ Secondary Wood-using Industry
- ⊗ Primary and Secondary Wood-using Industry

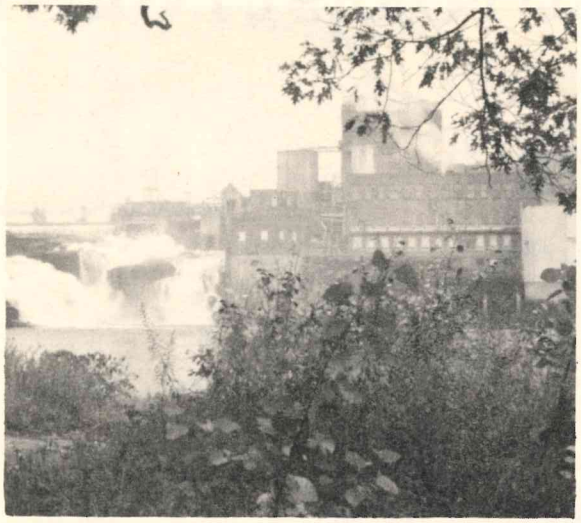


Photo by THC

Lyons Falls Pulp and Paper is the largest industrial landowner on Tug Hill.

Many non-industrial owners harvest only firewood or limited sawtimber from their woodlots. These non-industrial owners often do not have a formal management plan and harvest to suit their needs.

Some non-industrial private forest owners choose to manage mainly for wildlife or recreation, clearing small openings for wildlife or trails for hiking or skiing. Other non-industrial, private landowners manage their woods for the production of Christmas trees or maple syrup, whereas others simply choose not to manage the woods at all. A 1984 survey of 716 Tug Hill landowners found that more than half harvested timber from their lands, and over three-quarters planned some type of harvesting within the next five years.

The typical non-industrial land owner manages his woodlot less intensively than does an industrial owner. The 1984 survey showed that most non-industrial forest owners of Tug Hill own their land for an average of ten to twenty years. Considering that it takes nearly 20 to 50 years to yield a crop for commercial harvest, the incentive to implement good, long-term timber management practices on individual land is reduced.

For a variety of reasons, however, Tug Hill's non-industrial, private forests are somewhat more likely to be managed than non-industrial woodlots in other parts of the state. For example, there are good markets in the region, enabling the landowners to sell their products. The average family income in the area is generally lower than in other regions, serving as an incentive to manage and harvest the woodlot as a supplemental income source. The tradition of working in the woods dates back over generations and is upheld in the communities. Many people of the Tug Hill region have a strong understanding of forest management having been exposed to it for generations. These factors add up to more woodlots on Tug Hill receiving attention, and perhaps a greater likelihood that non-industrial, private forest lands will continue to be available to supply the region's forest industry.

THEIR ROOTS IN THE WOODS

The people of Tug Hill have strong ties to Tug Hill forests. Its streams are fished in the spring and summer and the forests are hunted in the fall. Snowmobilers and skiers travel in the woods in the winter. Many of the people of the area owe their livelihood to the forest and its products. The presence of the forest provides employment opportunities to loggers, millworkers, foresters, equipment dealers, and forest landowners among others.

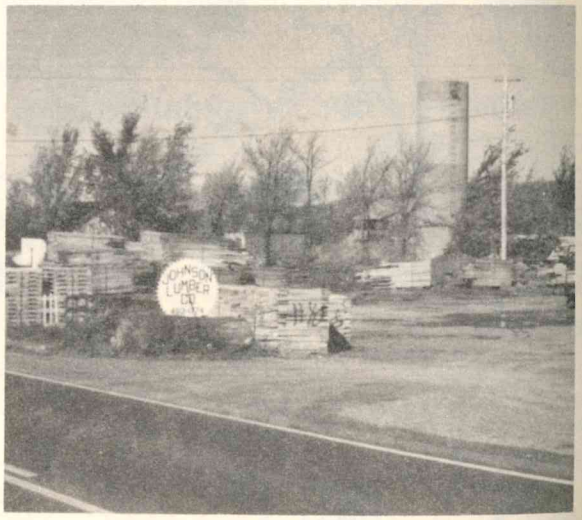


Photo by THC

Sawmills process trees into lumber and other unfinished products.

According to a 1982 survey, the region's sawmills utilized nearly 41 million board feet (a piece of wood 12" wide, 12" long and 1" thick) of sawlogs, of which 84 percent came from the region. At that time, the logging and primary processing sectors provided employment for 993 people in the region, the wood pulp and paper mills employed an estimated 1100 people in the region, and wood

product manufacturing plants employed 563 regional residents. The region's forests contribute over $80 million to the regional economy in wood products and paper manufacturing.

There are currently over seventy wood-using industries on or near Tug Hill forests, as depicted on the Forest Resources and Forest Industry map. Over twenty of the industries are considered "primary". Primary industries are mostly sawmills that process trees into lumber or other unfinished products, such as wood chips, rough cut lumber, landscape bark, and posts. Additionally, there are nearly fifty "secondary" industries in the region. These are predominantly woodworking plants that turn the lumber into finished product for re-sale. Secondary products include furniture, paper, bowling pins, and cabinets. The size and scale of operation of the industries varies greatly, ranging from one person operations to over 300 employees. Major forest industry employers in the region include Lyons Falls Pulp and Paper, Harden Furniture, Ethan Allen, and AMF.

STATE LAND ON TUG HILL

The State of New York is the largest single owner of land on Tug Hill. The state owns about ten percent of the total land area in the Tug Hill region, about 145,000 acres. These lands include state forests and wildlife management areas.

The state lands of the Tug Hill region are concentrated mainly in the area between the fertile Black River valley and the remote upland core forest as denoted on the Significant Recreation Resources map. Most state forests were formerly abandoned agricultural lands purchased and reforested under the 1929 Hewitt Reforestation Act.

In some cases, wildlife management areas were purchased by the federal government under the Federal Resettlement Program of 1935 and later leased or sold to the state. Other wildlife management areas were purchased by the state with environmental quality bond monies. These areas are managed for the specific purpose of protecting wildlife habitat.

Tug Hill has five such areas: Happy Valley Wildlife Management Area in the Towns of Albion, Williamstown, Parish and Amboy; Little John Wildlife Management Area in the Towns of Boylston, Redfield, Lorraine and Worth; Tug Hill Wildlife Management Area in the Town of Montague; Honeyville Wildlife Management Area in the Town of Adams; and Three Mile Bay Wildlife Management Area in the Towns of West Monroe and Constantia.

The number one recreational use of state lands on Tug Hill is hunting. Some state forests have extensive cross-country skiing and hiking trails developed on them and are heavily used for these purposes. State lands are also used by Tug Hill residents and visitors for fishing, camping, picnicking, wildlife observation, snowmobiling, biking, firewood gathering and other purposes.

LARGE LANDHOLDINGS ON TUG HILL

Large parcels of land held in single ownership play an important role in past, present and future land use patterns, and in sustaining the forest industry. Much of the value of the forest of Tug Hill is in its expansiveness and continuity. There are more than 225,000 acres of land on Tug Hill held in large landholdings of 400 acres or more as shown on the Tug Hill Forest Resources and Forest Industry map.

The concentration of large landholdings on Tug Hill is significant in the state as well as in the northeast. The pattern of large landholdings perpetuates a forest that is expansive and remote, forming a continuous, predominantly privately-owned, carpet across the landscape of Tug Hill. There are few areas left in the northeast that can boast such a large tract of contiguous forest land. This is emphasized by the inclusion of the Tug Hill forest in the Northern Forest Lands Study conducted by the U.S. Forest Service.

Tug Hill's expanse of forest provides numerous benefits in addition to jobs. Its contiguous forest provides habitat for wildlife species that require large tracts of land. Its vast woods provide watershed protection, maintaining the quality of drinking water and providing habitat for trout and salmon. The knowledge that such a remote land exists in the shadow of the megalopolis of the eastern seaboard is a comfort to many who value the land and environment.

Although development pressures on Tug Hill may not be as great as some other areas of the northeast, the decisions of a few major landholders could put the region in jeopardy. These few landowners,



Photo by THC

The forests of Tug Hill provide watershed protection and help keep streams cool, an important condition for most trout species.

forced by economic pressures, could make decisions which would change the character of Tug Hill forever. There are actions, however, that could be taken today to preclude such a loss.

KEEPING TUG HILL FORESTS

Retaining Tug Hill's most important forest lands, and retaining their private ownership, will require a variety of actions. For example, the region's forest industry needs to stay healthy and diverse to provide good markets for harvested timber. Private forest land owners will need good information on managing their lands for timber production as well as recreation, beauty and wildlife habitat.

Perhaps the most significant public policy question that needs attention is how to stabilize Tug Hill's forest land base. The large, private land ownerships that characterize Tug Hill are likely to be fragmented in the future if property taxes and development pressures force landowners to subdivide their lands. The final section of this book suggests some actions that could help private forest landowners to deal with these pressures.

TUG HILL LANDSCAPES

The meaning of landscape is much more than scenery. It is in fact a physical record of the dynamic interaction between nature and humans. The natural components of landform, water systems and vegetation provide the framework within which mankind builds. Throughout history, natural landscape components and climate have, to varying degrees, influenced the form, location and pattern of man's built environment. In turn, human activity has affected the natural systems, altering its elements and changing the balance of ecological relationships.

Today, we are beginning to recognize that the scenic beauty of the physical landscape and the cultural values attached to it are important to our environmental and social well-being. With the majority of the population living in metropolitan population centers, the value of the rural countryside has taken on a new level of importance. Many now recognize that these rural landscapes are a resource worthy of preservation.

Tug Hill's 2000 square miles create a rural landscape of unusual size. Among the pleasing features of the Tug Hill landscape are: clear water streams and rivers, spectacular gorges and gulfs, extensive forests, productive farms, and expansive open space. Together these elements contribute to a landscape of simple charm and rugged beauty.

Research has shown that it is possible to describe the visual parts of a landscape in a systematic way and to create a descriptive classification. Tug Hill is comprised of six distinct sub-regions each distinguished by the unique characteristics of land formation and surface cover. Within each of these sub-regions, human modification of the natural environment has accentuated the differences inherent in the natural patterns of the land to create a variety of landscapes (See Tug Hill Landscape map).

THE TUG HILL UPLAND SUB-REGION

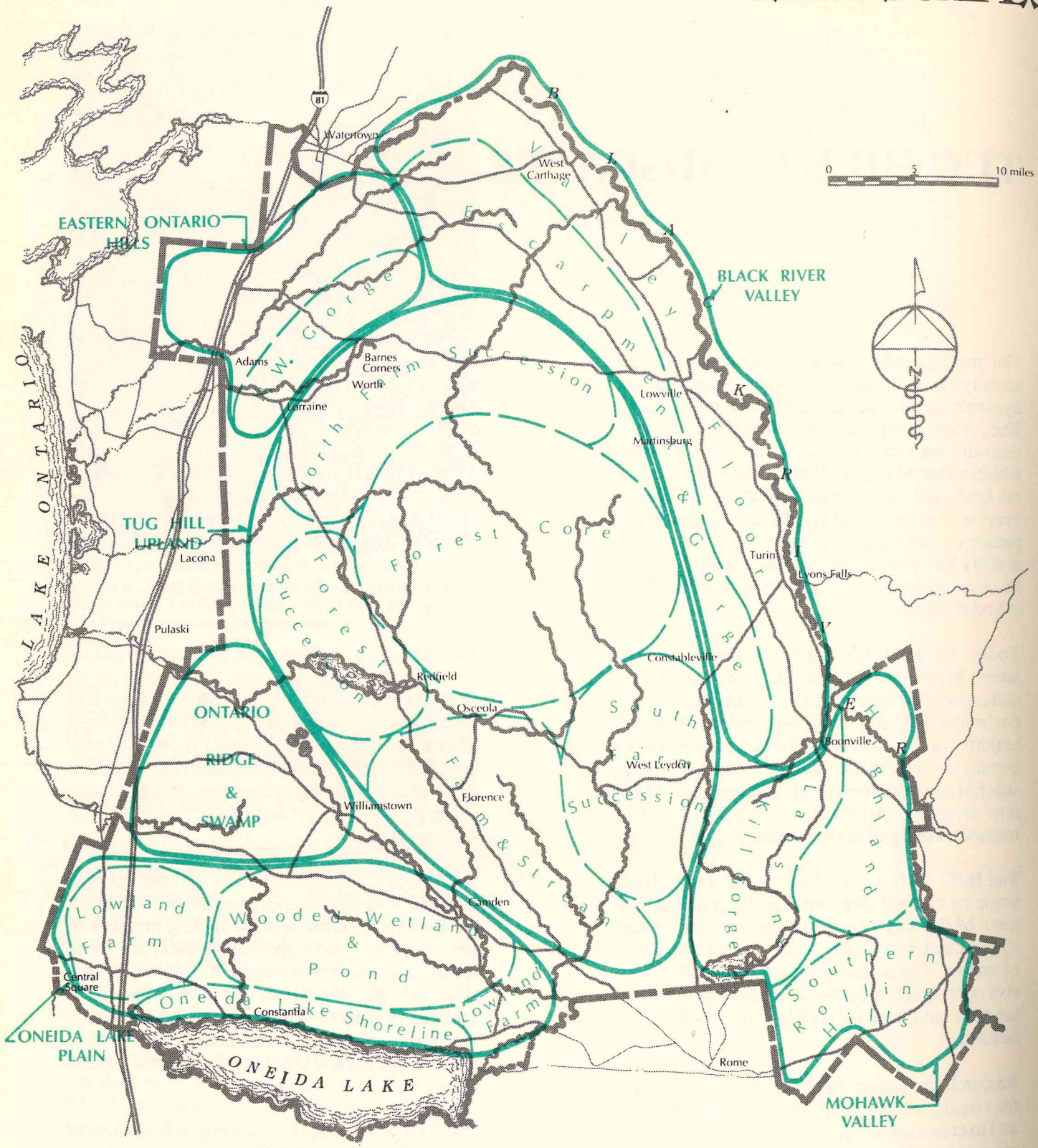
The Upland Sub-region constitutes about 75% of the total land area designated as the Tug Hill region by New York State and traces a roughly circular area over the entire central portion of the region.

The surface is characterized by a gently rolling landform that gradually rises in elevation in an easterly direction from an elevation of about 250 feet above sea level at Lake Ontario to an elevation of over 2,000 feet along the eastern boundary with the Black River Valley. This eastern edge is marked by a terraced and relatively steep drop off to the Black River Valley creating an escarpment cut by deep gorges.

A rich fabric of vegetation and land use patterns brought on by the ebb and flow of nearly 200 years of human settlement, and the abiding pressure of natural reclamation forces, shape the character of the Upland Sub-region. Originally forested in what is termed a transitional mix of northern hardwoods and mixed hardwood/spruce-fir forests, the Upland today, displays the remnant patterns of bygone lumbering and farming activities that cleared nearly all native forest cover.

The reality of poor soils and severe weather has led to the abandonment of most Upland farms. Many of the remaining small farms have changed their agricultural practices and field crops have been replaced by dairy and hay production. What re-

TUG HILL LANDSCAPES



Prepared By: BAGDON ENVIRONMENTAL ASSOCIATES, INC.

mains today is an Upland area returning to forest and dominated by a landscape of succession forests and, where still profitable, working farms.

The Upland can be divided into four basic landscape types: the Forest Core, Farm Succession, Forest Succession and the Farm and Stream Landscape (see Tug Hill Landscapes map).

Forest Core Landscape

The Forest Core is a landscape that offers a wide variety of both open space and "wilderness" experience to the more adventurous visitor. Located in the east central Upland Sub-region, the landscape is characterized by both mature and often dense stands of mixed hardwood and conifer forests. Few public through roads exist. Access is often limited to dirt roads that wind and curve around a rolling landform. At its very center this landscape is devoid of public roads. Each crest and turn promises new and often surprising views including the fully enclosed forest corridor and the broad views to the distant perimeter low areas.

Settlement is sparse. Small farms and hamlets are found only along the edge of the Forest Core Landscape. The community of Osceola, with its intact nineteenth century architecture, is typical of the Forest Core Landscape. Here, a small grouping of homes and commercial establishments cluster at a crossroad forming a small outpost in the midst of expansive fields and forests.



Photo by THC

The Forest Core of the Tug Hill Upland is the result of nearly 100 years of forest growth following heavy cutting in the mid and late 1800's. Dense forests are interspersed by large wetland areas.

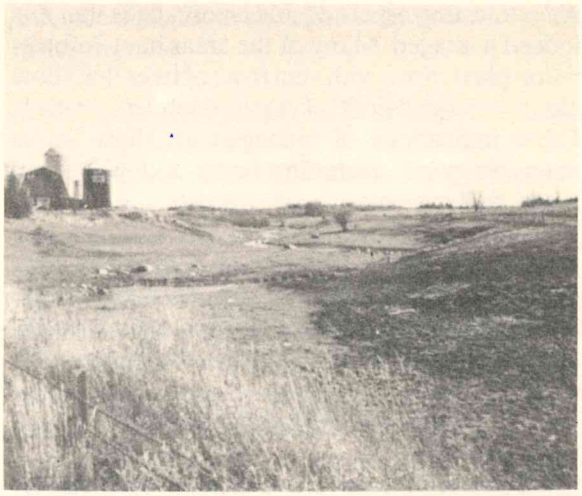


Photo by THC

The open land, litter of field stones and lack of field crops create an image of rugged severity typical of the Farm Succession Landscape of the Upland.

Farm Succession Landscape

Along the outer perimeter of the Forest Core, to the north and the south, exists a mid-elevation zone of Farm Succession Landscapes. Many of the small family farms that once dominated the Upland 60 years ago have now been abandoned or, where soils permit, been reorganized and consolidated into larger agricultural units. The resulting landscape is comprised of fields, farms and forests intermixed. The more vigorous working farms are generally in the lower elevations and along the floodplains of adjacent streams.

The openness of the gently sloping fields offer large panoramic views and an extensive horizon which is not found in many Tug Hill landscapes. The ruins of farm buildings and field structures are highly visible. In many instances, the poor state of repair of farms produces a melancholy feeling as one views a landscape that is only an echo of the past.

Forest Succession Landscapes

The Forest Succession Landscapes contribute significantly to the visual character of Tug Hill through both internal experience and external background appearance. Internally, the forested areas provide a near-wild forest landscape for the recreational user and offer a setting of relative remoteness with dense forest cover, ponds, and habitat for forest animals and plants. Access, which is key to experiencing these landscapes, is by dirt roads and fire trails, and some improved public roads.

An interesting aspect of this landscape is that it is indeed managed. Many of the areas have reforestation plantations with neat rows of trees that show clearly the gridwork of a purposeful plantation. Other indications of management show up as reservoir ponds including dams and weirs and linear trail systems.

Since much of the Upland Sub-region has open views to distant hills, the presence of conifer plantations along these hillsides creates a patchwork of contrasting vegetation in the background.

Farm and Stream Landscape

The Farm and Stream Landscape is dominated by years of farming. Visible are the patterns of present and past agricultural enterprises: pastures of working dairy farms with grazing cattle, fields outlined by hedgerows thick with mature and aged maples and brush and trees reclaiming unnecessary pastures. Although these are similar traits to the Farm Succession Landscape, there are a number of unique elements that distinguish these landscapes from the former.

For the most part, the farms are smaller and have smaller sized fields. The fields average about 20 acres with mature hedgerows that are both tall and thick with vegetation which creates a clearly defined field structure. Woodlots provide a backdrop to the farm fields and contribute a sense of enclosure to the landscape that is nct apparent in the other farming regions of Tug Hill. Also, field stone walls are more prevalent in this area than in other areas.

One of the most distinguishing elements of this area is the numerous creeks and streams. Communities such as Taberg and Camden are clustered along streams and are well defined by stream valley topography, streets lined with aged sugar maples, and a rich, well kept collection of nineteenth century architecture. Although the general appearance of farms and hamlets is one of stability and health, there are pockets that indicate decline.

THE BLACK RIVER VALLEY SUB-REGION

The Black River Valley Sub-region creates a strong and dramatic edge along the eastern side of the Upland as the river curves northwest on its course to Lake Ontario. The river valley is a significant boundary separating Tug Hill from the Adirondack Mountains. This sub-region contains two distinct landscape types: the Valley Floor Landscape and the Escarpment and Gorge Landscape which climbs to the rim of the Upland.

Valley Floor Landscape

The Valley Floor Landscape contains the most productive agricultural soils in the entire Tug Hill region and agricultural practices have created a strong geometric pattern on the landscape. The open space of the cultivated fields provide expansive views across the valley, while hedgerows and wood lots break the open space. The productivity of the land has led to the development of large scale farm operations. The clusters of outbuildings, barns, and silos stand out clearly on the level plain of the valley and are visible from great distances. The wooded banks of the Black River create an interesting linear backdrop to this scene.



Photo by THC

This cluster of buildings along the Deer River is typical of the settlement pattern in the Black River Valley.

The width of the valley changes along its course from a narrow plain in the south gradually widening to the expansive agricultural areas in the north. The river itself is a distinctive landscape feature, yet its presence in the landscape, especially in the southern valley area, is not readily visible. In many areas the water movement has cut deeply through the landscape and today, steep banks, rock gorges and vegetation often block its view from the valley floor. During the spring months, the river overflows its banks washing large areas in water, and

momentarily it takes on a stronger visual presence. In the northern valley area, where the road alignment has followed the river and its tributaries, the river landscape has a much stronger visual presence.

The Black is a working river. Over the past two centuries, water power has influenced industrial development and community settlement in the valley. Today, these village settlements, like West Carthage and Lyons Falls, along with their mill facilities, dams and bridges remain active and historic elements in the Valley Floor Landscape.

Escarpment and Gorge Landscape

The Escarpment and Gorge Landscape is a unique landform which rises dramatically 1,000 feet from the valley floor to the crest of the Upland. The land rises in a series of two steep slopes, separated by an intermediary level plain. The visual presence of the land form is quite strong because of the marked contrast from the relatively level terrain of the valley floor. Streams flowing easterly from the Upland down this steep escarpment have cut deep ravines through the easily eroded shale. These ravines, known locally as gulfs, are unique scenic resources. The gulfs, however, do not generally claim a strong presence in the landscape. Often, they must be individually sought out by travelling side roads and hiking trails, as is the case with Whetstone Gulf and Roaring Brook.

Many small village communities were settled on the level plain which separate the steep slopes of the escarpment. Today, these villages provide fine examples of nineteenth century architecture and maintain the integrity of the early village settlement patterns. Limestone homes in the towns of Denmark and Champion are examples of some of the earliest settlements of this part of New York State.

The continued success of agriculture in this area has preserved the nineteenth century farmstead pattern. The same patchwork pattern of the Valley Floor Landscape below is present, however, the fields and pastures are smaller and the farmstead landscape is more diversified.

The expansive view across the river valley to the Adirondack Mountains is a dominant characteristic of the Escarpment and Gorge Landscape. Due to the agricultural land use along the intermediary plain, there are broad areas of open space that enhance visibility and heighten the presence of the distant views.

EASTERN ONTARIO HILLS SUB-REGION

The Eastern Ontario Hills define a transition zone between the low lying Eastern Ontario Lake Plain and the generally uniform slope of the Tug Hill Upland Sub-region. The hilly topography including irregular mounds, ridges and steep hills was created by the retreat of the last glaciers, thousands of years ago. There are also numerous small valleys and glens that developed as a result of stream runoff. The most spectacular of these stream-eroded valleys are the gorges or "gulfs" that make up one of the most unique landscapes of Tug Hill, the Northwest Gorge Landscape.

The resulting landscape image is one of great variety. Travel through this region reveals both the cool, enclosed, small scale space of a winding stream valley and the wide open, expansive panoramas of the hill top farms. Hill top views include distant hills, the Lake Ontario plain area, and often Lake Ontario itself in the far distance.

Since open, flat lands are unusual in the valley areas, agriculture is limited to the more gentle of

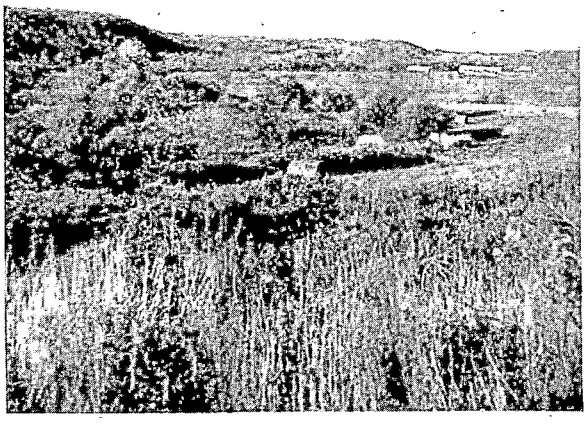


Photo by THC

The ridges of the Eastern Ontario Hills climb the Tug Hill Upland, and maintain a strong visual presence in the landscape.

the hill side slopes and valley bottom land. Steeper side slopes remain as woodlots. The resulting image is one of farms "nestled" within the hills and valleys surrounded by forests, providing a rich contrast of open fields, forest, stream and farm architecture that is usually partially concealed by landform and vegetation.

Northwest Gorge Landscape

The Northwest Gorge Landscape is formed through the erodible nature of the underlying glacial soils. Streams flowing north and west from the Upland Sub-region have gained enough momentum to cut relatively deep channels or gorges into the underlying shale bedrock, like Inman and Lorraine Gulfs. The landscape that emerges is one of a steeply rolling land form punctuated by often dramatic gorges of swift moving water, falls and hemlock lined rock cliffs. Settlements are located along the streams where waterfalls once provided power for milling operations. Small farmsteads alternate with mixed hardwood forests along the hilltops to create a small scale and relatively fine pattern of rural open space. This area contrasts dramatically with the Farm Succession Landscape of the Upland.

ONTARIO RIDGE AND SWAMP SUB-REGION

The Ontario Ridge and Swamp Sub-region exhibits a wide variety of natural and managed landscapes and is generally composed of two basic landforms; a low, poorly drained, rolling to flat surface, and irregular mounds and hills formed by glacial deposits. Consequently, a majority of roadside views of this landscape are of succession forests and shrubby fields with a few breaks that open views into adjoining wetlands. No appreciable elevation exists to allow distant landscape viewing. There are, however, significant remnants of a farming past, principally indicated as dense stands of aging sugar maples that once graced and protected the now vanished farm yards. Old hedgerows and massive stone walls within the succession forests give further testimony of past farm fields.

Settlement is less clustered and uniform than in other regions where water power once provided the nucleus for village development along the numerous streams of the region. Although commercial centers do exist, settlement in this region is primarily unconsolidated and tends to be sporadic all along the road sides.

ONEIDA LAKE PLAIN SUB-REGION

The southern most portion of Tug Hill slopes gently into the Oneida Lake Plain Sub-region, a lowland area extending in an easterly direction from the Great Lakes Basin. Moving north and east from the lake toward the Upland Sub-region, the landform takes on a very gently rolling character. The low relief, in combination with the heavy stands of succession forest found throughout this region, limit the presence of broad landscape views. Vegetation and land use in this region have created three distinct landscape types: the Wooded Wetland and Pond, the Lowland Farm and the Oneida Lake Shoreline Landscapes.

Wooded Wetland and Pond Landscape

The Wooded Wetland and Pond Landscape is characterized by areas of mature forests mixed with succession forests and reforestation plantations, creating a strong woodland landscape. Generally, the forest areas extend to a highway right-of-way and the changing mix of deciduous and evergreen trees and shrubs allow varying degrees of visual penetration into the woods. For the most part, views in this area are limited to the open areas along the highways. Due to the low topographic

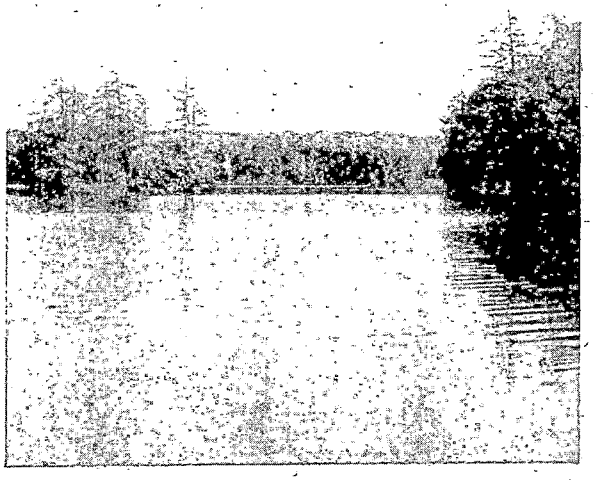


Photo by THC

Dense vegetation crowds the shoreline of a pond in the Wooded Wetland and Pond Landscape of the Oneida Lake Plain.

relief and the presence of poorly drained soils, there are large areas of wet woods, broad swamps and ponds. Ponds in the area are numerous and vary significantly in size. These areas create a dramatic contrast to the dense woodlands in which they are located, providing open space and permitting broad landscape views. The presence of water and the unique wetland vegetation adds variety and interest to the forest landscape.

Lowland Farm Landscape

At one time the Lowland Farm Landscape covered a large portion of the Lake Plain Sub-region. Today, however, agriculture in the area has declined substantially and the majority of the remaining productive farms are located on the eastern and western extremes of the region.

The cultivated fields of this landscape provide large areas of open space permitting panoramic views. The basic units of this landscape include the farmstead, a cluster of buildings generally located along the highway, and a combination of cultivated land, wood lots, hedge rows and wetlands. The farm residence generally has a strong relationship to the road and often stands on a raised knoll overlooking the surrounding fields. The dense cluster of the buildings and the monumental scale of the barns and silos stand out as strong silhouettes against the sky and horizon of the surrounding open fields. While the scale of today's agricultural work has changed, many of the 19th century field patterns still remain.

Small communities such as Hastings, West Monroe and McConnellsville are typical of the Lowland Farm Landscape, and many share similar settlement patterns. Generally, a dense residential, civic and commercial center developed around two cross roads. Trees were cleared from around this cluster settlement to provide agricultural fields and pasture land for the village residents. While much of the commercial activity in these small villages has disappeared, the community structure, including street trees, period architecture, church, cemetery, post office and outlying fields still remain.

The decline of agriculture in this region has resulted in large areas of succession fields. The succession growth is changing the visual character of the area and eventually succession woods will reduce the visual openness. Today, these lands are undergoing a new wave of settlement as small homesteads and commercial enterprises again clear the roadside vegetation. This new development exhibits little relationship to the landform and natural setting of the area and disrupts the visual unity of the evolving field vegetation.

Oneida Lake Shoreline Landscape

The Oneida Lake Shoreline Landscape is the most heavily developed area of the Oneida Lake Plain Sub-region. This linear corridor contains a broad mix of development types.

The early villages and residential settlements along the lake established a sensitive pattern which respected the natural beauty of the lake and the public needs of community living. Homes were set well back from the lake with expansive areas of open space leading to the lake edge, and large shade trees planted along the roads. While these patterns are still visible today, they are generally ignored by new development.

The lake is clearly a preeminent visual resource and yet the scenic quality of this resource has been diminished by the location, density and discordant nature of contemporary development. In addition, private ownership limits public access to most of the lake shore.

MOHAWK VALLEY SUB-REGION

The Mohawk Valley Sub-region establishes the southeastern boundary of the Tug Hill region. The area is dramatically separated from the Tug Hill Upland by the deep cut of the Lansing Kill Gorge. The landform in this area is distinguished by strong topographic contrast and change. This dramatic relief, in conjunction with open cultivated agricultural fields, offers a variety of spectacular and changing views. The landform relief and land use in this district create three distinct landscapes: The Lansing Kill Gorge, the Highlands, and the Southern Rolling Hills Landscapes.

