Lower Lamoille River History

By

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for
Vermont Natural
Resources Council

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2000

Cover Photo: John Grainger of West Milton. The covered bridge pictured was washed out by the Flood of 1902.

Design and Layout by Deborah Daniels.

Printed by Hull Printing, Inc., Barre, VT.

ACKNOWLEDGEMENTS

This project would not have been possible without the generous gifts of time, knowledge, and energy (and food!) of the following: Jane FitzGerald and the Milton Historical Society, Dr. Robert Daniels, W. B., Jr., Kim Kendall, Sylvia Knight, Jeff Robbins, Chet McKenzie, Morgan Goodson, Liz Thompson, Dana Weigel, the VNRC staff, and all those citizens who were willing to share their memories about the Lamoille River. To all, THANK YOU.

PREFACE

It is the purpose of this work to bring together the historical information, both civic and natural, known about the "Lower Lamoille" River, and also to discuss the factors that have brought the river to its present state. The Lower Lamoille is defined here as the approximately nine-mile stretch of river downstream and west from Milton Village in Chittenden County, Vermont. The knowledge found in this paper shall, it is my great hope, allow all who read it to appreciate the rich history that surrounds this river, and at the same time gain a better understanding of the importance of the river's ecological health.

INTRODUCTION

"Civilization has its triumphs, it is true, but what a pity that it achieves them at the cost of such a vast destruction. If the lake had the fish to-day that it did fifty years ago, it would bring millions of dollars to the two States that border its waters."

W. H. H. Murray, "Lake Champlain and its Shores," 1890.

The Lamoille River has seen phenomenal change since colonial settlers came to the region in the late 1700s. Since that time, human interactions with the river have been extensive; logging, milling, farming, fishing, commerce, development - all have played a major role in shaping the geographic, demographic, and economic character of this region. The Lamoille's waters provided the blessings of power-production and transportation needed for these endeavors. The settlements of West Milton, Milton, Fairfax, Cambridge, Johnson, Morrisville, Hardwick, and others, all formed where they did because of the river. The prosperity the river brought to the settlers, and those that succeeded them, damaged the ecological health of the river.

Throughout the more than two-hundred years of industrial fervor in the United States, humans have cut, chopped, shipped, dug, dammed and fished our waterways and lands with the honest intent and belief that what we did was for the betterment of our neighbors and ourselves. But as the years have passed, we have seen that our economic growth has come at a large cost to our natural ecological systems. The Lamoille River is not the clear, cold, free-flowing waterway it once was. A great deal of polluted water finds its way into the river from industrial, municipal, and agricultural sources all along

the river. Ask any fisherman or boater who knows the river. He or she will tell you that the Lamoille today is very different than it once was.

In this century, much of the Lamoille's flow has been harnessed to produce electricity in hydropower dams. In 1948, the St. Albans, Vermont based Public Electric Light Company (PEL) completed its final hydropower dam project just upriver from the village of West Milton. A.W. Peterson, Superintendent for Public Electric, drew up the plans for this project and oversaw its construction. The dam was built at the base of what was known as Wood's Falls and the station took that name. It flooded 136 acres of land. In 1953 Central Vermont Public Service Company (CVPS) purchased this plant and three other upstream hydro-dams on the Lamoille: the Milton, Clark's Falls, and Fairfax Stations, all of which were built by PEL. CVPS still owns these plants today, and the four dams operate collectively as the Lamoille River Project. In honor of its designer, the Wood's Falls plant was renamed Peterson Station in 1955 (Ballway and Noble 1975).

Rivers are more than just water. They are rocks and sand and plants and animals. They are pathways of energy and life. By linking what is known about the natural and human histories of this region, we learn how people have changed the land and waterways upon which they live, and why. This knowledge can help us find solutions for the ecological problems the river faces today.

Around the bend in West Milton, circa 1915.
Courtesy of Fern Sparks.

Floating bridge over the Lamoille - post 1902 Flood.
Courtesy of Fern Sparks.

THE RIVER

Lamoille - by Ms. Lavina L. Fletcher
who later became the wife of State Legislator
Frank Plumley.
- Circa 1865 -

The world is proud of its rivers,
The mighty, grand and free
And their praise is a theme forever-
I bring my praise to thee.

Thou art not named in story,
A stranger art to fame,
No deeds of war or glory
We mingle with thy name;

But of all the mighty rivers,
That haste to meet the sea
Not one to me shall ever
Be beautiful like thee.

But sweet and beauteous daughters,
And hardy sons of toil
Have a home beside thy waters,
O, beautiful Lamoille

I would dwell beside thee ever,
And by the crystal wave
Of my dear Green Mountain River,
Let them make my peaceful grave.

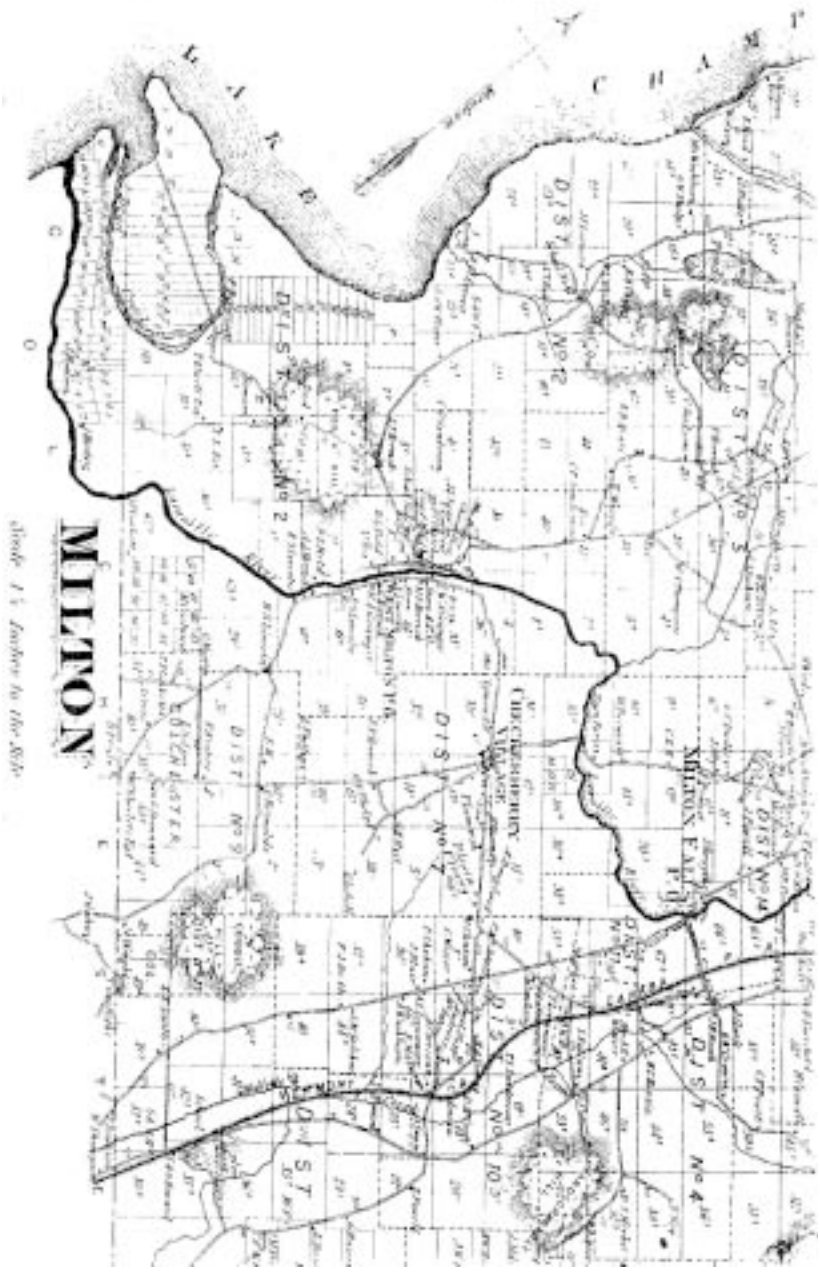
The Lamoille River flows along an eighty-five mile path as it winds its way to Lake Champlain (Map 1 - the lower watershed in Milton). From its headwaters north of Greensboro to its mouth just south of the Sandbar Causeway, it drains an area of 706 square miles as it descends 1,200 vertical feet through 6 counties: Caledonia, Orleans, Lamoille, Washington, Franklin, and Chittenden (Vermont Department of Fish & Game 1959). Eight dams are in place along the main stem of the river and impound a total of approximately 400 million cubic feet of water (Vermont Department of Water Resources 1976). Seven of these dams are used for power generation. The Clark's Falls dam in the center of Milton Village was completed in 1937 and created the largest impoundment on the river, now known as Arrowhead Mountain Lake.

