

CONTROLLING STORMWATER RUNOFF TO MINIMIZE NUTRIENT LOADING INTO QUEECHY LAKE

By Luke Legere
New England School of Law Environmental Advocacy Project
2004

INTRODUCTION

Queechy Lake is a 135 acre body of water located in [Canaan, New York](#). The lake has an average depth of 19 feet, with a maximum depth of 45 feet. Queechy Lake Road is a paved road bordering the western shore of the lake. Roughly 23 residences, a restaurant, and a motel are located along this road. The motel and the majority of the residences lie above and to the west of the road. Two homes and the restaurant sit directly on the lake's western shore. The [Berkshire Farm Center and Services For Youth](#), a non-profit organization which works with "at-risk" youths, occupies 1,700 acres along the north and eastern shorelines, constituting a mile of the lake's shore, or one-third of the total shoreline. The [State of New York operates a public boat launch](#) adjacent to the property, with access limited to car-top boats. Boats requiring trailers may only be launched with permission from lakeshore owners with boat ramps. The remainder of lakefront property is occupied by residences controlled by private landowners. Only a handful of homeowners live on the lake year-round.

MAJOR THREATS TO QUEECHY LAKE'S WATER QUALITY

The major contributors to the deterioration of Queechy Lake's water quality are uncontrolled runoff and problems relating to poor maintenance of septic systems.¹ Presently, the greatest threat to the lake's water quality comes from excess nutrient loading, particularly phosphorous loading.² A major source of phosphorous loading is stormwater runoff that drains into Queechy, carrying silt from watershed erosion into the

lake.³ Nutrient loading, which increases nutrient levels in the lake, increases the probability that [alien strains of aquatic plant life](#) will thrive in Queechey's waters.⁴

A BRIEF HISTORY OF NUTRIENT LOADING IN QUEECHY

European settlers colonized the area beginning in the 1750's, and within 100 years old-growth forests in the region had been harvested for timber and charcoal, clearing the land for agriculture.⁵ Deforestation and agriculture ultimately caused erosion and greater amounts of runoff, increasing nutrient loading into the lake.⁶ Today, runoff is especially common from roadways, hills cleared of vegetation, and construction sites. Septic systems contribute coliform contamination and household water products which contain phosphorous.⁷ Finally, "internal nutrient loading" can occur when phosphorous rises up from sediments on the lake's bottom, although it is unclear to what extent this may be a factor in Queechey Lake.⁸

SOURCES OF RUNOFF

Queechey lake receives runoff from three catchments, meaning areas of land which drain water into the lake. The northern and southern catchments have steep slopes and drain roughly half of the total catchment area into wetlands near the lake's shore.⁹ The other half of the total catchment area drains directly into the lake.¹⁰ The land on the northern and eastern shorelines accounts for approximately 43 percent of Queechey Lake's watershed, but runoff from this land has a very low impact on the lake due to the fact that the vast majority of the property remains undeveloped.¹¹

AREAS OF CONCERN IDENTIFIED BY LAKE USERS

As part of Queechey Lake's participation in the [Citizens' Statewide Lake Assessment Program \(CSLAP\)](#), surveys of lake-users are conducted periodically. CSLAP

is a cooperative effort between the [New York State Department of Environmental Conservation \(NYSDEC\)](#) and the not-for-profit [New York State Federation of Lake Associations, Inc. \(NYSFOLA\)](#). Alien forms of aquatic plants and recreational use of the lake are the issues most often cited by surveyed lake users.¹² About half of the respondents surveyed noted a perceived deterioration in water quality within the past 25 years.¹³

EURASIAN WATER-MILFOIL

The only significant environmental problem identified in the surveys was the proliferation of alien strains of aquatic weeds, which was considered to be a minor problem by 62 percent of respondents, a major problem by 26 percent, and no problem by 11 percent.¹⁴ Specifically, there has been an explosion of [Eurasian water-milfoil](#) in Queechy Lake over the past decade. Eurasian milfoil is an invasive species that flourishes in high nutrient lakes, growing very near to the lake's surface and creating a canopy which can screen native vegetation from the sunlight.¹⁵ It can impair the ability of certain fish species to spawn, impair recreational activities, increase sedimentation rates, and decrease oxygen levels in deeper waters.¹⁶ Once the weed is well-established in a water body, it becomes difficult or impossible to remove.¹⁷

Respondents were not in favor of using chemical treatments to control weed growth¹⁸, although there has been a history of some success using fluridone in lakes similar in size to Queechy.¹⁹ A potential biological remedy is to introduce a native North American weevil which feeds and reproduces on Eurasian milfoil, although it may feed on native aquatic plants as well.²⁰ This method was not included as an option in the

survey.²¹ According to survey respondents, the preferred methods of controlling these weeds are mechanical harvesting and prevention of nutrient loading.²²