Lansing Kill Gorge Landscape

The Lansing Kill Gorge Landscape dramatically divides the Tug Hill Upland and the Highland area of the Mohawk Valley Sub-region. The steep forested walls of the winding gorge restrict views within the gorge and provide a strong sense of enclosure at its base. Driving through the winding gorge, the viewer is continually presented with



Photo by THC

The steep slopes of the Lansing Kill Gorge and the meandering course of the river have created a landscape of contrast and change.

changing views, and the drama of the steep undulating land form is amplified by the rugged skyline of the surrounding hills. The limestone lock structures of the Black River Canal still stand proudly in the gorge as a reminder of the determination and perseverance of the area's earlier settlers.

From the highway, the Lansing Kill has a continually changing landscape presence. Disappearing and reappearing as it flows south, the river gradually widens, taking on a much greater visual presence, as it moves south through the gorge. At the southern end, the landform opens onto a broad flood plain and the pattern of agricultural land use and village settlements reappear.

Highland Landscape

East of the Lansing Kill the landform climbs rapidly to the Highland Landscape of the Mohawk Valley Sub-region. Immediately, the change in elevation presents broad landscape views of the eastern valley below. From the top of the highlands, expansive views of the Adirondack foot hills provide a distant back drop for the rolling agricultural fields. Once again it is the agricultural development and the openness of the cultivated fields that contribute dramatic views in this area. The Highlands Landscape slopes gradually to the south exposing views of the Appalachian highlands south of the lake plain and Mohawk Valley.

Rolling Hills Landscape

The southern most portion of the Mohawk Valley Sub-region continues a gradual slope toward the valley. The Rolling Hills Landscape provides a pleasant surrounding for settlement centers that are nestled in the valleys. Agricultural land use continues in this area but the facilities and the field patterns are generally on a smaller scale than those in the Highland Landscape.

The village settlements in this area provide interesting examples of architecture and community organization. Many of these villages are set out around a community square or open space. While this pattern is typical of many New England villages, it is not generally found in the other regions of Tug Hill. The community square is generally surrounded by residential and civic buildings, while the commercial structures are found along the side streets extending from the square. The use of the native limestone on buildings is also distinctive of this landscape.

PRESERVING VISUAL RESOURCES IN THE RURAL LANDSCAPE

The visual resources of the landscape today are present because of decisions and actions of those who came before. Generally, those landscapes that we find most scenic are the places where human activity have complemented rather than compromised the natural environment. The early settlers of rural areas came to work the land and their well-being was closely tied to the natural environment. For this reason their decisions were generally sympathetic to the needs of the natural system.

Today, our rural landscapes are in transition. Earlier land use activities which were based on active use of the land are being replaced by activities which are less dependent on the land and local resources. The disappearance of landscape elements and patterns associated with earlier land use activities such as farming are being replaced by new elements which often appear out of place and discordant in the rural landscape.

Preserving valued visual landscape resources during periods of transition and new development is a very real challenge for the residents of rural communities.

The strategy for preservation, restoration and maintenance of visual resources will depend on the type of resources present and their potential vulnerability. There are three basic approaches to consider – education and assistance, local regulatory powers, and management through ownership. Examples of each are listed in the final chapter of this book.



The views along many Tug Hill roads are worthy of recognition.

Photo by THC

HEADWATERS

Water is perhaps Tug Hill's most important natural resource. Tug Hill holds the pristine headwaters and upper stretches of the Mohawk and Salmon Rivers, Fish Creek and Sandy Creek. The Black River forms the region's eastern and northern boundary. In total there are nearly 4,000 miles of river and stream, that, coupled with Oneida Lake, extensive wetlands and groundwater, makes Tug Hill's water the life-blood of the region and neighboring cities and towns. Downstream, drinking water, fishing, and industry are all threatened if Tug Hill's waters are polluted.

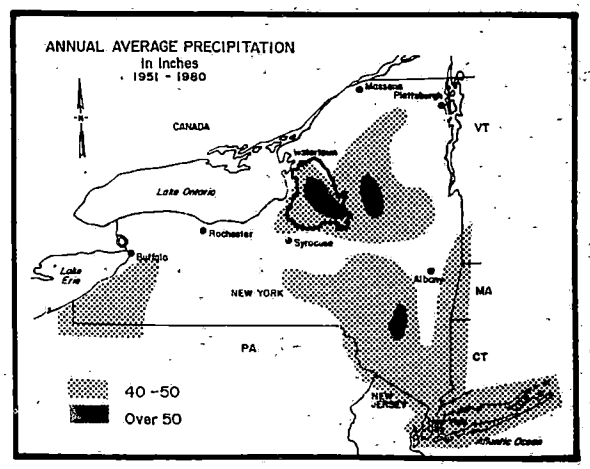
Starting as rain and snow that falls on the flat, forested uplands, water moves slowly at first, collecting in innumerable wetlands and small ponds, then makes its way to small stream channels. Small channels flow together forming larger streams that roll off the uplands, cutting deep gorges into the bedrock foundation of Tug Hill. Once through the gorges, streams level off onto the rim area of farmlands that edge Tug Hill.

THE SOURCE

Tug Hill is New York State's wettest region. Although isolated portions of the southwestern Adirondacks and eastern Catskills receive over 50 inches of precipitation, only the Tug Hill region in New York State receives over 55 inches. Nearly a third of this water falls in the form of snow in Tug Hill's heaviest snowfall areas. It is this large amount of snow for which Tug Hill is most famous.

Snowfall

The Tug Hill region receives more snowfall than any other region of New York State. Annual snowfalls vary throughout the region depending upon elevation and position with respect to Lake Ontario. In general, snowfall in lower elevation areas averages roughly 100 inches per year. Annual snowfall accumulations increase rapidly with elevation and the higher elevation core area receives levels in excess of 200 inches per year.

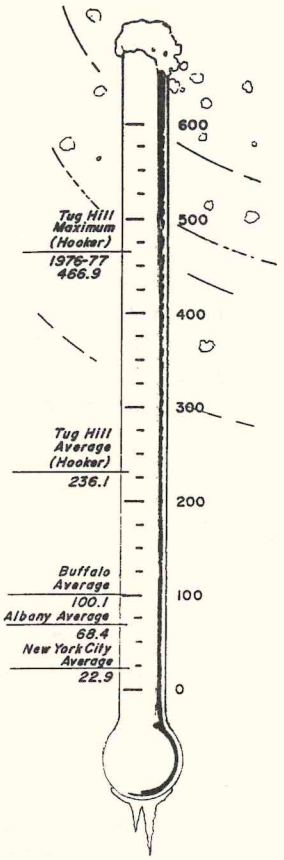


At 55 inches, Tug Hill's average annual precipitation is New York's heaviest.

The maximum snowfall recorded on Tug Hill occurred during the winter of 1976-77 at Hooker, a bend in the road in the Town of Montague. During the 76-77 winter season, snow began in October and continued through May, piling up a New York State record of 466.9 inches; nearly 39 feet! This volume of snow has gained Tug Hill the reputation of being the snowiest area of the state, and perhaps the snowiest spot in all of the eastern United States.

Most of the snowfall results from local, "lake effect" storms that form as air passes across Lake

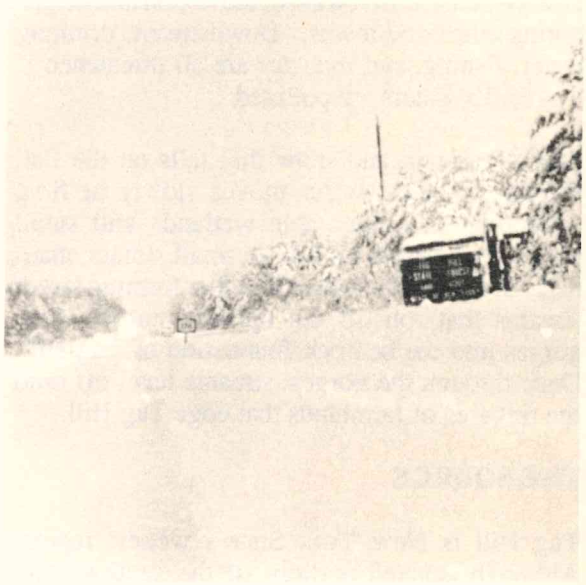
Ontario and moves over Tug Hill. Cool winter winds begin to blow as early as October from the prevailing westerly direction. The cool winds pick up moisture as they pass over the summer-warmed waters of Lake Ontario.



Snowfall in inches.

Moving eastward, the moist air is cooled a bit more as it is forced to rise over the uplands of Tug Hill. The cooling effect acts to form clouds, and if conditions are right, to kick off snow squalls. Lake effect snow storms occur as thin squall lines, or bands, that appear to radiate as fingers from Lake Ontario. The location and duration of squalls is largely dependent upon the direction and strength of the winds. A southwest wind will bring snow to the northern part of the region and Watertown, while a more northwesterly wind will set up squalls further south. If winds remain from a constant direction, snowfall can accumulate very quickly, with amounts varying greatly over very short distances.

Although lake effect storms are not unique to the Tug Hill region, they do tend to be more severe here than in other areas that are affected. Buffalo, for example, feels the full sweep of Lake Erie when southwest winds pick up moisture and dump snow on the congested metropolitan area. However, Lake Erie freezes relatively early in the winter season due to its comparatively shallow depth, shutting off the source of moisture. Lake Ontario, on the other hand, is much deeper and remains free of ice cover for a longer period of time. Tug Hill also differs from areas like Rochester, Oswego and Syracuse in that it is exposed to the full 180 mile sweep of Lake Ontario, and has the added effect of a more than 1800-foot rise in elevation which tends to squeeze more snow from the clouds. To further the effect, the air that is forced to rise also increases in speed, blowing snow to enhance blizzard and "white-out" conditions.



Photos by THC

Snowfall on Tug Hill normally exceeds 200 inches per year.

The large volume of snow that falls on Tug Hill, typically between the months of October and April, creates a sizable snowpack throughout much of the region. The snowpack normally reaches its maximum depth by mid-March, reaching depths of roughly 20 inches at the edges of the region and steadily increasing to slightly greater than 45 inches

in the Upland Core area. The "stored" water in the core area snowpack is equivalent to slightly more than 16 inches of water, while the region as a whole can expect over 5 inches.

The stored water in the snowpack acts to slowly feed or recharge wetlands and streams throughout the winter, with the most significant release of water beginning in April with the advent of higher temperatures. Release of water from the snowpack commonly continues into June, a time when patches of snow still can be seen on north facing slopes and in the deep recesses of the forests.

SURFACE WATER

The high precipitation received by Tug Hill supplies an abundance of wetlands, streams and rivers, noted for their near pristine quality in upland and headwater areas.

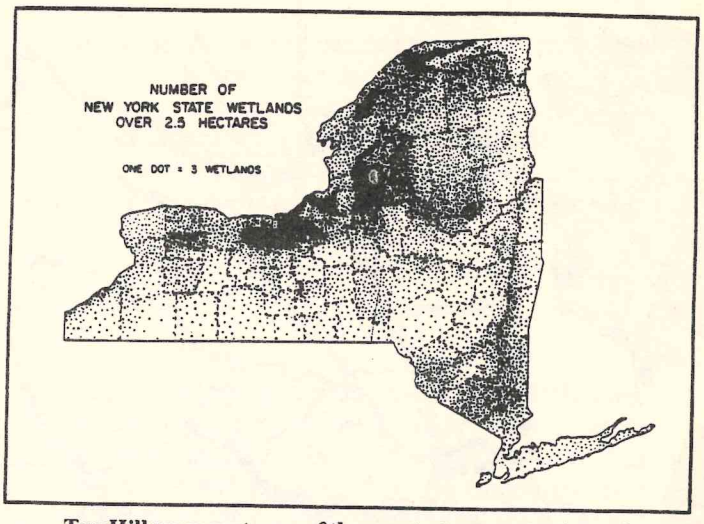
Wetlands

Wetlands are prolific on Tug Hill, with especially high concentrations in the core area and within the Oneida Lake lowlands of the southwestern portion of the region (see Tug Hill Surface Water Resources map). The high concentration of wetlands is rivaled only by the Lake Ontario lowlands between Rochester and Syracuse, and portions of the St. Lawrence River Valley. The relatively flat nature of the uplands and the cover of clay-rich, bouldery soils (called till), accounts for the poor



Photos by THC

Small wetlands like this, situated in the swales between elongated hills (drumlins), account for many of the wetlands on Tug Hill.



Tug Hill represents one of the greatest concentrations of wetlands in the state.

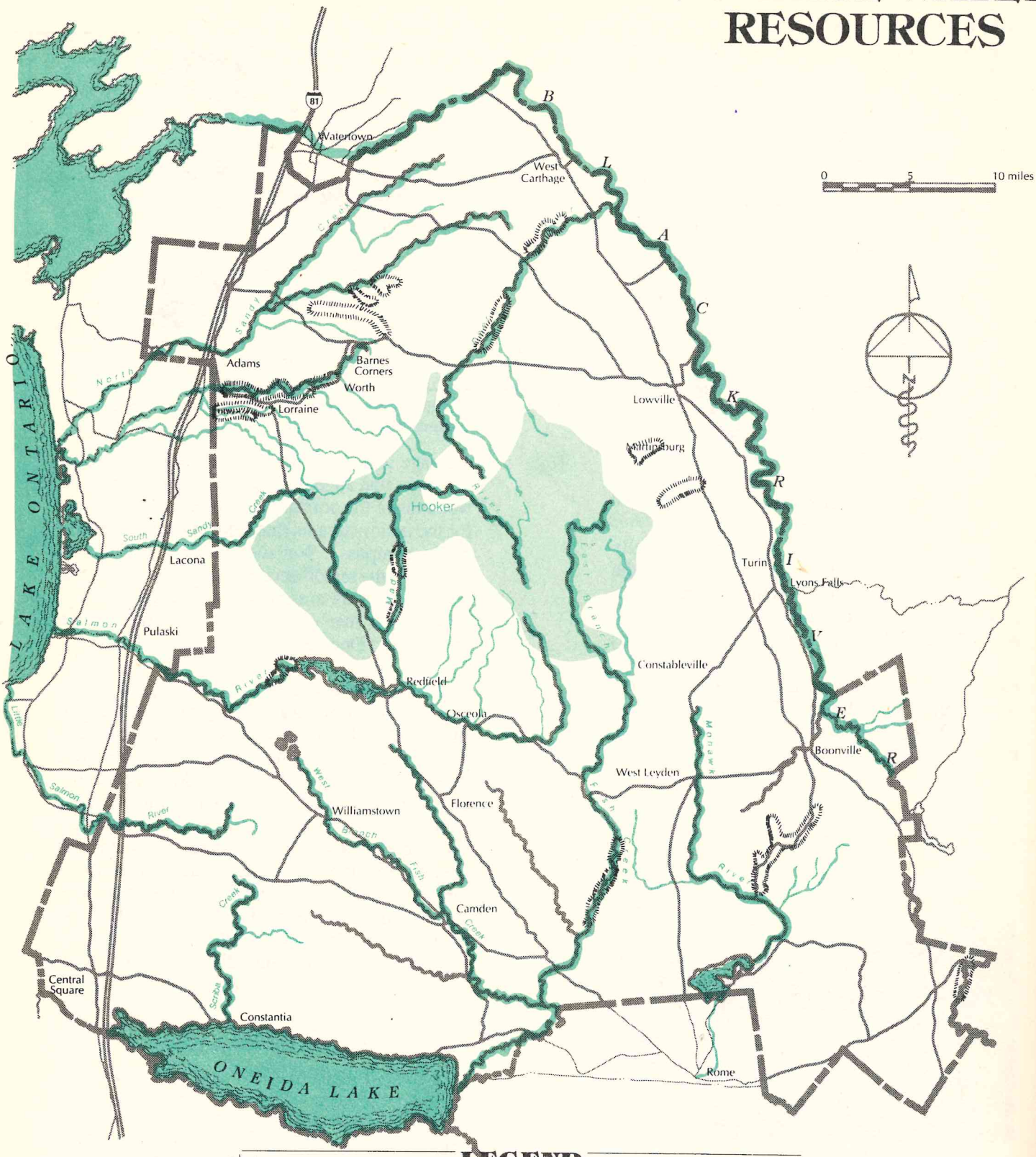
drainage that is typified by wetlands and stream networks that appear to have no real pattern. The wetlands of the core area serve as the headwaters for the major streams that flow in every direction of the compass. Wetlands in the southwestern portion of the region occupy the clay-rich lowland that was once an arm of "Lake Iroquois," a large glacial lake that occupied what is today Lake Ontario and Oneida Lake.

Wetlands comprised of open swamps and wet woods make up about 117,000 acres of the region. Many wetlands occupy swales between small hills and near small streams. The region's wetlands provide homes for waterfowl, and a wide variety of wildlife, plants and invertebrate animals. These wetlands also act as a filter to remove impurities, and to collect and store excess surface water and prevent flooding. The latter is an important feature on Tug Hill because of the large snowpack that accumulates during the winter months. At times, heavy rains can combine with high springtime temperatures to cause the snowpack to melt rapidly, causing streams to swell.

Lakes

Few natural lakes exist on Tug Hill that are of considerable size. With the exception of Oneida Lake at Tug Hill's southern fringe, North Pond, at roughly 215 acres, is Tug Hill's largest natural lake. The largest bodies of water on Tug Hill proper are reservoirs that were created by dams on major rivers. The Redfield Reservoir on the Salmon River is the largest and was constructed to

TUG HILL SURFACE WATER RESOURCES



LEGEND

- Major River Corridor
- Gulf
- Concentration of Wetlands

Prepared By: BAGDON ENVIRONMENTAL ASSOCIATES, INC.

store water for the generation of hydroelectric power. Other reservoirs hold water for municipal water supplies and, in the case of Delta Lake reservoir on the Mohawk River, to feed water to the Barge Canal system.

Oneida Lake extends more than 20 miles along the southwestern edge of Tug Hill. Formed as a remnant of Glacial Lake Iroquois, this 80 square mile lake is perhaps best known as New York's finest walleye lake. Water enters the lake from a five-county, 800,000 acre watershed, with Tug Hill contributing about 67 percent of the water. The high quality water from Tug Hill is important to the health of the lake since it dilutes the nutrient rich waters received from the southern portions of the lake's watershed which accelerate algae production and indirectly degrade the lake's water quality.

Rivers and Streams

The movement of glaciers, and their eventual retreat from Tug Hill thousands of years ago, had a tremendous influence upon the way that water flows from the region today. Advancing glaciers scoured out valleys to deeper depths and acted to dam rivers, forcing them to take different routes. As glaciers retreated toward the north, they set down a dense veneer of till over much of the uplands, and melt-water streams deposited layers of sand and gravel in the valleys and along shorelines.

Due to the abundance of precipitation in the region, runoff in streams is probably as high as any other part of the state. The 2000-square-mile Tug Hill watershed is drained by roughly 4000 miles of stream channel, 90 percent of which eventually drain to Lake Ontario (see Tug Hill Surface Water Resources map). The remaining waters drain through the Mohawk River basin to the Hudson River. Prominent Tug Hill streams include the following:

Mohawk River

The Mohawk River rises on Tug Hill's southeastern flank, and is the only Tug Hill river basin that drains to the Hudson River instead of Lake Ontario. Roughly seven percent, or 150 square miles, of Tug Hill feeds the river above Delta Lake, a reservoir created in 1912 to supply water for the Erie Canal system.

Black River

Forming Tug Hill's eastern and northern boundary, the Black River is the largest river in the region. Although most of the flow in the Black River comes from the western Adirondacks, Tug Hill contributes through numerous streams that drain the steep, eastern escarpment. Major tributary streams include the Sugar River, Whetstone Creek, Roaring Brook, Mill Creek, and Deer River.

Deer River

Tug Hill's largest tributary to the Black is the Deer River. The Deer consists of roughly 190 miles of stream channel that drain 95 square miles of Tug Hill's northern expanse. At Copenhagen, the river has formed the region's greatest cataract. At just over 165 feet, "High Falls" is slightly higher than Niagara Falls. Three miles downstream, the Deer plunges over King's Falls, a comparatively small falls at roughly 40 feet.

Fish Creek

Runoff from the southern and eastern part of Tug Hill flows into Oneida Lake, the largest contributor being the Fish Creek system. Fish Creek is fed by two main branches, the East and the West, that merge to flow into the lake's eastern shore at Sylvan Beach. Flow from Fish Creek accounts for roughly 50 percent of the runoff that feeds Oneida Lake. The creek has carved some spectacular, deep gorges and is considered one of the state's best trout streams as well as a challenging whitewater run. Due to these qualities and its remote character, Fish Creek has been considered for federal and state protection.

Sandy and Salmon Rivers

Due to the gentle westward slope of Tug Hill, most of the region's streams coalesce and flow down Tug Hill toward Lake Ontario. Major streams include the Sandy Creek system of North, South, and Little branches, and the Salmon and Little Salmon Rivers. The Salmon drains roughly 250 square miles of Tug Hill's core area with 650 miles of stream that wind their way in nearly all directions of the compass before collecting and flowing down through Pulaski, the state's salmon fishing capital.

Gorges

Many of the streams that drain Tug Hill flow through gorges comparable to the spectacular glens and gorges of the Finger Lakes and Genesee River. On nearly all sides, the uplands are separated from the rim area by deep, narrow gorges that have cut their way several hundred feet into the rock (see Tug Hill Surface Water Resources map). The gorges were formed by waters that poured from melting glaciers on the uplands, cutting into the soft shales and siltstones.

Two of Tug Hill's gorges are homes to Whetstone Gulf and Pixley Falls state parks. Whetstone Gulf formed as torrents of glacial meltwater flowed from the uplands to cut through the soft shales that are now exposed in the gorge walls. In a similar manner, glacial meltwater carved many other Tug Hill gorges, including Inman, Shingle, Totman and Lorraine Gulfs. The Lansing Kill gorge, where Pixley Falls State Park is located, was formed by glacial meltwater that accumulated in the Black River Valley and then drained southward toward the Mohawk Valley until the glaciers melted and allowed the water to flow northward as it does today.

There are few steep bedrock gorges on Tug Hill's southwestern edge. This is due to the gentle southwestward dip of Tug Hill's bedrock foundation that appears to slip imperceptibly into the lowlands of Oneida Lake and Lake Ontario. There are some exceptions, however, for one of Tug Hill's biggest gorges occurs along the course of the West Branch of Fish Creek in the Towns of Williamstown and Camden. The creek flows over a fill of sand, gravel, and clay that, in places, is greater than 160 feet deep and nearly one mile wide.

GROUNDWATER

Water that is stored beneath the land surface in the soil and rock is called groundwater. Groundwater supplies most of the homes and farms of Tug Hill. Most of the villages and hamlets throughout the region also rely upon groundwater that is collected and distributed via municipal water supplies (see Tug Hill Groundwater Resources map).

Geologic formations that can provide large amounts of high quality groundwater are referred to as aquifers. Aquifers generally consist of unconsolidated sand and gravel deposits, or of limestone or sandstone bedrock. Most of the groundwater in sand and gravel aquifers comes from rain and snow that falls directly on exposed areas of aquifer. In certain circumstances, small surface streams that flow over an aquifer can drain into it, whereas larger streams generally act to collect groundwater that flows, or discharges, from the aquifer.

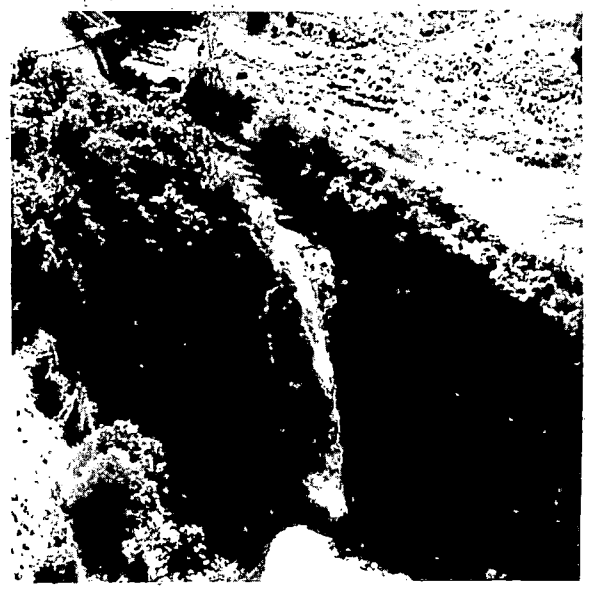


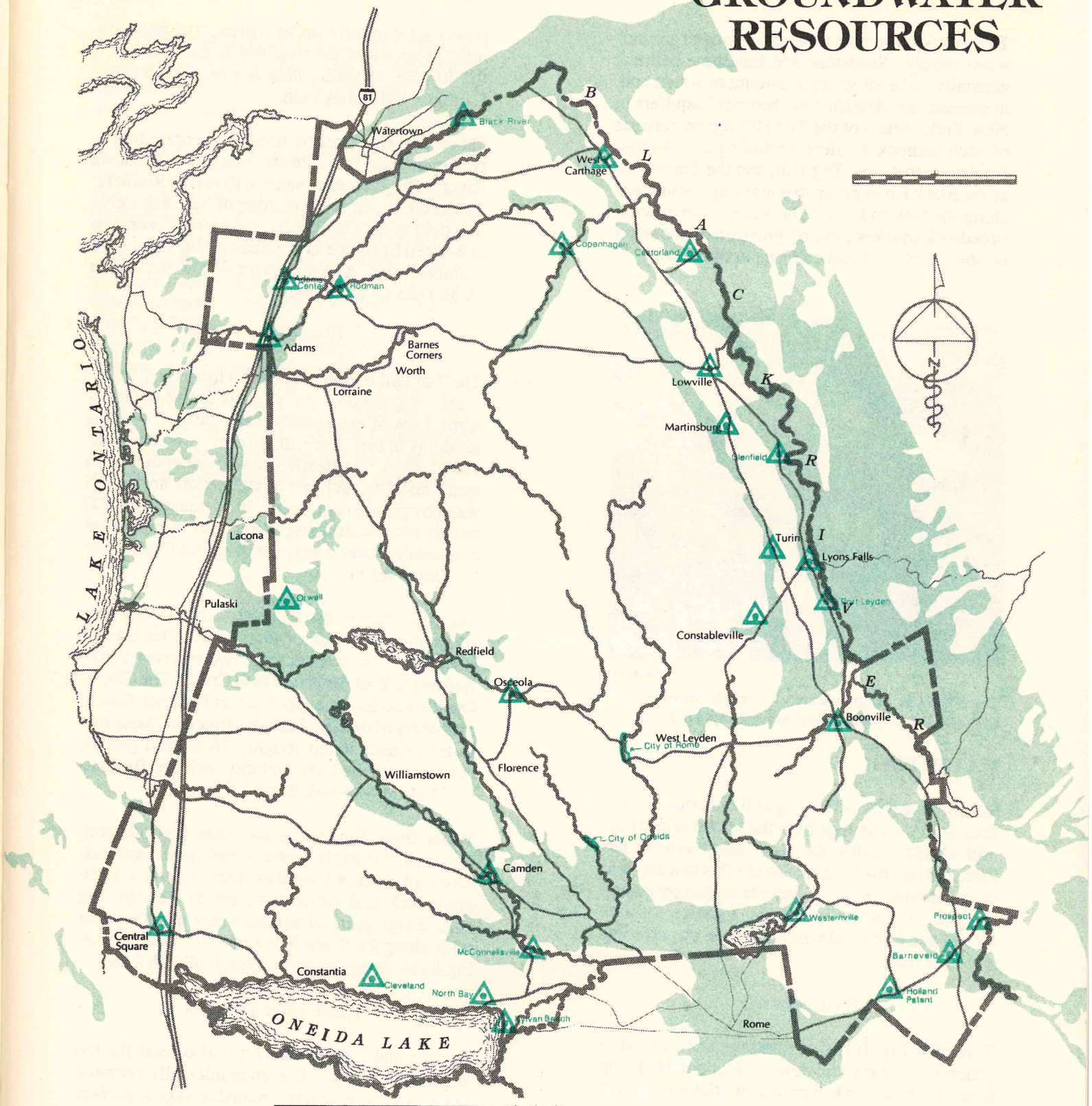
Photo by TH

Flowing northward to meet the Black River, High Falls on the Deer River slowly marches southward into the 400-plus million year old limestones of Tug Hill, producing one of the highest falls in the state and creating one of the region's deepest gorges in its wake.

In Tug Hill, many of the most productive aquifers occur around the flanks of the uplands, coinciding with areas where the region's population is greatest (see Tug Hill Groundwater Resources map). The lesser populated uplands are covered with a veneer of till, a non-aquifer type material that possess limited reserves of groundwater that only provide enough water to serve individual homes.

The Tug Hill Aquifer, which wraps around the western and southwestern edge of the uplands, and the sand and gravel deposits that fill the Black River Valley along the eastern edge of the upland are highly productive, and have been designated as "principal" aquifers. A number of smaller aquifer areas exist throughout the region, representing areas that have abundant groundwater supplies and have very good water quality.

TUG HILL GROUNDWATER RESOURCES



LEGEND

- Aquifer
- Municipal Water Supply

Prepared By: BAGDON ENVIRONMENTAL ASSOCIATES, INC.

Bedrock aquifers also serve as a source of groundwater supply. Sandstone and limestone bedrock generally yield the greatest amount of water, and, in general, are classified as "bedrock" aquifers in New York. Much of the Tug Hill region consists of such bedrock aquifers, including the Oswego Sandstone that caps Tug Hill, and the limestones of the Black River group that make up the terraces along the eastern flank. The water yield of wells in bedrock aquifers can vary greatly because water is stored in cracks and crevices in the rock.

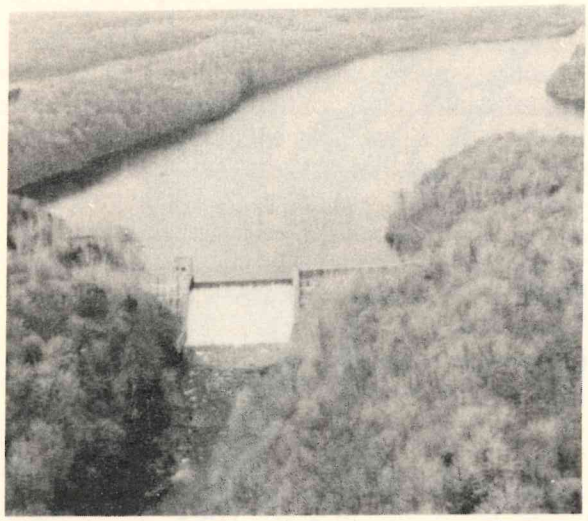


Photo by THC

The 3380-acre Salmon River Reservoir supplies both hydroelectric power and recreational opportunities.

WATER USE

Streams that flow off of Tug Hill historically have been used to carry logs from the forests and to turn mill wheels. Today, the water flows without the logs, and past the foundations of mills that are now quiet. Instead, water shapes the region by generating electric power, providing a source for municipal and industrial water supplies, and offering areas for recreation.

Hydroelectric

Several of Tug Hill's rivers and streams are used to generate hydroelectric power. Most notable is the Black River which has been a "working river" for more than 200 years. More than a dozen dams on this river are currently used to generate power, with the most significant concentration of dams located between Carthage and Watertown. Several new proposals for developing hydroelectric power are currently under review. The most significant stretch of the river that is not dammed is the 40 mile, primarily flatwater section, between Carthage and Lyons Falls.

Other Tug Hill streams used to generate hydropower include the Salmon, Deer, and Mohawk Rivers. The 3380-acre Salmon River (or Redfield) Reservoir on the western edge of Tug Hill's core was built to store water for hydropower generation at Bennett Bridges and Lighthouse Hill sites on the Salmon River. A power plant is also located at Delta Dam on the Mohawk.

Water Supply

The Tug Hill region includes 39 towns and 21 villages. Eighteen of the villages are serviced by some form of community water supply, whereas residents in two Tug Hill villages rely upon individual wells. Six hamlets have created their own water districts, and two other hamlets are served water by private companies. In all, roughly 27,500 people receive drinking water from a municipal community water supply (see Tug Hill Groundwater Resources map).