THE "PETERSON REACH"

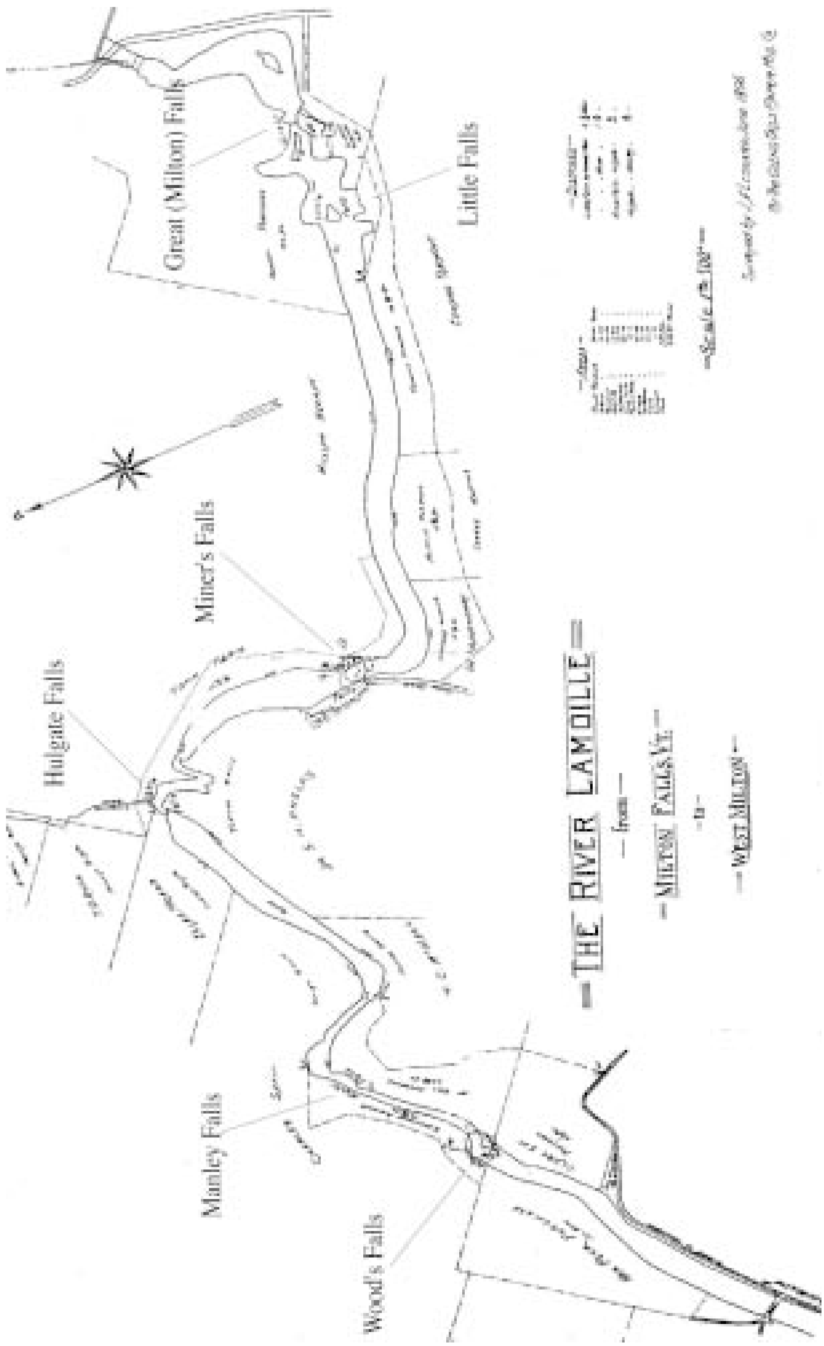
One half mile downstream from Milton Village lies Milton Falls or the Great Falls, a rocky, multi-channeled falls where water drops more than 100 vertical feet in less than half a mile (Secretary of War 1932). From Milton Falls the river runs along almost 3 miles of a winding, narrow, densely wooded valley before reaching the Peterson Dam. These 3 miles make up the Peterson Reach. Past the Peterson Dam the river flows through the village of West Milton. Here, a distinct geographic change occurs. The landscape flattens, and the remaining six miles of river run through low-lying farmland and rolling hills until reaching Lake Champlain. In springtime, when the lake water is high, the river is influenced by lake level fluctuations all the way up to the Peterson Dam.

Four distinct falls were flooded when the Peterson Dam impounded this stretch of river in 1949. Some of these falls have held different names at different times. Travelling downstream they were known as Miner's or

the Poor Farm Falls, Hulgate, Manley, and then the Lower or Wood's Falls (Map 2) (Leonard 1896).



Map 1. Beers Atlas, 1869.



Map 2. Survey of the Lamoille for the Glens Falls
Paper Mill Co., June 1896.

THE FLOODED FALLS

The majority of the information in this section was provided by Richard "Meester" Morgan during an interview by Vermont Natural Resources Council in 1995. Miner's or Poor Farm Falls was the first downstream from Milton Falls and also the largest of the four falls flooded by the Peterson impoundment. After a straight, smooth, westerly flowing stretch, the river turns ninety degrees to the north. Lying just downstream from where Interstate 89 now crosses the river, Miner's was a sizeable cascade of deep, fast current. It quickly descended about twenty feet over step-like, slate ledges. All of the flow was concentrated along the western bank. During low water it was possible to walk up the "steps" along the east bank. This falls was named after James Miner, Sr. who had been "a great lumberman of former days" and ran a grist and sawmill from the property in the early 1800s (Rann 1886). An iron forge, woolen mill, and plaster mill also operated near these falls at one time.

The riverbed then widened for approximately a half mile at a section known as "the pond" before reaching Hulgate Falls. Hulgate was a relatively small falls that consisted of a rock outcropping extending from the northern bank into the river. These ledges formed a channel within the riverbed which curved around like a big number "3" from one bank to the other. This is visible on pre-dam aerial photographs. The river then makes a slow sweep to the southwest. Streeter Brook enters the river from the north at this elbow.

Past Hulgate Falls there were several short sections of fast, broken water. The river turns briefly to the northwest and then back to the southwest, and then reaches the head of Manley Falls and the beginning of a long, straight, ledge-sided run. Manley was not a vertical waterfall, but a chute formed by a high, steep ledge on the western bank and a lesser ledge on the eastern side. A large spine of ledge stuck out of the middle of the

channel and the water flowed quickly around it before sloping into a narrow pool. These rapids were most likely named after N.M. Manley, one of the first tavern-keepers in Checkerberry Village (Rann 1886).

The Pre-Peterson Dam view looking upriver from Wood's Falls, 1946.

At the base of this narrow pool, a long stretch of rapids continued along the run, sloping gradually for about one thousand feet, bubbling and bouncing over a shallow section of rocks before plunging down around a large rock known as Middle Rock**.** The flow around this large rock formed the Lower Falls. The well-known "Sturgeon Hole" was found at the base of these falls, to the west side of Middle Rock. The water on the east side was known as the "Sucker Hole." Middle Rock marked the end of the river's rapids, and the beginning of the same flat water that flows through West Milton and along the low floodplain to Lake Champlain today. In the mid-nineteenth century this final set of falls was named Wood's Falls, after William V. Wood, who acquired the property in 1803 and owned it until 1839 (F.C. Wright 1941).

Middle Rock and Wood's Falls showing early construction of Peterson Dam, circa 1946.

West side of Middle Rock, circa 1946.

THE WATER

"Still further north the clear Lamoille
Breaks through the plains of fertile soil"
W. L. Paine, The Rivers of Vermont, 1908.

Prior to the influx of colonial settlers, the Lamoille was a free-flowing and undisturbed river. Starting in the dense forests above Greensboro, this cold, largely spring-fed stream once flowed its way down to West Milton in a long series of falls, riffles, rapids, meanders, sandbars, and straight runs. Large falls such as Fairfax Falls and Milton Falls were beautiful, dramatic scenes on the river as it cascaded and rolled and channeled its way to Lake Champlain. Because of the numerous falls the water was well aerated, contributing to high dissolved oxygen levels. The water remained cool even in the summer because a thick forest canopy shaded the river from the sun. Rapids churned the water and exchanged heat between the water and the air. Sediments were moved and redistributed along the river's banks, bottom, and bars in a natural riparian fashion (Rann 1886).

