

Four centuries of human influence upon
the ecology of the Lake George Basin

Completed by

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FOUR CENTURIES OF HUMAN INFLUENCE UPON THE
ECOLOGY OF THE LAKE GEORGE BASIN

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ABSTRACT

Several forces have influenced the ecology of Lake George over the last 350 years. These are briefly reviewed here. A number of early historical observations are recounted. The effects of permanent settlement at Lake George and the impact of industry on the ecology of the basin are discussed. The dawn of environmental awareness, wilderness preservation and the scientific ecological study of the lake and its watershed in the last century are also presented.

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Lake George has long been one of New York State's most beloved scenic areas. It is famous for its spectacular scenery, its role in colonial military history and as a recreational resource for much of the Northeast. In this article a few of the earliest known observations concerning its natural history, the ecological changes brought to the basin by human activity and the development of scientific investigations at Lake George are recounted.

Early Descriptions of Lake George

From the very beginnings of colonial settlement in North America during the 1600's, Lake George became a crucial part of a natural navigation system which included the Hudson River, Lake George, Lake Champlain, the Richelieu River and the St. Lawrence - the major overland stretch lying between Lake George and the upper Hudson. The area around Lake George remained mostly an untracked wilderness, however, until the late 1700's due primarily to the hostility between the two major Indian cultures of the region - the Iroquois and the Algonquians as well as between the French in Canada and the British in New York and New England their conquest of the colonial "northern frontier".

The earliest travelers to Lake George were often captured or murdered outright - fortunately a price no longer extracted today. Such was the ultimate fate of the first European to gaze upon its waters, Father Isaac Jogues who traversed the lake in 1646. He christened it

Lac du St. Sacrement - the Lake of Holy Communion. Nevertheless, there exist a variety of early accounts describing numerous aspects of its natural history. The most notable were the observations of Peter Kalm, a Swedish botanist. Supported by Linneaus and financed by the Swedish Academy of Sciences on a mission to locate and import new varieties of useful plants and trees to Sweden, Kalm spent the better part of 1749-1750 traveling through New York to Canada and back again. His descriptive account of Lake George in particular is detailed and surprisingly accurate considering his journey by canoe was almost 250 years ago. To make brief note of a few observations:

"We passed the nights in the midst of the forest, plagued with mosquitoes, gnats and woodlice, and in fear of all kinds of snakes... An incredible quantity of gnats fill the woods. The gnats are very minute. They are ten times worse than the larger ones or mosquitoes for the size renders them next to imperceptible.

"Almost every night we heard trees crack and fall while we lay here in the woods, though the air was so calm that not a leaf stirred... It may be that wild pigeons settle in such quantities on one tree as to weigh it down... When the wind blows hard it is dangerous to sleep or walk in the woods...and even when it is very calm there is some danger in passing under very large and old trees.

"The American elm grew in abundance in the forest hereabouts. Chestnut... walnut, water-beech, red juniper, oak, white pine, firs, etc... The mountains were everywhere overgrown with forests.

"It was awe-inspiring when we rowed at the foot of the mountain and looked up, for it seemed as if the mountain hung right over our heads as we proceeded. The lake at the shore was very deep... The lake divides into two branches at its [South] end, one toward the right and the other toward the left. We are now following the left, but after we had gone to the end of the bay and found only a small brook which ran out of a swamp, but no trail nor sign of a portage, we had the pleasure of turning back to see if we were to be more successful along the other branch...the peninsula between is a lowland, mostly overgrown with fir... The wolves were howling fearfully in the bay which we had just left. It was said that they had just torn to bits a roe deer over

which they rejoiced..."

Permanent Settlement at Lake George

Lake George was uninhabited when the Europeans first arrived - the Indians using the lake and its environs for seasonal foraging. Trails led to it from all directions. From time to time the forest vegetation in the basin would be burned because the Iroquois were known to deliberately set fires for hunting and clearing (Day, 1953).

The first European settlement in the area was in 1710 and came only as far north as Ft. Ann. Only after the American Revolution were settlements made north along the shores of Lake George and to the west and northwest. In 1790 in all present day Warren County the population was only 1080. It may be recalled that the Dutch had established a settlement at Fort Nassau (present day Albany) nearly two centuries earlier in 1614 only 50 miles to the south!

With settlement came all that is characteristic to the despoliation of the land and water common even to the earliest arrival of the Europeans. Educated accounts of the early American settlers were not often favorable in terms of their misuse of the environment. Timothy Dwight, President of Yale College, wrote extensively of his travels to Lake George. Approaching the lake from Glens Falls in 1802, he wrote:

"The road was indifferent; being alternately encumbered with sand and stones; and the settlements are few, recent and very unpromising."