Tug Hill water is also tapped to provide water for communities outside of the region. The City of Rome collects its water from two reservoirs situated on the East Branch of Fish Creek. The City of Oneida also has one reservoir on Florence Creek, a tributary of the East Branch. Together, these two water systems divert roughly 16 million gallons per day from the Lake Ontario Drainage Basin to the Hudson-Mohawk Basin.

Water from Tug Hill is also used for industrial purposes. An ample source of high quality groundwater attracted a state fish hatchery and a high-grade technical paper company to western Tug Hill. Large users of surface water include paper mills along the Black River and wire manufacturing firms along the West Branch of Fish Creek.

Wastewater Disposal

Surface and groundwaters are also used for the disposal of sewage. Eleven municipally operated sewer systems discharge treated sewage to surface waters. In areas not serviced by a municipal sewer system, waste water is typically discharged into the ground via some form of septic system. The capacity of septic systems range in size from those used at individual homes to those that service

schools and institutions. With proper maintenance, design and soil conditions, septic systems represent an effective way of disposing of waste water in rural areas.

TUG HILL'S WATER LINK

Tug Hill is one of New York State's most extensive and most important headwater areas. In 1900, Tug Hill waters were being studied as a source for converting the Erie Canal to a seaway. Twenty-six years later, a report by the New York State Commission on Housing and Regional Planning identified Tug Hill as one of several proposed reservations for state water supply, and in a 1934 progress report to the National Resources Board, Tug Hill was identified as a "critical watershed area." Over fifty years later, in 1989, at public forums conducted by the Tug Hill Commission, Tug Hill residents indicated that they felt water was the most important resource of the region.

LESSER KNOWN WILDERNESS: TUG HILL'S DIVERSE HABITATS

Lying in the shadow of the "Greater Wilderness" of the Adirondacks, the special qualities of the "Lesser Wilderness" of Tug Hill may not be readily apparent. But as one takes a closer look, a wild, remote beauty is revealed. Expansive forests, isolated marshes and swamps, steep gorges, combined with limited public roads and few human inhabitants, add up to a special home for wildlife and a special land for man to appreciate and enjoy.

SPECIES THAT CALL TUG HILL HOME

Though most wildlife species generally favor a particular habitat type, they often utilize other habitats to meet all their needs: food, water, breeding, nesting, resting and shelter. Tug Hill, with its diverse habitats ranging from the lowlands of the Black River Valley to the dense northern woods of the core forest, sustains a healthy and productive assemblage of wildlife species.

Big game animals such as white-tailed deer use the deciduous woods during the warmer months and find winter refuge in the conifers. Beaver, mink, muskrat, otter and fisher are among the furbearers that live in the wetlands and travel along the forested waterways of Tug Hill. Abundant wetlands are also home to waterfowl, snowshoe hare, and many amphibians and reptiles. The old fields growing back to woods harbor woodcock, ruffed grouse and numerous songbirds and small mammals. Trout and other fish abound in the cool, rippling waters that flow from Tug Hill. This diversity adds up to a significant wildlife resource.

The importance of Tug Hill's habitat to New York State as well as the United States is made evident in a recently completed report by the New York Natural Heritage Program which identifies over 200 historical records of 70 rare plant and 29 rare animal species throughout the Tug Hill region. Of these species identified, 32 plants and nine animals were found to be extremely rare in New York State, which means there are five or fewer known locations in the state. The Heritage list of 12 potentially significant natural areas was developed from information on rare plant and animal life in combination with natural communities including cliffs, forests and wetland habitats. There are thought to be less than 100 occurrences of each of these vulnerable communities in the state.



Photo by THC

Farms, fields and forests combine to make Tug Hill's diverse wildlife habitats.

DIVERSE HABITATS

Although Tug Hill is mostly forested, with nearly two-thirds of the land or 778,000 acres in woods and brush, a variety of habitat types can be distinguished. Most of the land is covered with northern hardwoods.

Interspersed with the hardwood forest are scattered conifers, numerous shrub swamps and wooded wetlands, patches of shrubland, and extensive agricultural fields. This complexity of the Tug Hill landscape serves to meet the needs of many wildlife species adapted to the harsh conditions of the north woods.

Hardwood Forest

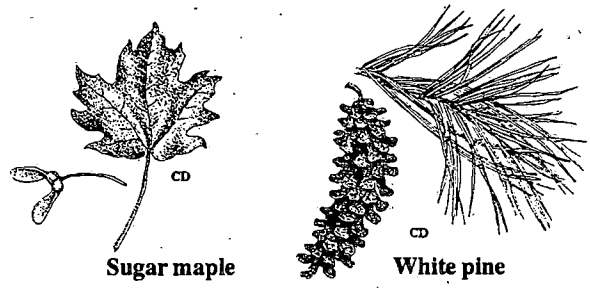
The northern hardwood forest of the Tug Hill upland core is comprised primarily of sugar maple, beech, hemlock, white pine, red maple and yellow birch. Elsewhere on Tug Hill, the northern hardwood forest is comprised primarily of red and sugar maple, along with white pine, hemlock and black cherry.

The core area is almost 80% in forest or brush. The remainder of the core is fields, scattered camps, or under water. The north shore of Oneida Lake also has a large, concentrated block of forest cover, interspersed with numerous wooded wetlands.

The tree species found in the hardwood forest provide an assemblage of seeds, cones, and tender leaves for food for a variety of birds and mammals, as well as cover and nesting sites. Other food is available in the understory, where shrubs bear fruit that is valuable to wildlife in both winter and summer. The forest is well-shaded, creating a moist forest floor suitable for a variety of salamanders, reptiles, and small rodents. These, in turn, serve as food for predators such as hawks, owls and foxes.

Coniferous Forest

The coniferous forests of Tug Hill, though less abundant than hardwoods, provide an essential habitat for deer and other species. The majority of coniferous forests on Tug Hill are a result of reforestation efforts by the state. These stands are scattered around the upland core forest. The north shore of Oneida Lake has the greatest proportion of hemlock and white pine. There are also areas of



Sugar maple White pine

abandoned farmland which have regenerated naturally back to spruce and fir, as well as strips along rivers and gulfs which were not logged in the past.

In the spring and summer, birds and mammals that favor cones feed in the conifer areas. Warblers, kinglets, woodpeckers and other birds feed and nest in these woods, and porcupine feed on the buds, leaves, and twigs of conifers. During Tug Hill's harsh winters, the dense overlapping branches of conifers provide shelter from cold winter winds and cover from deep snows. Deer congregate in these shelters for protection and browse, as do snowshoe hare and ruffed grouse.

Wetlands

Among the forests of Tug Hill, the landscape is interspersed with wetlands. The relatively flat landscape and poorly drained soils set the stage for melt waters of the great Tug Hill snows to form wetlands in nearly every dip in topography. There are about 117,000 acres of open swamps and wet woods. The greatest concentrations of wetlands are the headwater areas in the upland core forest as indicated on the Surface Water Resources map in the preceding chapter, and in the lowlands north of Oneida Lake.



Photo by DEC

Many wetlands are formed by beaver, as in this flooded woodland.

The wetlands of Tug Hill are valuable ecosystems, providing many benefits and functions. They serve as natural flood control, regulating the flow of water and protecting fish habitat. They improve the quality of the water flowing off Tug Hill by absorbing nutrients and sediments. Wetlands are productive wildlife habitats that are used by a diversity of species for feeding, nesting, resting and cover.

The most common wetland type on Tug Hill is the shrub swamp, dominated by alder. These moist, shaded thickets provide habitat for moles, shrews, woodcock, snowshoe hare, ruffed grouse, deer, beaver, and numerous other species of mammals, birds, and amphibians.

Shrubland

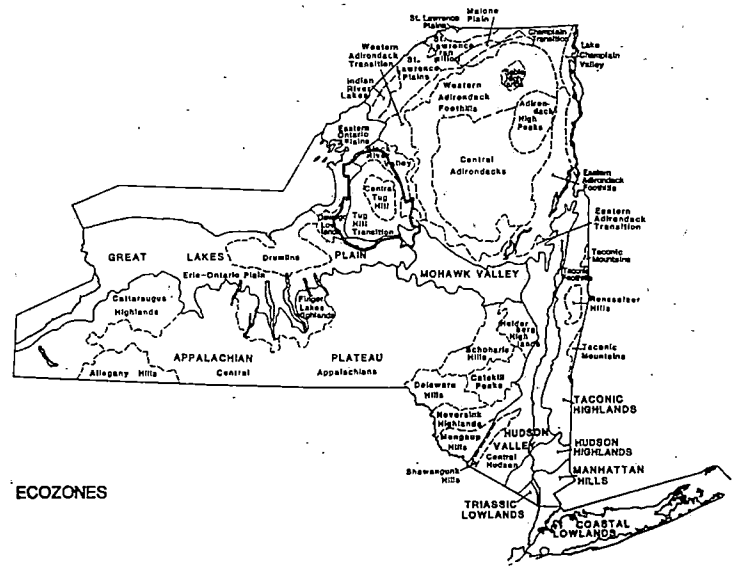
The dense thickets of shrubs and saplings in the shrublands of Tug Hill provide the special habitat needs of many wildlife species and add diversity to the landscape. Shrublands result from disturbance to the land, such as farmland abandonment, forest clearing, or fire. The shrubland habitat is ever-changing: a forest in the making. The succulent grasses and flowering plants, as well as the variety of seeds and fruits abundant in this habitat type, provide food for birds and mammals. The openness of the shrubland attracts aerial predators, such as hawks and owls, and displaying birds such as woodcock. The edge, where the shrubland opening meets the forest, is a very important community for birds and mammals that depend on the converging habitat types.

Farm Fields

Farm fields and pastures are important to wildlife as sources of open areas and food. Many species of wildlife come out of the closed forest to visit these openings for sunshine and warmth. Pastures are often the first areas free of snow and the first to green up in the spring, providing new growth for food. Cultivated cropland provides corn and other food for wildlife. Deer, squirrel, Canada goose, and crow are among the many wildlife species that take advantage of farm fields in the Tug Hill area. The majority of active farmland in the Tug Hill region can be found outside the core area, especially along the Black River Valley.

TUG HILL ECOLOGICAL ZONES

Tug Hill's habitats have been distinguished from other habitats in New York State. Biologists have separated Tug Hill into three ecological zones to better facilitate wildlife management, based on both natural and social factors. These include the Black River Valley, Tug Hill Transition, and Central Tug Hill Zones. Natural factors considered were land form and topography, bedrock geology, soil productivity, climate and forest type. Social factors included land ownership, land use, road access, and human population density.



Biologists have distinguished Tug Hill's diverse habitats from the rest of the state.

SOILS

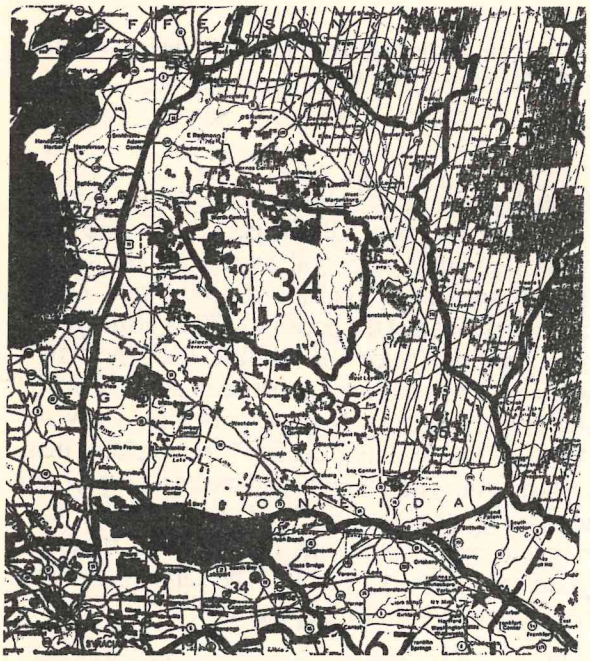
Though the wildlife habitat on Tug Hill is diverse and abundant, many wildlife populations are indirectly limited by poor soil conditions and severe winters with long durations of deep snow. Many biologists feel that the poor soil of Tug Hill is more of a limiting factor for wildlife than the harsh winters. The relationship between soil and wildlife may have been best described by Durward Allen in "Our Wildlife Legacy". He explains that, in agriculture, good soils yield the best crops, both in quantity and quality. Good crops, in turn, support the best populations of livestock. In short, good soils grow big rabbits. The same model can be applied to wildlife populations.

The soils of Tug Hill generally decrease in fertility as one ascends the plateau. The soils in the valleys are fertile, yielding cultivated crops and pasture for dairy cows. The fertility of the soil of the transition area is marginal for cropland, and the core forest area has the least productive soil. The populations of wildlife in the undeveloped portions of Tug Hill, the transition area and central Tug Hill, are limited by the low quality soils.

WINTER SHELTER FOR DEER

White-tailed deer, the largest of the common resident wildlife species on Tug Hill, are greatly influenced by the climate of the region. Biologists have found that populations of deer in the upland core of Tug Hill fluctuate in direct response to the severity of winter. Snow pack can get as deep as 45 inches, making travel difficult and food scarce. Populations were quite low in the 1970's following several harsh winters.

In the 1980's, winters were not as severe and deer populations rebounded. Though the present-day deer populations are increasing moderately, biologists expect the number of deer could drastically decrease following a severe winter. A reflection of deer population densities is the number harvested. The adult bucks harvested on Tug Hill increased from around 350 in 1960 to over 2,300 in 1989.



The Tug Hill region is included in Deer Management Units 34 and 35. The hatching indicates black bear hunting areas.



CD

Deer



Photo by DEC

Concentrations of conifers, like this one near Highmarket, provide protection from wind and deep snow.

Presently, the estimated deer population of the two deer management units (DMU) of Tug Hill is between 17,000 and 18,000 deer. This is approximately nine deer per square mile on Tug Hill. Biologists have estimated that the upland core of Tug Hill (DMU 34) could support between 4 and 10 deer per square mile, and between 10 and 18 deer per square mile outside the core of Tug Hill (DMU 35).

Though deer are distributed throughout the Tug Hill area during the summer months, they migrate to the coniferous yarding areas that provide protection from wind and deep snows as winter progresses. These wintering areas are critical to the survival of the deer herd on Tug Hill.

Wildlife biologists have identified four major deer wintering areas on Tug Hill, located near Highmarket, Rodman/Barnes Corners, Otto Mills and Osceola. There are also two less intensively used wintering areas located near Constantia and Boonville.

The boundaries of the deer wintering areas are dynamic, changing with the intensity of winter and with the concentrations of deer. Because the limits of the areas are not static, the boundaries defined on the map differ from those of the 1970s and likely from those in the future. Deer return to the wintering areas with the coming of snow and cold, with the intensity of the winter determining the concentration of the deer. In the milder winters, deer wintering areas are more dispersed, even overlapping with one another as is the case with the Rodman/Barnes Corners wintering area.

Much of the food source has been virtually depleted in the deer wintering areas that receive repeated use by deer each year. Deer that concentrate in these areas in the winter browse seedlings as soon as they start to grow, thus limiting or eliminating regeneration in the wintering areas. This overbrowsing affects the forest composition and limits the availability of future food supply for deer. Due to lack of browse for deer in these wintering areas, many deer die of starvation each year, regardless of the severity of the winter. Heavy winter mortality is well documented at the Highmarket area, and is periodically significant, but not as well documented at Barnes Corners.

THE RETURN OF THE MOOSE?

Moose is the largest of the deer family. It has historically been a resident of the Tug Hill region. The status of moose in the state has been the subject of much speculation. Biologists have noted the slow but evident natural return of the moose to its historic range on Tug Hill. Moose have travelled south from Canada or west from Vermont to the Tug Hill and Adirondack regions, using traditional routes. One such route has been documented between the Tug Hill region and the Adirondacks at the southern end of the Black River Valley farm belt.

Moose entering from Canada swim or walk on the ice across the St. Lawrence River and travel south towards Watertown. Although moose are currently only moving through Tug Hill, it seems possible that a natural population of moose could eventually become established on Tug Hill, though the process would be gradual.

This possible, natural reestablishment of the moose on Tug Hill could get a boost from man. Biologists at New York State's Department of Environmental Conservation (DEC) are studying the possible effects of deliberately reintroducing moose in northern New York.

A variety of factors make Tug Hill prime moose habitat. The mix of managed forests and numerous wetlands provide favored foods for moose. The browse from trees and swamp and marsh plants contribute to the potential for moose on Tug Hill. Moose, however, can have a negative effect on forest regeneration, as a result of overbrowsing. However, in Maine, New Hampshire and Vermont, where moose are already established,



Tug Hill has ideal moose habitat.

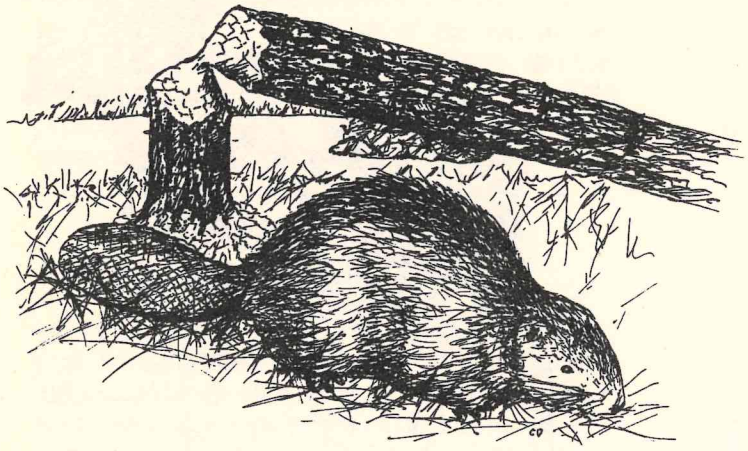
according to landowners interviewed, the effects on forest regeneration do not seem to be a problem.

A parasite of moose known as brainworm (Parelaphostrongylus tenuis) may also not be a serious limiting factor as once suspected. Fatal to moose, brainworm is carried by deer, but usually is not fatal to deer. Yet, for some reason (perhaps the relatively low density of deer in Tug Hill and northern New York), brainworm has not yet appeared to be a limiting factor to the moose moving into New York State on their own.

The limited extent of public roads and low human density also makes Tug Hill a good area for moose. Though Tug Hill is relatively remote, its proximity to more populated areas may be a hindrance to the reestablishment of moose in the Tug Hill area. Considering the great distances moose can travel and the public road network encompassing the region, there is some chance of moose-car collisions. The probability of collisions, however, is less than in much of the rest of the state.

BEAVER—RESIDENTS AND CREATORS OF WETLANDS

One of the most common, and often troublesome, inhabitants of the numerous Tug Hill wetlands is the beaver. Beaver populations are currently at very high levels in the Tug Hill region and across



Beaver help create habitat diversity.

the state. This is noteworthy considering that beaver were rare, and possibly locally eliminated, in the Tug Hill region about a century ago. The current high population density has been causing some nuisance problems to the human inhabitants of Tug Hill.

Beavers are often the creators of the growing number of wetlands in the region. They create a habitat suitable for many other wildlife species by creating a habitat to suit their own needs. The impact of beaver on an area is cyclic. This cycle, from forest to pond to shrubland to forest again, contributes to and helps to sustain habitat diversity.

Unfortunately, beaver do not always decide to make their home in an area that is conducive to man's activities. On the contrary, beaver impoundments often cause floods, damaging roads or quality timberlands, resulting in economic losses.

Since most of the natural predators of beaver, as well as other furbearers, have been eradicated, trapping is the most effective management tool to control their numbers. Trapping activity, however, is strongly influenced by fur prices. There is presently a slump in the price of fur, resulting in lower harvests of furbearers, including beaver, mink, and muskrat. In 1986 there were almost 2200 beaver taken off Tug Hill, in 1987 there were over 1400 taken, and in 1988 the number taken dropped to 1147. With the incentive of fur prices removed, trappers are paid to remove specific nuisance beaver. DEC also issues permits to trap and destroy nuisance beaver.

THE ELUSIVE FISHER

The fisher, an elusive inhabitant of the north woods, is a furbearer whose status has been of interest over the years. Because the fisher is vulnerable to trapping, DEC closely monitors its population. In the early 1980's, at the peak of their value, there was concern that fisher were being over-harvested. The 1979 take for Tug Hill was 208, by 1982 it was down to 54. In an effort to avoid serious decline of the population of fisher, DEC temporarily closed the trapping season to allow the populations to stabilize. The fisher population bounced back and today biologists report that fisher on Tug Hill have the highest population per acre in New York State.

Fisher inhabit the forests of Tug Hill and travel along its watercourses. They prey on various species that inhabit the conifer forest, including porcupine, snowshoe hare, and small rodents. They also feed on carrion, especially of deer and beaver. Fisher den in hollow trees, or under logs, brush piles or tree roots, showing some preference for coniferous trees. The continued positive outlook of the fisher is dependent on the preservation of the contiguous expanse of north woods in the Tug Hill region and the Adirondacks.



Photo by DEC

The fisher population on Tug Hill is stable after a sharp decline in the early 1980's.

TUG HILL FUR HARVEST

	1986-87	1987-88	1988-89	1989-90
Beaver**	2,190	1,470	1,147	2,083
Bobcat**	0	3	6	2
Coyote**	150	178	143	64
Fisher**	118	114	102	78
Gray Fox*	122	100	172	76
Mink*	1,014	1,279	540	1,294
Muskrat*	13,136	13,854	5,401	6,037
Opossum*	1,078	159	264	142
Otter**	72	79	33	97
Raccoon*	2,405	2,518	747	1,287
Red Fox*	306	194	162	202
Skunk*	555	179	136	180

* Pelts which do not require a tag; based on telephone survey.
** Pelts which require a tag; reported take.

BOBCAT-COYOTE CONFLICT

Bobcat and coyote are two predators that depend on snowshoe hare as a major staple of their diet. Coyotes are more competitive for their food than bobcats and have a broader range of food preferences.

Though it is not certain, there is speculation that an increase in coyote populations can result in a decrease in bobcat populations. This trend is noted in the Tug Hill region where the bobcat population has drastically decreased over the past years to the point where it is negligible. Corresponding with this decrease is the increase in coyote population. It is unclear whether this is a direct response or if there are other factors, such as hunting, contributing to the decline.

COYOTE AND FOX

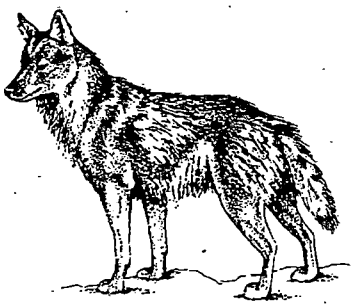
Coyote, red fox, and gray fox inhabit the Tug Hill region. All three are hunted and trapped in varying degrees for their fur. Interest in hunting and trapping these animals is directly related to pelt prices, which are currently very low.

It is most commonly believed that coyotes invaded northern New York from Canada in the early part of the century. Coyotes are very adaptable animals, which may be part of the reason for their success on Tug Hill. They feed on small mammals, birds, rodents, and plant materials, as well as dead animals. The reported takes have been fairly stable from 1979-1988 ranging from a high of 178 in 1987 to a low of 64 in 1989. Coyotes are territorial, which limits the number of animals that can live in an area. In the northern New York hunting zone, population densities range from 3-12 per 100 square miles.

CD

Bobcat

DEC is currently conducting a study on the effects of coyotes on deer and livestock, and on public attitude toward the eastern coyote. This study is in response to legislation proposing a year-round hunting season for coyotes in the northern New York hunting zone.



CD

The coyote has become one of the more controversial inhabitants of Tug Hill.

Red fox and gray fox both have similar food staples as the coyote. Red fox are found more in agricultural areas, while the gray fox seems to prefer more of a woodland habitat. Both have healthy populations on Tug Hill. But from estimated takes, based on trapper telephone surveys, red fox seem to be more abundant than gray fox. As is the case with most animal populations, their numbers seem to be cyclical.

OTHER FURBEARERS

The wetlands, streams, and forests of Tug Hill are home to many other furbearers including mink, muskrat, and otter. Trappers have found that some of the highest quality pelts come off of Tug Hill. The otter population is not as high as the mink and muskrat, which is probably due to their low reproductive rate and high mobility. On Tug Hill, otter population density is believed to be the lowest in New York State. In 1988, 33 otter were taken off Tug Hill, only 2.5% of the reported statewide harvest.

A popular game species associated with the Tug Hill is the varying hare, or snowshoe hare. The abundant alder shrub swamps and thickets of young conifers comprise excellent habitat for this species. The snowshoe hare is well-adapted to survive the deep snows of Tug Hill, with it's snowshoe-like feet (hence the name) and thick fur. This species is abundant throughout the region. Snowshoe hare hunting with dogs is a popular sport on Tug Hill.

Cottontail rabbits, on the other hand, are rarely seen on Tug Hill because they cannot survive its winters.



Otter

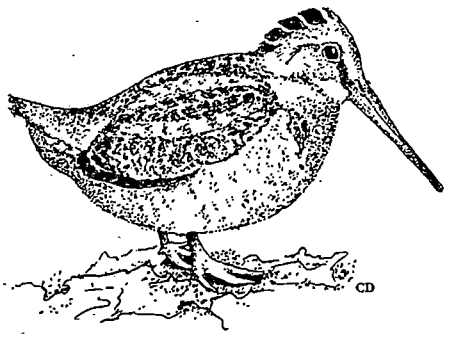
BIRDS

The vast number of wetlands and headwater areas on Tug Hill provide habitat to a variety of waterfowl during migration and breeding. Wetlands on Tug Hill are mostly shrub swamps and wooded wetlands, with scattered emergent marshes and wet meadows, and few areas of large open water. This influences the waterfowl species that use the region.

Wetlands on Tug Hill provide suitable breeding habitat for species such as mallard, wood duck, hooded merganser, and black duck, and resting and feeding habitat for migratory waterfowl. Populations of waterfowl in the Tug Hill area are increasing due, at least in part, to the growing number of wetlands created by beaver.

Tug Hill open water areas along the Black River, Oneida Lake and Redfield Reservoir serve the needs of other waterfowl species migrating and breeding in the Tug Hill region. Consistent with this diversity and abundance, opportunities for waterfowl hunting are excellent in the area. Sportsmen enjoy hunting the isolated wetlands harboring great numbers of migrating waterfowl in the autumn.

The shores and marshes of Oneida Lake provide habitat for a broad assemblage of waterfowl during migration and for breeding including mallards, black ducks, great blue herons, red-breasted mergansers and blue-winged teal. The open waters of Oneida Lake and Redfield Reservoir provide suitable habitat for coots, scaups, goldeneyes, buffleheads and oldsquaws. Uncommon bird species that use Oneida Lake for a migration stopover or for breeding include common tern, osprey, bald eagle, double-crested cormorant, and common loon.



Woodcock favor the earlier stages of old field succession.

EVER-CHANGING FIELDS FOR WOODCOCK AND GROUSE

Ruffed grouse and American woodcock are among the wildlife species that directly benefit from the conversion of farm fields to old field, shrubland, and poletimber, outside the upland core area. Woodcock generally favor the earlier stages of old field succession. Ruffed grouse prefer the poletimber stages. Woodcock also use the numerous alder swamps across the landscape. Though much marginal farmland was abandoned years ago, suitable successional habitat will continue to be available for grouse and woodcock as small areas are cleared for timber and areas are abandoned by beaver and revert to shrubland.

Woodcock and ruffed grouse are both popular game species. Woodcock hunting on Tug Hill is said to be the best in the state.

WHERE ARE THE TURKEY AND THE BEAR?

Despite the availability of suitable habitat and food, biologists believe severe winters and deep snows limit the establishment of a stable turkey population in Tug Hill. While an active state program to reestablish turkey has brought them close to Tug Hill (St. Lawrence County), and turkey is seen scattered over Tug Hill, especially during milder winters, it does not look like there will be a major, established population.

There is little evidence that black bear historically inhabited the core of Tug Hill, although numerous sightings of black bear have been recorded. It is believed that these bear are just travelling through the region, while roaming within their range. The major limitation to bear habitation is apparently the lack of winter den sites, which are essential to black bear survival.

The eastern edge of Tug Hill, however, is home to black bear. DEC personnel have located denning sites, and in 1989 there were two black bears harvested in the towns of Boonville and Trenton. One of the largest black bear ever taken in New York State, weighing over 600 pounds, was harvested in Penn Mountain State Forest, in the town of Steuben.

THE TROUT-FILLED WATERS

The cool, clean, rippling waters of Tug Hill streams harbor brown, brook, and rainbow trout, as well as other cold-water fish species. Trout require cool, shaded waters that are fairly swiftmoving. The small streams in the central portion of Tug Hill support mostly wild brook trout, whereas other Tug Hill streams support a mix of wild and stocked trout. Brook trout, brown trout and rainbow trout are stocked in Black River, Sandy Creek, Fish Creek, Mad River, Point Rock Creek, West Canada Creek, and Mohawk River, among others. The high-quality fishery of Tug Hill benefits from the continued conversion of old field to forest, providing the streams with shade to keep the water temperatures low.

The East and West Branch of the Mohawk River and the East Branch of the Salmon River are both blue ribbon trout streams, in the top 16 of the very best New York State has to offer, according to DEC.



Black bear denning sites have been found on the eastern edge of Tug Hill.

SIGNIFICANT HABITATS

Retaining Tug Hill's ecological resources means retaining its wildlife and plant habitats. The diversity of Tug Hill's ecological resources will be retained by action that retains diverse habitats — such as wetlands, large forested tracts, old fields, and river corridors.

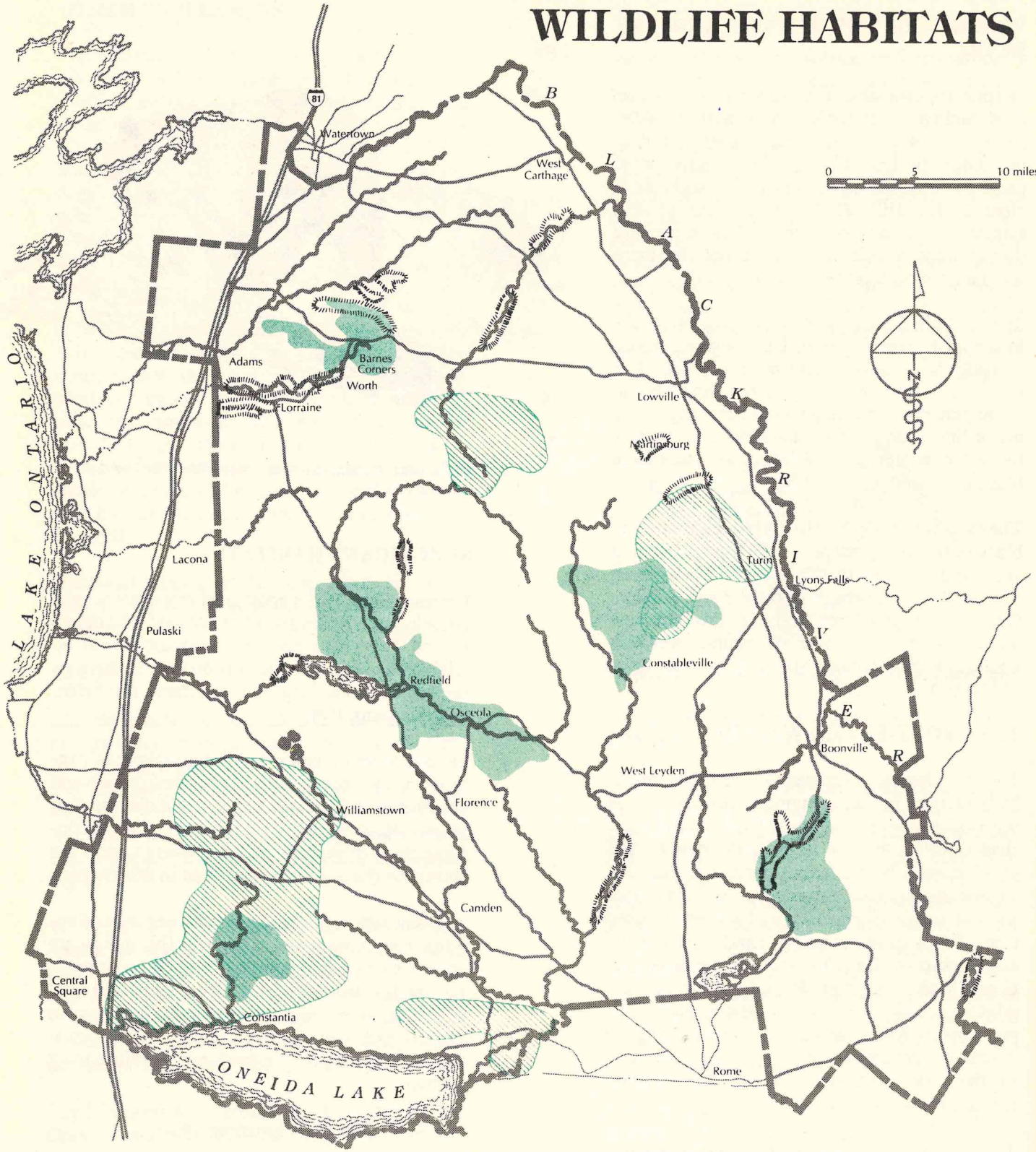
Six categories of habitat are discussed here as "significant". River corridors, large forest parcels and headwater wetlands are mapped and discussed in greater detail elsewhere in this book. Gulfs, concentrations of rarities, and deer winter areas are shown on the accompanying map in this chapter.