These conditions amounted to excellent habitat for shoreline creatures, aquatic insects, invertebrates and fish. As early settlers attested, and as will be discussed in the following pages, the abundance of life this and the other rivers connected to Lake Champlain offered was once truly remarkable.

River Ecology

Prior to human industrial effects, the Lamoille's clear and well-aerated water, the numerous but passable falls, and the dynamic sand, rock, and gravel bottom, all provided ideal conditions for spawning fish. Areas of gravel bottom are especially important to the spawning process because this is where many species make nests and

deposit eggs. The eggs are protected from currents and predators in the spaces between the gravel. Certain types of fish, especially from the Salmonid family (salmon and trout) evolved in cold water, which holds more dissolved oxygen than warm water. These fish require cold water for habitat.

Although a portion of the river downstream from Milton Falls had a rock and ledge bottom, aquatic and semi-aquatic plant growth was supported in those stretches where the water was flat or ebbed behind boulders or a point of land. In addition to natural agitation over rocks, aquatic plant life also helped aerate the water through the process of photosynthesis. These areas of plants were essential zones of biological activity. Fish, insects, mussels, and crustaceans utilized such plant beds for feeding, breeding and shelter.

Insects play a major role in the ecology of a river. Dobson flies, caddis flies, and mayflies, to name a few, were found in abundance along the Lamoille. Although the prominent forms of these insects occur in the air, many of their egg and larval stages occur in the water. They require aquatic habitats for successful reproduction. Dragonflys, which directly benefit humans by consuming mosquitoes, are another example. In their countless varieties, insects also provide an essential food source for many aquatic organisms, especially fish.

HUMAN INTERACTIONS WITH THE RIVER

Humans have dwelt on the banks of the Lamoille for millennia. Native tribes impacted the river only with camping and fishing. As colonial Americans began to settle and utilize the river and the surrounding land, their usage quickly affected the quality of the river's water. And through the years human alterations of the river have grown in scale. The following section discusses the significant influences human beings have had on the lower Lamoille over time.

Native Peoples

The Pleistocene glaciers receded from this region around 10,000 years ago. As climate and soil composition slowly became suitable, plant growth was able to take hold in the basin around the Champlain Sea (Power and Haviland 1981). Pre-historic Americans slowly migrated northward and began to inhabit river and lakeshore areas. The Native American tribes that evolved into what we know as Mohawk, Iroquois, Algonquin, and Huron, camped and fished these territories for thousands of years. Archaeologists and citizens have discovered copious artifacts along the Lamoille's banks throughout Milton. Artifacts from as early as the middle Woodland period, or about 1,700 years ago, have been found at a site known as Higley Rock, located on the river in eastern Milton. Manley Falls was another area where many stone implements made for catching and cleaning fish have been discovered (Daniels 1963). Native American burial sites were found and exhumed at the mouth of the river prior to 1900. Curiously, the human skeletons found were in a seated posture, facing westward (Murray 1890). It is understood by local archaeologists that the Lamoille was an "Indian stream of great importance" (Daniels 1963).

European Discovery

In the summer of 1609 Samuel de Champlain became the first known European to view the "shining" lake to which he would later give his name (Hill 1976). In June of that year he and two other Frenchmen journeyed with an Algonquin war party south from Quebec to the "Sea of the Iroquois." At the mouth of the Richelieu River there was a dispute between the tribesmen and some left the party. The final group consisted of sixty Native Americans and twenty-four canoes. All along this voyage de Champlain recorded and mapped his observations of the landscape and waterways.

After de Champlain and the war party paddled by a stretch of beautiful islands (Grand Isle, Valcour, etc...) they observed the mouth of a large river off to the east (Hill 1976). There were many seagulls flying above it. "The gull," in French, is "La Mouette." At some point, either in the rough sketched maps or in later transcription, an alteration in the river's name took place; "...this change from Champlain's nomenclature being due unquestionably to a failure in the part of the writing clerk to cross the two "t's" (Murray 1890). In the Charlevoix map of 1744, the name appears as La Riviere a la Mouelle. Spelling approximations can be found within many historical writings, but eventually it made the simple evolution into "moille."

William Gilliland, a British soldier who fought in the French and Indian War, is the first known settler to document his exploration of the lower Lamoille. In 1765 he purchased land on the west shore of the lake in what is now Westport, New York. From there he would often explore and survey areas of the lake and record his findings. On August 9th, 1766, on a voyage to Grand Isle, he traveled up the river "Alamoille," and explored. Of the river he wrote "it is a very large river, much larger than Otter Creek; went about six miles up it, no falls or rapids appeared, continued smooth, deep and wide, is well stored with fish, the land on both sides very sandy and bad, much ordinary pine timber. Near the lake it looks as if flooded in spring" (Crockett 1938).

Early Industry

The town of Milton was chartered June 8, 1763, and the first settlers, despite the statements of Mr. Gilliland about ordinary timber, were chiefly involved in logging. Towering stands of white pine covered much of the town land. The largest may have been two hundred and fifty feet tall and six feet in diameter. These immense trees were felled and hauled by horse team to the banks down-

stream from the Lower Falls, most often during winter-time when the ground was frozen (Clark 1976). From here the logs were transported by way of raft, schooner, portage, and strong-arm, north on Lake Champlain, down the Richelieu to the St. Lawrence and to the Quebec markets. The straight pine logs were especially well suited for ships' masts and were coveted by the King of England for the British Navy. Once the Champlain Canal was completed in 1824, Milton timber was shipped south to the New York market, as well (Rann 1886).

The series of falls down river from the present Milton Village was not passable by raft or boat. But the currents and cascades provided ample opportunity for water-powered milling, and at one time or another all of these falls supported some sort of industrial activity. Amos Mansfield's sawmill and gristmill at the Lower Falls were the first to harness the waterpower. Completed in July 1789, the mills sat on the east bank of these falls and marked the genesis of West Milton Village (Rann 1886).

Overland travel was laborious at best during these times, so water travel provided the most efficient means of moving goods and people. Thus, West Milton and the shores flanking this widening, smooth-watered portion of river became the center of commerce for the Milton Township. Boats and barges had unimpeded access to the lake from this point. Other mills and various industries, such as forges, tin smelters, cooperages, and a cheese factory were to follow Mansfield's first mills and thrive in this riverside community until well into the 1800s. At one time or another, anything and everything made its way through West Milton. Logs, whole grains, minerals for fertilizer, milk, wool, iron ore: all were brought in and used, or fashioned somehow, and then shipped off to market in Burlington and beyond.

It was not until the mid-nineteenth century that this dynamic outpost of commerce began to fade in prowess. As land was successively cleared of timber throughout

Milton, a new agrarian way of life arose. Merino sheep farming became a dominant practice in the township by the early 1800s. Sheep were well suited to graze on the rough, shrubby, newly deforested land. The 1840 town livestock census counted 16,000! (Clark 1976). The census also reports 2,863 cattle, 19,204 pounds of maple sugar, and 5, 978 tons of hay. Livelihoods were shifting away from the river and towards agriculture, and Milton Village was taking over as the town's center of commerce. In 1850 Joseph Clark's Vermont and Canada Railroad connected Burlington to Milton Village and this solidified the village's place as the town hub. These factors all contributed to the demise of the river industries in West Milton.

Dairy farming succeeded sheep farming by the later 1840s and for the next one hundred and thirty years or so was the foundation of Milton's economy. Despite the loss of many Milton farms in recent decades, families such as the Sandersons and the Mears' who began farming in this early era, still persist today.

Lumber mills and gristmills continued to operate around Milton Village, but new industry on the river was absent until around the turn of the twentieth century. In 1898 The International Paper pulp mill was built at the foot of Milton Falls (Ballway and Noble 1975). This plant took advantage of the large drop in elevation the falls provided by placing a dam at the head of the falls and running a large wooden penstock from the dam to the powerhouse. The mill provided a large boon to Milton's economy as many men were employed to build the plant and operate the facility. A daily supply of pulpwood came in by train on a small spur of track. A workers' strike shut down the plant in 1925 and it never reopened. The site was purchased by the Public Electric Light Company one year later.

International Paper pulp mill, circa 1900. Courtesy of the Milton Historical Society.

By this time PEL was already well underway developing property along the lower Lamoille for electric power generation (Ballway and Noble 1975). In 1920 the beautiful Fairfax Falls cataract was dammed at its head and water was harnessed to a power station at the base of the falls through a long penstock. By the fall of 1926 PEL had installed two small generators at the old Pulp Mill site at Milton Falls. Both of these plants were heavily damaged by the 1927 flood, but were then rebuilt and enhanced. In 1937 the generating capacity of Milton Station was doubled. In 1939 PEL then built the Clark's Falls dam, creating Arrowhead Mountain Lake. The final PEL project on the Lamoille was the Wood's Falls or Peterson Station. Construction on this dam began in the summer of 1946 and was completed in the fall two years later. This was the last major industrial endeavor in Milton for many years.