In 1750 Kahn noted at length the often ruthless attack upon nature by the settlers in lower New York. We can only surmise early settlers at Lake George treated their environment any better.

"All the old Swedes and Englishmen born in America whom I ever questioned asserted that there were not nearly so many edible birds at present as there used to be when they were children, and that their decrease was visible. About sixty or seventy years ago, a single person could kill eighty ducks in a morning; but at present you frequently waited in vain for a single one. The wild turkeys, partridges and hazelhens, were [once] seen in large flocks in the woods.

"The cause of this diminution is not difficult to find. Before the arrival of the Europeans, the country was uncultivated and full of great forests. Now the woods are cut down. The people, increasing in this country, have by hunting and shooting in

part extirpated the birds, in part frightened them away. In spring the people still steal eggs, mothers and young indifferently, because no regulations are made to the contrary. And if any had been made, the spirit of freedom which prevails in the country would not suffer them to be obeyed.

"Aged people had experienced with the fish the same conditions which I have just mentioned in regard to birds. In their youth, the bays, rivers and brooks, had such quantities of fish that at one draught in the morning they caught as many as a horse was able to carry home. But at present things are greatly altered, and they often work in vain all night long with their fishing tackle. The causes of this decrease of fish are partly the same as those of the diminution in the number of birds. They are of late caught by a greater variety of contrivances, and in different manners than before. Many old people said that the difference in the quantity of fish in their youth in comparison with that of today was as great as between day and night.

At Lake George in 1848 Charles Lanham wrote:

"The days of trout-fishing in Lake Horicon are nearly at an end. A few years ago it bounded in salmon-trout, which were frequently caught weighing twenty pounds, but their average weight at the present is not more than a pound and a half, and they are scarce even at that... The cause of the great decrease in the large trout of this lake is this-- in the autumn, when they have sought the shores for the purpose of spawning, the neighboring barbarians have been accustomed to spear them by torch-light; and if the heartless business does not soon cease, the result will be, that in a few years they will be extinct."

Certainly wildlife was a major staple in the diets of the settlers. Dwight observed in 1802 that a hunter's take of deer at Lake George would amount to 20-30/year. So without moderation, without regulation, without concern the wildlife virtually disappeared from the forests and from the water.

Initially forests were cut to provide space as well as wood for houses and barns. Subsistence crops were raised on cleared land.

Pastures and shrubland grazed by cattle and sheep often occupied a much larger area than croplands and consumed some of the steeper shoreline such as the slopes of Tongue Mt.

The Impact of Industry on Lake George

Long before any permanent settlement the Lake George basin was rich animal hunting grounds - beaver, bear, otter and so on. The extensive fur trade carried on with Mohawk and Algonquin Indians by the Dutch, French and English traders was lucrative. The systematic eradication of wildlife was extreme. By the early 1800's logging, fishing and mining were well established commercial enterprises.

Initially hemlock was selectively cut to provide bark for the numerous tanneries in the region. Later white pine and spruce and a variety of hardwoods were logged extensively for building lumber. Still later pulp wood was cut from the slopes around the lake to supply a growing paper industry first at Glens Falls and then at Ticonderoga. Through the early 1800's lumbering was the main commercial activity. Ultimately the Adirondack forests including those of Lake George were exhausted and often reduced to bare eroded areas. Mining activity - iron, titanium and graphite - occurred in the Lake George basin but probably has had a minor impact upon the ecology of the lake. A commercial fishery was located at Lake George Village at the turn of this century.

From early settlement days the natural beauty of the region attracted visitors by stagecoach traveling mainly by the military trails. Hospitality was provided by the numerous inns and boarding houses. It has been said the natives of this region lived upon fish and strangers (Van de Water, 1946). The influx of vacationers increased with the coming of the railroad to Glens Falls in 1869 and to Lake George in 1882. Resort hotels flourished. Steamboats traveled the lake in ever-increasing numbers, stopping at all the larger islands. In this century tourism and recreation continue to be the major industry having a significant effect on the ecology of the lake.

The Lake George Aqueduct Scheme

The summers of 1876, 1877 and 1880 brought New York City dangerously close to a water famine. The possibility of the recurrence of such dangers, threatening the city at frequent intervals brought about the organization of the New York and Hudson Aqueduct Company for the express purpose of utilizing Lake George as the water supply for "the Metropolis of America". A civil engineer J.T. Fanning (1881) proposed to flow the waters of Lake George through a 225 mile canal system which would have an effective head above tide-water of from

180 to 200 ft. as it flowed into Manhattan. The waters were to be led out of the lake through a short tunnel at the head of Dunham's Bay. He proposed as well to divert a portion of the waters of the mountain lakes and tributaries of the Upper Hudson directly into Lake George as a reinforcing supply. The justification for the ambitiousness of this Victorian enterprise appeared self-evident upon the discovery of a gorge through the Queensbury Ridge by which he could connect the two watersheds.