As elsewhere in this report, these categories of important working lands in the Tug Hill region are shown just as a starting point. Tug Hill communities wanting to work to retain these lands will want to look at more specific boundaries, and involve citizens and others in developing further information and deciding which lands are most important to them.

Deer Wintering Areas

The scattered coniferous forests of the region are critical to the survival of the Tug Hill deer herd. These deer wintering areas are a refuge from the

TUG HILL SIGNIFICANT PLANT AND WILDLIFE HABITATS



Prepared By: BAGDON ENVIRONMENTAL ASSOCIATES, INC.

winters. The protection of known and potential deer wintering areas is essential to sustaining a viable deer herd on Tug Hill.

Concentration of Rarities

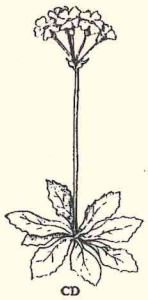
Over 200 historical records of 70 rare plant and 29 rare animal occurrences have been identified for the Tug Hill region by the New York Natural Heritage Program. Concentrations of these rarities have been delineated on the accompanying Significant Plant and Wildlife Habitats map. These mapped sites are general locations indicating where further research should be done.

The Gulfs

The seventeen gulfs mapped on Tug Hill are distinct landforms that provide unique habitat for plants and wildlife. Most gulfs have some gorge sections up to 200 feet deep. In some cases, the streams have cut gorges almost 300 feet deep, and it is not uncommon to see those streams spilling over falls. The steep-sided, often unstable slopes of the gorges and the flat lowland areas in the basins have the potential to support rare species. The Natural Heritage Program has documented several rare plants and animals occurring in the gulfs including bird's-eye primrose, large-leaf aster, soft fox sedge, rock cress, jacob's ladder and the raven.



CD
Jacob's ladder



CD
Bird's-eye-primrose



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Red-shouldered hawk

Large Forested Tracts of Land

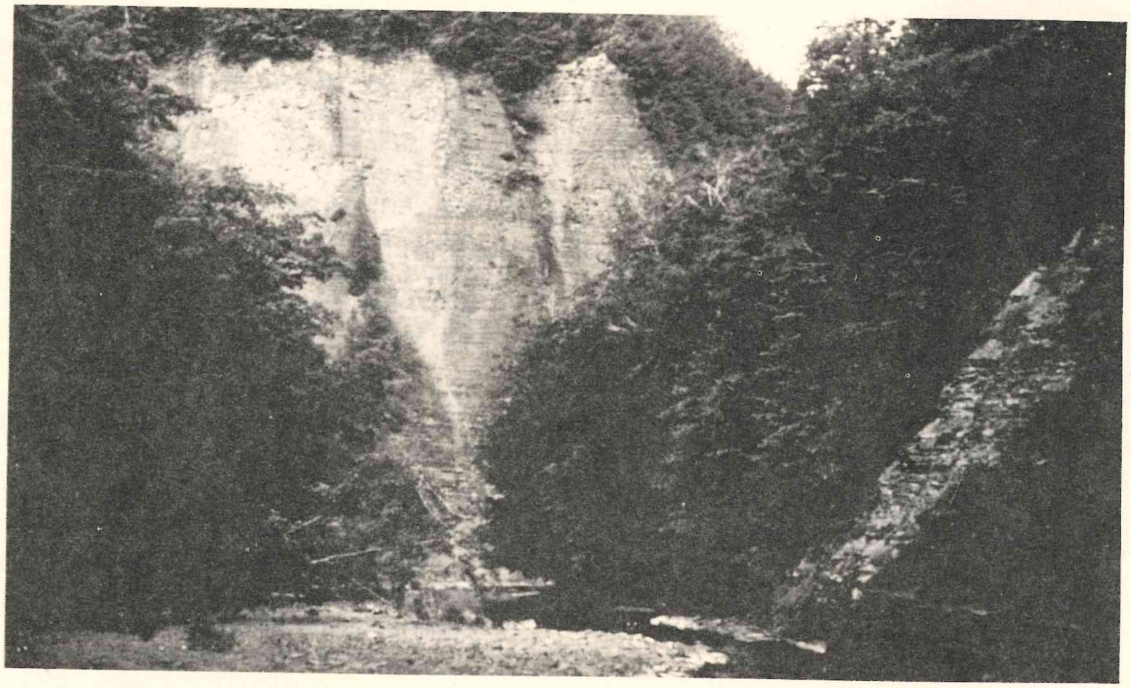
Large, contiguous tracts of forest can provide important habitat, especially for larger animals, and can help reduce the adverse effects of habitat fragmentation occurring in surrounding areas.

River Corridors

The forest cover bounding major rivers and streams flowing from Tug Hill is important in maintaining water quality and fish and wildlife habitat. The trees stabilize the stream banks to reduce turbidity and filter nutrients from runoff prior to entering the streams. The forested waterways of the region serve as corridors for wildlife traveling throughout the region, and the cool waters of the shaded streams are essential for trout survival. These corridors could be especially important to animals with large range requirements such as the moose.

Headwater Wetlands

Wetlands located in the upland core of Tug Hill serve as the headwaters for rivers and streams that flow off Tug Hill in every direction of the compass. These wetlands are excellent habitat for waterfowl and furbearers, as well as supplying pure water for the trout-rich streams and rivers. They also provide crucial flood control and help maintain the quality of water drawn for human use.



The steep-sided slopes of Inman Gulf have been found to support rare plant species. Photo by THC

FARMING TUG HILL

FARMING SHAPES TUG HILL

Farming is important to Tug Hill's way of life. It is also one of the most important factors in Tug Hill's economy. There are over 700 active dairy farms in the region, and at least 350 non-dairy farm operations. These support numerous agriculture-related businesses, such as feed stores, dairy products manufacturers, farm equipment dealers, and veterinary clinics, all creating jobs and tying livelihoods close to the land.

Tug Hill farming has changed greatly in the last century. Small, subsistence farms have been consolidated into larger, more commercially-oriented farms. In addition, farms have concentrated on the better suited lands like those of the Black River Valley. Farmers who tried tilling lands of Tug Hill's core soon learned that the land was unsuited for farming due to a harsh climate and poor soils. When tractors replaced horses, making small farms on marginal land unprofitable, even more of these farms were abandoned. The result is fewer farms that are larger in size and more productive than the numerous smaller farms. Today, the greatest concentration of farms is along New York State Routes 12 and 26 in the Black River Valley and on the west side of Tug Hill along Interstate-81 and U.S. Route 11 in Jefferson County.

FARMING SOILS

There are two categories of soils which identify the most productive farmlands in New York State. These are "prime agricultural soils" and "soils of state-wide importance". According to the Soil Conservation Service, prime farmland is one of the most important resources of the nation. It is exceptional land which can be farmed continuously, or nearly so, under proper management without degrading the environment. Farmland of state-wide importance is important to agriculture in New York, but does not meet all prime farmland criteria. In the Black River Valley, areas have been identified which contain more than 75 percent prime farmland (see Tug Hill Farms and Prime Farm Soil map).

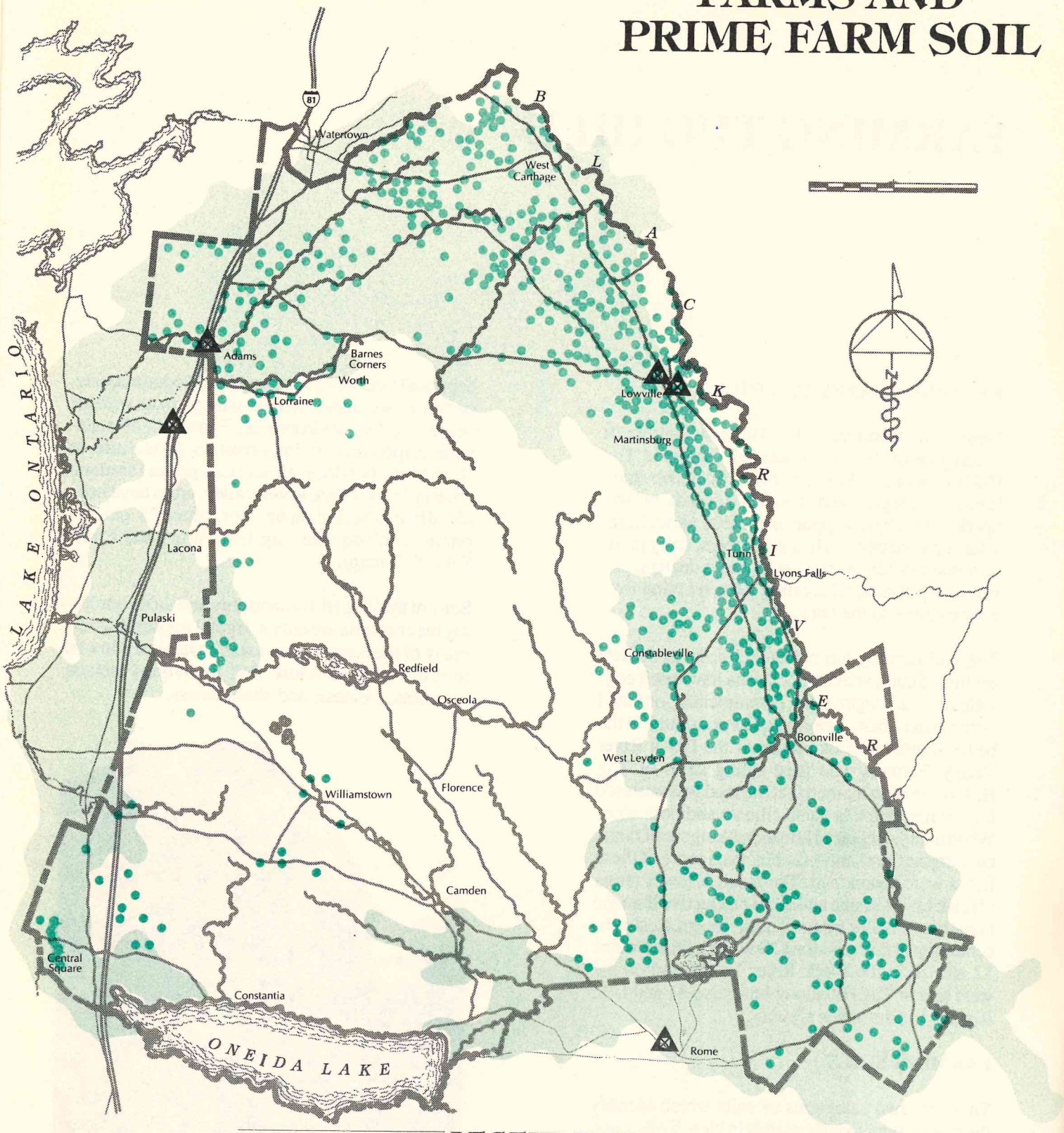
Soils of the Tug Hill upland core and those bordering the core area are only marginal for farming and many of the former farm areas have been allowed to revert back to forest. Soil limitations include stoniness, wetness, and shallowness.



Photo by THC

Abandoned farms and scrubby brushland are typical sights at old farming communities.

TUG HILL FARMS AND PRIME FARM SOIL



LEGEND

- Prime and Important Agricultural Soils
- Dairy Farm Location
- Agricultural Industry

Prepared By: BAGDON ENVIRONMENTAL ASSOCIATES, INC.

In addition to the limitations of the soil, the climate is too harsh and the growing season too short to make farming a viable business in much of the Tug Hill region. Remnants of the lost battle to farm the land are evident throughout the area: abandoned farmhouses, scrubby brushland, rusty farm machinery scattered at abandoned farm sites, and farm communities which are now virtually ghost towns.

DAIRY FARMING

Dairying dominates Tug Hill farming. There are over 700 active dairy farms in the region based on one local inventory (see Tug Hill Farms and Prime Farm Soil map). Over half of Tug Hill's dairy farms are located in the Black River Valley of Lewis County. The portions of Jefferson and Oneida Counties that are in the Tug Hill region each have less than a quarter of the farms. Farms in Oswego County only account for six percent of the dairy farms in the region. Not surprisingly, the majority of Tug Hill farms are on prime agricultural soils or soils of statewide importance, forming a semi-circle around the Tug Hill region.

A "typical" dairy farm on Tug Hill today is a family operation with one full-time and possibly one part time employee. The principal operator is 55 years old. The average farm is approximately 300 acres in size, 200 acres of which is tillable. There are between 75-80 holstein cows with as many as 60 young stock. The principal income is from the sale of milk primarily for dairy product manufacturing.

Other types of farming operations include beef cattle, sheep and field crop production. Generally, the crops grown in the area support the dairy operation as feed for cows. The main crops grown include corn, alfalfa, clover and hay. Christmas trees, maple sugar and firewood production are associated with some of the farming operations, though make up only a small fraction of the total farming industry of Tug Hill.

Farming is a key part of the economy in all four Tug Hill counties, though it plays a relatively minor role in the Tug Hill portion of Oswego County. Jefferson, Lewis, and Oneida Counties ranked within the top ten in the state in 1989 for various categories. Jefferson County ranked second in number of milk cows and total milk production; third in land in farms, total cropland, and all hay harvested; eighth in number of farms and oats production; and thirteenth in all corn planted, with much of this activity in the southern portion of the county including Tug Hill towns and towns along the shore of Lake Ontario. Lewis County ranked number one in New York State for the production of maple syrup, fifth for number of milk cows, and seventh for total milk production with much of this activity in the Tug Hill region, especially along the Black River Valley. Oneida County ranked fourth in the state in number of farms, number of milk cows, total milk production and all hay harvested;



Photo by THC

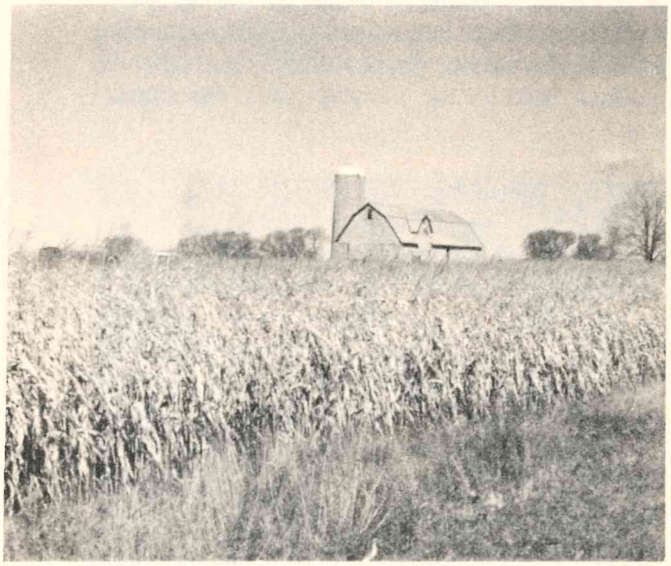


Photo by THC

Other common farm operations on Tug Hill, besides dairying, include maple syrup production and field crop production, such as corn.

fifth in land in farms, total cropland, and all corn planted; and sixth in oats, though much of this production is on farm land south of Tug Hill.

From a market stand point, Tug Hill farms are in a good position. Eight of the fifty-six plants in the state that manufactured dairy products in 1989 were in the vicinity of Tug Hill farms (see Tug Hill Farms and Prime Farm Soil map). Farmers do not have to transport their perishable product over long distances, and processing the product in the region means an even greater benefit to the local economy.

New York State ranked fourth among all states in the use of milk for manufactured dairy products in 1989. The dairy farms of Tug Hill contribute to the state's ability to maintain a leading rank in the nation. In 1989, New York State was one of the leading producers of such important manufactured dairy products as cottage cheese, cream cheese, American cheese, Italian cheese, soft cheeses, butter, ice cream, evaporated milk and condensed milk products.

The dairy plants in or near the Tug Hill region include: Kraft and Hoffman & Dudo, in the Town of Lowville; Great Lakes Cheese of New York, in the Town of Adams; Queens Farms Dairies, located in the Town of Ellisburg, just west of the region; Crowley Foods in LaFargeville in Jefferson County north of the region; Percaro Dairy in the Town of Rome just south of region; and Hood in the Town of Vernon just south of the region. Six of the seven plants are among the twenty-eight large capacity plants in the state. During 1989, these twenty-eight large capacity plants accounted for almost ninety-seven percent of the total milk products used for the manufacture of dairy products.

AGRICULTURAL DISTRICTS

In an effort to keep farming healthy in New York State, the Agricultural Districts Law was created in 1971. Once an agricultural district is established, a set of incentives are provided to farm operations, and a set of disincentives are in effect for non-farm uses. This law is based on the premise that farmland is preserved through the maintenance and fostering of farming itself. The object is not to save one farm in a sea of development, but rather to secure a beneficial environment for New York's farming communities.

One of the incentives farmers are eligible for in a designated agricultural district is an assessment for the agricultural value of the land rather than its potential value as a developable piece of property. Other incentives include not being assessed for sewer, lights, water or non-farm drainage except for residences and other non-farm structures. Unreasonable local regulations and restrictions are prohibited, except in instances of public health and safety. In return for these benefits, farmers agree to keep their land in agriculture for the next eight years, or to pay the deferred taxes if the land is sold for development.

Over 370,000 acres in the 39 towns comprising the Tug Hill region are in agricultural districts. The presence of active agriculture contributes greatly to the character of the land and way of life.

HERE TODAY...

Tug Hill is losing farms, as is all of New York State, while total production per farm is increasing. In much of the state, lost farmland is broken-up and developed. This has happened in some Tug Hill areas, such as the North Shore of Oneida Lake, where development pressures from the Syracuse area are changing the rural landscape; sometimes to development, sometimes to forest. Similar development pressures are now affecting Oneida County towns north of Rome and Utica.

Closer to the core of Tug Hill, however, much of the lost farm land is contributing to the rise in the size of Tug Hill forests. There, abandoned farmland often becomes brushland and then forest. This trend is adding acres to the forest resource of Tug Hill, while concentrating farming on the better suited areas.

There are mixed opinions about the future of farming on Tug Hill. On the eastern side of the hill, in the fertile Black River Valley, farms appear to be doing well. In Oneida County, farming is fairly stable with few marginal farms. Agriculture in the Tug Hill portions of Jefferson and Oswego counties, on the west side of the hill, seems to be in trouble. A casual drive around Tug Hill can give a good indication of the more prosperous farms like those found in the Black River Valley compared to those which are not faring as well.

Soils, individual farm management, and the overall economy are key factors influencing the survival of farms. Publicly-regulated prices for milk are another. The cyclical nature of milk prices continues to be a major influence on the health of

dairy operations. For example, after several years of good milk prices, from 1989 to 1990 the price dropped $4 per hundredweight. Although the dairy market is cyclical, each time the price drops, more small farms go under.

The Tug Hill portion of Lewis County has the strongest agribusiness base of the Tug Hill region. In a way, these support businesses, such as feed stores, equipment dealers, and veterinarians reflect the state of agriculture. When agriculture is healthy, these businesses thrive. As farming declines, these businesses go under or are forced to consolidate, becoming regional rather than local offices. This is currently happening in Oneida and Oswego Counties. The presence of a strong farming infrastructure likewise benefits the farmer. Without it farmers have to travel long distances to get needed supplies, parts and equipment.

...HERE TOMORROW?

Keeping farming a mainstay of the Tug Hill way of life will take a variety of actions that build upon the fundamental strengths farming has in the region. Key among those strengths are: good farm land in places, good access to markets, and a good system of businesses to support and process farm products.

A healthy national farm economy is probably the key to the success of farming in the Tug Hill region. Good markets for milk with good prices, for example, will probably do more to retain Tug Hill farms than any other single action. But local actions can help too.

For example, the best of our farm lands can be forced out of production by taxes that encourage the sale of land to non-farm uses. The extensive use of agricultural districts in the region is a major help. This protection might be further extended for the best of our agricultural lands by buying development rights (also called conservation easements) from willing farmers.

But buying development rights only insures that farm land will not be developed. It does not insure that it will be farmed. To encourage that such lands be farmed, local actions can be taken to strengthen the local farm economy.

For example, a host of Cornell Cooperative Extension programs and United States Department of Agriculture programs that are implemented on a county-by-county basis help farmers better manage their businesses. Oswego County Cornell Cooperative Extension's small business development program is a good example, as is the agricultural section at the Small Business Development Center at Jefferson Community College in Watertown.

Counties can also encourage the retention and expansion of farm-related businesses through a variety of other actions. Jefferson, Lewis, and Oneida counties have focused efforts on agriculturally-related businesses through their industrial development agencies. Oneida County, through regional groups such as the Mohawk Valley Regional Development Corporation and Regional Economic Development Council, is trying to open new markets for farm products of the region.

Farming can also be strengthened through efforts to diversify. A multi-county effort is trying to open new markets for fruits and vegetables grown in the area. The Tug Hill Commission has helped in the expansion of sheep and venison farming.

Diversification of farming in the region is not a panacea, but can help farmers take advantage of new markets, can provide supplemental income to existing farms, and may help support new farms. For example, in 1988 Northern New York had just a handful of farms raising deer for venison. Today, by providing technical assistance through the Tug Hill Commission and Cornell Cooperative Extension offices, Northern New York has dozens of such farms, and the state has a deer farmers association representing more than 60 farms. Similarly, sheep farming in Northern New York has been given a significant boost by efforts of the Tug Hill Commission and the Adirondack North Country Association to help in the formation and development of the Livestock and Meat Brokering Cooperative, Inc.

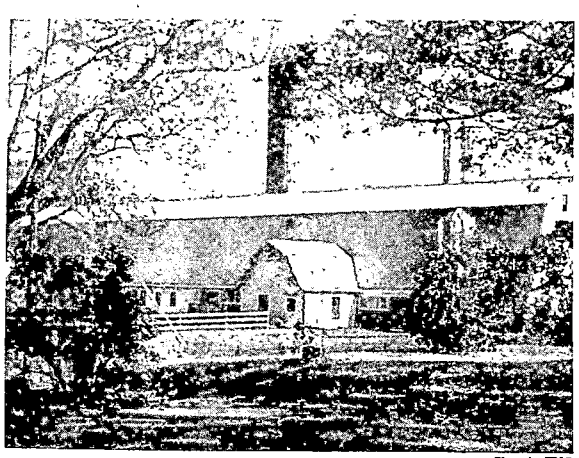


Photo by THC

A prosperous farm in the Tug Hill region.

TUG HILL RECREATION

RECREATIONAL USE OF TUG HILL

Tug Hill is a remote land of expansive forests, numerous rivers, streams and wetlands, deep gorges, diverse wildlife populations and abundant snow. Although these natural resources present diverse recreational opportunities, Tug Hill is less known for recreational use than its neighbor, the Adirondack Park. Not only is Tug Hill the lesser known wilderness, it is a lesser known recreational area as well. This anonymity, coupled with its abundant natural resources and remoteness, is part of what makes Tug Hill a special place for outdoor recreation. For many, hiking, bicycling, skiing, fishing, hunting, and snowmobiling are the way they experience and get to know Tug Hill best.

The bulk of the recreation activities occurring on Tug Hill are low-impact, outdoor pursuits compatible with the relatively undeveloped, rural character of the region. Outdoor recreation activities in the Tug Hill region are enjoyed both on and off trails. Traditional pastimes such as hunting, fishing, trapping, and hiking have been enjoyed for generations by Tug Hillers. Snowmobiling and cross-country skiing, relatively new recreational pastimes, have also become very popular. These activities require large open spaces and minimal facilities development.

The Tug Hill region is likely to continue to be used for outdoor pursuits in the future. The region is relatively well equipped to handle the present demand for outdoor recreation, though it appears demand for recreation will continue to increase. The Statewide Comprehensive Outdoor Recreation Plan (SCORP) projects the largest percentage increase in population in the state will, over the next 20 years, occur in northern New York, including Tug Hill, and projects growing individual participation in certain forms of outdoor recreation. This anticipated increase in participation and population will likely put more pressure on the facilities of Tug Hill and provide new opportunities for recreational businesses. According to SCORP, some pastimes of Tug Hill recreationists that are expected to increase in participation are nature walking (+10%), bicycling (+5%), fishing, (+7%), day hiking (+9%), cross-country skiing (+10%), hunting (+12%), and snowmobiling (+2%).

About 12 percent of the land, or 154,200 acres, on Tug Hill is publicly-owned. This includes state, county and town properties. These lands are heavily used by recreationists because they are better known, and because use of privately-owned lands is often restricted through posting. In addition, many publicly-owned lands are easily accessible and managed for recreational use.

Because Tug Hill is predominantly privately-owned, the availability of private lands for outdoor recreation is important for meeting future demand and opportunities. However, much of the private land owned by individuals is posted, prohibiting public use of these lands. Liability threats and protection of property are two of the strongest arguments for individual landowners to restrict access to their land. Industrial landowners, which hold about 85,000 acres of land, often lease exclusive recreational rights to sporting groups. This approach keeps land in recreational use, though closes it to general public use. Fees paid for the lease of recreational rights assist the industrial owners in paying their land taxes.

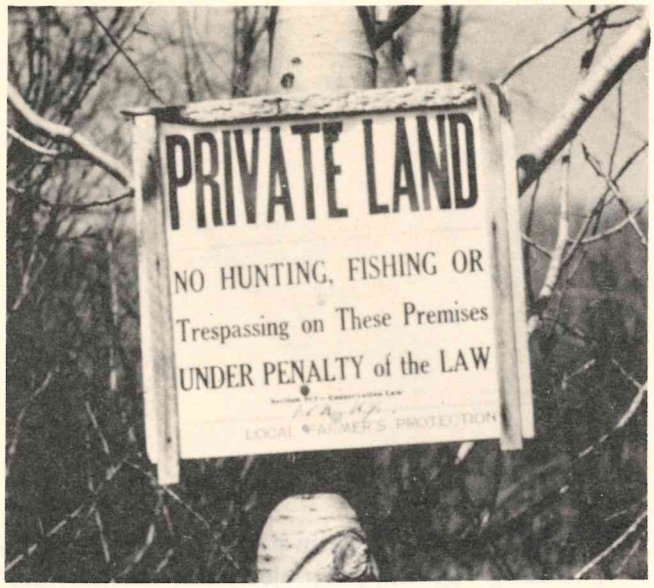


Photo by THC



Photo by THC

Much of the private land on Tug Hill is posted, making public lands an important recreation resource.

Not all private landowners restrict the recreational use of their property. Recreationists and landowners have reached agreements, both formally through voluntary easements or informally through verbal permission, for purposes such as fishing access, snowmobile and ski trails, and hunting.

TRAILS

The extensive trail systems of Tug Hill are utilized for a variety of outdoor recreation pursuits, including cross-country skiing, snowmobiling, hiking and bicycling. A majority of the hiking and cross-country ski trails are concentrated on public lands, though there are some trails on privately-owned lands. The trails are often used for multiple purposes rather than for a single endeavor and are usually available for year-round use.

There are presently several existing and proposed long-distance trails which have the potential to serve as links to other areas and facilities. The Black River Recreation Trail provides opportunities for hiking, biking, cross-country skiing and fishing access. This trail follows the Black River along the northern border of the Tug Hill region, linking the Village of Black River and the City of Watertown. The Office of Parks, Recreation and Historic Preservation has purchased and is developing 7.5 miles of abandoned railroad right-of-way, with the possibility of expanding the trail to the east to Carthage (approximately 17 miles).

The Barge Canal Recreationway is a multi-purpose greenway crossing the southern portion of Tug Hill. The recreationway affords opportunities for hiking, bicycling, horseback riding, ski touring, snowmobiling, boating and nature walks. The cross-state system is jointly operated and administered by New York State Department of Transportation and Office of Parks, Recreation, and Historic Preservation. When completed, the recreationway will serve as the major east-west spine, connecting various parks and trails in the state.



Exisiting long-distance trails on Tug Hill.

WORKING LANDS PROJECT

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The TUG HILL WORKING LANDS Book is Just a Starting Point

TUG HILL WORKING LANDS is intended to provide a broad view of the Tug Hill region to help local and state decision makers, residents, visitors and students to better understand this special part of New York State. It suggests ideas to retain Tug Hill's character through local action. It is not a statement of policy. It is a workbook . . . a starting point.

State-level decision makers will be most interested in the book's summary and the suggested actions listed in the chapter, "Keeping It the Way It Is."

Local decision makers, such as town board and planning board members will likewise find the suggested actions and summary of interest. They will also be interested in specific resource information contained in each of the chapters.

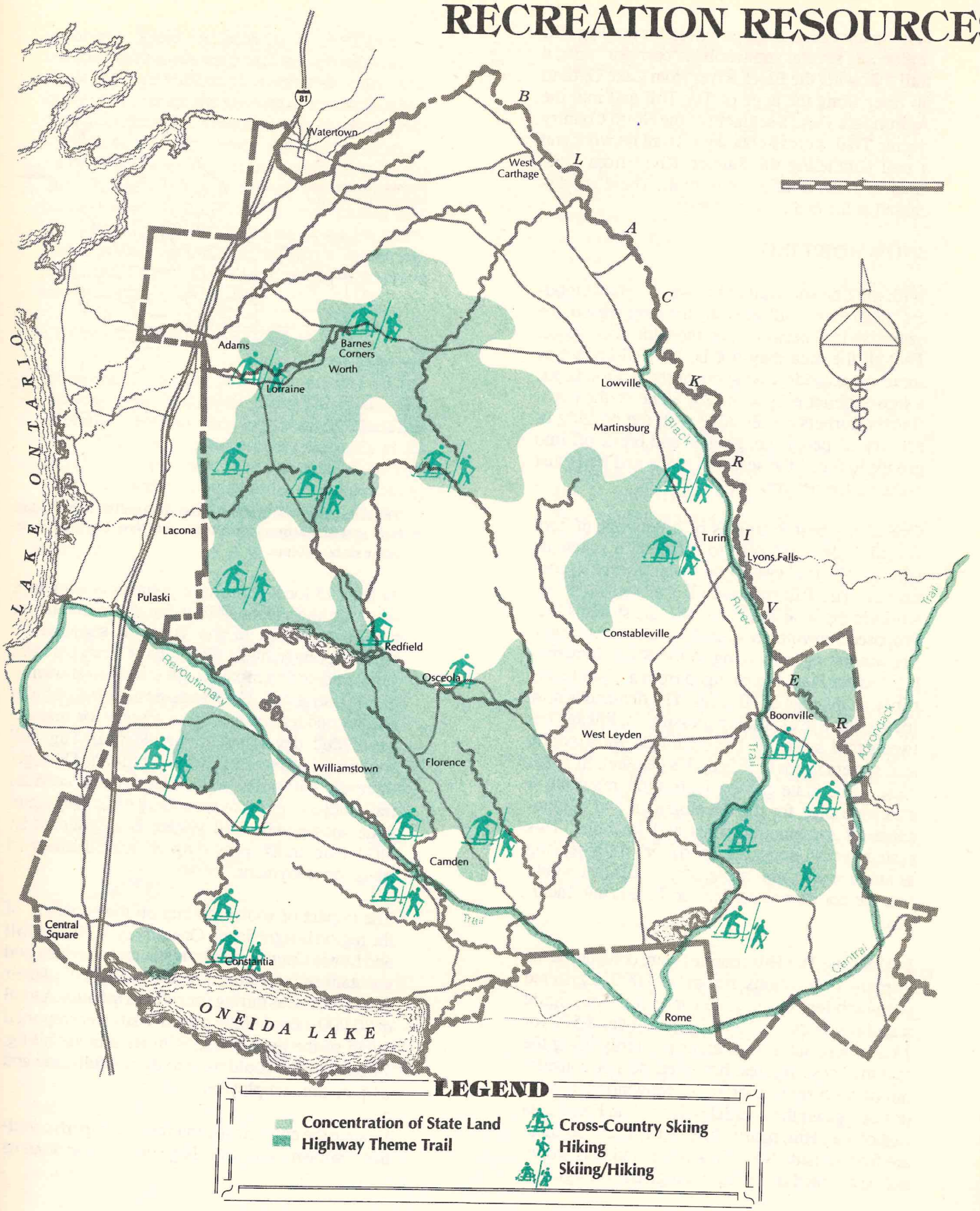
Local officials should remember, however, that this information is just a starting point. Towns and villages contemplating local actions to protect Tug Hill will want to add to this information through the active involvement of citizens and others – those who know their town and surrounding areas best.