Old pulp mill site in 1947. Note the logging taking place in preparation for the Peterson impoundment. Courtesy of Robert Spears.

Peterson Dam construction, 1947.

THE FISH

Although humans have used the Lamoille River for a long time, fish were using it long before our presence. Prior to European settlement, aquatic species in the Champlain basin had access to any and all attached waterways - the Lamoille, the Winooski, Otter Creek and the Missisquoi of Vermont and the Saranac, Au Sable, and Bouquet of New York. The Richelieu River to the north provided contiguous access between Lake Champlain and the Atlantic Ocean.

In 1853 State Naturalist Zadock Thompson wrote a comprehensive study of Vermont's natural history. This is his catalogue of Vermont Fishes, many of which were at one time or another present in the Lamoille River: (List 1). Many of the scientific and common names have changed or are incorrect, but for its time the list is quite thorough.

Conditions in the Lamoille have changed markedly over the years, and numerous factors have influenced the types of fish found in the river during certain eras. Even with the changes and declines that came as industry and population grew in Milton, for generations the river provided sustenance and livelihood to many of those who chose to settle on or near its banks. Some families ate fish as their primary staple. Others used fish to augment their diets through lean times. The Lamoille River invited settlement for many reasons, but what tied many folks to the river most tightly was the food it provided.

FISHING

Lake Champlain and its tributaries were once home to an incredible diversity and abundance of fish. The clean, cold, mountain-fed rivers, along with the lake's post-glacial and present connections to the Atlantic by way of the Richelieu River and to the Hudson valley provided an incredible wealth of habitat for many freshwater and

List 1 - From Zadock Thompson, History of Vermont, Natural, Civil and Statistical, 1853.

I. OSSEOUS, OR BONY FISHES.

Order I.—Acanthopterygii.

Family I.—Percidæ.

Perca serrato-granulata, Common Perch.
Lucio-Perca americana, Pike Perch.
Pomotis vulgaris. Common Sun Fish.
" *megalotis*, Big Eared Sun Fish.
Centrarchus æneus, Rock Bass.
" *fasciatus*, Black Bass.
Ethcostoma cyprodes, Hog Fish.

Family II.—Sciænidæ.

Corvina oscula, Sheep's Head.

Ord. II.—Malacopterygii Abdominales

Family I.—Cyprinidæ.

Catostomus cyprinus, Carp Sucker.
" *oblongus*, Lake Mullet.
" *teres*, Sucker.
" *nigricans*, Black Sucker.
" *longirostrum*, Long Nosed Sucker.
Leuciscus pulchellus, Common Dace.
" *crysoleucas*, Shiner.
" *atronasus*, Brook Minnow
Hydrargyra fusca, Mud Fish.

Family II.—Esocidæ.

Esox estor, Common Pike.
" *reticulatus*, Pickerel.

Family III.—Siluridæ.

Pimelodus vulgaris, Horned Pout.
" *nebulosus*, Bull Pout.
" *cænosus*, Cat Fish.

Family IV.—Salmonidæ.

Salmo salar, Salmon.
" *namaycush*, Namaycush, or Longe.
" *fontinalis*, Brook Trout.
Osmerus eperlanus, Smelt.
Coregonus albus, White Fish.

Family V.—Clupeidæ.

Alosa vulgaris, Shad.
Hiodon clodalus. Winter Shad.
Lepisosteus oxyurus, Bill Fish.
" *lineatus*, Striped Bill Fish.

Ord. II.—Malacopterygii Subbrachiati

Family, Gadidæ.

Lota maculosa, Ling.
" *compressa*, Eel-pout.

Order IV.—Malacopterygii Apodes.

Family, Murænidæ.

Murena vulgaris, Common Eel.
" *bostoniensis*, Black Eel.
" *argentea*, Silver Eel.

II. CARTILAGINOUS FISHES.

Family I.—Sturionidæ.

Acipenser rubicundus, Round Nosed Sturgeon.
" *oxyrhynchus*, Sharp Nosed Sturgeon.

Family II.—Cyclostomidæ.

Petromyzon nigricans. Blue Lamprey.
Ammocœtes concolor, Mud Lamprey.

possibly anadromous fish. Anadromous fish, such as the Atlantic salmon live and feed in salt water and then swim to fresh water river to spawn. It is arguable whether Lake Champlain's salmon were ocean run or became landlocked after the post-glacial Champlain Sea freshened (See note 1). Historical documents speak repeatedly of the Atlantic salmon which thronged the rivers as they swam upstream during their spawning seasons, and the ease at which these fish were extracted for use as food. Sturgeon and walleye have also played interesting roles in the fishing history of Lamoille.

(Note 1 - Despite these historical records, much speculation remains about the exact heritage and the migratory habits of the Lake Champlain Atlantic salmon population. Were they a true ocean-run population? Were they always a completely landlocked population? Did a landlocked population diverge from an ocean population? Were they two separate populations? No one knows for certain. However, a report by Samuel Williams in 1809 discusses Lake Champlain salmon as large, ocean going fish. Other documents, as well, support the argument that the salmon that thronged the rivers in the spring indeed came from the North Atlantic (Williams 1809; Thompson 1853; Watson 1876; Webster 1982). Whatever the case may be, at the time of the first settlements on Lake Champlain's shores, there was an incredible abundance of some form of this fish.)

Atlantic Salmon

Salmon are revered in fishing lore throughout the world as the king of all game fish. Whether King, Coho, Pacific, or Atlantic, their incredible leaping and navigation abilities, their power and determination to reach the

rivers of their birth, and their exquisite flavor continue to leave them in highest regard with all who catch, observe, or taste them.

Lake Champlain was a busy place during the Revolutionary War. In the summer of 1776 Benedict Arnold was cruising on the lake with the American flotilla. William Gilliland was a friend to Arnold's naval forces and often helped provide food for the soldiers. A letter records that on one occasion Gilliland gave a petty officer seventy-five salmon in exchange for repairs to Gilliland's "salmon-crib," which had been carried away in a flood. In 1777 Arnold reported to Congress that in one year Gilliland had supplied the American Army with fifteen hundred salmon (Watson 1876).

In his extensive survey of Vermont, Zadock Thompson wrote:

> *"When the country was new all our waters swarmed with fishes of various kinds. Salmon and Shad...were abundant in Lake Champlain and in most of the streams connected with it. In the spring of the year, when these fishes were ascending our streams to their breeding places, they could be taken at the falls and rapids in scoop-nets, or in baskets fastened to poles, in almost any quantities desired."*
>
> (Thompson, 1853)

Many early settlers reported incidents where, during spawning season, their attempts to ford streams on horseback were foiled by the multitude of salmon in the river. The fish would ram a horse's legs as the horse attempted to wade across. When possible, settlers would drive a wagon into shallow tributaries to the river and, employing their pitchforks, spear as many fish as they desired (Watson 1876). It is claimed that the largest of these salmon weighed 30 to 40 pounds! (Williams 1809).

Specific information about salmon in the Lamoille and how far they were able to swim up river is limited. Milton Falls is commonly accepted as the terminus to upstream migration for any fish. However, with the reported fourteen foot leaping ability and power to swim up crashing torrents of water, we can speculate that, at one time, the salmon may have reached much more of the river (Van Oosten 1933; Watson 1876). Fisheries biologists generally agree that salmon probably migrated at least to Fairfax Falls, one of the largest falls in the state located approximately 19 miles upstream from Lake Champlain.

Unfortunately, no one alive today remembers the great salmon runs. The population was extirpated by the early half of the nineteenth century (Marsh 1857). Joint efforts by Vermont and New York are currently underway to restore Atlantic Salmon to Lake Champlain.

Sturgeon

Lake sturgeon also populated the lake and rivers in great numbers in the early days. These unmistakable, polyploid (see note 2) fish descended from primitive ancestors of the upper Cretaceous period, or about 100 million years ago, and have not changed much in appearance since (Moreau and Parrish 1994). Lake Sturgeon can live to be over 150 years in age and weigh in excess of 200 lbs. (Harkness and Dymond 1961). At one time these fish congregated in a deep pool at the base of Wood's Falls known as the "Sturgeon Hole" before heading further upstream to spawn (F. Baker 1995; R. Lamphere 1995; M. McCoy 1995).

(Note 2 - Polyploidy is a rare genetic condition in which an organisms' gametes, normally diploid, are polyploid. This means instead of having two alleles of genetic code which match together during reproduction, there may be three or four.

