



Division of Fish and Wildlife

**Final Generic Environmental Impact
Statement on the New York State
Department of Environmental
Conservation Program of Liming
Selected Acidified Waters**

October, 1990

FINAL GENERIC
ENVIRONMENTAL IMPACT STATEMENT
ON THE
NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
PROGRAM OF LIMING
SELECTED ACIDIFIED WATERS

Required Under: State Environmental Quality Review Act of
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SUMMARY

This Final Environmental Impact Statement presents information relating to the New York State Department of Environmental Conservation (DEC) program of liming selected acidified waters. A Draft Environmental Impact Statement was published in September 1988, and numerous comments were received from a number of organizations and individuals. These comments and the DEC responses are included as appendices in this FEIS. A number of changes and additions were made in this FEIS as a result of these public comments.

Liming consists of applying agricultural limestone to the waters of acidified lakes or ponds for the purpose of neutralizing the acidity and creating water quality favorable for the survival of fish and other aquatic life. The DEC began neutralizing certain acidic waters in 1959, and the practice is a recognized management tool used to help restore or protect valuable fish communities. This document includes a discussion of the factors important to the liming program, the beneficial and adverse impacts associated with liming, and a proposed revision to the DEC policy which would improve the effectiveness of the program.

This generic environmental impact statement has been prepared in compliance with the State Environmental Quality Review Act and applies to the DEC program of liming selected acidified waters. Following the release of this document a brief Findings Statement will also be released, and a revised DEC liming policy will be implemented. The result of this action will be that any new waters planned for liming by the DEC must meet the revised candidate selection criteria outlined in the policy, all waters in the program will be monitored for water chemistry changes on a yearly basis, and reliming of waters in the program will be scheduled when needed. The DEC will be committed to the long-term management of these waters until air pollution controls become effective and acidic deposition levels decrease.

Liming is viewed by the DEC primarily as a fisheries management tool for use in certain acidified waters, but liming is not viewed as a solution to the problem of acidic deposition ("acid rain"). Many valuable waters in New York State have become acidified, and many fish communities have been lost as a result of acidic deposition. The most desirable solution is to control the source of the problem - excessive emissions of sulfur dioxide and nitrogen oxides. New York State has taken the lead in reducing its emissions of sulfur dioxide, and it is imperative that other states take similar action to solve the problem. Strong and effective federal legislation is needed to insure that emissions of these acidic deposition precursors are controlled in a fair and equitable manner.

Although the first DEC liming projects were mainly conducted in dark water bog ponds using primarily hydrated lime, the program has evolved, and projects now are limited to waters impacted by acidic deposition. The neutralizing material used is agricultural limestone. The DEC liming program currently includes 32 waters, all of which are located within the Adirondack Park. Implementation of the Adirondack

Brook Trout Restoration and Enhancement Program will increase the number of waters in the liming program to a total of 50 waters. Other waters both inside and outside of the Adirondacks have become acidified and may also be considered as viable liming candidates. While this proposed revision of the DEC liming policy will expand the program to a limited degree; it is primarily intended to refine and improve the program. This has been made possible by the completion of several important liming research projects and the completion of an extensive survey of Adirondack waters.

Under the revised policy a number of guidelines and criteria are explained which will insure that the program is carried out properly on waters expected to exhibit favorable results. Naturally highly acidic waters will not be included in the program, nor will waters which do not exhibit dissolved oxygen and temperature levels suitable for fish life. Candidate waters must have a summer surface air equilibrated pH of 5.7 or less (or an acid neutralizing capacity (ANC) of 20 $\mu\text{eq/l}$ or less) and a hydraulic flushing rate of less than two times per year. Finally candidate waters must either have a historic record of an important fishery; must be a broodstock water for a unique strain or species of fish; or must represent a seriously degraded aquatic ecosystem where restoration of the ecosystem is the primary objective. Retreatment of waters in the liming program will be based on annual water sample analysis and will be scheduled as soon as possible after the summer surface pH decreases to 6.0 (or an ANC of 25 $\mu\text{eq/l}$).

All liming projects in the Adirondacks will be carried out according to the guidelines of the Adirondack Park State Land Master Plan and Unit Management Plans. Liming projects conducted in wilderness or primitive areas will be with the primary objective of perpetuating natural aquatic ecosystems, including perpetuation of indigenous fish species on a self sustaining basis. These projects will be carried out during low public use times of the year to minimize the impacts of intrusion into these wilderness areas.