The 1972 legislatively-designated Tug Hill region incorporates 39 towns and 21 villages. In 1991, the towns of Forestport and Remsen, located on the eastern edge of the region, petitioned to be included in the region. This was approved during the 1991 state legislative session, bringing the total Tug Hill towns to 41. Some of the maps included in the TUG HILL WORKING LANDS book were completed prior to this addition, and do not reflect the change.

COVER PHOTO: Tug Hill farm lands border the core forest, stretching to the horizan. (Photo by Tug Hill Commission).

TUG HILL WORKING LANDS is printed on Lyons Falls Pulp and Paper Pathfinder paper, made from trees grown on Tug Hill.

TUG HILL SIGNIFICANT RECREATION RESOURCES



Prepared By: BAGDON ENVIRONMENTAL ASSOCIATES, INC.

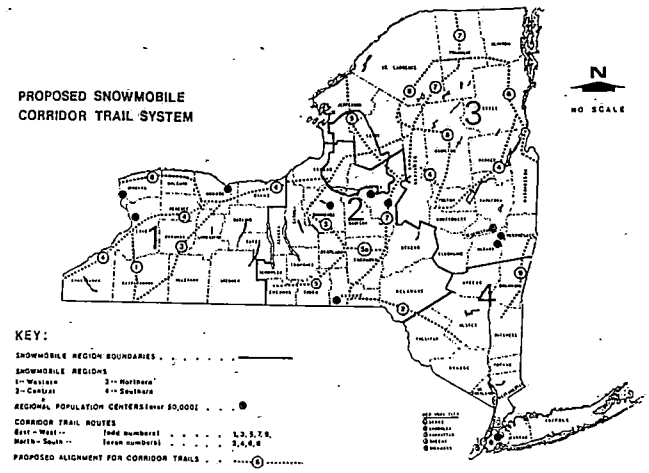
Among recreation trails proposed for the Tug Hill region are: several snowmobile "corridor" tails; a trail following the Black River from Lake Ontario up river along the edge of Tug Hill and into the Adirondack Park; a segment of the North Country Scenic Trail; a cross-country ski trail network and a trail paralleling the Salmon River from Lake Ontario to the Redfield Reservoir. These are discussed at the end of this chapter.

SNOWMOBILING

With the first snowfall of the winter, snowmobilers "head to the hill" to enjoy the long season, the extensive trail network, and the wide open space. Though the area may not be so well-known as some snowsledding hotspots of the Adirondacks, a snowmobiler is by no means alone on the trails. Barnes Corners comes alive with the buzzing of activity, as people congregate and break off into groups to travel the seasonal roads and trails that make up the network on Tug Hill.

One of the best examples of a network of connected trails is the plan to establish a statewide snowmobile trail system that would serve to connect the Tug Hill snowmobile trails to other networks in the state and to out-of-state systems (see Proposed Snowmobile Corridor Trail System map). Snowmobiling, according to the State Snowmobile Master Plan, has changed from a 10-mile day trip to an average of 80 miles. The demand is now for extended trips, adding pressure for linkage between trail systems. The statewide snowmobile trail system needs to reflect this demand. In 1985, New York State passed legislation requiring a statewide plan for the development and maintenance of snowmobile trails and facilities. This system would designate "corridor" trails serving as major routes and "secondary" trails that would link the corridor system to local trails and facilities.

In 1989, the Tug Hill counties were considered the primary destinations for over 5,000 registered snowmobilers in the state (or 16%). This figure was down from the 1985 figure of over 8,500 (or 14% of state total) registrants primarily using the region. These figures, however, do not consider out-of-state snowmobilers or snowmobilers who do not register their vehicles. In the Old Forge area east of Tug Hill, nearly 70% of the snowmobilers are from outside New York State, and thus would not be counted in the state's registration figures.



The statewide snowmobile trail system will ultimately link trail systems around the state, and New York trails to other state systems.

At least 25 local clubs have volunteers who have taken on the responsibility for the maintenance and development of the Tug Hill snowmobile trails. Recently, their efforts have been partially supplemented by monies collected from snowmobile registrations. Only state-designated corridor and secondary trails receive money for maintenance and development. In the four Tug Hill counties of Jefferson, Lewis, Oneida and Oswego, there are 440 miles of state-designated corridor trails and 370 miles of secondary trails. The statewide snowmobile trail system is augmented by local club trails, providing additional miles of trails for enjoyment.

The impact of snowmobiling on the economy of the region is significant. One survey of 20 Tug Hill and Lewis County motels, restaurants, taverns and gas stations found that most did nearly half of their annual business during four winter months. A total of 30,000 snowmobiler patron-visits were reported by 16 of the businesses. Without snowmobiling, 14 businesses would have to drop 9 full-time and 24 part-time employees.

Despite the enthusiastic interest and superb conditions, snowmobiling on Tug Hill is not without its

problems. There are gaps in the trail network because some roads are closed to snowmobiling or landowners prohibit trails crossing their land. Liability concerns are the greatest deterrent to eliminating these gaps. Guaranteeing existing trails through formal landowner agreements or easements is one solution, but the process is long and difficult. More education on responsible snowmobiling and its benefits to local economies may help change some negative opinions about the sport. Better maintenance of primary trails, better signage, and better enforcement will also improve snowmobiling in the region.

CROSS-COUNTRY SKIING

Cross-country skiing is another popular winter pastime on Tug Hill, again, thanks to the tremendous amount of snow and long seasons. There are over 225 miles of cross-country ski trails at 22 areas for skiers to enjoy. The trail network on Tug Hill accommodates novice and expert skiers alike, and allows for day trips or week-long ventures. The majority of the cross-country ski areas do not charge a fee.



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Cross-country skiers have over 225 miles of trails at 22 areas to enjoy.

The region has the potential for long-distance trails which could link existing areas, or connect inn to inn. One possible ski trail would link the east side of Tug Hill with the west.

In addition to individual leisure skiing, Tug Hill is host to organized ski events. The Tug Hill Tourathon is an exciting 50-kilometer race that has become an annual event for many avid skiers and has grown to include other events. This decade-old tradition has attracted as many as 600 participants from across the state and from 20 different New England and Mid-Atlantic states. The Tourathon trail system is suitable for diagonal cross-country skiing, and with much of the trail on broad, seasonally-maintained roads, ski-skating is also ideal. The abundance of snow is a delight to the cross-country skier, particularly in recent years of limited snow cover in other parts of the state and in the northeast. In addition, Tug Hill's ski season often runs longer than the rest of the northeast – sometimes extending from November into April.

The reliability of snow cover on Tug Hill has become an important component of both state and national ski competitions. Both the Empire State Games biathlon qualifier series and the U.S. Ski Orienteering Championships were held on Tug Hill in 1991. There are also nordic sprint races in Watertown that are held as qualifiers for the Empire State Winter Games. Jefferson County was host to the 1990-91 I Love New York Winter Festival, with the cross-country ski and dog sled races specifically being held on Tug Hill.

DOWNHILL SKIING

There are three downhill ski areas in the Tug Hill region. Dry Hill is located in the Town of Watertown in the northern portion of the region; Snow Ridge, located in the Town of Turin, is on the eastern edge of the plateau. These two areas provide 28 ski slopes/trails and 8 lifts. The vertical drop of the northern ski area is approximately 300 feet, and the drop of the eastern area is 500 feet. Another downhill area is Woods Valley in the Town of Western, north of Rome.

SNOWSHOEING

Though not as popular as some of the other winter activities on Tug Hill, snowshoeing is a sport that can be enjoyed throughout the region. Snowshoeing enables the winter traveller to access some of the most beautiful and remote areas of the region, such as gorges/gulfs and wooded areas, that are inaccessible to the cross-country skier or snowmobiler. Many winter hunters enjoy snowshoeing on Tug Hill, especially those that hunt varying hare.

SLED DOG RACING

Appreciators of the north woods and associated traditional pastimes can enjoy dog sledding during the long Tug Hill winters. Members of the Mohawk Valley Sled Dog Racing Association utilize the Little John Wildlife Management Area as a training area for dog sled racing. Dog sledders (or teams) come from as far south as Pennsylvania or from as far north as Quebec, Canada to use the area. The heavy snows of Tug Hill enable dog sledders to train into the month of April.



Photo by THC

Sled dog racing is experiencing renewed interest on Tug Hill.

BIRD WATCHING AND NATURE STUDY

The character of the region is well suited to many low-impact, passive recreation activities, including bird watching, wildlife photography, and nature study. Such activities are compatible with the natural environment and rural way of life of Tug Hill, serving to introduce people to the area and help them to appreciate and care for their environment. The diverse landscapes of Tug Hill, together with the road network and accessible state lands, present opportunities to residents and visitors alike to become acquainted with the specialness of Tug Hill.

The forests, wetlands, gorges, farm fields, rivers, and lakes of Tug Hill provide diverse habitats to support an attractive medley of bird life. With the spring thaw, many birds return to Tug Hill to breed or to rest on their northward migration.

Tens of thousands of raptors travel along the western edge of Tug Hill, using "thermals", or heated air uplifts, to soar on their journey northward. Many of these hawks fly over Tug Hill and along the Ontario Lake shore west of Tug Hill during spring hawk migration between March and May.

HIKING

The existing individual trail areas of Tug Hill are enjoyed by hikers during the warmer months. There are seventeen areas with over 165 miles of trails accessible for day or weekend hikes. The trails are mostly concentrated on state-owned lands and are open to the general public. This low-impact, non-consumptive use of the Tug Hill lands serves to acquaint residents and visitors to the beauty and wilderness of the region.

BICYCLING

Tug Hill, with its network of scenic, lightly-trafficked, paved roads, is well-suited for safe bicycle touring. Tug Hill is becoming more recognized and utilized by bicycling enthusiasts, as two local bicycling events and a major national bicycling route bring cyclists to the region. There are also numerous dirt roads and old logging roads that provide unique opportunities for mountain bicycle touring.

Two annual events which demonstrate the growth of bicycling in the region are Camden's "Tour-de-Tug" and the "South Jeff Heart Ride" in Adams. These two events each offer a variety of tour loops around Tug Hill, ranging from 25 miles to 110 miles in length. The events also reflect the increased interest in mountain biking by offering courses for those who prefer off-road adventure. Each event attracts 200 to 300 riders.

A major national bicycling route brings cyclists to the Tug Hill region each year. The Bikecentennial (Iowa to Maine Bicycle Route) crosses Tug Hill between Lake Ontario and the Adirondacks on its interstate path. The cyclists following this route enter the Tug Hill region from the west near the Town of Orwell. They proceed across the lower half of Tug Hill, through the Towns of Redfield, Osceola, Lewis, Ava, and Boonville. Portions of this route could be used for day trips or weekend trips.

HUNTING AND TRAPPING

Hunting and trapping are two popular recreational activities on Tug Hill. In fact, hunting and trapping accounts for the largest recreational user-day activity on state-owned land. More than a recreational pursuit, hunting and trapping are a key part of the Tug Hill way of life. In addition to hunting on state land, most of the industrially owned land is leased to sportsmen's groups, for their exclusive use.

On Tug Hill there are hunting seasons for white-tailed deer, black bear (on the eastern edge of the region), grouse, woodcock, snowshoe hare, duck and goose. During the 1989 season, there were close to 60,000 deer hunting license sales in the four Tug Hill counties. According to trapping license sales and telephone surveys, there are over 1500 licensed trappers in the four Tug Hill counties, a 43% decrease from 1980. Trapping is declining in popularity, mainly due to low pelt prices. Some of the most common animals trapped on Tug Hill are beaver, muskrat, mink, otter, fisher, fox, bobcat and coyote.



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There are almost unlimited opportunities for hunting on Tug Hill.

FISHING

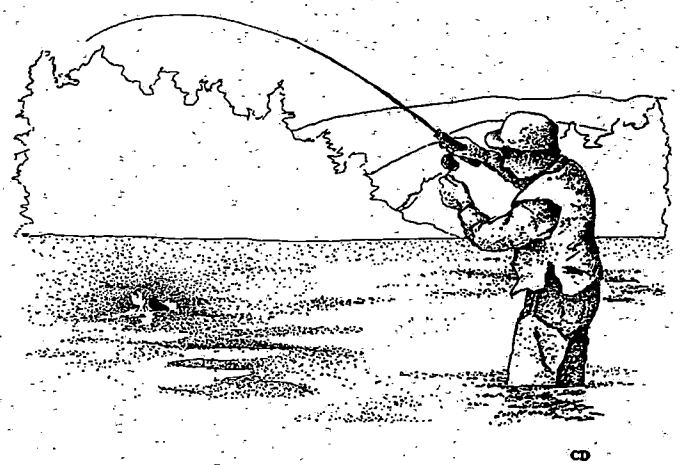
Trout abound in the cool, rippling waters flowing off Tug Hill, as many an avid trout fisherman is aware. There are small streams in the central portion of Tug Hill, supporting mostly wild brook trout. Other areas of Tug Hill have a mix of wild and stocked trout streams. Brook trout, brown trout and rainbow trout are stocked in many of the streams. Black River, Sandy Creek, Fish Creek, Mad River, Point Rock Creek, West Canada Creek, and Mohawk River are among the Tug Hill waters stocked with trout by the Department of Environmental Conservation (DEC).

The fishery resource of Tug Hill is of high quality because Tug Hill rivers and streams have not faced the pollution problems brought on by excessive development. This quality continues to improve as streams become well-shaded with the natural succession from field to forest in many areas. Though the wild brook trout streams of Tug Hill are within an hours drive of several populated areas, the fishing pressure on trout streams is not great.

Salmon River is one of the most popular salmon fishing streams in the east. Each year hundreds of thousands of fisherman crowd the banks hoping to land a big one. An estimated 180,400 angler days were spent along the Salmon River between August 17 and December 4, 1989.

This popularity has contributed greatly to the economy of the towns in the southwestern portion of Tug Hill. Established businesses, especially restaurants and motels have expanded, and new fishing related businesses have opened such as bed and breakfasts, campgrounds, fish-cleaning stations, and smokehouses.

Two of the most famous walleye lakes in the state, Delta and Oneida Lakes, are found in the Tug Hill region. Larger streams in the southern portion of Tug Hill, such as the Mohawk River, Salmon River and Fish Creek, contain walleye and small mouth bass.



CD

Trout fishermen can enjoy the solitude of Tug Hill's remote streams.

To ensure public use and enjoyment of fishing, DEC has purchased permanent easements along many of the important fishing waters of Tug Hill. There are twenty-five rivers and streams with over 150 miles of public fishing easements and access rights-of-way. These easements have been procured along Tug Hill waterways, including Salmon River, Fish Creek, Black River, Sandy Creek, and Mad River among others. The easements, generally 33 feet on either side of the stream bank, have been purchased for the exclusive purpose of fishing. The easements do not allow for other activities, such as camping, picnicking, or hunting without permission from the landowner.



Photo by THC

A leisurely paddle on one of Tug Hill's calmer stretches of river.

PUBLIC CAMPING

There are three State Parks in the Tug Hill region which provide formal campsites: Whetstone Gulf, Pixley Falls, and Delta Lake. Camping is also allowed on all state forests without a permit and on wildlife management areas with a permit. The majority of camping done on Tug Hill is usually in conjunction with other recreational activities such as fishing and hunting.

CANOEING AND WHITE WATER RAFTING

Tug Hill's rivers and streams, fed by Tug Hill's heavy precipitation, provide excellent opportunities for canoeing, kayaking, and white water rafting. For the most part, these waterways are clean, remote and relatively undeveloped. Travelling by canoe allows the adventurer access to areas of Tug Hill which are not readily accessible by other means.

Several canoe guide books which overlap into the Tug Hill region have identified some of the best canoe routes on Tug Hill including the East and West Branch of Fish Creek, Salmon River and Reservoir, West Canada Creek, Mad River and the Black River.

Fish Creek has been rated an expert canoe river. The 54 mile East Branch offers 37 miles of canoeable water which is mostly a white water trip. The West Branch of Fish Creek is 36 miles long, 21 miles canoeable, and also has plenty of white water stretches. The Salmon River is 48 miles long with 13 miles of canoeable waters rated for the expert to intermediate canoeist. An additional 6 miles of flat water is available on the Salmon River Reservoir.

Motorized boats and rowboats are allowed on Oneida Lake, Delta Lake and the Salmon River Reservoir.

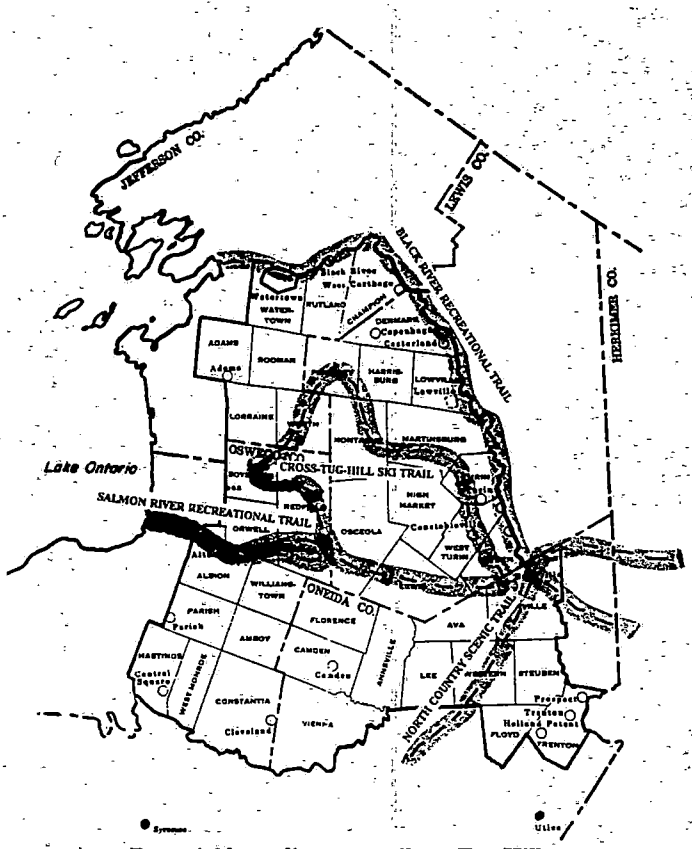
HIGHWAY THEME TRAILS

Portions of three state-designated highway theme trails traverse the Tug Hill area: the Black River Trail, the Revolutionary Trail, and the Central Adirondack Trail. These highway trails have been legislatively designated for the purpose of increasing the tourism potential of areas along the trails.

The Black River Trail covers 111 miles of scenic areas from Rome to Ogdensburg, and as its name implies, focuses on the history of the Black River.

The Revolutionary Trail is a 158-mile historic and scenic highway extending from Albany to Port Ontario. This theme highway crosses 35 miles of the Tug Hill region from Lee to Altmar.

The Central Adirondack Trail begins in Rome, crossing approximately 15 miles of the southeast portion of Tug Hill, and continuing into the Adirondacks ending near Glens Falls.



Potential long-distance trails on Tug Hill.

TRAIL CONNECTIONS

Tug Hill's existing recreation trails, good as they are, still have not met their potential to enhance recreation opportunities, appreciation of Tug Hill, and appropriate economic benefit for the region.

Experience in other parts of the rural northeast suggests more people would use Tug Hill trails, with less adverse effect and more economic benefit, if a well-designed, well-maintained network of long-distance recreation trails tied together communities and existing trails.

These long-distance trails can provide opportunities for inn-to-inn travel. The adventure of long distance trails can fire the imagination in ways that encourage use, and encourage the participation of communities, volunteers and affected businesses.

The economic, environmental and recreational benefits of such trails has been seen in the cross-country ski trail network of Jackson, New Hampshire; the hiking and skiing trails of the Stowe, Vermont area; Vermont's snowmobile corridor trail network; the Adirondack's Northville-Placid hiking trail and Jack Rabbit Ski Trail; the Appalachian Trail; Vermont's Long Trail; New York's Barge Canal Trail; Colorado's 10th Mountain Division ski trail network and Quebec's Petit Rogue ski and snowmobile trail network, and more.

If Tug Hill groups and communities could establish permanent long-distance trails that protected landowners from liability, the region could enjoy greater economic benefit while retaining its rural character. Here are some examples of possible trails suggested in a 1990 report examining the future of the Adirondacks and adjoining areas in northern New York, including Tug Hill:

Black River Recreational Trail

This trail could be used in part by hikers, bicyclers, canoeists, rafters and kayakers. It might stretch from the mouth of the Black River at Dexter on Lake Ontario, up river past Watertown, Carthage, Lowville, Lyons Falls, Boonville, and on into the Adirondack Park. It would build on current efforts to establish a multi-use trail along the river east of Watertown, and a multi-town effort from Carthage to Lyons Falls to protect and encourage access to the river's flat water sections.

Salmon River Recreational Trail

From the fishing "meccas" of Port Ontario and Pulaski, up river to the Redfield Reservoir, much of the Salmon River corridor is owned by Niagara Mohawk Power Corporation. Cooperative efforts between communities along the river and Niagara Mohawk could lead to a multi-purpose trail to be used by those who fish the river as well as hikers, skiers and others.

Cross-Tug-Hill Ski Trail

Tug Hill cross-country ski opportunities are only starting to realize their potential. The snow is there, and an incredible volunteer effort over the past decade or so has created extensive local networks of ski trails. Linking some of these areas could provide a high adventure experience for skiers, and could provide a bonus to bed-and-breakfast operators.

The trail could be a large loop through the heart of Tug Hill's snowbelt, or could be a series of trails linking some of the best local trail networks such as Boonville's BREIA trails, the state trails at Carpenter Hill and Barnes Corners/Rodman, state trails at Tug Hill and Littlejohn wildlife manage-

ment areas, Osceola-Tug Hill trails, and Tug Hill Tourathon trails in the Boylston area.

Snowmobile Corridor Trail Network

Snowmobile groups and counties in the Tug Hill region are working toward permanent establishment of the most important "corridor" trails as part of the proposed statewide system. Permanent agreements with land owners, signage based on statewide standards, enhanced maintenance of trails, snowmobiler education programs, and improved enforcement of snowmobile laws, are all parts of the effort needed to retain a quality snowmobile experience that minimizes land owner and environmental conflicts, and provides a good return to the local economy.

North Country Scenic Trail

More than a decade ago, a hiking trail linking New England, the Midwest, and the West was proposed. It would cut through the Adirondacks and pass through the southeastern portion of Tug Hill in Oneida County — an east-west version of the country's premier long distance hiking trails, the Appalachian Trail and the Pacific Crest Trail.

The concept is still just that in northern New York, due in large measure to some resistance to the proposed route in the Adirondack Park. If ever created, it could link with other Tug Hill trails, and increase Tug Hill's recognition as an outdoor recreation destination.

BACK ROADS, SCENIC ROADS

Tug Hill's road network reflects the character of the region and past development patterns. The heavily forested, undeveloped core of the region remains free of public roads with the only access provided by logging roads and trails. In contrast, the more heavily developed eastern and western flanks of the region are serviced by major state routes which provide access to and around the region. In between is a modestly developed local-state network serving the small communities, farms, and scattered residential development of Tug Hill's working lands.

The road network also provides Tug Hill's local governments with a mechanism for helping to direct future development of the region. By developing and maintaining roads only in areas where development is desirable, communities can continue to keep Tug Hill the way it is and keep costs to local government under control.

Tug Hill's roads are also the means by which many people know the region – whether back road or scenic road. Back roads of dirt and gravel, and narrow pavement weave through tunnels of forest, alternating with vistas across ponds, wet meadows and fields. Broader paved roads, including some state highways, often provide scenic vistas across Tug Hill's flinty blend of forest, farm and hamlet to distant views of the Adirondacks, Lake Ontario, Black River Valley, Oneida Lake, Mohawk Valley and the Appalachian Plateau south of Utica, Rome and Syracuse.

Part of keeping Tug Hill the way it is will be retaining some of the remote and scenic character of these back roads and scenic roads.

THE PUBLIC ROADS OF TUG HILL

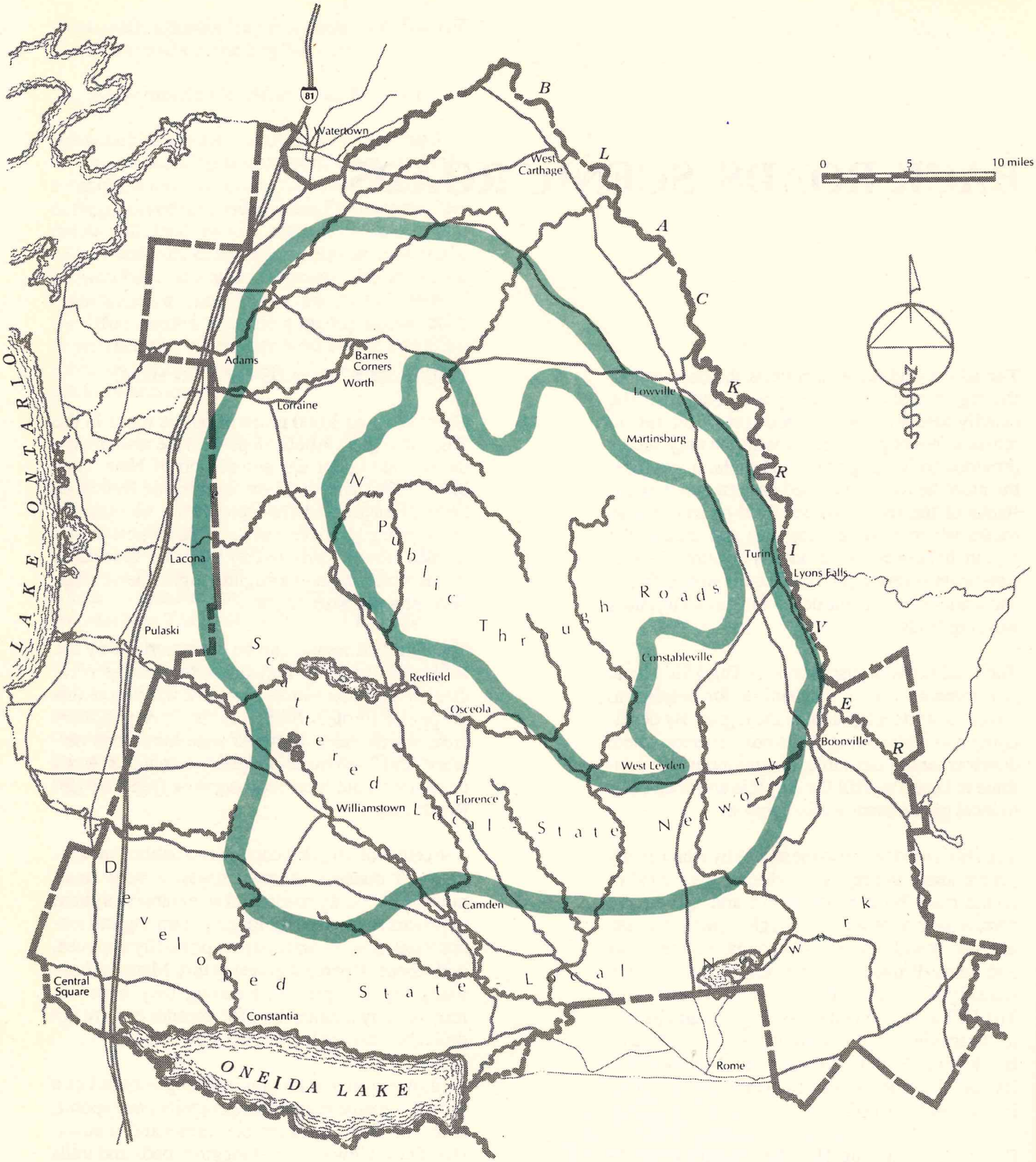
There are over 3,000 miles of public roads in the Tug Hill region. About 58 percent are town roads, the rest are under the jurisdiction of New York State (15%) and the four counties of Jefferson, Lewis, Oneida and Oswego (27%). The central towns of the hill have a slightly higher percentage of local town roads (62%) than the outermost towns which contain a slightly higher percentage of county and state roads.

The Tug Hill region can be characterized by the nature of the road network into three general categories: 1) the remote core area, which contains no public through-roads 2) the core-periphery area, which has a scattered state-local road network, and 3) an outer-periphery area which has a developed state-local road network (see Tug Hill Roads map).

The center of Tug Hill contains no public through-roads. It consists of town roads, a very small number of county roads, and an extensive system of private roads used for logging, farming and recreational uses. These roads are primarily unpaved, with about 90 percent gravel or dirt. Many of these roads are unimproved, meaning they have not received any maintenance for decades and are not driveable, except by specialized vehicles.

Within this area of no public through-roads lies a virtually roadless area that generally corresponds with Tug Hill's most remote forests and headwaters. Only a few scattered logging roads and trails interrupt this expanse of managed and wild forest covering some 100 or more square miles.

TUG HILL ROADS



Prepared By: BAGDON ENVIRONMENTAL ASSOCIATES, INC.

A high proportion of roads in the central area are used seasonally to access farm fields and seasonal residences, and do not serve year-round dwellings or businesses.

Just outside the center of Tug Hill is an area that, in comparison to the rest of New York State, has a scattered network of local and state roads. Compared to the center of Tug Hill, a much higher proportion of roads in this area are improved, meaning they are regularly graded and surfaced, either with asphalt or gravel, and are passable by passenger vehicles. More roads in this area are open year-round than in the central area.



Photo by THC

The core area has a large portion which does not have any public roads, rather there is a network of logging roads.

For the most part, these roads provide access to year-round dwellings and farms, as well as seasonal camps. Unimproved roads do exist, although they are a much smaller proportion of the total road network. Many roads in this area have the potential to create financial problems for local governments if they were to require substantial improvements.

The outer periphery of the region contains a road network which has the greatest proportion of roads that are well developed. This network is a combination of state and local roads, nearly all of which are improved and used year-round, similiar to much of rural New York.

WHEN ROADS, NOT COMMUNITIES, DIRECT DEVELOPMENT

Much of the public road network of Tug Hill predates the modern automobile. These roads were laid out to provide access to the populated areas of Tug Hill in an age when snow and ice control on roads was unheard of. As the population in the center of Tug Hill declined in the last century, lands were abandoned and the roads accessing the more remote areas of the region became unused. This has left a fairly extensive system of roads which have little or no use.