"This discovery, in the enthusiasm of the moment, appeared of the most momentous interest, for here God in his all wise and provident plans seemed to have moulded the mountain and the plain and the lake in anticipation of the special necessity, not only of the great metropolitan city, but of the vast population now gathered and gathering in the several cities of the harbor and the Lower Hudson Valley, and here He had provided for them all an ample water supply."

The scheme was estimated to supply an average of 1500 million gallons of water per day to New York. Fortunately, ecologically speaking and for reasons I have not investigated, the project never went beyond Fanning's report.

Environmental Awareness and Preservation

In the mid to late 1800's with the decline of the lumber and mining industries in the Adirondacks, the State began to make major land purchases which included much of the water shed land around Lake George as well as many of the islands. The establishment of the Adirondack Forest Preserve in 1885 ultimately brought to the region sound ecological forest and lake management. Section 8 of the law reads as follows: "The lands now or hereafter constituting the forest preserve shall be forever kept as wild forest lands. They shall not be sold, nor shall they be leased or taken by any corporation, public or private." The creation of the Forest Preserve marked the real beginning of the conservation movement in the nation. It was not until 1891 that the National Forests were established (Brown, 1963). The Adirondack Park was established in 1892. For the first time since the arrival of the original settlers, wildlife and environmental regulation and protection became a worthy American endeavor. The Lake George Association composed of and representing area property owners was organized in 1885 and has become one of the oldest and largest groups of its kind. From its inception, the LGA has lobbied for state and local legislation which would preserve the lake and its ecology.

The State Biological Surveys

During the early years after 1900 fishing conditions in the lake began to deteriorate and at least 13 species of fish had to be planted in the lake - some in large numbers (Needham et al., 1922). Even in light of special State legislation to protect the fishes of Lake George, fish populations continued to decline especially with reference to the lake trout.

In 1920 the State Legislature appropriated \$2000 and authorized the Conservation Commission to make a biological survey of the waters of Lake George to determine the most practical method of increasing fish production. James G. Needham of Cornell directed the investigations through the summer season of 1920 assisted by Chancey Juday, a leading limnologist from Wisconsin, Emmeline Moore an aquatic botanist, and Charles Sibley a fish culturist, both from the Conservation Commission.

The biological survey of 1920 was probably the first and most comprehensive of its kind, embodying many angles of scientific investigation. It was one of the first applications of the whole ecosystem approach to freshwater studies. The quality of this investigation of aquatic ecosystem function led to the establishment of the State Conservation Fund in 1926. Systematically on a yearly basis other inland lake and river watersheds were studied in detail. During the summer of 1929 a biological survey of the Champlain watershed of which Lake George is a part was undertaken. The appropriation had grown to \$50000 and a staff of 30 scientists.

Current Directions of Scientific Research at Lake George

NYSDEC and the Bureau of Fisheries have maintained a continued research interest in Lake George since the 1920's. A major discovery of worldwide implication by DEC at L. George in the 1950's was the first scientific data showing the accumulation of DDT in fish and its adverse effect on fish reproduction. The Department of Education through the State Science Service and the Department of Health also have had an active research interest in the lake in recent years. The continued research presence by the State at Lake George through investigators from the NYSDH, NYSDEC and the State Science Service reaffirms the State's dedication to maintaining this exquisite natural environment.

In 1967 the Lake George Water Research Center was organized at Rensselaer Polytechnic Institute. Now known as the Rensselaer Fresh Water Institute (FWI), it provides a field station laboratory at Smith Bay on the northeast side of the lake not only for investigators directly associated with RPI but for those from other colleges and universities as well. During the early 1970's funding for the U.S. International Biological Program (IBP) by the National Science Foundation moved Lake George into national ecological awareness

when it was chosen as a study site within the Eastern Deciduous Forest Biome. Under this intensive national program the country was divided into several natural ecological groupings based on vegetation patterns (biomes). Research direction for IBP ecosystem analysis at Lake George for investigating biological and chemical relationships at the land - water interface came from the FWI. The Fresh Water Institute has continued to grow as a research and educational multidisciplinary research center dedicated to better understanding of the structure and function of ecosystems within the aquatic, terrestrial and atmospheric environment.

Lake George has been a prized natural study site for nearly a century. The magnitude of current scientific interest in Lake George is evident in the number of original research articles in this book.

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