Beneficial Impacts

The primary objective of lake liming projects is to improve water quality to allow survival of important fish populations in ponds impacted by acidic deposition. There are many beneficial impacts associated with improving the water quality, the main benefit being that fish survival is clearly improved as a result of liming. The beneficial impacts also include the restoration of a habitat suitable for a great diversity of other aquatic life ranging from mayflies to otters. Acid sensitive organisms which had become eliminated or very scarce because of acidification can then become reestablished. The presence of fish in a lake benefit fish eating wildlife such as osprey, loons, eagles, and mink.

When waters which contain unique strains of fish (eg. heritage strains of brook trout) are threatened by acidification, liming can prevent loss of these fish. In this type of maintenance liming the benefits are derived from the protection of valuable strains of fish.

Maintenance of satisfactory, non-toxic water quality is imperative for the survival of fish in both restoration and protective liming projects. Liming results in decreased acidity, and, consequently, decreased levels of toxic aluminum in the water.

Favorable cost/benefit ratios and other societal benefits allow the department to produce the beneficial impacts of liming acidified waters. The restoration of fish communities to previously acidic lakes benefits fishermen, naturalists, and the local community. The value of wilderness waters is increased because of the restoration of a more natural biological community, and accessible waters increase in value because of the establishment of viable sport fisheries.

Adverse Impacts

The liming of acidic waters would be expected to have certain adverse impacts on animals and plants which are tolerant of the acidic conditions. These acid tolerant species are also present in many circumneutral ponds. Certain species of filamentous algae, Sphagnum mosses, bladderwort, sundew, dragonfly larvae, and water boatmen among others are known to become very abundant in acidic ponds which are too toxic for fish life. The liming of such waters may make the environment less favorable for certain acid tolerant species of plants, and the stocking of fish may reduce the abundance of certain aquatic insects because the fish feed on these organisms. The liming of acidified waters would also be expected to reduce the water clarity as viable plankton populations again become established. Reductions in water clarity may have some negative ecological or esthetic impacts but may also re-establish a dimictic temperature regime in the lake, because solar heating will be more restricted to surface waters. Fluctuations in water chemistry would also be expected to be greater in a limed pond than in a pond which is always acidic, and liming may not protect the aquatic system from the impacts of acidic episodes.

Special concerns about the DEC liming program include the possibility that liming projects may draw attention away from programs or legislation designed to reduce acidic deposition. Although the DEC does not consider liming to be a solution to the acid rain problem, media coverage of liming projects may present that impression.

The increased recreational use of the resource following liming may also be considered an adverse impact because of the possible increases in littering and trail erosion. The use of snowmobiles, helicopters, or motor boats during application of lime may also be viewed as an adverse impact in forest preserve lands.

Alternatives

A number of alternatives to the proposed liming program are discussed in this final EIS. The control of acidic deposition-causing emissions is discussed as an alternative, but in reality the DEC is already doing all within its power to push for strong emissions controls. New York State passed an acid deposition control act in 1984 and is advocating that the federal government pass similar

legislation. Selecting this alternative instead of the proposed program would therefore merely mean eliminating the liming program, with loss of potential for protection and restoration of the resource in the interim. Eliminating the program is discussed as an alternative but would have significant adverse impacts as the waters currently in the program reacidified and aquatic communities were degraded. The management and maintenance of public fisheries in currently limed waters are responsibilities of DEC and would be adversely affected.

Liming all acidified waters is not considered a viable alternative, because many acidic waters would not be expected to respond favorably to liming. Many acidic waters have high flushing rates, and others are naturally acidic ponds which need to be maintained and protected.

Other alternatives considered unacceptable are to lime only waters critical to the survival of unique strains of fish, only waters critical to the survival of threatened or endangered fish, or only waters with a potential for a high use fishery. The proposed program includes provisions for each of these situations and provides a better overall approach than to unnecessarily restrict the program to one category. Other alternatives are combinations of these categories and also are considered as less effective and less desirable than the proposed program.

Two other alternatives are currently active areas of research. Genetically selecting and stocking strains of fish which are more resistant to acid has been done by the DEC and Cornell University researchers, and hybrid brook trout which are more acid resistant are currently being stocked in many Adirondack ponds and lakes. Cornell University is continuing its research efforts to genetically select more resistant fish, but many acidified waters are still too acidic for fish survival. Research on watershed liming will be conducted as part of the Lake Acidification Mitigation Project. The impacts and effects of liming the whole ecosystem on the pond's water chemistry, terrestrial vegetation, and soil biota must be assessed before this can be considered a viable alternative.