Tug Hill's current mix of public roads is well suited to maintaining the region's remote and rural character, while also providing access for logging and recreation, and linking its communities. But Tug Hill's scattered road network, combined with state law's affecting public roads, could lead to uncontrolled and costly development.

To allow access by emergency vehicles, state law requires that building permits be issued only for proposed structures which have road access. Structures must be on lots which have at least 15 feet of access to either an officially designated town road, a road on a subdivision plat approved by the local planning board, or a road on the official map of the town. The only exceptions are for areas of towns which are designated as "open development" areas.

State law also requires that public roads must be maintained to certain standards if they serve residents.

The combination of state laws and Tug Hill's scattered road system often means that development on Tug Hill is dictated by the happenstance of a century-old road network and the decision of individuals about where to live. Community decisions about where growth ought to occur often take a backseat. Meanwhile, the costs to the community of that growth can drive up taxes, and those increasing taxes can drive more farm and forest land out of production.



Photos by THC

The roads on Tug Hill vary in their condition. The picture on the left depicts a typical road found in the core area while the picture on the right a more typical road in the periphery. The center picture depicts a road that might be found anywhere on Tug Hill.

THE COST OF ROADS

Roads cost New York State local governments dearly. Transportation budgets are the largest single category of most town budgets, usually running between 20 and 25 percent of most budgets on a statewide average. In the Tug Hill region, these costs reach 65 to 75 percent, and in some towns approach 90 percent. About half of this expense is for snow and ice control.

Because public roads must be maintained upon the demand of the residents or businesses which are located on them, it has often been necessary to rebuild roads and to commence operation and maintenance of formerly unused road segments, often at great public expense.

Nearly every Tug Hill town has some experience with the development of new residences or businesses in remote areas which had not previously had year-round road service. This has often been through the change of a seasonal residence into a year-round residence.

CAMPS TO HOMES

Hunting camps, seasonal residences and campgrounds are very popular on the hill. These appropriate uses of the hill have been encouraged by local governments because they are generally in keeping with the character of the community, and they provide badly needed support to the local tax base. These uses of the land do not generally require a great deal of local public expenditures to support them. Generally, all that they require is minor, yearly road work to keep them passable, and occasional police and fire protection.

This picture can change dramatically, however, when seasonal uses become year-round uses necessitating winter road access. Roads subject to year-round use often need to be constructed to higher standards than seasonal roads. In addition, there is usually a need to make roads suitable for the safe passage of school buses. The removal of snow by conventional snowplowing equipment may require some widening and realignment of the roadway, as well as differing surface treatment. Thus, there is often a need to make both new capital expenditures for road improvements and increased yearly expenditures for road operation and maintenance.

The costs of plowing can be considerable. Many factors are involved in plowing costs, among them the amount of snowfall, the conditions of the roads, snow drifting patterns, types of removal equipment used, and the efficiency of the road pattern. One study in 1983 indicated that the mean annual cost of plowing a road in Lewis County (1976-81) was $1035 per mile. The 1983 study indicated that there were approximately 174 miles of unplowed town roads in the Lewis County portion of Tug Hill at that time. Thus, the additional local liability for snow plowing costs, should all unplowed roads be plowed, could amount to over $180,000 per year in the Lewis County portion of Tug Hill alone, a figure that has certainly increased in the decade since the study.

While the situation may be more severe in Lewis County, there are known to be many miles of unused local roads in every county jurisdiction of the core of Tug Hill.

Two techniques have been suggested for controlling costs associated with road maintenance in rural New York State. One is abandonment of little used roads. The other is less expensive standards for road construction and maintenance.

COMMUNITIES CONTROLLING DEVELOPMENT AND ROAD COSTS: ABANDONMENT

New York State law provides for "abandoning" from public ownership roads that are little used. There are three predominant methods of road abandonment used in New York State. These are absolute abandonment, qualified abandonment, and designation of roads "for seasonal use only".

Virtually all town roads on Tug Hill have been established as easements and are not owned outright (in fee) as are, for instance, state highways. One method of abandonment, absolute abandonment, eliminates the easement, reverting the right-of-way back to the adjacent landowner. New York State Highway Law (Section 205) allows the abandonment of any road which has not been "traveled or used as a highway for six years." Such abandonment merely requires a filing of a written description of the road by the town superintendent in the town clerk's office, upon the consent of the town board.

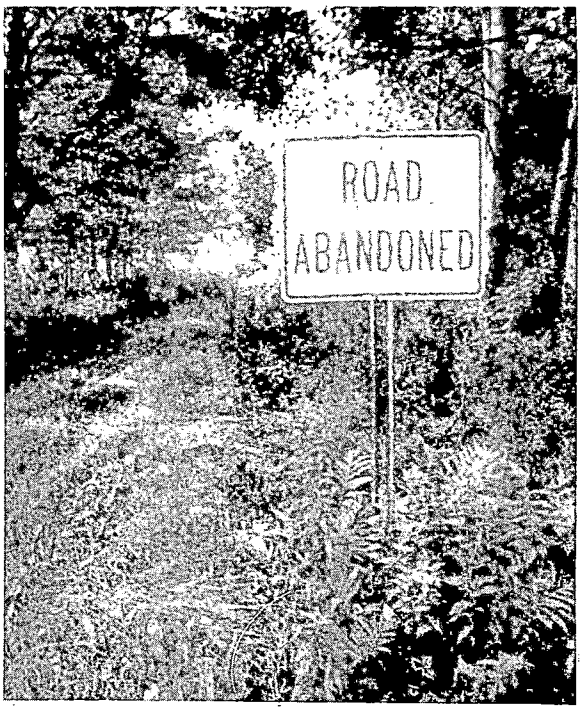


Photo by THC

Road abandonment is one option to reduce maintenance costs of little used or unused roads.

The second method, qualified abandonment, allows the municipality to retain the right-of-way without continuing maintenance operations. State Highway Law (Section 205) provides for the "qualified abandonment" of highways which have been used by no more than two vehicles daily for a two year period. Such abandonments may be accomplished upon public hearing and a decision by the county highway superintendent at such time as the local town board and highway superintendent have determined that the road is eligible for abandonment.

There are numerous other minor abandonment procedures. These generally apply to roads which transverse special lands or are applicable to roads in special circumstances. These other methods are generally of very limited use to most Tug Hill roads.

There is a reasonable alternative to abandonment which is very useful under some circumstances. Seasonal use designation may be appropriate for roads which are in generally good condition but which are difficult or expensive to operate with regard to snow and ice control. State Highway Law Section 205-a permits town boards to designate roads, by resolution, for seasonal limited use from the first day of December to the first day of April, and to post such roads to notify the public. This designation expresses the towns intention to temporarily discontinue snow and ice removal and maintenance on these roads during the winter months as long as no residences or businesses require access.

Abandoning or seasonally limiting use of these roads does not necessarily eliminate their value for recreational purposes. In many cases, seasonally limited road sections are used for snowmobile and cross-country ski trails. Abandoned roads are also used for this purpose, as well as for hiking and mountain biking, and have the potential of being a vital part of well established, long-distance recreation trails.

LIMITATIONS OF ABANDONMENT

Many little used roads have not been abandoned

for a wide variety of reasons. The most common reason is that state highway aid funding formulas have discouraged abandonment and have sometimes inadvertently resulted in unhealthy highway planning practices.

For many years the state aid programs for localities [Irwin plan, Donovan plan, and Consolidated Local Street and Highway Improvement Program (CHIP's)] have included aid distribution formulas based on highway mileage. The more highway mileage a community can claim, the more state funding they are eligible for. This can serve as an incentive to retain as much highway mileage as possible on the town highway inventory in order to obtain maximum funding. Many towns have done exactly this, even though this practice may lead to large, unanticipated costs in the future, and to a costly, scattered development pattern.

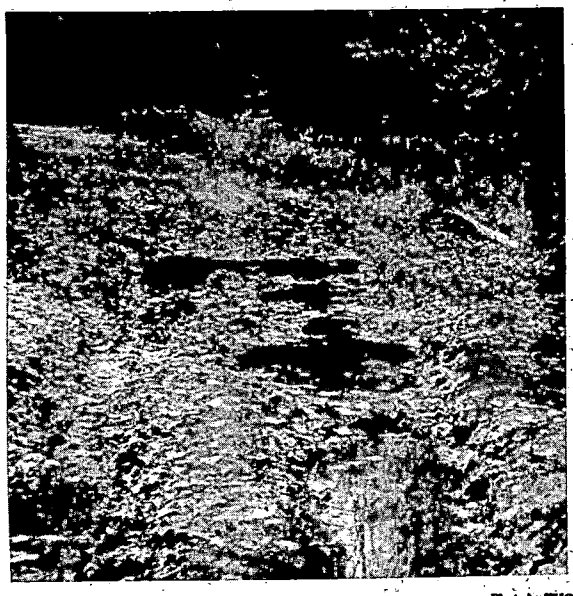


Photo by THC

The condition and use of some Tug Hill roads merits abandonment, but for political and financial reasons, this alternative is rarely used.

The condition of existing highway mileage is inconsequential to state funding formulas. The highway mileage calculations can include totally unimproved or impassable roads which a town has no hopes or desires of operating and maintaining. Some town highway inventories list roads which disappear into swamps or sprout large trees in the center of the right-of-way. These roads still bring some level of state funding into the town. Therefore, many miles of very poor quality road have remained on town inventories for what adds up to a very small amount of additional state funding.

Another reason towns do not abandon roads is that the methods have some inherent problems. Total abandonment, whereby the right-of-way reverts to the adjacent landowners, is generally not a favorable option. Many of the roads on Tug Hill which are inaccessible to automobiles are used to some extent for agriculture, forestry and recreational uses. Some have hay fields, wood lots, and other nonresidential agricultural uses along them which are accessed by specialized vehicles such as tractors.

Many roads are used recreationally by all-terrain vehicle riders and hikers in summer and snowmobiliers and skiers in winter. Many citizens object to total abandonment out of a desire to protect and maintain these existing uses of the right-of-way. Many landowners along unimproved roads also object to abandonment out of a desire to protect the speculative value of their land for future sales or development.

The qualified abandonment procedure is generally preferred by local governments because it retains the public easement of the former road, rather than having it absorbed by adjacent parcels. This allows the easement to be used by the public even after the road is abandoned, and makes it much easier to reopen the road at some future date, should there be a need. From a local perspective, therefore, qualified abandonment is a much more politically acceptable option.

The qualified abandonment procedure, however, requires the cooperation of the county highway superintendent. The county superintendent must hold a public hearing and make the final decision on the abandonment. Some county highway superintendents have been reluctant to become involved in local highway abandonments. Such abandonments have little impact on county highway budgets yet have the potential of embroiling the superintendent in local land use disputes. This has made qualified abandonments an extremely difficult local option in some jurisdictions.

A further problem with road abandonment is that the status of many roads can not be readily determined. Town and county records in many instances are not available and have been either lost or destroyed. Many towns do not have permanent locations for the deposit of town records. Records are often maintained by town clerks who are elected officials, operating offices in their homes. It is not unusual for town records to go back no

further than a few decades. This is certainly not sufficient to reconstruct the entire histories of local roads. Likewise, at least one county courthouse has had a disastrous fire, destroying all records including, presumably, any records of qualified abandonments which may have been done by the county highway superintendent.

The means by which a road was acquired must be determined, and this is made difficult in many instances due to the chaotic nature of local records. Where roads have been rumored to have been abandoned at some time in the past, there are often no existing records substantiating the claim. Many local officials, therefore, have no clear picture of what their actual road system might consist of and what are their potential liabilities.

Road planning is generally conducted using the N.Y.S. Department of Transportation Highway Inventory. It is through this record that highway aid to localities is determined. These records, although a great aid to localities, are certainly not definitive and may contain errors and omissions.

Another factor may sometimes enter into local decisions about abandoning roads. The laying out and opening of roads, and the abandonment of roads is a local function of the town board. This is at odds with the fact that many of the public costs of rural sprawl are not directly accounted for in local town budgets. The costs of school busing, fire protection, police protection, and environmental regulation are usually handled by other levels of government or agencies. These costs are sometimes not considered in decisions to open or abandon roads. Town governments' cost/benefit decisions are likely to be based solely upon the expected property tax revenues versus the costs of the road construction, operation and maintenance. The true cost of new and reopened roads may, therefore, be underrepresented in local decision making.

Another method of dealing with little-used roads has been seasonal use designation. This method has been popular with local governments where major expenditures go toward snow removal. Seasonal use designation is easily accomplished through a simple resolution of the town board. This alternative allows the road to remain on the town records, available for year-round use, should the need arise. It allows the road to be used during the summer months for agricultural or recreational uses, but relieves the town of the financial burdens associated with winter snow and ice control.

This procedure has inherent difficulties, however. Seasonal use designation provides little continuing protection to taxpayers as these roads must be reopened on the demand of any resident or business needing road access. Such demands often come with little notice, and have been known to occur during the winter months themselves. This requires that the seasonal designation be immediately rescinded, and creates havoc with existing highway plans and budgets.

NEW INITIATIVES TO DEAL WITH LITTLE USED ROADS

It is evident that new statutory authority would be helpful to Tug Hill communities which would allow greater flexibility in road operations and maintenance. Communities may find it useful to designate certain roads as "minimum maintenance" roads which require a lesser level of service, as an alternative to abandonment. Such legislation has been developed by the N.Y.S. Legislative Commission on Rural Resources. If adopted, this legislation would allow local governments to suspend snow and ice control of certain roads, while continuing the minor maintenance necessary to continue the existing level of use.

The New York State Local Roads Research and Coordinating Council was created in 1990 to, among other things, study the minimum maintenance issue further and develop new legislation. Such legislation could be a major assistance to local governments in developing more rational methods of allocating increasingly scarce highway resources to the areas where they are most needed.

Many roads, in the past, were reconstructed to the standards of the state Irwin and Donovan plans. These plans called for roads to be constructed to exact design specifications in order to be eligible for state funding. This attempt to implement a single design standard on a statewide basis is now considered a failure in many rural areas. Roads built to these standards are often "overbuilt" considering their function and level of use. Many were marginally economical for municipalities to construct, and would not have been constructed to such standards had state requirements been more flexible. Many turned out to be uneconomical to maintain over the long run.



Photo by THC

Developing road standards which are appropriate for the level and types of uses is essential for rural areas like Tug Hill.

Limiting additional road construction and using appropriate design standards could be a key part of keeping Tug Hill as it is while limiting the costs of local governments.

SCENIC ROADS

Much of the character of any region is seen and appreciated from its roads. Tug Hill roads provide an excellent sampling of both the region's subtle, coarse beauty, and its traditional working of the land.

The core forest of Tug Hill is encircled by a loop of roads that offer dramatic views of its eastern escarpment, farms, and the distant Adirondacks, as well as long stretches, through "tunnels" created by the over-hanging forest canopy.

Inside this scenic loop, a small number of unpaved roads link the "landings" of logging jobs, camps and favorite fishing and hunting spots. For all their beauty, these remote back roads are rough and can be hazardous and confusing to all but those who know Tug Hill best.

Outside the core loop, scenic roads range from the incredible roller-coasters of the hill country south of Boonville, to sweeping vistas of Lake Ontario and Oneida Lake.

Scenic roads are not only important to the character of the region. They can play a key role in community pride, property values and appropriate economic development. Attractive roads can encourage driving for pleasure and tourism that can be a plus to local economies. For example, the state's Black River Trail and Revolutionary Trail Scenic Highways (discussed in the recreation section) can provide opportunities for community beautification and tourism development appropriate to the character of the region.

Tug Hill's scenic roads are threatened in places by poorly located development. This threat to the region's character could be reduced through community decisions made with awareness of the contribution scenic roads offer.

TOWNS, VILLAGES AND HAMLETS

CHARACTER AND HOME RULE

The Tug Hill region's legislated boundaries are based on towns. The region's 2,000 square miles is made up of forty-one towns, which contain 21 villages. Towns and villages are self-governing, with a board of elected officials to oversee affairs. Dozens of hamlets and cross-road communities, without governing bodies of their own, add to the variety of dwelling places that make up the region's character.

These communities are vital to the character and governance of the region. Village square, white church steeple, band stand, tree-lined street, barn and silo, sawmill, abandoned schoolhouse, and maple syrup taps are among the variety of features in and near Tug Hill communities that reflect lives lived close to the land and the region's heritage. The citizens who dedicate time and energy to town boards and village boards, and the civic organizations that are so essential to making small communities work, make major contributions to shaping their communities at the grassroots level — they provide the "home rule" that makes things happen.

Keeping Tug Hill's towns, villages and hamlets healthy is key to retaining the region's visual character, but also to providing jobs, community pride and the very life blood of self-determination that makes the region work.

Retaining what Tug Hillers value most in their environment — clean water; healthy forests; opportunities for hunting, fishing, and recreation; decent jobs close to the land; and decisions about the region's future made as close to home as possible — means that its communities must remain good places to live. Adequate housing, water supply, waste water treatment, attractive appearance, basic commercial services, and recreational opportunities, are all part of the picture.

THE CHALLENGE OF SMALL COMMUNITIES

It is not easy to make small communities work. Much of what gets done in protecting natural resources, as well as making communities more liveable, is done by volunteers and elected officials who usually work at their community service jobs far beyond any payment they may receive. Of course, public spiritedness is important in any community, but it is especially important in small communities with small populations. And a small population is something Tug Hill has.

One of Tug Hill's most notable characteristics — some would say one of its greatest qualities — is its relative lack of people. With just over 100,000 people in a region of 2,000 square miles, or about 50 people per square mile, Tug Hill is rural by any standard. When you realize that two-thirds of those people live in a dozen or so towns at the edge of the region, you begin to see that in the rest of Tug Hill we are looking at some very small communities.

For example, the towns of Hastings, West Monroe, and Constantia are densely forested, with some farming. Yet being within 20 or 30 miles of Syracuse, these towns (and their two villages) have significant development, changing land use patterns, and growing populations. Their populations have grown 17 percent in the last decade, and now average nearly 6,000 per town, making them among the region's most populous. Other "service-center" towns of the region, such as Adams, Camden, Boonville, and Lowville, have populations of 4,000 to 5,000 each.

TUG HILL POPULATION BY COOPERATING GROUP, TOWN AND VILLAGE*

Cooperative Tug Hill Council

	1990	1980	Percent change
Boylston	443	390	14
Florence	852	688	24
Harrisburg	425	418	2
Lewis	858	720	19
Leyden	1271	1121	13
Port Leyden/V	525	539	-3
Lorraine	766	720	6
Martinsburg	1358	1494	-9
Montague	47	32	47
Osceola	239	321	-26
Pinckney	323	305	6
Redfield	564	459	23
Rodman	1016	836	22
Turin	578	540	7
Turin/V	295	284	4
W. Turin	821	866	-5
Constableville/V	307	330	-7
Lyons Falls/V	698	755	-8
Worth	219	153	43

Northern Oneida County Council of Governments

	1990	1980	Percent change
Annsville	2786	2389	17
Ava	792	664	19
Boonville	2026	1750	16
Boonville/V	2220	2344	-5
Camden	2582	2258	14
Camden/V	2552	2667	-4
Floyd	3856	3863	—
Forestport	1556	1380	13
Lee	7115	6892	3
Remsen	1243	1027	21
Remsen/V	518	621	-17
Steuben	1006	897	12
Trenton	3665	3117	18
Barneveld/V	272	396	-31
Holland Patent/V	411	534	-23
Prospect/V	312	368	-15
Vienna	4445	3954	12
Sylvan Beach/V	1119	1243	-1
Western	2057	1954	5

North Shore Cooperative Planning Board

	1990	1980	Percent change
Constantia	4084	3457	18
Cleveland/V	784	855	-8
Hastings	6442	5677	14
Central Square/V	1671	1418	18
West Monroe	4393	3482	26

Salmon Rivers Local Gov't Service Cooperative

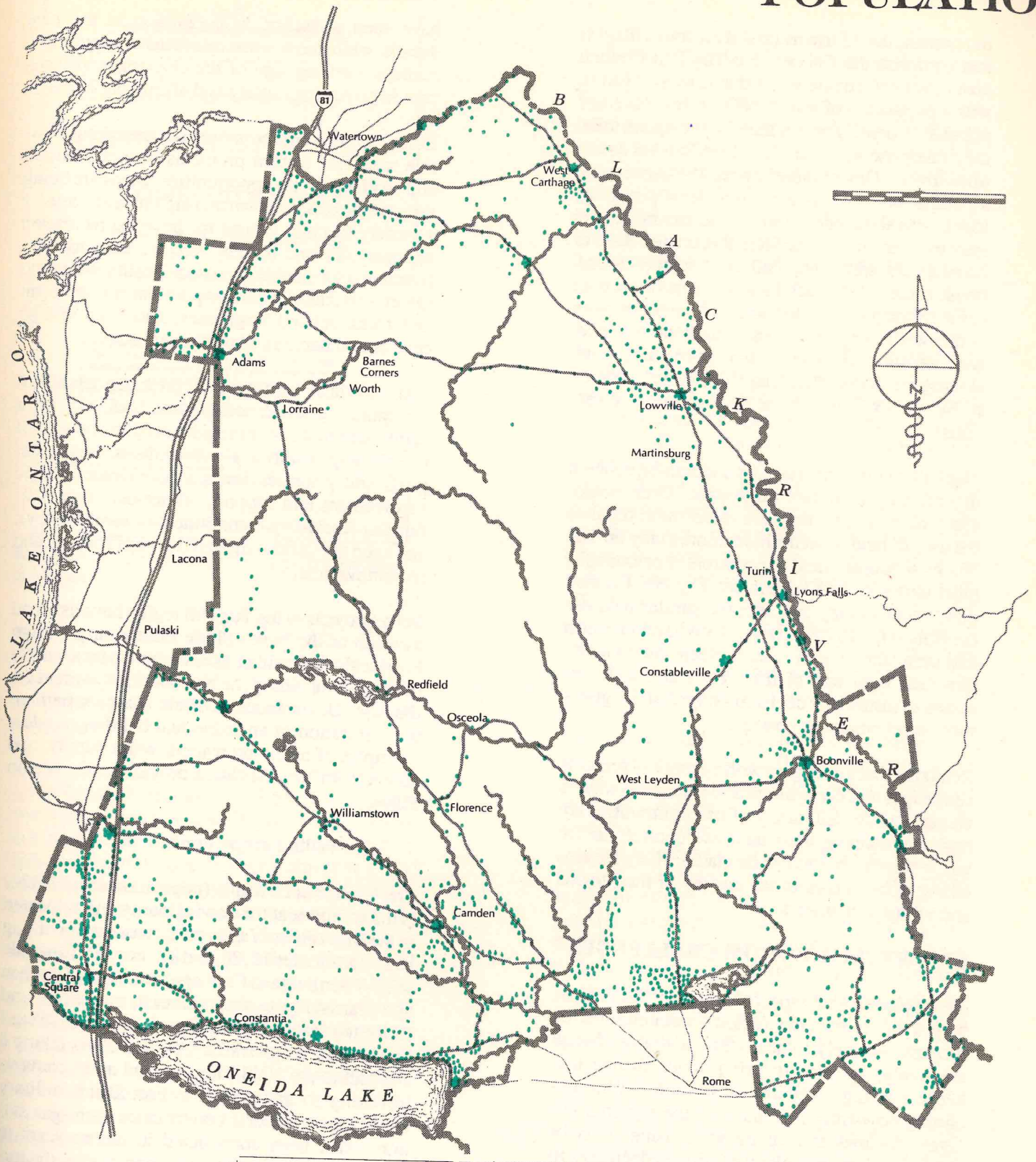
	1990	1980	Percent change
Albion	1707	1383	23
Altmar/V	336	347	-3
Amboy	1010	836	21
Orwell	1171	1031	14
Parish	1952	1637	19
Parish/V	473	536	-12
Williamstown	1279	1008	27

Unaffiliated municipalities - not part of a cooperative group

	1990	1980	Percent change
Adams	3224	2689	20
Adams/V	1753	1701	3
Champion	2408	2232	8
W. Carthage/V	2166	1824	19
Denmark	1550	1515	2
Castorland/V	292	277	5
Copenhagen/V	876	656	34
Lowville	1217	1211	—
Lowville/V	3632	3364	8
Rutland	2477	2125	17
Black River/V	546	560	-2
Watertown	4341	3098	40
Tug Hill Region Total	101,922	92,207	11

*Place names are all towns, except where noted as village. Villages, shown by V, are listed under the town in which they are located. Town population figures exclude population of village(s) within that town.

TUG HILL POPULATION



LEGEND

●50 People

Prepared By: BAGDON ENVIRONMENTAL ASSOCIATES, INC.

In contrast, the 15 towns (and their four villages) that comprise the Cooperative Tug Hill Council area cover 860 square miles that is mostly forest, with a population of just 11,500. With an average population density of less than 14 per square mile, they comprise some of New York's least developed towns. One of those towns, Montague, with a population of 47, is the state's least populated town, with about one person per square mile. The only town in New York State that comes close to Montague's small population is remote Morehouse in the Adirondack Park; and it has more than twice Montague's population. A number of other core towns have populations of just a few hundred, with densities of four or five per square mile, making the Cooperative Tug Hill Council area one of New York State's most rural and remote sections.

Tug Hill communities take an uncommon concern in protecting what they value most. Even though many rural communities are reluctant to regulate the uses of land in their jurisdiction, many on Tug Hill have adopted land use controls. For example, most towns in the Cooperative Tug Hill Council area, small as they are, adopted similar land use controls in the 1970s. They did this to retain forest and farm land, to keep waters clean, and to maintain their rural way of life. They also took this action to insure that decisions stayed at the grassroots level wherever possible.

Realizing that a changing world economy presents challenges and opportunities for retaining what is valued in Tug Hill, many of its communities are now reexamining their land use controls to see where improvements can be made. Many are also taking steps to control the destiny of their towns and villages in other ways.

OPPORTUNITIES FROM CHALLENGES

An absolutely vital aspect of "keeping Tug Hill the way it is" is that the region's communities be prepared not only to deal with inevitable change creatively, but also to bring about change that keeps existing communities liveable. With declining populations in many of the region's villages, declines in real income, rising costs of public services, and likely continued decreases in state aid, Tug Hill communities are challenged to find ways of maintaining basic services while also retaining the region's natural resource-based economy. In fact, most villages in the Tug Hill region have seen a decline in population in the past decade, while most towns increased in population, perhaps a telling sign of the challenges villages face in providing quality and affordable living.

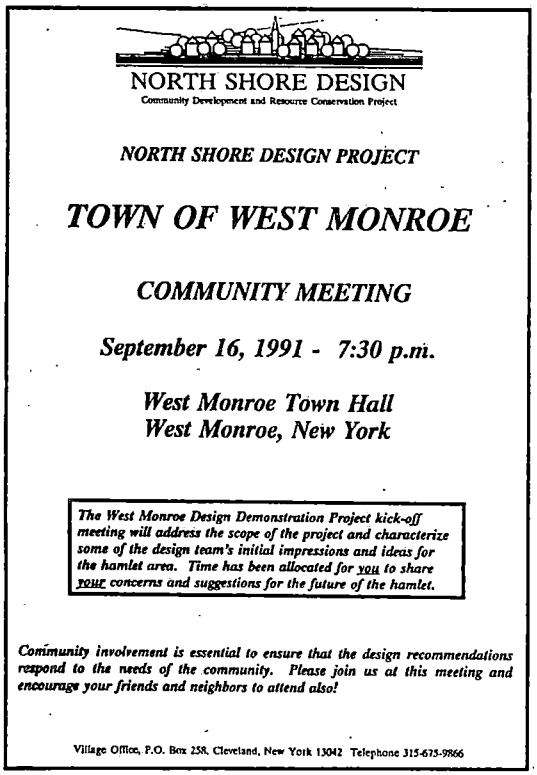
But many Tug Hill communities are taking positive measures to turn problems into challenges, and challenges into opportunities. Steps are being taken at the county, town and village levels and by a variety of civic groups to: improve recreation opportunities and thereby also enhance tourism business opportunities; provide quality water and sewer services; improve opportunities for farm and forest related businesses; and keep village centers and hamlets attractive and active.

Some of these ventures rely on a partnership of community and private groups. All rely on a combination of community leadership and a spirit of self-help, combined with skills to: set clear goals and priorities for action; maintain public involvement and support; ferret-out sources of funding (including commitment of local money); and keep the various involved groups focused and in communication.

Some projects in the Tug Hill region have as broad a sweep as the North Shore Community Design Project along Oneida Lake, supported by a variety of sources including the National Endowment for the Arts. Others focus on discrete targets, perhaps the restoration of an individual building. A few examples of recent recreation, water supply, and "downtown" revitalization projects in the region follow.

Lowville Fairgrounds Master Plan

The Village of Lowville (population about 3,600) is the county seat for Lewis County and is located in the Black River Valley on the eastern rim of Tug Hill. State routes 12, 26, and 812 connect Lowville with Watertown and Carthage to the north, Croghan and Harrisville to the northeast, and Utica and Rome to the south. The village is therefore subject to a lot of through traffic from travellers taking a shortcut to the NYS Thruway and army convoys travelling to and from the Fort Drum military installation. Several convenience store-gas stations have been constructed in recent years to capitalize on this traffic. In terms of manufacturing, the AMF plant turns local forest products into bowling pins and lanes. Otherwise, the business community consists of small retail shops, a depart-



NORTH SHORE DESIGN
Community Development and Resource Conservation Project

NORTH SHORE DESIGN PROJECT

TOWN OF WEST MONROE

COMMUNITY MEETING

September 16, 1991 - 7:30 p.m.

West Monroe Town Hall
West Monroe, New York

The West Monroe Design Demonstration Project kick-off meeting will address the scope of the project and characterize some of the design team's initial impressions and ideas for the hamlet area. Time has been allocated for you to share your concerns and suggestions for the future of the hamlet.

Community involvement is essential to ensure that the design recommendations respond to the needs of the community. Please join us at this meeting and encourage your friends and neighbors to attend also!

Village Office, P.O. Box 258, Cleveland, New York 13042 Telephone 315-675-9866

Public involvement is the key to success for all projects in the region.

ment store, a cheese plant, and a number of farm-related businesses. Heading out of town in any direction, one will quickly see that agriculture, particularly dairy farming, is the area's cornerstone industry.

As the county seat, Lowville is also home to the Lewis County Fair. Since 1987, the Lewis County Fair Association has been implementing successive phases of a comprehensive recreation plan listing near-, mid-, and long-term objectives. The ultimate purpose of this plan has been to turn the fairgrounds into a regional recreation facility for year-round use. Step-by-step improvements have included the purchase of bleachers for the ball fields, improvements to the race track, new lighting, construction of an ice arena, construction of a new exhibit building, and construction of a creative playground. Progress has resulted from cooperative efforts and the sharing of resources between various groups in the community. Funding for projects has come from the fair association, the playground committee's fundraising efforts, the Lowville Recreation Commission, local foundations, and state grants. Future steps include the creation of additional parking areas, expansion of the ice arena pavilion for multi-purpose use, and construction of additional playing fields.