This allows for more genetic diversity through the reproductive process and closely related individuals may be able to mate without compounding any negative genetic complications. This condition has allowed the sturgeon in Lake Champlain to survive as long as they have with a very limited population base.)

The drained Sturgeon Hole during the construction of the Peterson Dam, circa 1947.

Catching these giants called for some ingenuity; they commonly weighed over 75 lbs. (Halnon 1963). Angling with a bamboo rod was rarely effective. Clifton Lamphere was a great fisherman, but the rod he holds here is just for a laugh.

Clifton Lamphere, July 1948. The sturgeon, caught in Lake Champlain at the mouth of the Lamoille, was 6'3" and weighed 164 lbs.
Courtesy of the Milton Historical Society

There exists very early information about sturgeon spawning in the Lamoille, Missisquoi and Winooski rivers (Stone 1900; Carter 1904). The reports speak of large fish weighing 150 pounds or so and sturgeon catches of over 100 fish in one spawning season in the Missisquoi River alone. The reports also document the custom of fishermen spearing sturgeon on the Mississquoi River in Swanton just below a bridge as the fish migrated upriver to spawn. The stench of the eggs that had been smeared all over the bridge was so bad that the authorities from the village put an end to the practice.

The sturgeon swam up the spawning tributaries in great numbers sometime between the first of May to the middle of June. Their stay on the spawning beds was apparently short when all at once perhaps hundreds of fish went downriver in a rush.

Between 1900 and 1904, the U. S. Bureau of Fisheries collected sturgeon eggs in the Lamoille and Missisquoi rivers for sturgeon culture. In the Lamoille, sturgeon were taken from the "Sturgeon Hole". Stone (1901) describes the "Sturgeon Hole" on the Lamoille River as follows: "Here the main body of the river rushes through a rocky gorge not over twenty or thirty feet wide, with precipitous walls of solid rock on each side. Just below the gorge is a hole about forty-five feet deep, apparently shaped somewhat like a boat, in which the spawning sturgeon collect, usually very soon after their appearance at the mouth of the river, but most probably when the water reaches the right temperature for spawning." "The spawning fish lie in this hole, which is forty feet deep, and it is impossible to take them by any other method than this "hooking up," as it is locally termed" (Carter 1904). Under this method, a fisherman in a securely anchored boat casts a weighted line into the upper end of the Sturgeon Hole. He drags the line along the length of the channel applying a succession of yanks in an effort to hook a sturgeon. In late May, 1904 fifteen sturgeon were caught in the "Sturgeon Hole" using this method and

hardly were damaged because of their tough skin. Ten were males each weighing about 35 pounds. Five were females estimated to weigh 85, 100, 125, 140 and 150 pounds. This particular attempt to propogate sturgeon was unsuccessful because a fungus killed the eggs. Earlier attempts were somewhat more successful in hatching sturgeon eggs.

One biologist Mr. Livingston Stone makes this point about the Sturgeon Hole on the Lamoille River and the difficulties in sturgeon culture in finding both a ripe female and a male at the same time: "I have hunted sturgeon for many years in Lake Ontario, Lake Champlain, Missisquoi river and Lamoille river, the Delaware river and Delaware Bay, and the only place that I know of anywhere in the country where you can get sturgeon eggs and impregnate them, is in the "Sturgeon Hole" of the Lamoille river..." He went on to say that the sturgeon came in great numbers to spawn here. In 1948 the Peterson dam was erected right atop the Sturgeon Hole according to old-timers and based on the early descriptions of the location of the hole.

As commerce developed in Chittenden County, sturgeon increased in commercial importance. Of special value was the roe, or eggs of the female sturgeon, which, when salted properly, becomes caviar. When caught in the proper season, the roe was extracted and sent to markets far and wide.

Richard "Meester" Morgan, who lived for much of his life in West Milton, once saw two sturgeons jump clear out of the water simultaneously. Georgette Lamphere Hutchins, who grew up on the Lamoille, used to hear them jumping and slapping back into the water through her bedroom window as she fell asleep at night. Mr. Duel Ballard, who spent parts of his childhood on the river, has vivid memories of sturgeon literally "rolling" nose over tail down with the current, through the Wood's Falls rapids after spawning upstream in the spring, right around apple blossom time. Frank Baker's grandfather,

Lewis Lamphere Sr., used to see sturgeon moving up through Miner's Falls, battling their way up the rapids (F. Baker 1995).

Walleye

Northern Lake Champlain has always supported large populations of warm water species: bass, perch, mullet (redhorse sucker), northern pike, and especially walleye. Walleye (walleyed pike, pike perch, pike) thrive in the lake's shallow bays and shore zones where lake waters are warmest. The fish winter in these zones, and then spawn in tributaries in the spring. Missisquoi Bay was a major wintering and feeding ground for walleye, and from here the fish would swim up the Lamoille and other rivers to spawn. In the 1870s and 80s net fishing at the mouths of these rivers during spawning runs resulted in catches of up to forty barrels per day (Halnon 1963).

Walleye were able to maintain a viable, albeit fluctuant population in the lake and its tributaries up through the 1940s. Fishermen and women had very little trouble catching their fill of walleye, especially during the

Henry Bremen and Lyman Powell with their walleye catch, 1904.

spawning run. Georgette Lamphere Hutchins says that as the walleye headed up river in the spring in the 1930s and 40s, "You could smell 'um, there were so many fish." Her brother Robert recalls "you could catch your limit (25 lbs.) in two hours." May 1 became the regular opening day of walleye fishing season. On any given Sunday of that month, (after church, of course) rowboats clogged the river in West Milton. It is said that you could practically walk from one bank to the other and not wet your feet.

FISHING TECHNIQUES

Humans have been catching fish for a long time. The methods for catching them range from square miles of ocean netting to the tiniest dry midge on a fly rod. Whatever the circumstance, fishermen have toiled with the challenge of finding the best ways to pull these diverse creatures from the watery depths. In the Lamoille, the particular populations of fish governed what techniques were most commonly used. From nets to worms to smacking salmon over the head with an oar, fish catchers in the Lamoille have tried it all. The following descriptions are a sampling of those historical methods used when practicality or desire called for more than just a hook and line.

Net Fishing

A number of different net fishing techniques have been used at one time or another in Lake Champlain and the Lamoille. These methods were used primarily for commercial fishing and allowed for large harvests in relatively short amounts of time. Seine, fyke, pound, and barrel type nets were used the most frequently (Halnon 1963). Variations of these techniques occurred depending on the materials, task, and situation at hand. Whitefish, in particular, were hunted through the 1800s with nets because they do not readily bite a baited hook.

Seining is an active form of net fishing. Many variations of this ancient method exist world-wide. The basic hand-seining technique used in the Lake Champlain basin was performed by dropping a strip of net, with floats along one long edge and weights along the other, into moderately deep to shallow water. With one end affixed to shore or to a boat, the net is stretched out straight. The floats stay on top of the water and the weights pull the base of the net towards the bottom, forming a wall of net. The net is then circled around, and all things inside the circle are caught and dragged in. This technique requires more effort than typical rod angling, but the resulting catch usually provided ample payoff. In 1823, near Port Kendall, New York, fifteen-hundred pounds of salmon were reported to be caught at "a single haul of the seine" (Watson 1876).

The following three styles are passive styles of net fishing. Fyke netting involves two wings of netting that funnel into a bag (Fig. 1). The wings are spread apart and secured to the bottom with an anchor, rock or stake. Fish are guided inward by the wings and become trapped in the bag at the end. This net is left in place like a trap, and the catch is comprised of whatever gets stuck in the bag. Pound netting is similar in style, except that there is only one wing, and this diverts fish into chambers in which they become trapped (Fig. 2).

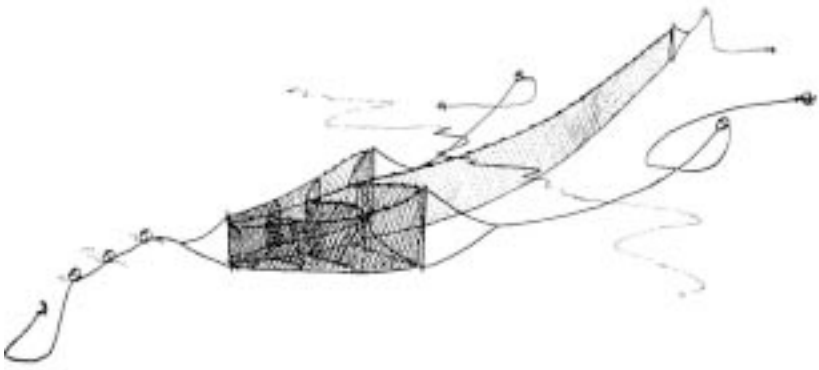


Figure 1. Fyke net.