PREFERRED STRATEGIES TO PREVENT NUTRIENT LOADING

Strategies to prevent nutrient loading that appealed to those surveyed included septic tank pumping, restricted fertilizer use, and greater restrictions on public access to the lake.²³ Educating homeowners and modernizing septic tanks can dramatically improve nutrient loading from septic systems and fertilizers.²⁴ However, the most effective means of nutrient loading prevention is to treat stormwater runoff before it enters the lake.²⁵ Stormwater runoff is the major culprit behind nutrient loading, and must be addressed if the problems presented by alien weeds and deteriorating water quality are to be corrected.²⁶ Specifically, Eurasian water-milfoil is much less likely to thrive in a low nutrient environment.²⁷

STUDYING POLLUTANTS INTRODUCED BY RUNOFF

The Queechy Lake Club recently commissioned a study of Queechy's waters in order to identify pollutants in stormwater that may be contributing to the growth of weeds and diminishing the lake's water quality.²⁸ The objective of the study was to identify potential water quality treatment devices which can be installed to reduce the stormwater pollutant loading into the lake.²⁹ The study confirmed that the major contributors to the lake's pollution come from sedimentation and phosphorous in stormwater runoff that drains into the lake, mainly from Queechy Lake Road.³⁰ Runoff begins on the steep hillside to the west of the lake, and runs down toward Queechy Lake Road where it is captured by roadside ditches.³¹ Runoff then drains into catch basins located along the west side of the road, through culverts under the road and directly into the lake.³²

POTENTIAL METHODS FOR TREATING STORMWATER

[New York State's Stormwater Management Design Manual](#) provides techniques for treating stormwater runoff which are intended to capture and treat 90% of the average annual stormwater runoff volume. Due to the fact that this water directly introduces pollutants into the lake, significant improvements in water quality can result from treatment of this amount of stormwater.³³ One approach focuses on installing treatment devices along the western edge of the road. The most effective treatment devices provide settling and filtration of the stormwater through sand or an organic medium.³⁴ These devices collect runoff, filter it down through sand, collect it at the bottom of the sand filter and direct the filtered water to the catch basins from which the water enters the lake.³⁵ This type of treatment is relatively uncomplicated and inexpensive, particularly because maintenance is simple.³⁶ However, a [legal conflict](#) may exist if the installation of the treatment devices will cross private property.

Another type of treatment system has been suggested for the northern end of Queechy Lake Road. This is a low area adjacent to the road which has been identified as a candidate for development as a wetland based runoff treatment system.³⁷ Wetlands are recognized as having a large capacity for treating stormwater, and thus may have the potential to treat runoff originating from the northern end of the lake's western border.³⁸ The development of wetland areas also creates a potential [legal problem](#).

LEGAL LIMITATIONS AND CONCERNS REGARDING REMEDIES

The most detrimental contributor to Queechy Lake's water quality is stormwater runoff from the western shore of the lake. Nutrient loading from stormwater runoff encourages the spread of alien strains of aquatic plant life. The most effective means of

treating the deterioration of water quality in the lake is to limit the volume of nutrient loading into the water through treatment of stormwater runoff. While legitimate means of reducing the levels of nutrients (particularly phosphorous) entering the lake do exist, potential legal problems may arise in implementing them.

It seems that any infringement upon private property, or the use of that property, would be temporary and concern only a minor portion of the total property, and thus not constitute a [taking under the Fifth Amendment](#). However, liability has been found for a temporary restriction on property use caused by an unconstitutional regulation.³⁹ It is difficult to predict how a court would react to a potential infringement upon a landowner's ability to use her land without having a concrete idea of the extent and nature of the encroachment.

Regarding the wetland based runoff treatment system detailed above, the [U.S. Army Corps of Engineers](#) ("Corps") has jurisdiction over areas classified as protected wetlands under the Clean Water Act (CWA).⁴⁰ The CWA also requires application to the Corps for a permit to fill or develop federally regulated wetlands.⁴¹ While the Corps would likely be able to assert jurisdiction over Queechy Lake's northern wetlands, it is also difficult to determine whether it would issue a permit for treating stormwater. Although the permit would only seek development of the wetland only for use as a filter for the lake, it is unclear what the short or long term impacts of such use would be on the wetland. Without more information, it is difficult to ascertain what decision the Corps would reach.

NEW YORK STATE'S POLICE POWER

New York state law provides that “property shall be acquired by exercise of the power of eminent domain in New York state ... for public use as well as the legitimate interests of private property owners, local communities and the quality of the environment... .”⁴² Therefore, an action taken to protect the quality of Queechey Lake’s water would fall squarely within New York’s state police power. To the extent that property owners may suffer financial loss, state law also exists “to assure that just compensation shall be paid to those persons whose property rights are acquired by the exercise of the power of eminent domain.”⁴³

FIFTH AMENDMENT ISSUES WITH RESPECT TO LANDOWNERS’ RIGHTS

Installing treatment devices in the area along the western edge of the road will not pose significant legal barriers so long as the devices are located between the edge of the road and any property line. However, if installation of this treatment system were to infringe upon the property of adjacent landowners, a potential legal problem may arise. The Fifth Amendment to the U.S. Constitution includes the takings clause, which requires “just compensation” for private property taken for public use.⁴⁴ Although the Fifth Amendment applies strictly to the federal government, the Fourteenth Amendment’s due process clause creates a similar requirement for state governments.