Town of Lewis—Fire Protection System

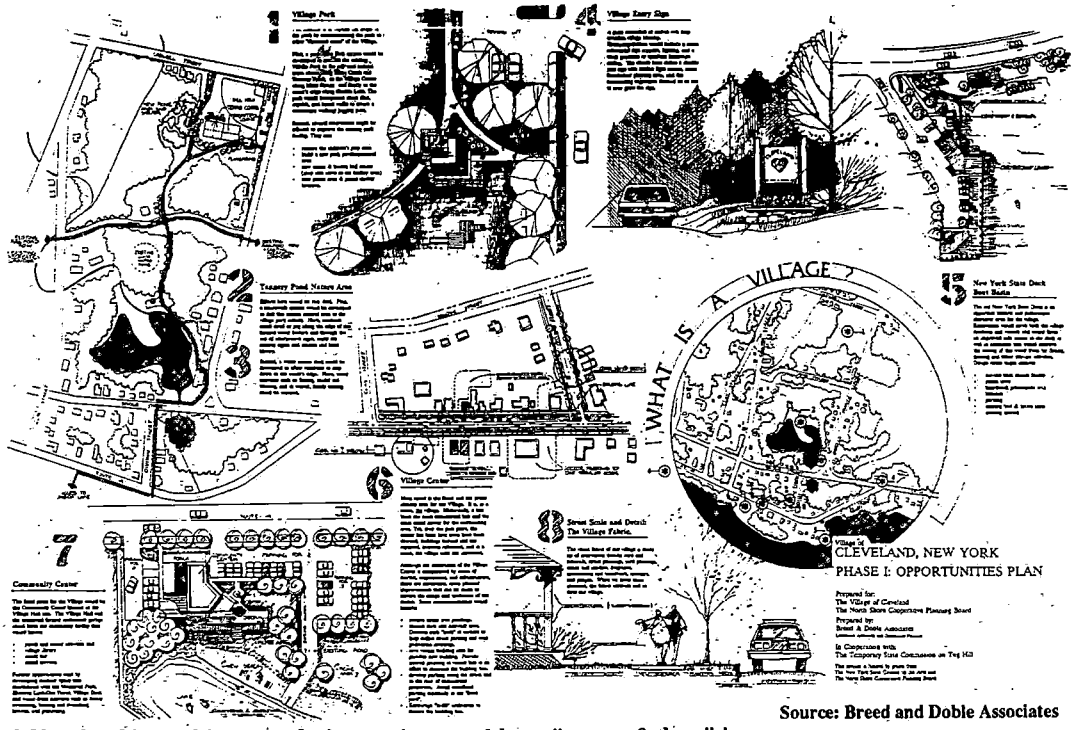
The Town of Lewis (population about 860), located in the southern part of Lewis County, receives fire protection service from the West Leyden Volunteer Fire Company. This same department also serves the Town of Ava and the northern quarter of the Town of Lee, both in Oneida County. There are no villages in the Town of Lewis, only the (unincorporated) hamlet of West Leyden.

The water supply for fire protection services had been drawn, by right of easement, from a water impoundment formed by a privately-owned dam on the east branch of the Mohawk River. A planning effort in 1986 concluded that the dam was in serious disrepair and in some danger of collapse. The hydrant from which the water had been pumped was found to be seasonally dysfunctional. These conditions delayed response time and posed a threat to the public health, safety, and welfare of the communities served by the fire company. However, the costs to purchase the dam, repair it, and maintain it were well above the affordable level for the community. With the assistance of the Cooperative Tug Hill Council and the Tug Hill Commission, the Lewis Town Board developed a plan to address the problem in a cost effective and innovative fashion.

To avoid reinventing the wheel, those working on the project visited other fire departments in the North Country to find out if they had any insight on low-cost solutions to the problems. Based on these visits, along with advice from the Department of Environmental Conservation, the town chose to construct an in-stream well and pump water directly to the firehouse. An engineer donated his services to design the system. With a $33,000 grant from the New York State Legislature, the town crew and fire company volunteers were able to work together and build the new system for less than half the cost it would have required to hire a private contractor.

Cleveland Design Plan

The Village of Cleveland (population about 700), Oswego County, is located along Route 49 on the central north shore of Oneida Lake. The recreational amenities of the lake, the varied beauty and rural character of the area, and its proximity to the metropolitan areas of Rome, Utica, and Syracuse have resulted in increased development pressures.



Source: Breed and Doble Associates

The village of Cleveland is working on a design project to address "sense of place" issues.

This growth has caused a number of interrelated problems including deterioration of water quality, high traffic volumes, loss of visual and physical access to the lake, and the loss of a "sense of place" in the north shore hamlets and villages.

A village design project is addressing "sense of place" issues through streetscape improvements (tree plantings, benches, etc.), park design, and improved access to the waterfront. This project has been particularly grassroots oriented by involving residents in the design process. Designs were drawn keeping in mind that the community's resources were limited and that much of the work would be done by volunteers. The Cleveland Development Committee, a citizen's committee appointed by the village board, is overseeing implementation.

The design work for this pilot demonstration project was funded largely by the New York State Council on the Arts under its Architecture, Planning & Design Program. The North Shore Cooperative Planning Board also provided some support, with the intent that the Cleveland design process could serve as a model for other north shore communities.

To cut implementation costs, the development committee is coordinating its efforts with engineers for the village sewer project, which is being funded by grants and low-interest loans from the Farmers Home Administration and the Small Cities Community Development Block Grant program. The village has also received a Small Business Administration tree planting grant for planting street trees along Main Street and around the village office, as recommended in the design project described above.

Black River Community Overlook

The Village of Black River (population about 825) is located on the northern edge of Tug Hill and in the center of the Fort Drum area. The business district offers some shops and restaurants, but the village is primarily a small, neighborly bedroom community whose residents work elsewhere. The Black River itself passes through the middle of the village.

In 1987, the Tug Hill Commission hired award-winning landscape architect Roger Trancik to prepare a comprehensive downtown revitalization plan. The commission funded this design proposal as part of a pilot project in community-based revitalization, for which Black River was selected as a model. Trancik's plan identified four major revitalization projects designed to create a sense of arrival in the central square of the village, provide better visual and physical access to the waterfront, improve parking, make the downtown center more inviting to pedestrians, increase business activity, and create a central gathering place for village

residents and visitors. As a result of enthusiastic endorsement by the general public, the Village Board appointed a citizen's group, the Black River Improvement Committee (BRIC), to guide the effort, raise funds, and recruit volunteers.

BRIC first chose to complete the small "vest pocket" park recommended in the design proposal. Being the most readily achievable element of the plan, this project allowed the committee to see some early success and build their confidence for undertaking larger projects. With the help of volunteers, BRIC cleaned up the small corner lot, planted shrubs and flowers, and purchased benches and a park table for the site ($700). The village DPW purchased and laid brick for the sidewalk which now borders the park. Completing this project also gave BRIC a credible image for leading the next project.



Photo by THC

The Black River overlook is an excellent example of how partnerships and strong community support can turn into a successful project.

Construction of the community overlook on the bank of the river, in the center of downtown, was a major step in the implementation of Trancik's design study. Together with the vest pocket park, the overlook helped to set the tone for continued streetscape improvements in the downtown area while also creating a sense of momentum for future efforts. The overlook project created a brick resting area with wooden benches and an iron railing along the river bank. Its success was due to support from several public and private sector sources. Niagara Mohawk Power Corporation gave the village free use of the property and also contributed financially to the project. Bernier, Carr, & Associates, consulting engineers for the village, donated the services of their staff to draw up the design specifications. The village DPW helped cut the project costs by doing the site preparation work and laying the brick. A grant from the Northern New York Community Foundation covered the cost of the bricks and an interpretive sign. The remaining funds were raised by BRIC.

COMMON ELEMENTS—LOCAL ENTHUSIASM, LEADERSHIP, AND A PLAN

It is important to note that each of the above projects, however different in focus, were guided by a comprehensive plan and overall strategy. This not only encouraged effective use of limited resources, but also aided fundraising efforts. Potential supporters were much more receptive to projects which fit into an overall plan. It was much easier for them to visualize the benefits of such projects and to believe that their money would be well spent.

The presence of local involvement and leadership were also important to the success of each project. Public representation generated the broad-based public support necessary to leverage government support and outside assistance. Lastly, each project maximized the use of available local resources (cash, in-kind services, and volunteer labor) and raised the balance needed through a variety of other sources. These funds came from local fundraising activities, corporate donations, government grants, user fees, and private foundations. Skills in coordinating planning, public involvement and fund raising were provided by the Tug Hill Commission.

CAN DEVELOPMENT COMPLEMENT PROTECTION... YES!

Although protection of the region's resources and development of the region's communities may seem like contradictory terms, there is a real need to balance the two activities. Good development provides for appropriate growth in desired areas, thereby helping to steer growth away from less appropriate natural areas. Communities must remain viable and liveable for people to keep living in the midst of the surroundings they love and wish to protect. You cannot prevent development in one area without providing an outlet for growth elsewhere. Not only does such a balanced approach make sense, but this type of planning is also necessary to improve chances for funding help.

Community development projects offer several benefits to a community:

1. **Improve the quality of life for residents.** Preservation activities and beautification projects instill local pride and appreciation for a community's unique character and cultural heritage. Sewage and water systems provide residents with a valuable service and play a major role in community health and growth potential. Recreation facilities and parks provide residents and their families the opportunity to play and relax. They also serve as good locations for community events which build stronger social ties. A community which demonstrates its social and economic vitality, through its physical appearance and quality of life, will stand a better chance of attracting additional business activity.

2. **Strengthen the local economy.** A healthy business community will provide "jobs for our kids," but it requires access to markets, transportation, sewers, and water. A declining population and poor infrastructure will contribute very little to local business development. A stable population and active business district will generally expand the community's tax base and its ability to provide adequate services to its residents. Community growth and economic development means more jobs and increased property values. A good plan will identify the type of business activity an area wishes to encourage and the necessary tasks to facilitate its growth.

   It is essential that the appropriate decision makers thoroughly evaluate the economic impact of proposed development to ensure that there is a true economic benefit. New development does increase the cost of services such as sewer, water and road maintenance and there have been many cases where the revenue from development has not paid for the costs of the services it requires.

   A number of arrangements can be made with developers to ensure that the benefits do, in fact, outweigh the costs.

3. **Increase local appreciation for environmental assets.** Building a park near a scenic attraction can help draw attention to the value of that attraction and encourage greater appreciation for a community's existing natural assets, thereby stimulating broad-based public support for protection efforts. Encouraging certain types of economic development, such as outdoor recreation and tourism, may increase the economic value of a community's resources. The business community and general public may be motivated to protect their environmental resources to ensure their own continued financial benefit from tourist activity.

4. **Protect natural areas through guided development.** By providing the necessary infrastructure and access to transportation routes, a community can steer development toward desired areas. Providing for growth in the "right" areas not only protects areas where development is not wanted, but it also provides an expanded tax base which can help finance community design projects and preservation activities which further tie the community to its geographic location and heritage.

ELEMENTS OF SUCCESSFUL COMMUNITY DEVELOPMENT

Several key elements are necessary if community development efforts are to be successful:

1. **Local leadership** to coordinate efforts and to ensure that things get done. This leadership may be provided through a local official, community service group, or specially appointed committee.

2. **Citizen involvement and broad-based** public support to justify commitment of local resources, add credibility to the project, and generate the necessary volunteer participation.

3. **Comprehensive planning and "vision."** Individual efforts must be guided by an ultimate goal. Each project should represent a step toward that goal. The ability to demonstrate good planning is a significant factor in many funding programs.

4. **Demonstrated commitment of local resources** and maximum utilization of those resources. Everything has a price. A commitment of local resources (cash, materials, manpower) shows potential funders that the community is committed to following through on its plans.

KEEPING IT THE WAY IT IS : SUGGESTED ACTIONS

The following suggestions for action would help retain Tug Hill's character. Most are actions that could be taken by Tug Hill's local governments, communities and citizen groups. Some are actions that could be taken by the Tug Hill Commission, or by state agencies or groups outside the Tug Hill region. The key to the entire approach, however, is the active involvement, understanding and support of Tug Hillers. Most of these actions could be taken with little expense beyond that of programs now in place.

HOME RULE, SPECIAL AREAS, TOWN COOPERATION

Many of the actions listed here as examples of what could be done locally depend upon town-based land use controls. Specifically, this section suggests towns identify special areas of several types for local protection – large blocks of managed forest land, important wildlife areas, and significant water resources to include major river corridors, for example.

Such an approach, if adopted by towns, would probably work best if information on resources needing protection were shared across town lines. The multi-town councils of governments and other cooperating groups that already exist in the Tug Hill region could play a key role in this regard.

The Cooperative Tug Hill Council (CTHC), made up of the 15 towns in the central core of Tug Hill, is already working toward such an approach in their Planning Accord for Tug Hill (PATH) Project. They are preparing a broad, 15-town plan that will list the resources of their area most in need of protection. This plan, once adopted by all 15 towns, would be the starting point for updating individual town plans and land use controls. Technical assistance to individual towns would come from CTHC, with back-up from the Tug Hill Commission. It is an approach that may have application in the core area, elsewhere in the Tug Hill region, and perhaps in other rural areas.

KEEPING TUG HILL FORESTS PRODUCTIVE

Although the amount of Tug Hill forest land appears to be increasing, and the extent of the core forest actually expanding, it is very possible that sufficient forests will not be available to support forest industry in the future due to fragmentation of forest parcels, continuing development pressures, and related increases in property taxation. The following actions could help avoid this threat to the region's economy:

1. Town-Designated Forestry Special Areas

Stabilize the land base for the forest products industry and non-industrial forest land managers through community land use controls that recognize large, contiguous blocks of forest land as "special areas".

Many Tug Hill communities, especially those in and near the core forest, have already designated major forest zones in their land use controls. Tug Hill communities, working together through their councils of governments, could reexamine forest lands to identify those most important to keep in forest uses.

In these areas, activities that contribute to the break-up of forest land could be discouraged. Town land use controls could designate uses

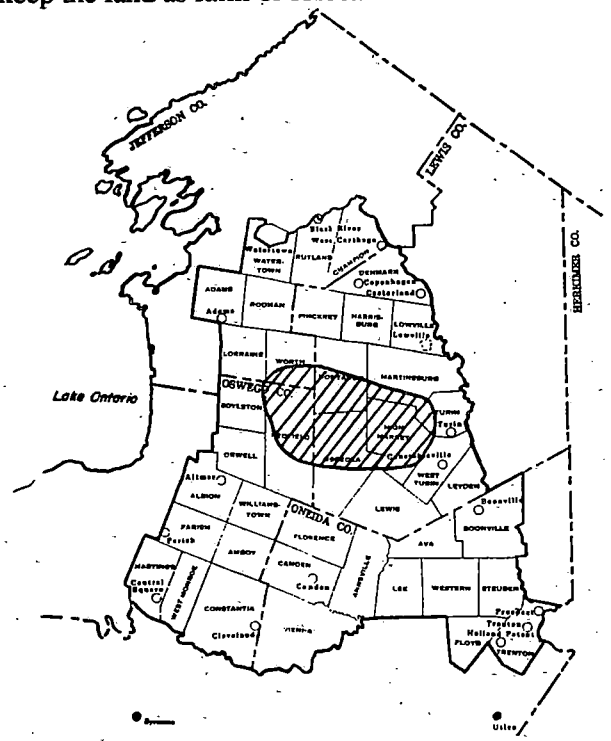
compatible with forest activities, to include recreation and farming. It could discourage development likely to increase property taxes, such as residential development.

2. Purchased Forestry Conservation Easements

Further encourage stabilization of this forest land base through the use of voluntary, "willing-seller" conservation easements that remove the development potential from those lands most likely to be managed for production of forest products.

State or federal funds might be used to purchase the development rights. Forest special areas designated by Tug Hill towns could constitute a priority list for acquisition of these easements.

With a conservation easement, the private land owner is still the owner of the land, and retains all rights to it, other than the right to subdivide and develop the land. He or she may sell the land (without development rights), or use it for farming, forestry, recreation, or other activities that keep the land as farm or forest.



Approximately 150,000 acres in the core of Tug Hill are uninterrupted forest land, zoned for forest uses by eight Cooperative Tug Hill Council towns during the past decade or so.

When a conservation easement is purchased, the state or federal government does not retain the right to develop the land. That right is extinguished to prevent development any time in the future.

Participation would be strictly voluntary, involving only private land owners willing to sell easements. For the land owner who is committed to farm and forest use of his or her land, there is a significant incentive to consider a conservation easement.

Assume, for example, that an acre of Tug Hill core forest is valued at $300 and that $100 of that value is attributed to the development potential of the land. With a forestry conservation easement program in place, state or federal funds might be used to purchase the $100 development potential of the land. An owner of 1,000 acres of core forest could receive $100,000, and continue to use the land as he or she sees fit for hunting, fishing, logging, farming, and similar activities.

Applying such a program could be the single most important action in preserving Tug Hill's working forest lands for the future. It would not be cheap, but in comparison to some proposals for state land acquisition in New York State, a relatively small investment could stabilize, for example, major portions of the core forest of Tug Hill.

For example, it would cost about $15,000,000 if forestry conservation easements were purchased on all the 150,000 core forest acres already zoned "forest" by eight Tug Hill towns, assuming a development value of $100 per acre.

Of course, it is highly unlikely that a program of strictly voluntary conservation easements would cover all lands in the core forest. But such a program could stabilize a significant portion of core forest lands, and also play a key role in preserving the extensive forests of the southern portion of Tug Hill, north of Oneida Lake, and other key concentrations of forest lands in the region.

To be most effective in keeping Tug Hill forest lands in productive use, these easements should just purchase development rights. It would not be necessary for these easements to include public recreation rights or public access.

3. Donated Forestry Conservation Easements

Augment purchased forestry conservation easements with an opportunity for similar easements donated to a public agency or a local land trust.

Donated easements could play several roles. They could be used on forest lands not designated by a town as a special area, but on which the private land owner still wanted to dedicate future use to farm and forest activities. They also could be used to protect forest lands in the absence of public funds to buy easements.

Many forest land owners may also find donation attractive because it offers tax advantages, and because they might be reluctant to deal with a public agency. Land trusts are the usual recipients of donated conservation easements. Land trusts are not-for-profit corporations that operate under strict Internal Revenue Service guidelines for keeping open lands undeveloped in perpetuity.

TUG HILL TOMORROW INCORPORATED

The newly-formed land trust, Tug Hill Tomorrow, Inc., will accept donated conservation easements.

As with a public agency buying a conservation easement, the land trust does not become the owner of the development rights. Instead, the development rights are extinguished forever. It is the responsibility of the trust to insure that the easement is never violated.

An easement can have several economic advantages in addition to keeping the land in forestry use into the future. When donated, the value of the donation can be taken as a charitable donation to reduce the landowner's federal income tax. The diminished value of the land can help reduce estate taxes when the land goes from one generation to the next. In some cases, there may be property tax benefits too.

A new local land trust, called Tug Hill Tomorrow, Inc., formed in 1990 to accept conservation easements on key Tug Hill lands.

4. Limited State Land Acquisition

In certain cases, limited state land acquisition of full title to key Tug Hill forest lands may make sense to protect especially important forest areas, or to improve public access to existing state lands.

Examples of this might be to protect a remnant of the original Tug Hill spruce-fir forest, or acquisition of an additional parcel that would allow access to a portion of state forest land or wildlife management land now inaccessible.

5. Greater Utilization of Existing State Forest Lands

Prepare unit management plans for Department of Environmental Conservation (DEC) lands in the Tug Hill region stressing increased timber harvests and recreational uses that are compatible with maintenance of wildlife habitat and other multiple-use objectives.

The overall forest economy of the Tug Hill region would be enhanced by more intensive management of existing lands. The state is already working in this direction in the Tug Hill region. "Unit management plans" developed with public in-

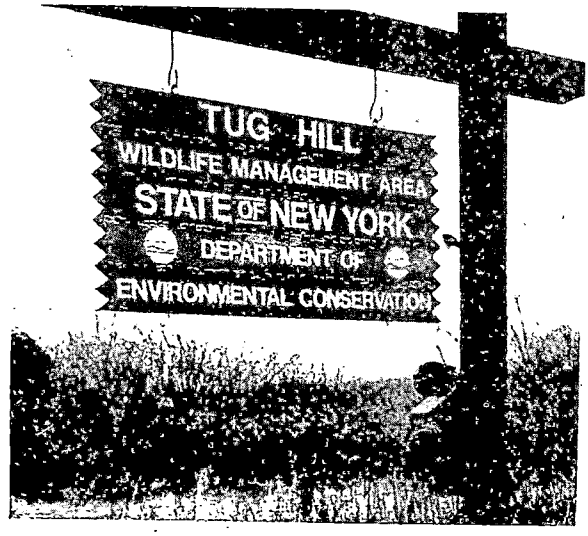


Photo by THC

Wildlife management areas, such as this one, are used not only to maintain wildlife habitat, but for many recreational pursuits such as hunting, fishing, hiking and cross-country skiing.

volvement have been underway for several years for wilderness and wild forest areas in the Adirondacks, and now are underway in the Tug Hill region as well as elsewhere in the state.

Implementing these plans will probably require more intensive management of state lands. To this end, DEC should continue, or even expand, its new policy of returning income from timber harvests to activities that support those harvests, such as timber cruising and forest management planning.

6. Payment of Taxes on All DEC Lands and Easements

No additional DEC lands or conservation easements should be acquired in the Tug Hill region until the state provides for payment of taxes for all purposes on those lands, or on the development value of those lands in the case of conservation easements.

The state currently has a patchwork of practices covering payment of taxes on lands held by the Department of Environmental Conservation. This patchwork results in a blatantly unfair approach that penalizes areas like Tug Hill.

In the nearby Adirondack Park (as well as the Catskill Park), for example, payments are made to local taxing jurisdictions on the forest land value of state forest preserve lands. In the Adirondack Park, payments are also made to local taxing jurisdictions for the development value (and recreational value) of conservation easements held. In effect, virtually any DEC interest in land in the Adirondack Park results in payments to local taxing jurisdictions.

In contrast, in the rest of the state, including Tug Hill, some payments are made to local taxing jurisdictions for state reforestation lands, but not wildlife management areas — in most cases. In some instances, payments are made in certain towns because such is required by state law. These disparities in taxing of state lands leads to unfair burdens on certain towns for benefits that accrue to all the state.

7. Reimbursement for Forest Land Partial Tax Exemptions

The state should reimburse local taxing jurisdictions for lost revenues resulting from partial exemptions for timber lands managed in accord with a Department of Environmental Conservation plan.

Section 480-a of New York State's Real Property Tax Law provides for a partial reduction in real property taxes for certain forest lands managed under a plan approved by DEC. This partial exemption can help keep timber lands in productive use, but the benefits of keeping them in that use accrue to many, while the lost tax revenues only accrue to the taxing jurisdictions in which the land is located. The state should reimburse local taxing jurisdictions that lose revenue as a result of this state-sanctioned exemption.

8. Strengthen Forest Industry Manufacturing

Programs to strengthen the region's and the state's forest industry need to be implemented, and continued where they exist.

Healthy forest industries are critical to the future of the Tug Hill region. Stabilizing the land base through easements, designating forest special areas, and other related actions listed above, will not in themselves yield good management of Tug Hill forest lands for long-term productivity nor ensure that the industry is healthy in the long term.

A wide variety of actions have been suggested in the past two years by the Governor's Task Force on Forest Industry, and by a strategic plan for wood products industry development prepared for the North Country Regional Economic Development Council. They build on actions underway by groups such as the North Country Alliance, the Resource Conservation and Development Councils of the north country, and the Adirondack North Country Association.

All the actions that could be initiated or undertaken are intended to send a clear signal that the state and northern New York want to see a healthy forest industry. Among the actions the groups above have undertaken or recommended are:

- targeting economic developers' activities on the wood products industry because of its importance to the region's economy and its contribution to retaining the character of the region;

- improving the ability of forest industry in the region to expand markets and create new products to match those markets through research and development, and new approaches to marketing;

- encouraging industry that can utilize lower quality wood, that is a major component of forests of the region today, as a means of providing an economic incentive to land owners to manage in the long term for trees of higher quality, which when harvested can yield more profit to the land owner, and when processed can yield products that will return more to the region's economy;

- keeping down the cost of commercial forest land ownership (especially property taxes and liability); and

- recognizing the value of responsible forest management through policies such as New Hampshire's, which states "...forestry activities, including the harvest and transport of forest products, shall not be unreasonably limited by use of municipal planning and zoning..."

9. Avoid New Public Roads That Break Up Major Forest Parcels

Discourage new public road construction that can fragment key forest lands directly, or indirectly by encouraging new development, in town-designated forest special areas.

To reduce the costs of government, some existing roads might be abandoned, partially abandoned, or maintained at a lower standard than now required by state law. This could not only reduce forest fragmentation, but could also reduce local road maintenance and other local service costs.

10. Educate Youth, Residents and Visitors About the Importance of Forests and Forest Industry to the Region

Incorporate into classroom curricula (such as Project Learning Tree) and public education materials (such as those produced by the region's Resource Conservation and Development Council) information on the value of forests and forest industry to the region and its economy.

A private, not-for-profit corporation such as Tug Hill Tomorrow, Inc., could work with school districts and groups such as THRIFT (Tug Hill Resources Investment For Tomorrow) on such programs.

RETAINING THE CHARACTER OF TUG HILL LANDSCAPES

The scenic qualities of the Tug Hill region are compromised in places by poor community design, scattered development, inappropriate location of power lines, junkyards and thoughtless disposal of waste along highways.



Photo by THC

Spectacular vistas, like this one across the Black River Valley, are common from many Tug Hill roads.

Despite these compromises, Tug Hill retains scenic beauty that ranges from the tranquility of a country road winding through farms and woodlots, to spectacular vistas across the Black River to the Adirondacks, to views over the rolling hills east of Lansing Kill to the Mohawk Valley and Oneida Lake, and to views west across the usually-snowy fields of Boylston to Lake Ontario, and more.

The most likely and, according to Tug Hillers, most appropriate means of retaining these scenic qualities is through local action on a variety of fronts.

11. Town-Designated Scenic Vistas and Scenic Roads

Assist Tug Hill communities in identifying scenic vistas, scenic areas, and scenic roads that they think are important to their character.

Tug Hill towns can take a first step toward protecting scenic qualities in their communities by identifying those areas they consider scenic, and incorporating those findings into their planning, land use controls, and decisions on development and beautification.

Several Tug Hill communities already are taking such steps. Towns along the north shore of Oneida Lake, for example, are identifying areas they feel are most important to the character of their area. Upland Tug Hill towns of the Cooperative Tug Hill Council have also begun to identify scenic areas important to the remote character of their area.

Some communities have begun to identify scenic stretches of road where development should be tailored to avoid disrupting views that are key to giving a sense of place to residents and visitors to the area. The Department of Environmental Conservation has guidelines for the identification of scenic stretches of road that may be used as is or tailored for local considerations.

12. Modify Land Use Controls to Include Scenic Considerations

Assist communities in evaluating a range of development controls that can preserve scenic qualities.

A number of communities in the Northeast are experimenting with new approaches to retain scenic qualities in their land use decisions, such as "clustering" of development. Through careful planning, development can proceed without fragmenting a stretch of highway, destroying much of it's scenic quality, and increasing the cost of public services. North shore of Oneida Lake communities are exploring such tools through their community design project, for example.

13. Plan for Safe and Scenic Travel Corridors

Assist communities in planning for travel corridors that are safe and attractive.

Putting development in the right locations for scenic reasons can also mean safer, more efficient roads. In the past few years, communities just north of Watertown and along the Route 49 corridor on Oneida Lake's north shore have used low cost aerial photography and other planning tools to identify ways to place new development so that scenic qualities are retained, but also to minimize new road intersections and curb cuts that can lead to more accidents and slower speeds along roads important for commuting.

14. Education and Awareness of Scenic Qualities

Work with community and school groups in the region to raise awareness of scenic qualities of the region and its communities.

Many people who know Tug Hill do not think of it first as a scenic area. The region's visual qualities often are subtle, and often are related to the interrelation of the landscape and people's use of the land to make a living – through farming and forestry for the most part.

Our young people and residents need to understand and appreciate this subtle beauty of our landscape, and not feel apologetic about it. They need to know it is okay for Tug Hillers to work for the protection of the land they cherish.

15. Development Simulation Modeling

Develop a local capacity for reviewing proposed development using computer-aided visual simulations.

Computers can be used to place a drawing or photo of a proposed development project in a photo or drawing of the existing setting. This technique is growing in its use in many areas, but has had little use so far by small rural governments – the people in an area like Tug Hill that are making some of the most important decisions about development that will shape the future visual quality and character of their communities.

The Tug Hill Commission has explored applying this technique in the region. If such a capability could be created locally, it could be shared among towns and villages of the region.

16. Scenic Easements and Acquisitions

Scenic vistas, scenic stretches of land adjacent to roads, and other areas with high visual quality can be permanently protected by purchase or donation of a scenic easement.

Municipalities or land trusts could hold such easements based on a town-approved plan.

PROTECTING SURFACE AND GROUNDWATERS

The remoteness of the core of Tug Hill seems to insure that the sources of Tug Hill's pristine water will be undiminished in the future. We have seen in recent years that this is not necessarily the case. The recreational development proposed in the 1970's, and the waste disposal facilities proposed in recent years suggest that even remote headwater areas and now-pure groundwater supplies and major rivers may be threatened in years to come.

17. Town Identification of Important Water Resources

Communities of the region could identify their most important surface and ground water resources using a variety of existing information and citizen surveys.

Clusters of wetlands that comprise important headwater areas, aquifer recharge areas, trout spawning streams, and major river corridors, are among the key water resources towns may want to identify for protection in addition to those protections already afforded by state and federal regulation. Identifying such resources is the first step in working for their protection. Their protection usually will have the multiple benefit of protecting water supplies for human use while also protecting fish and wildlife habitat.

18. Enhance Water Resource Information

Additional information on Tug Hill water resources, especially aquifers and municipal water supplies, would enhance locally-based efforts to protect these resources.

Research on the location, quantity, quality and dynamics of water resources, especially aquifers, is expensive and highly technical. Such research is often beyond the capabilities of local governments, but it is important to know the nature and extent of these resources so that protective actions can be taken before contamination occurs. Councils of governments, groups of towns, and the Tug Hill Commission and other state agencies could seek means of financing such research.



Photo by THC

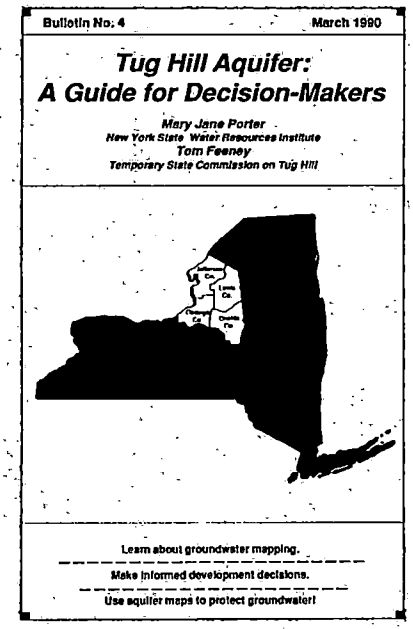
Wetlands not only provide fish and wildlife habitat, but provide water for human consumption.

19. Coordinate Water Resource Information and Protection Across Town Lines

Towns could share water resource information in their planning activities, and could work together on enforcement to protect water resources.

Water resources, like other natural resources, do not respect political boundaries. Protection of major stream corridors, headwater areas and the like can be done best by towns and villages using similar information and tools. The existence of multi-town councils of governments in the Tug Hill region sets the stage for towns sharing water resource information and coordinating protection.

A prime example of a potential for such cooperation is the continuing interest in retaining the remote character and high quality water of Fish Creek. Running from headwaters in Martinsburg, Williamstown and Redfield to supply a vast amount of the high quality water filling Oneida Lake, Fish Creek has been the focus of federal and state efforts to protect its corridor. Towns have found these proposals unwise. Some have taken, and others are considering, local action to protect the



Educational materials have already been developed to help local government officials protect ground water supplies.

river. Coordination of these actions could do much to keep Fish Creek's high quality through local action.

20. Conservation Easements to Protect Headwaters and Major River Corridors

Use voluntary conservation easements for limiting development in the most important headwaters and aquifer recharge areas, and along the most important river corridors.

Purchased or donated conservation easements could be a prime tool for limiting development in the most important and most sensitive water resource areas. They would limit development into the future, keep the land in private ownership, give some economic advantages to the landowner, and protect the land at less cost than outright purchase.

The Fish Creek corridors in Lewis, Oswego and Oneida counties could be a pilot area for trying the use of conservation easements along a major river corridor in the region. This tool has been used along key river corridors elsewhere in the country.