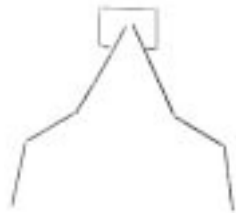


Figure 2. Pound net.

Barrel netting involves a barrel shaped frame covered with net and has one or two inward pointing cones at its ends. These nets can vary in size. Bait of some kind is often placed inside the barrel. Fish that travel in through the cones become trapped inside the net. Fisheries biologists often use barrel nets to catch specimens for research purposes.

Restrictions were placed on net fishing as early as 1878 (Burlington Free Press 1878). The techniques were proving too efficient. Entire spawning beds could be cleaned out with a few well-placed traps or seine pulls. The first bans were seasonal, put in place in order to protect spawning runs of fish. Net fishing permits, primarily applying to seining, were soon awarded by the Vermont Fish and Game Department in an effort to record and control the amount of fish taken, especially during the spawning runs. The Vermont, New York, and Canadian governments did their best to work through disputes regarding net fishing rights and laws. Canada was involved because of Missisquoi Bay, a very productive fishing ground, most of which lies within the province of Quebec. Yet even with the collaboration net fishing was eventually deemed to be too harmful to fish populations. By 1905 the Vermont Legislature had prohibited net fishing in Lake Champlain and all her tributaries. New York and Canada (for a time) had done the same (Halnon 1963). By 1918 fish populations were

recovering, the Burlington Free Press claiming that "fishing has never been better" (VT Fish and Game Biennial Report 1916 - 1918).

Catching Sturgeon

Catching these monsters was a major undertaking, but all the effort was worth it for the potential pounds of delicious meat and caviar. Although these fish will eat almost anything, getting them to bite a regular rod fishing set-up was not always feasible. Most fishing line, especially from older days, could not hold the bigger fish (50 + lbs.) anyway. So the catching of these "dinosaurs" required some ingenuity. Nets were used when it was feasible and legal, but some other methods were thought up, as well. Information about the following techniques has been compiled from the personal accounts of Robert Lamphere, Ronald Morgan, Richard Morgan, and Frank Baker:

Hand-Lining - Usually performed from the shore, this technique involved a length of strong rope with a grapple hook fixed to the end. The line was weighted up ten or so feet from the hook, baited with a live perch or the like, and then heaved into the desired spot or "hole." This line was often tied to a tree and left for a time. The fisherman would then check on the line at his or her leisure. This method "was the quickest way to get a fish on" (F. Baker 1995).

Shagging - The technique of "Shagging" or "Hooking up" is a bit more of an art form than net fishing or hand lining, and a bit more feasible than net fishing in a deep pool such as the Sturgeon Hole. A number of large hooks are affixed to a stout line. The line would then be thrown across a shallow hole and yanked on in hopes that one of the hooks would snag a sturgeon. The line could also be dropped into a deeper hole from a boat, perhaps affixed to a stiff pole. As a nudge was felt on the line, yank up! With any luck, one of the hooks would catch the body of

the sturgeon. When fishermen succeeded with either style, they were in for a wicked fight, and perhaps even a very exciting boat ride. Mr. Frank Baker fished the Sturgeon Hole and other spots as a child. He remembers shagging sturgeon and having his hands rubbed raw by the line. Fishermen would sometimes tie the end of the hand line to a car's bumper and use the car to drag the fish out of the water (F. Baker 1995).

FISHING'S DEMISE

By the early 1800s colonial settlers were significantly impacting fish populations in the lake and its tributaries. People caught salmon by the thousands for food and livestock feed and for sport. Before long, foreign species such as brown and rainbow (steelhead) trout were introduced as game fish (Van Oosten 1933). Predator species, such as gar and northern pike, were labeled as "curses" to the game fish populations and killed at every opportunity (Edmunds and Goldsmith 1874). As logging and industry changed the physical nature of the river's banks and its water, resilient warm water species replaced those fish that required cold, clear flows. In the span of just one hundred years the face of the lower Lamoille River fishery had been totally changed by human manipulation.

By the 1840s, salmon, in particular, along with other fish had become exceedingly rare in the Lake Champlain basin. In his 1853 study, Zadock Thompson was "unable to obtain a specimen [salmon] taken from our waters" (Thompson 1853). This decline was largely attributed to the effects of human activity along the rivers: milling, timbering, disposal of sewage, and even the Lake's steamship fleet and the clatter and disturbance the boats caused (Watson 1876). Addressing the problem, State Congressman and naturalist George Perkins Marsh stated:

"It is believed moreover, and doubtless with good reason, that the erection of sawmills, factories and other industrial establishments on all our considerable streams, has tended to destroy or drive away fish, partly by the obstruction which dams present to their migration, and partly by filling the water with saw dust, vegetable and mineral coloring matter from factories, and other refuse which render it less suitable as a habitation for aquatic life."

(Marsh, 1857)

Early observation was made by Silas Arnold, Esq. of Reesville, New York, of salmon in sawdust-filled water. He noted that as the fish took water in across their gills, the wood particles remained stuck to these delicate breathing structures. He believed this to cause the fish undue annoyance and possibly death (Watson 1876).

By the 1870s the State of Vermont Fish Commissioners began to research the reasons behind the near extinction of salmon in the Lake, and to develop a re-stocking program. The Commissioners realized that viable populations of these fish would yield a tremendous benefit to the state's economy and food production abilities. The Lamoille was regarded as the finest river in the State in which to begin these efforts. Most, if not all, of the river was thought to be accessible to spawning salmon. According to State Fish Commissioner Dr. M. C. Edmunds:

"*It is a more rapid stream than the Winooski; has more dams situated on it, yet no high perpendicular fall. Although it has many cataracts and cascades, yet not being abrupt, and the dams and falls being low, they could be easily surmounted by the salmon without the aid of fish-ways. The bed of the river being gravelly and the water clear and cold, I think it affords unsurpassed advantage for the introduction of salmon."*

(Edmunds, 1874)

On those rivers where higher dams did prohibit the passage of fish, the commissioners discussed the absolute necessity of fishway construction if any re-introduction programs were to be successful (Edmunds 1876; Edmunds and Goldsmith 1874, 1872). They recommended:

> *"That such laws should be enacted as will compel all persons who have built, or shall hereafter build, dams, or other obstructions to the ascent of migratory fish known to have inhabited such streams prior to the building of such obstructions, and which the Commissioners of Fisheries shall select for restocking with migratory fish, to remove said obstructions, or provide fish-ways over the same."*
>
> (Edmunds and Goldsmith, 1872)

In efforts to revive these migratory fish populations, releases of thousands of salmon were placed into Lake Champlain and its northern tributaries at various locations throughout the 1870s, 80s and 90s (Halnon 1963). Various stocks, including the "California Salmon," were used as hatchlings. Seventy-thousand of the "Penobscot" variety were released into the Lamoille in the town of Georgia in May of 1874 (Edmunds and Goldsmith 1874). Similar amounts were placed into other rivers in the state. But these efforts resulted in only moderate, short-term success for the salmon. By the early 1900s it was realized that the fisheries simply were not recovering, and the project lost emphasis. Despite the Commissioners' suggestions, fish-way construction was never implemented on existing dams, or on those built later on.

One hundred years passed before sturgeon began to feel similar pressures on their population. In 1967 the Vermont Department of Fish and Game withdrew all commercial sturgeon-fishing permits and the species was placed on the State Endangered Species list. This came in

response to the precipitous decline in sturgeon catch that occurred in the twenty years prior to 1967. In 1946, the state record shows one hundred and ninety five fish caught on six permits. By 1962, fourteen fish were caught on four permits (Halnon 1963). In an eleven-day gillnet sampling of the Lamoille in the spring of 1999, State Fisheries Biologists netted four male sturgeon. The largest of these weighed 72 pounds (Mackenzie 1999). The goal of this current study is to examine what is left of the sturgeon population in Lake Champlain and if it could be restored.

Although walleye are perhaps still the most popular sport fish in the Champlain basin, their population has fluctuated greatly over the past one hundred and thirty years. As early as the 1870s state officials and citizens alike were concerned with over-harvesting during walleye feeding and spawning seasons. Fishing regulations were put in place with mixed results. Commercial net fishing was restricted but still had too much impact on the fish, and populations had declined noticeably by the 1890s. Laws were strengthened and numbers recovered for a while, boosted by a state stocking program begun in early 1900 (Halnon 1963). By the late 1910s net fishing was banned outright in Vermont waters and as the stocking program improved, the walleye population boomed in the lake once more. In the Lamoille, these were the infamous days where folks remember fishing around the West Milton Bridge and being able to scoop up the fish with their hands.