21. Well Head Protection Through Local Action

Municipalities could further protect drinking water supplies through well head protection programs that draw on a variety of tools.

The Tug Hill Commission is working with some communities in the region to develop a variety of tools – from easement, to land use controls, to good land management practices – to help protect municipal water supplies in the region. Not only can such actions insure public safety, they may also help reduce costs incurred in correcting problems through remedial action such as chlorination and filtration of drinking water, or in developing new supplies.

22. Educational Programs Regarding Water Resources

Raise awareness of the importance of Tug Hill water resources through educational programs for schools and communities.

The New York State Water Resources Institute, Center for Environmental Research (Cornell University), and the Tug Hill Commission have developed educational materials on ground water resources of the region and tools to protect those resources. These materials are being used with several communities interested in local protection of water supplies. These materials could be modified and supplemented for use in schools of the region as well.

PROTECTING SPECIAL HABITAT AREAS

Wildlife plays a key role in Tug Hill's way of life. Wildlife contributes greatly to the feeling of remoteness and lack of development associated with Tug Hill. It is a part of the fabric of the land, and hunting and fishing are part of the fabric of life in the region. These two activities also contribute to the region's economy.

Retaining habitat and wildlife diversity characteristic of Tug Hill depends on keeping our forests, rivers, and headwaters intact. A variety of the measures listed above, if implemented, will help retain our forests and waters, and thereby help retain important wildlife areas that otherwise would be threatened by haphazard or inappropriate development of Tug Hill.

23. Towns Identify Habitat Special Areas

Towns could identify special wildlife and fish habitat areas within their boundaries, and share such information with neighboring communities.

Some special habitat areas are already identified in the Tug Hill region. The state's Department of Environmental Conservation classifies streams based on their importance to trout and trout spawning, delineates deer winter yards, and classifies wetlands as to their importance based, in part, on wildlife values. The state's Natural Heritage Program (a public-private partnership) maintains information on the location of habitats of rare and endangered plants and animals as well as other important habitat areas.

Towns can not only build this existing information into their planning and development review procedures, but can add to it as well. Local, knowledgeable people such as hunters, fishermen, and nature enthusiasts can add greatly to existing information sources. Very little official information exists, for example, on wildlife travel corridors, something some communities may want to give special attention to in making land use decisions.

24. Enhance Rare and Endangered Habitat Information

Information on rare and endangered plant and wildlife habitats in the Tug Hill region can be enhanced by further Natural Heritage Program research in the region.

Professional assistance can augment citizen inventories of habitat areas, and be done with a rigor that meets state, national and international standards for habitat classification. Groups like Tug Hill Tomorrow, Inc. can pursue funding from a variety of sources to help carry out such research.

25. Retain Habitat By Retaining Large Blocks of Forest Land, River Corridors, and Limiting New Road Construction in Some Areas

Steps identified above to retain large blocks of forest land and major river corridors through local land use controls and voluntary conservation easements, and measures to limit new road construction in remote areas, can also make major contributions to retaining wildlife habitat.

Towns could explore use of these three types of tools, separately but ideally in combination, as a means of retaining habitats while also encouraging forest management and limiting the costs of government services.



Photo by THC

"Jack-in-the-pulpit" a Tug Hill plant on the state's rare and endangered list.

26. Education to Raise Awareness of Habitat Importance to Tug Hill

Develop information on Tug Hill habitats to help make our young people and community decision makers aware of its importance to the region.

Traditional community planning plays plenty of attention to soils, slopes, and such factors. It seldom gives much consideration to wildlife, fish and important, rare or endangered plant species. Improved information on the location and importance of wildlife and habitats in the region could lead to better integration of these factors into decisions made about the future of the region.

PROTECTING TUG HILL'S FARM LAND

Tug Hill's farmers and extensive acreages of active farm lands are a significant element of the region's economy, way of life and character. Productive farms provide much of the income that supports many of the region's businesses and keeps communities viable. Productive farms are major contributors to the local tax base and retain some of the region's most important open space. While the future of the region's farms will be affected most by economic decisions made at the state and federal levels and by management decisions of the individual farmers, there are actions that communities can take to keep farming viable and to encourage retention of key farm lands.

27. Map Important Farm Lands

Communities can identify important farm lands as part of their planning process.

Maps of soils, prime agricultural lands, location of agricultural districts, and community knowledge of important concentrations of farms can all be incorporated into local land planning and development review to help avoid actions that could threaten farming in the community.

28. Farm Easements and Fair Taxation

Communities can be supportive of partial tax exemptions available to farms as a key part of keeping farming viable, and may consider use of voluntary conservation easements as a means of providing additional economic benefit to farmers.



Photo by THC

Local markets play a part in the vitality of the farm economy, and can add to tourism as well.

Voluntary conservation easements can be a help to farmers in several ways. If public money is available to buy such easements, it can provide an immediate economic help to a farmer. If a farm easement is donated to a community or land trust, the farmer may be able to lower income and estate taxes, or reduce the principle on a Farmer's Home Administration loan. It may also help lower property taxes, though this is much more likely to happen as a result of putting lands in an agricultural assessment under state law.

29. Helping Farms Diversify and Find New Products and Markets

Help farmers try alternative farming ventures that may diversify and increase their income.

Alternative sources of income is not the whole answer to retaining farming in the Tug Hill region, but it can help some farmers who are looking to expand or change their operation, and can help keep land that might otherwise go back to brush and forest in active agricultural use.

For example, the Tug Hill Commission in coordination with local Cornell Cooperative Extension offices has helped expand sheep and deer farming in northern New York through programs of technical assistance to farmers.

30. Education and Awareness of Farming's Importance to the Region

Build awareness of farming's importance to the Tug Hill region into community planning and development review, and into area schools.

Programs such as the state's "Agriculture in the Classroom" could be adapted for area schools, employing information on agriculture in the Tug Hill region.

31. Assist in Use of Innovative Farm Protection Techniques

Assist communities considering farm land protection through transfer of development rights, cluster development and other innovative techniques.

Some Tug Hill communities, especially those experiencing greater rates of growth near Utica-Rome and Watertown, may wish to explore a variety of new land protection tools, such as transfer of development rights and cluster development. Tug Hill Commission staff and county planning offices may be able to assist communities in weighing these options with others such as farm land zoning, agricultural districts, purchase of development rights (another name for farm easements), and right-to-farm laws.

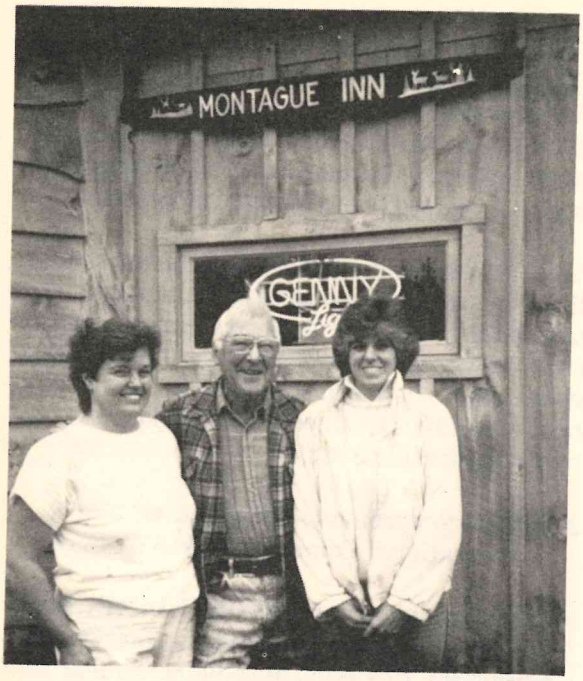


Photo by THC

The Montague Inn is an example of a business on Tug Hill that benefits from snowmobiling.

EXPANDING RECREATIONAL OPTIONS AND BUSINESS ON TUG HILL

Tug Hill is already noted for its recreational opportunities, especially snowmobiling and cross-country skiing. These are growing, and are being augmented by biking, hiking, canoeing and other summer sports that are adding to Tug Hill's traditional use for hunting and fishing.

Properly planned and executed, recreation on Tug Hill can continue to grow and add to the lives of those who live there and those who visit, as well as be a boost to the local economy. The expansion of recreational options and businesses in the Tug Hill region is jeopardized, however, by the possible fragmentation of land ownership, making it more likely that private lands will be closed to recreational use; by lack of planning for growth in recreation; and by limited facilities and capital for expanding businesses.

Water pollution and habitat destruction could also limit fishing and hunting opportunities in the future. In addition, inadequate access to existing public lands, and inadequate funding for state agency management of existing public lands could jeopardize potential recreational use of Tug Hill.

32. Retain Large Forest Ownerships Through Voluntary Means

Use voluntary conservation easements and partial property tax exemptions, with local taxing jurisdiction reimbursement by the state, to help retain large, privately-owned forest parcels in the region.

The measures outlined in earlier suggestions to help protect forest industry, water purity, and wildlife habitat would have the added benefit of retaining recreational opportunities in the region.

33. Create a Network of Long Distance Recreational Trails for Tug Hill

Towns and regional land trusts like Tug Hill Tomorrow, Inc. could create a network of long-distance recreational trails in the Tug Hill region to build upon the existing network of snowmobile trails, and excellent, but scattered, groupings of skiing and hiking trails now in the region.

Snowmobilers are already working toward an excellent network of major, "trunk" trails for the region, based in part on trails that have been used for years. Hikers and skiers could follow this example by establishing one or more long-distance trials to link the multitude of existing, short-distance trails.

Such a network could expand recreational options for Tug Hillers and visitors to the region, and help all to get to know the region better. The trails also would help heighten awareness of Tug Hill and its recreational opportunities. In addition, it could help foster area businesses related to recreation.

Land owners, businesses, local governments and user groups would have to support the system by working together on planning and maintaining the system.

34. Easements for Long-Distance Recreational Trails

Use voluntary conservation easements to secure a network of long-distance recreational trails in the Tug Hill region.

As snowmobilers have seen, good land owner

agreements are key to keeping trails open. To secure a network of snowmobiling, skiing and hiking trails, voluntary conservation easements could be purchased for the major trails to insure their existence into the future. Less formal land owner agreements are also an option, but a less certain one, and therefore an option less likely to spur business investment near trails.

35. Role for a Regional Land Trust

A regional land trust, like Tug Hill Tomorrow, Inc., could help in coordinating long-distance recreational trail easements that would cross town and county boundaries, and could serve a coordinating role with user groups (such as hiking and skiing groups), inn-owners and other businesses, state agencies and local governments, in establishing and maintaining the trails.

36. Give Private Land Owners Greater Liability Protection

Give private land owners greater protection from liability for recreational uses on their land.

New York State law provides land owners some protection from liability in law suits arising from some recreational uses of their land. This protection needs to be strengthened. Some options to do this might include recreationist codes of conduct like those now employed by state law at downhill ski areas in New York State; expansion of the protections now provided in the state's General Obligations Law; and the use of easements as a possible means of removing land owners from liability exposure.

The Tug Hill Commission, local governments of the region, recreation user groups, and groups like Tug Hill Tomorrow, Inc. might be supporters of legislation to provide such protection to land owners.

37. Plan for Sound Recreational Development

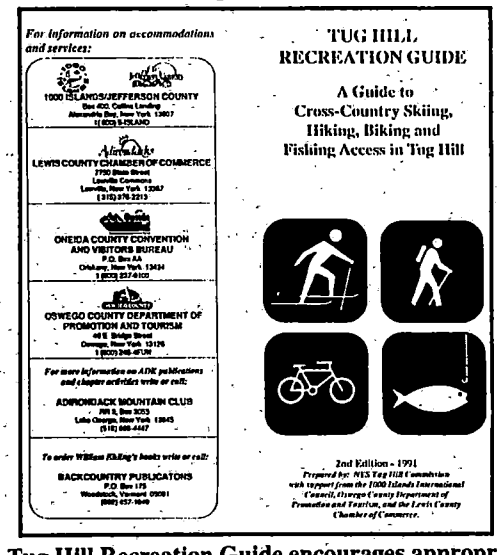
Develop regional plans for recreation development in concert with town and county plans, and explore existing and potential markets and needed facilities.

The Tug Hill Commission has helped counties of the region prepare snowmobile trail development plans, and has worked with groups such as the Cooperative Tug Hill Council and the Lewis County Planning Department in identifying needs for snowmobile access parking. Similar coordinating efforts for other recreational opportunities, to include long-distance trails, could help lend a regional perspective to such development.

To help in such planning, and to assist businesses that might expand or arise as a result, the commission could work with the counties of the region (who have prime responsibilities in tourism) to investigate existing and potential markets and needed facilities to support expanded recreational opportunities in the region.

38. Build Awareness of Tug Hill's Recreational Opportunities

Publications such as TUG HILL RECREATION GUIDE, first published by the Tug Hill Commission in 1990, could be continued as a means of raising awareness of Tug Hill recreational opportunities among residents of the region, and visitors who care about Tug Hill's resources and the region's future.



The Tug Hill Recreation Guide encourages appropriate use of Tug Hill's recreation resources.

Unplanned promotion of Tug Hill could have undesirable consequences, such as crowding and over use of resources. Careful awareness building, however, tied with planned development of recreational facilities can help protect Tug Hill and help its economy. At the same time, more people come to appreciate the region, and come to care for its future.

TUG HILL ROADS

The lack of public through-roads in the core of Tug Hill virtually defines the character of the region. Construction of new roads through that area could significantly alter the character of the region, and could increase the costs of government.

Outside the nearly-roadless core, road maintenance is among the greatest costs of government. Limiting new road construction in the core area, and establishing a rural standard for road design and maintenance for certain low-volume rural roads could be a major step in retaining Tug Hill's character and reducing the costs of government.

39. Avoid New Public Road Construction in Remote Areas

To help reduce costs of road construction and maintenance, to avoid loss of the remote character of the Tug Hill core forest and break-up of major forest land holdings, new public road construction should be avoided in the core area that is now nearly devoid of public through - roads.

This policy could be drawn so as to not affect construction of new private roads for access to camps and for logging operations.

40. Road Abandonment

Encourage informed use of road abandonment, qualified abandonment, and seasonal road designation in areas where new development is not desired by a town.

The various forms of road abandonment and seasonal use designation can help cut the cost of local government and avoid unwanted, sometimes expensive, development. Qualified abandonment and seasonal road designations can also help add to recreational opportunities such as hiking and skiing trails, and snowmobiling.

Good record keeping on qualified abandonment and seasonal designations is important. This is a town and county function, and one that might be strengthened through towns working together and sharing information.

41. Rural Road Standard

Support state legislation for a differing standard of road design and maintenance for locally-designated rural roads which usually have low volumes of traffic yet must support use by logging and farm equipment.



Photo by THC

Development along remote roads could be very expensive for Tug Hill towns by requiring upgrading and maintenance.

Towns working together, and with their counties, could develop a plan for designation of rural roads that would be maintained at this differing standard. Towns could also work with the Local Roads Research and Coordinating Council as it considers new standards for rural roads, which could be implemented through new state law and regulation.

KEEPING HAMLETS VITAL

Tug Hill's character is related as much to its small hamlets and villages as it is to its remote forests. Retaining Tug Hill's rural character will require keeping its hamlets and villages good places to live.

42. Water and Sewer Assistance

Assist towns, villages and hamlets in planning and grantsmanship for water and sewer systems.

Small communities are especially hard pressed in dealing with the complexity of federal and state grant and loan programs for construction of water and sewer systems. The Tug Hill Commission,

along with the state's Self-Help Program and others, has helped a number of Tug Hill communities in applying for sewer and water grants.

Continuing assistance of this type will be especially important as small communities begin to deal with new requirements, such as the filtration of all surface water systems, likely to occur in coming years.

43. Community Revitalization Assistance

Assist towns, villages and hamlets in the planning and grantsmanship for community revitalization and "Main Street" grants.

Vital business areas, attractive communities, parks, and good housing are other essential parts of retaining the quality of Tug Hill hamlets and villages. Work ranging from establishment of a village park to facade improvement of businesses is necessary.

The Tug Hill Commission has worked with many of the region's communities on such projects, often drawing on state and federal grants and private, local foundation support. The vital ingredient in making a project idea a reality is, of course, the work of dedicated volunteers in the community. Particularly noteworthy is the 1991-92 community design project along the north shore of Oneida Lake, being supported by a grant from the National Endowment for the Arts, the commission, and a number of local organizations and area schools.

Some projects which have not been possible in the past for lack of an incorporated, tax-exempt organization may now be possible because of the creation of Tug Hill Tomorrow, Inc.

44. Housing Assistance

Assist towns, villages and hamlets in providing adequate housing through good planning and grantsmanship.

Tug Hill's small communities in the past have usually been ineligible for many housing grants that were oriented to larger communites, or had definitions of low or moderate income that did not fit the relatively low population densities of Tug Hill communities. The advent of "scattered site" housing assistance programs, rural preservation companies and other tools has helped change this



Photo by THC

A design study has been completed as part of a "Main Street" revitalization project for the Village of Boonville.

limited-eligibility situation. Still, many small communities are unsure how to get started in such programs, how to best prepare an application for the programs, and how to administer a grant if received.

Grant administration funds cannot only help a community oversee a current project, but can help it prepare for future projects. A not-for-profit, such as Tug Hill Tomorrow, Inc., can help a community or group of communities manage grant administration.

Providing a good range of housing can be a key part of keeping Tug Hill communities vital and the economy and way of life of the region healthy.

THE COST OF RETAINING TUG HILL'S CHARACTER

Retaining Tug Hill's pure waters, forests, wildlife, recreation, farming and vital hamlets need not be an expensive venture. Much of what needs to be done simply requires continuing the flame of volunteerism and private land stewardship that already characterizes Tug Hill. Towns working together to share ideas and to work on common opportunities and problems, as they do today in the Tug Hill region, is key to accomplishing most of the suggested actions outlined above.

This network of cooperation is supported first and

foremost by volunteers in local government – the part-time, local officials that have near full-time obligations to their towns and villages. This volunteer work is augmented by the contributions of a myriad of volunteers in local organizations (members of snowmobile clubs, ski clubs, historical societies, and chambers of commerce, just to name a few).

For most Tug Hill towns, the work of these volunteers is facilitated by rural "circuit-riders" who are paid by a combination of town funds, or town and county funds, along with grants from the Tug Hill Commission. Circuit-riders, in turn get back-up support from a small staff at the Tug Hill Commission which provides technical assistance, help in community development planning, research on issues affecting the entire region, and natural resource information gathering.

The existing network of volunteers, circuit-riders, and Tug Hill Commission staff could accomplish most of the actions suggested above within current expenditures, with four possible exceptions. They are:

A. Increased assistance to towns coordinating community development, land use controls, and development review, may require additional circuit-rider assistance.

Today, the Tug Hill region's two councils of governments, for example, have the equivalent of about one and one-half circuit-rider positions each. Increased development review and protection measures may lead to a need for two or two and one-half positions each.

B. The increased cost for improving information on the resources of the region through a geographic information system shared between agencies and local governments.

The Tug Hill Commission and the St. Lawrence-Eastern Ontario Commission are sharing a new geographic information system that is being used to thoroughly document resources of the region in a cost-effective manner. New projects and information can probably be entered into this system with existing staff augmented by interns.

The costs of gathering new information on Tug Hill resources such as important wildlife areas, forest resources, aquifers, etc., would have additional costs, estimated to be about $25,000 to $50,000 per year. Some portion of the cost could be covered by foundation grants to the not-for-profit Tug Hill Tomorrow, Inc. Some of the costs might also be covered by work being carried out over several years by the federally-funded Northern Forest Lands Council.

C. The cost of protecting key tracts of land through voluntary, purchased conservation easements.

Many conservation easements to protect key Tug Hill lands may be donated in exchange for tax benefits. Some, however, are likely to require purchase. Possible funding sources to cover these costs could include state or federally-designated funds for protecting important, private forest and farm lands.

Tug Hill Tomorrow, Inc. could assist in voluntary and purchased conservation easement acquisition.

D. The cost of educational materials to raise awareness of Tug Hill's natural and human heritage through school programs, public education programs, and interpretive materials for visitors to the region.

Tug Hill Tomorrow, Inc. has planned an educational program that, over the next several years, will develop a range of materials about Tug Hill for a variety of audiences. This work is intended to be supported by foundation, corporate and individual tax-exempt gifts. These gifts, and the work of volunteers on Tug Hill Tomorrow's board and advisory group, along with other participating groups, is anticipated to be the sole source of funds for these programs.

LIST OF PEOPLE INTERVIEWED FOR WORKING LANDS PUBLICATION

Christine Braley, American Farmland Trust
Thomas Brown, NYSDEC - Watertown
Tommy Brown, Cornell Department of Natural Resources
David Bruce, Jefferson County Cooperative Extension
Frank Bulsiewicz, NYSDEC - Cortland
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Dr. Hugh Canham, CESF
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David Files, NYSDEC - Syracuse
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Henry Stebbins, NYS Department of Agriculture & Markets
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Steven Widrick, Widrick & Sons - Lowville
Mark Wiggins, NYSDEC - Watertown
Bruce Williamson, NYSDEC - Albany

Abbreviations

CESF	- SUNY College of Environmental Science & Forestry
EMC	- Environmental Management Council
IDA	- Industrial Development Agency
NYSDEC	- NYS Dept. of Environmental Conservation
RC&D	- Resource Conservation and Development
SCS	- Soil Conservation Service
SWCD	- Soil and Water Conservation District

REFERENCES

Allen, Durward L. ***Our Wildlife Legacy***. Funk & Wagnall, Inc., New York, NY, 1954.

Andrle, Robert F., and Janet R. Carroll, eds. ***The Atlas of Breeding Birds in New York State***. Cornell University Press, Ithaca, NY, 1988.

Armstrong, George. ***The Forests and Economy of Lewis County, New York***, 1954.

Benyus, Janine M. ***The Field Guide to Wildlife Habitats of the Eastern United States***. Simon & Shuster, Inc., New York, NY, 1989.

Black River-St. Lawrence Resource Conservation and Development. ***Directory of Lumber and Wood Products***, 1987.

Blair, Linda M., and Robert R. Quinn. "Greenways in Northern New York." Temporary State Commission on Tug Hill, Watertown, NY, 1989.

Bodden, Thomas R., and Philip J. Street. "Lewis County Highway Study." Black River-St. Lawrence Regional Planning Board and Temporary State Commission on Tug Hill, Watertown, NY, June 1983.

Canham, Hugh O., and Edward J. LeBlanc. ***Economic Impact of the Timber Based Industries in the Tug Hill Region of New York***, 1982.

Canham, Hugh O. "Tug Hill Landowner Study." State University of New York College of Environmental Science and Forestry, Syracuse, NY, 1985.

Chapman, Joseph A., and George A. Feldhamer, eds. ***Wild Mammals of North America***. Johns Hopkins University Press, Baltimore, MD, 1982.

Connor, Paul F. ***The Mammals of the Tug Hill Plateau, New York***, May 1966.

Curran, Raymond P. "Biological Resources and Diversity of the Adirondack Park in the Twenty First Century." Commission on the Adirondacks in the Twenty First Century, Technical Report 17.

Dodd, Paul A. "Status of Land Use and Conservation Practices in New York State." Presented at the Empire State Chapter, SWCS, November 15, 1990.

Hagenstein, Perry R. "The Future of Large Private Forest Tracts in the Adirondack Park and Implications for Open Space." Commission on the Adirondacks in the Twenty First Century, Technical Report 41.

Halls, Lowell K., ed. ***White-tailed Deer: Ecology and Management***. Stackpole Books, Harrisburg, PA, 1984.

Hoover, Anne P. "Preserving Travel Routes for Wildlife in the Adirondack Park." Commission on the Adirondacks in the Twenty First Century, Technical Report 19.

Kogut, Kenneth L. "A Look at Fish and Wildlife Resources in the Adirondack Park in the Twenty First Century." Commission on the Adirondacks in the Twenty First Century, Technical Report 18.

Laws of 1986, Chapter 601, (extending commission to 1991) and Laws of 1991, Chapter 365, (adding Forestport and Remsen).

Local Road Classification Task Force. **Guidelines for Rural Town and County Roads**. December, 1988.

Lockwood-Post's Directory of the Pulp, Paper and Allied Trades. New York, NY. 1988.

Lyons-Swift, Lauren, New York Natural Heritage Program. ***Historical Records of Rare Plants and Animals and Significant Natural Communities of the Tug Hill Region of New York State***, 1991.

Moore, Lola and Elizabeth Quinn. ***Osceola, "Jewel of Tug Hill"***. Compco Custom Printing, Blossvale, NY. 1985.

National Association of Towns and Townships. ***Growing Our Own Jobs: A Small-town Guide to Creating Jobs Through Agricultural Diversification***, 1988.

National Association of Towns and Townships. ***Harvesting Hometown Jobs: A Small-town Guide to Local Economic Development***, 1986.

National Association of Towns and Townships. ***Innovative Grassroots Financing: A Small-town Guide to Raising Funds and Cutting Costs***, 1990.

New York Agricultural Statistics Service. ***Farms, Farmland and Major Crops -- New York County Estimates 1982-1989.*** New York State Department of Agriculture and Markets, Division of Statistics, Albany, NY, 1990.

New York State Commission on Housing and Regional Planning. ***1926 Annual Report.***

New York State Department of Agriculture and Markets. ***Agricultural Districts Program Handbook***, 1982.

New York State Department of Agriculture and Markets. ***List of Plants Manufacturing Dairy Products in New York State During 1989 Including Compilation of Largest Manufacturing Plants***, 1990.

New York State Department of Agriculture and Markets. ***New York Agricultural Statistics 1989-1990.***

New York State Department of Environmental Conservation. ***Big Game Hunting Guide*, 1990-91.**

New York State Department of Environmental Conservation. ***Directory of Primary and Secondary Wood-Using Industries in New York State***, April 1990.

New York State Department of Environmental Conservation. ***The Forest Resources of New York -- A Summary Assessment***, 1981.

New York State Department of Environmental Conservation. "Management of White-tailed Deer Population in Deer Management Units (DMU's) of Northern New York."

New York State Department of Environmental Conservation. ***Trapping Guide***, 1990-91.

New York State Department of Health. ***Atlas of Community Water System Sources***, 1982.

New York State Division of State Planning. ***Preliminary Survey of Water Resources in New York State***, The Black River, 1938.

New York State Office of Parks, Recreation and Historic Preservation. ***New York Statewide Comprehensive Outdoor Recreation Plan and Generic Environmental Impact Statement.*** 1989.

New York State Office of Parks, Recreation and Historic Preservation. ***People, Resources, Recreation -- 1988-1992 New York State Comprehensive Outdoor Recreation Plan.*** c. 1988.

New York State Office of the State Comptroller.. **Special Report on Municipal Affairs for Local Fiscal Year Ended 1988.** Legislative Document (1989), No. 91.

New York State Planning Board. ***A Progress Report to the National Resources Board***, 1934. Robert Whitten, Consultant.

New York State Water Resources Institute, Cornell Unviersity, Ithaca, New York. Personal communication - letter from Lyle Raymond to Robert Quinn.

Northeast Regional Climate Center, Cornell University, Ithaca, New York. Personal communication from Keith Eggleston.

Nyland, Ralph D., and Hugh O. Canham. "Forest Land Management in the Adirondacks." Commission on the Adirondacks in the Twenty First Century, Technical Report 42.

Omerinik, James M., "Ecoregions of the Conterminus United States", in ***Annals of the Association of American Geographers*** (Volume 77, Number 1, March 1987), pp. 118-125.

Poisson, Susan. ***Tug Hill Recreation Plan and Tourism Development Project - Strategic Plan for Trail Development and Promotion.*** 1986.

Quinn, Robert R. "Adirondack Greenways: Opportunities for Recreation, Resources Protection and Appropriate Economic Development." Commission on the Adirondacks in the Twenty First Century, Technical Report 14.

Reshke, Carol. ***Ecological Communities of New York State.*** New York Natural Heritage Program, Latham, NY, 1990.

Rice Creek Field Station. ***Natural Areas of Oswego County.*** Special Publication No. 2.

Ryan, Vernon D., "The Significance of Community Development to Rural Economic Development Initiatives," ***Rural Economic Development in the 1980's: Preparing for the Future,*** USDA, 1987.

Smith, C. Lavett. ***The Inland Fishes of New York State.*** New York State Department of Environmental Conservation, 1985.

Smyth, P.J. "Transportation Inventory and Analysis--Report #2." Cooperative Tug Hill Planning Board, July 1975.

Soil Conservation Service. ***Important Farmlands of New York State,*** November 1989.

State University of New York College of Environmental Science and Forestry. ***Resources of the Tug Hill Region,*** 1974.

Stout, Neil J. ***Atlas of Forestry in New York.*** M.S. Thesis, State University of New York College of Environmental Science and Forestry, Syracuse, NY, 1958. (pp. 40-52)

Trancik, Roger. ***Hamlets of the Adirondacks: Development Strategies,*** 1985.

Temporary State Commission on Tug Hill. ***Preparing for the Future.*** Watertown, NY, 1976.

Temporary State Commission on Tug Hill. ***Tug Hill Recreation Guide.*** Watertown, NY, 1990.

United States Department of Agriculture Forest Service, Northern Forest Lands, (full) report, 1990.

United States Department of Agriculture Forest Service. "Report Summary -- Northern Forests Land Study." Rutland, VT, 1990.

United States Geological Survey. ***Hydrogeology and Water quality of the Tug Hill Glacial Aquifer in Northern New York,*** Water-Resources Investigations Report 88-4014. Miller, T.S., Sherwood, D.A., and Krebs, M.M.

United States Geological Survey. ***National Water Summary 1987,*** Water Supply Paper 2350.

United States Geological Survey. ***Unconsolidated Aquifers in Upstate New York -- Adirondack Sheet,*** Water-Resources Investigations Report 87-4276.

United States Geological Survey. ***Unconsolidated Aquifers in Upstate New York -- Finger Lakes Sheet,*** Water-Resources Investigations Report 87-4122.

United States Geological Survey. ***Unconsolidated Aquifers in Upstate New York -- Hudson-Mohawk Sheet,*** Water-Resources Investigations Report 87-4275.

USDA, Soil Conservation Service, ***Land Resource Regions and Major Land Resource Areas of the United States,*** December 1981, p. 101.

Will, Gary B., Randall D. Stumvoll, Robert F. Gotie, and Edward S. Smith. "The Ecological Zones of Northern New York." ***New York Fish and Game Journal,*** 29 (1):1-25. 1982.

LIST OF MAP SOURCES

TUG HILL FOREST RESOURCES AND FOREST INDUSTRY MAP

Sources: NYS DEC, Directory of Primary & Secondary Wood Using Industries in New York State, 1990
Black River-St. Lawrence RC&D Directory of Lumber and Wood Products, 1987
Tug Hill Commission, 1990
Lockwood-Post's Directory of the Pulp, Paper, and Allied Trades, 1988.

TUG HILL LANDSCAPES

Source: Breed & Doble, 1990

TUG HILL SURFACE WATER RESOURCES MAP

Source: Tug Hill Commission Reports

TUG HILL GROUNDWATER RESOURCES MAP

Sources: NYS DOH, NYS Atlas of Community Water System Sources, 1982
USGS, 1987

TUG HILL SIGNIFICANT PLANT AND WILDLIFE HABITATS MAP

Sources: NYS DEC Bureau of Wildlife, 1991
NYS Natural Heritage Program, 1991

TUG HILL FARMS AND PRIME FARM SOIL MAP

Sources: USDA SCS Important Farm Land of New York, 1977
Widrick and Sons, 1990
NYS Department of Agriculture and Markets, 1990

TUG HILL SIGNIFICANT RECREATION RESOURCES MAP

Sources: Tug Hill Commission, 1991
Adirondack North Country Regional Map, 1989

TUG HILL ROADS MAP

Source: Tug Hill Commission, 1991

TUG HILL POPULATION MAP

Source: Tug Hill Commission, 1990 Preliminary Census