When the Peterson Dam was completed in 1948 fish were blocked from the spawning grounds upstream of Wood's Falls. In the years right after the completion of the dam, multitudes of walleye, sturgeon, and other species continued to run up the river in the springtime. Ron Morgan recalls seeing hundreds of walleye churning up in the powerhouse tailrace as they attempted to swim up the current. Georgette Lamphere Hutchins and her

brother Robert Lamphere remember the hundreds of fish that were left stranded among the rocks as the power station would end a generating cycle and the water was shut off. All kinds of fish were trapped and left to die: walleye, suckers, mullet (redhorse sucker species), northern pike, perch, and bull pout (brown bullhead). Robert used to fill bags up. He remembers the game warden telling him "you want any fish, go and get all you want. You don't have to pay for them" (R.Lamphere1995). By the early 1950s the walleye and fish no longer mobbed the base of the dam in springtime.

Effects of Dams

Hydropower dams are often considered to be environmentally friendly ("green") sources of power. They are thought of as essential power providers for the surrounding communities, and as important flood-control devices. Yet in most cases these sentiments are false. Over time the true costs and benefits of these structures have become more apparent. The impacts a dam has on a river system are numerous and far-reaching.

Dams completely change the natural hydrology of a river. A dam essentially plugs a river with a controllable, one-way river valve. The structure disrupts ecological conditions by breaking the river's natural continuum and energy. Dams prevent sediment, organic nutrients, and woody debris carried in the water from distributing normally downstream. Slowed by the dam, these materials precipitate out of the water to the bottom of the impoundment. Toxic heavy metals such as mercury can collect and concentrate in the sediment of an impoundment. Temperatures rise in the impoundment as the sun's rays heat up the stagnant water. Dissolved oxygen levels decline as the water heats up and ceases to mix. Any aquatic species above the dam become isolated from downstream feeding, spawning, nursery habitat and refuge. For species below the dam the reverse is true.

The creation of an impoundment causes a displacement of the shoreline. The water levels rise to areas that were previously fields or forested hillsides. Erosion results as the water laps at the new bank and undercuts the root systems of the plants growing at the impoundment's edge. Changes in the level of the impoundment that occur during the power generation cycle also cause soils to wash off the bank and settle to the bottom. These changes in water level, which are often abrupt, result in a littoral zone devoid of normal lacustrine, or lake-like, characteristics such as nutrient transfer, and transitional plant growth. These characteristics of a natural lake provide zones of breeding and feeding refuge. Organisms that would thrive in such areas of a natural lake cannot cope with the artificial variance between dry and wet conditions.

When a power station is operating, typically the water from the impoundment rapidly exits the powerhouse and gushes downstream. The speed of the water scours away any sediment that exists in the lower reach and the sediments that would normally replenish the lower reach have been left on the bottom of the impoundment. All of these effects combine to create an unhealthy reach of river, both upstream and downstream of the dam.

Rivers are a public resource. Utility companies use this resource to make and sell electricity. Utilities are required to uphold designated flow regimes for each river as specified in their federal and/or state operating permits. State natural resource agencies aim for a semblance of natural, seasonal flows. However, the required volumes are often less than the typical minimum flows needed to support a healthy river ecosystem. Utilities are often given substantial leeway. Within certain guidelines they choose when electricity is produced and how much water gets released and when. The power generated then goes to the grid, not to specific households nearby

that buy power from the utility. The river environment becomes regulated and artificial.

Rivers have a cycle of water governed mostly by the seasons. In Vermont, water levels are typically high in the springtime, lower through the summer, high again through the fall, and moderate during the winter. Severe weather can, of course, affect this pattern. The floods of 1902 and 1927 caused extensive property and infrastructure damage to many areas in the state, especially in communities built along rivers.

Milton Village during the Flood, November 4, 1927. This image is taken from an actual postcard. Courtesy of the Milton Historical Society.

Floods are always thought of as disasters because of the damage they inflict on human life and livelihood. However, floods are part of a river's natural lifecycle. Large flows of water clear debris and redistribute sediment along a river system. They disburse and dilute built up toxins to wetlands and other low areas where they can be broken down naturally. They reestablish habitat for river shore species, replenishing downstream areas with sand, gravel and nutrients. As floodwater recedes from low areas and fields, sediments are left

behind and enrich the soil. Flooding makes river valleys fertile.

Along with hydropower production, dams have been advocated and praised for their flood suppression capabilities. However, depending on the dam and the amount of buffer its impoundment can provide, the structure may serve as little more than a mild obstacle to a river during a storm surge. Impoundments are maintained at or near capacity to maximize power output, leaving little room to hold rising water. Contrary to popular belief, the Peterson Dam and its impoundment provide very little flood control capability.

Free-flowing rivers are dynamic systems. In their natural state, rivers provide diverse habitat, circulate minerals and nutrients, and have seasonal high and low flows and temperature changes that provide cues for fish spawning and behavior. Dams block these natural cycles.

PEOPLE

West Milton is an area rich with history. From the native peoples through the multiple generations of Mansfields, Boardmans, Graingers, and Lampheres humans have used and interacted with the Peterson area of the Lamoille for thousands of years. Many of the quotations in this work are taken from direct interviews with members of these old lineages who are still alive today and remember the river and the fish that it supported. The following is a sampling of stories and biographies about some of these folks who, over the years, found their lives directly connected to the Lamoille River.

Amos Mansfield - ? to 1797

One of Milton's original pioneers, Amos Mansfield came to Vermont from Tryington, Massachusetts to start a new life after soldiering in the Revolutionary War. As stated previously, he built the first saw and gristmills on

the banks of the Lower Falls in West Milton. In appreciation for building these structures of commerce, he was apportioned land by the town on July 13, 1789. His four lots, approximately 100 acres each, were situated around the Lower Falls (F.C. Wright 1943).

Mr. Mansfield played a large role in town operations and politics. He served as clerk during state Proprietor's Meetings, and performed the original surveying for the town's roads. Town and religious meetings were often held at his home. He was survived by four sons: Amos Jr., Alpheus, Nathan, and Theophilus. Alpheus was one of the first wheelwrights in Milton Village, and Theophilus became one of the town's first lawyers (Rann 1886).

Harry Costello - 1873 to 1972

From the 1860s, Peter J. Costello and his wife Sarah (Mahoney) lived on the west bank of the Lamoille in West Milton. Both were of Irish descent. They had four children, all of whom were raised along the river, learning about life by fishing and playing and reading. The oldest child was Harry.

As a teenager, Harry worked as a farm hand and then for a short time at a lake resort in New York State. By around age twenty, he returned home to West Milton. With money he had saved working at the resort he was able to buy the old brick place across the river from his parent's house. This beautiful, fourteen-room colonial structure was built around 1830 by Joseph Clark and H.G. Boardman. From this property Mr. Boardman transported goods by barge to and from Albany and NewYork City .

Harry had the house paid off by the time he married Maude Root of Jericho Corners, Vermont in 1901. Together they used the house and property for many different purposes; Harry was a very resourceful gentleman. They ran a summer boarding house and store and always

Harry Costello's house. Courtesy of Fern Sparks.

kept a dozen or so Guernsey cattle. Maude worked for the Central Vermont Railway as a dispatcher for a time. Harry had two Model A Fords and would keep one running with parts from the other. He gathered old and used lumber (W. Ballard 1999). A story told to Loren Sanderson by Roa and Rosalie Grainger, sisters who grew up in the farmhouse that is now Ron Morgan's home, touches on his thriftiness:

The flood of 1902 wreaked havoc on West Milton and, in particular, the old covered bridge that spanned the river a bit upstream from the present bridge's location. As the water rose, George and Mrs. Grainger, their four sons and two daughters (Roa and Rosalie) were forced to cross the bridge and get to higher ground. The family loaded hastily into a wagon and George commanded the team of horses across. Water was running just under the floor planks and chunks of ice battered the bridge's sides. They made it safely, but minutes afterward much of the bridge was torn away from its piers and carried down river by the rushing water and ice. A large portion of the bridge was deposited squarely in Harry's yard. The following summer Harry built a barn out the lumber from the bridge.

From his new barn Harry ran a boat building and rental shop. Between 1900 and 1940 folks could rent a rowboat from Harry and spend the day fishing the river. In the late 1930s a rental cost a dollar and a half a day (Conrad Sanderson, 1999). During this time, on Sundays in May after church, it was a common event to see 80 to 90 boats out on the Lamoille. Many of them were Harry's, and "you were lucky to see one with a motor..." (Lawrence 1999). Still today, people reminisce about the river being completely clogged with fishermen. When asked in 1970 about his memories of those days, Harry said "lots better fishing there then than now" (Kirkness 1970).

Harry Costello (right) listening to the "big fish" story of the day. Courtesy of the Milton Historical Society.

Maude died of cancer in 1940. They had no children, and Harry never remarried. As he got on in years, Ivan Sanderson, a life-long Milton farmer, kept an eye on the widower. The two originally met during the excitement of the 1927 Flood, and Ivan and his wife Leona would sometimes have Harry up for supper, and for an occa-

sional birthday party. Leona remembers that Harry used to love lemon pie, and watching baseball and boxing on TV. "He would watch with his face nearly touching the screen," she said. Ivan tells of hitching up a horse and sleigh in wintertime and heading down to the old brick place to visit with Harry.

Even as he aged, however, Mr. Costello looked after himself pretty well. He had never been a drinker or smoker. Loren Sanderson owns the farm on Sanderson Road that has been in his family for seven generations. He recalls riding down to West Milton village on horseback from time to time as a young man and seeing Harry walking to the barn out back to milk his nine head of cows with a cane in each hand. It was Harry's philosophy in life to take the good with the bad, and to make the best of things - with a chuckle whenever possible (Kirkness 1970). He took this attitude until he died at age ninety-nine.

Slim Buxton

Another fixture in the West Milton fishing scene during the 1930s and 1940s was an African American man named Slim Buxton. Information on Mr. Buxton is scarce, but it is thought that he resided in Burlington. In the springtime he would set up a big tent in West Milton, on the bank near Harry Costello's house. Here he would spend the summer cooking and selling chowder and frying up the fish people would catch in the river. It is thought that this red-freckled cook originally came to the area in the 3rd cavalry installment at Camp Johnson.

Fried fish, coffee, and mullet chowder were the standard menu items. Harry ate at Slim's tent frequently. Though he stayed away from booze he did drink coffee. On occasion, Slim would add a certain amount of whiskey to the coffee, just for fun, and he and some other fishermen would watch and chuckle as Harry poured himself another cup, unaware of its spiked nature.

The Lampheres

If there is one family that knows this part of West Milton and the Lamoille River well, it is the Lampheres. For more than five generations this clan made their living on and around these waters, fishing, trapping, hunting, and catching insects and minnows for bait. They would feed themselves with their catch or sell it to markets in Milton, Burlington and beyond. They knew where to fish, how to fish, how to cook fish, how to get by with what the land and water had to offer, and how to enjoy life. There are no Lampheres living in West Milton today, but many children and grandchildren still live in Milton and elsewhere in Chittenden County. They are a close family, and they still know how to laugh.

The Lamphere family tree is quite broad and in the interest of brevity this section will only discuss the lineage leading to Clayton Lamphere and his children.

Around 1870 Norman Lamphere married a Cherokee Indian woman named Mary Sun. Norman had grown up on the Lamoille like his father before him. He and Sun lived and fished on the river. Their son William and a handful of siblings grew up along the river, too. With the fishing skills learned from his parents, William became very involved in the commercial sturgeon fishing that arose around the turn of the century. He caught many, and would sell the meat and caviar eggs to a merchant in town.

William married a woman named Sarah Elwood in 1895 and they had three boys and a girl. Clayton and Clifton were two of the sons. Through the early 1900s Clayton and Clifton were known as some of the best fishermen around. Clifton was one of the last licensed sturgeon fishermen on the Lamoille and along with his father, who lived into his nineties, also sold a great deal of sturgeon to a local merchant.

Clayton was born in 1904 and lived until he was seventy-seven. He married Edith Wood on September

3rd, 1924. They had ten children, though only eight survived through childhood. They lived in the house on the Northwest bank of the river that had been William's, just upriver from the West Milton Bridge. All the children fished, and although they had fun doing it, fishing was business. No horseplay was allowed. Mrs. Lamphere forbade the children from going in or playing around the water for fear of them falling in and drowning. Few of them ever learned how to swim well.

Clayton Lamphere.

Clayton also did some work as a guide. Fishermen would hire him to take them out and teach them how and where to fish. His daughter Georgette recalls that other fishermen would follow her dad wherever he went on the river, often crowding him so much he could not fish himself, in hopes of being led to the best spots.

Robert, the youngest child of Clayton and Edith, still lives in Milton today. He has many vivid memories of the time he spent with his family and other friends fishing the river. More than anyone alive today, Robert knows how much things have changed:

> *"The [lower] Lamoille River is an all-together different river today. The Peterson dam ruined the fishing. Nobody on this earth is going to tell me any different. They shut that water right off, and they wonder where the fish went. Before the dam was built the fishing was excellent. You could stand on the bridge in West Milton, say around the first of May, and as far as you could see, down the river or up the river and the fish would be breaking the water all the time. It was hard to stand the strong smell of fish because there were so many fish there. All different fish, most of them were walleye. I remember that I'd try to get two lines going, and you couldn't because there was always a fish on. They were jumping around your boat all the time. It was like a dream but I know it was real because I was there."*
>
> (R. Lamphere, 1995)

CLOSING REMARKS

The landscape surrounding the lower Lamoille River has changed incredibly over the years. In its nearly 225 years of settled history, growth, decline, floods, timber, grain, cattle, men, women, boys, and girls have passed along its waters and banks. From the Native American fishing grounds to the present sleepy, residential farm road that runs down from Checkerberry Village and past the Peterson Dam, the human interaction with this corner of Vermont has been diverse and extensive.

But human usage has taken its toll on the appearance and ecological health of this landscape. The Lamoille River has served as waterway, food-provider, power-provider, livelihood-maker, swimming hole, and waste dump for many, many years. Many different communities - Milton, Fairfax, Cambridge, Johnson, Morrisville, Hardwick, and Greensboro - share the Lamoille's blessings. But Milton is at the proverbial "end of the pipe." Milton citizens see the culmination of all that is done to and put into the river. Every community within the Lamoille watershed is now faced with the realities of how human lifestyle and its economic endeavors have affected this grand waterway. The river pales in comparison to its former self. The reservoirs in Milton showcase the pollution and other problems because they are collection pools for the miles and miles of river above them. The impoundments cause the water to stagnate. Temperatures and dissolved oxygen levels stratify. The pollutants in the water concentrate at these locations. And these conditions affect the animal and plant life in and along the river.

The Peterson Dam was built at a time when hydropower utility construction was a booming industry. Today, the turbine continues to provide the Central Vermont Public Service Corporation with three thousand homes worth of power per year, and the property does pay the town of Milton a sizeable amount in taxes each

year. However, the dam does prohibit fish from travelling up river to at least three miles of what was once incredibly productive spawning habitat. It does prevent any young fish, whether stocked or native, from passing downstream to reach feeding grounds in Lake Champlain. It did completely change the make up of those three miles of river. The dam does control how and when water flows. And water is what the existence and survival of all fish and other aquatic organisms depend on.

By describing what "the old days" were like, we see the way things were. We can appreciate the hardships and triumphs our forebears experienced. We can also look to these old ways for guidance in fixing the problems we currently face. In the past, it was often the case that people simply did not understand that their actions would harm the river and the life it supported. Their own survival and prosperity was a more pressing issue. But now we have proof of what years of human control can do to a river. We have seen that such controls create unnatural conditions that harm ecosystems. The lack of life in the lower river demonstrates this.

It is the hope of the Vermont Natural Resources Council that by promoting awareness of the river's past, we, as fishermen, boaters, swimmers, electricity users, and Vermonters might all work together to improve the current state of the Lamoille River.

"But although we must, with respect to our land animals, be content to accept nature in the shorn and crippled condition to which human progress has reduced her, we may still do something to recover at least a share of the abundance which, in a more primitive state, the watery kingdom afforded."

(George Perkins Marsh, 1857).

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Jane Fitzgerald - June 9.
Robert Lamphere - June 9.
Loren Sanderson - June 22.
General Ron Morgan - June 22.
Maurice Lawrence - June 23.
Ivan and Leona Sanderson - June 23.
Jane Morgan - June 30.
William Kirby - July 20.
Dorris, Robert, and Annette North - July 26.
Robert Spear - July 27.
Duell & Nathalie Ballard - October 12.
Georgette Lamphere Hutchins - October 13.

By telephone (all in 1999):

Clifford Sanderson - June 24.
Conrad Sanderson - June 29.
Ward Ballard - October 12.