CATEGORICAL TAKINGS

The U.S. Supreme Court has recognized two “categories” of state action that require compensation “without a case-specific inquiry advanced in support of the restraint.”⁴⁵ These categorical takings occur where the government physically invades property, and where the government enforces a regulation that has the effect of denying

“all economically beneficial or productive use of land.”⁴⁶ Assuming that any interference with property rights of landowners along Queechy Lake Road would be temporary and pertain to only a small portion of their total property, it is unlikely that a court would consider such infringement to be a categorical taking. The Supreme Court has noted that the categorical takings established in *Lucas* are only meant to apply to “extraordinary” instances.⁴⁷

However, it is difficult to predict with certainty that a categorical taking would not be found because the Supreme Court has resisted establishing a “‘set formula’ for determining when ‘justice and fairness’ require that economic injuries caused by public action be compensated by the government.”⁴⁸ The fact that only a small portion of the property owners’ land would be affected is not determinative, because in deciding whether a government action constitutes a taking the Supreme Court has refused to “divide a single parcel into discrete segments.”⁴⁹ Rather, courts consider “the character of the action and ... the nature and extent of the interference with rights in the parcel as a whole.”⁵⁰ Furthermore, the Supreme Court has ruled that temporary takings may constitute a taking.⁵¹ Therefore, although it is unlikely, the possibility does exist that a partial, temporary infringement on property rights will be considered a physical invasion and thus constitute a categorical taking requiring compensation to property owners.

CASE-BY-CASE TAKINGS ANALYSIS

Where property has not been completely devalued, courts will require a case-by-case analysis to determine whether a taking has occurred.⁵² In *Penn Central Transportation Co. v. New York*,⁵³ the Supreme Court established the relevant questions to be answered in determining whether a taking has occurred on a case-by-case basis.

The issues to be addressed are whether the state action was legitimate, the extent to which it has interfered with the landowner's reasonable investment-backed expectations, and whether the state invaded the property or was simply adjusting the burdens and benefits of economic life to promote the common good.⁵⁴

Applying these questions to the hypothetical situation at hand, it seems that an action to protect and improve the water quality of Queechey Lake would be considered a legitimate state action. As mentioned above, it is difficult to imagine that the installation of stormwater treatment devices along the borders of private property would constitute any substantial interference with the investment-backed expectations of landowners. Finally, any burdens would most likely be minor, and would most likely be considered a reasonable adjustment of burdens to promote the common good created by a cleaner lake.

FEDERAL REGULATION OF PROTECTED WETLANDS

The CWA requires application to the Army Corps of Engineers for a permit to fill or develop federally regulated wetlands.⁵⁵ This permit process is a contested issue, with opponents arguing that wetlands are one of many factors to affect the water system, and that allowing the Corps to regulate them creates a slippery slope of permitting federal regulations. Despite these concerns, the Corps has conducted public interest reviews of permit applications for development of wetlands since 1968.⁵⁶ These reviews take into account environmental as well as conservation elements in addition to impacts upon navigational concerns.⁵⁷

Those who support the Corps' permit process maintain that their opponents' view is too narrow, and that wetlands are an integral part of the water system. They point out that wetlands gather and dilute contamination before it enters the water system. In

Canaan, the status of the wetlands located at Queechey's north-western shore is currently unknown. Therefore, the Corps would be required to make a determination as to whether the wetlands fall within its jurisdiction before any action could be taken to use the wetlands to treat stormwater.

¹ *Queechey Lake Management Plan*, Prepared by the Queechey Lake Club (July 2000).

² *Queechey Lake Management Plan*, Prepared by the Queechey Lake Club (July 2000).

³ *Queechey Lake Stormwater Improvements*, Prepared by Clark Engineering & Surveying, P.C. for the Queechey Lake Club, December 16, 2003.

⁴ *Invasive Species Fact Sheet*, Prepared by Ann F. Rhoads and Timothy A. Block, available at <http://www.paflora.org/Myriophyllum%20spicatum.pdf>

⁵ *The State of Queechey Lake Report*, Prepared by Paul T. Gremillion, Civil Engineering Dept., Union College (October 1999).

⁶ *The State of Queechey Lake Report*, Prepared by Paul T. Gremillion, Civil Engineering Dept., Union College (October 1999).

⁷ *The State of Queechey Lake Report*, Prepared by Paul T. Gremillion, Civil Engineering Dept., Union College (October 1999).

⁸ *The State of Queechey Lake Report*, Prepared by Paul T. Gremillion, Civil Engineering Dept., Union College (October 1999).

⁹ *The State of Queechey Lake Report*, Prepared by Paul T. Gremillion, Civil Engineering Dept., Union College (October 1999).

¹⁰ *Queechey Lake Stormwater Improvements*, Prepared by Clark Engineering & Surveying, P.C. for the Queechey Lake Club, December 16, 2003.

¹¹ *The State of Queechey Lake Report*, Prepared by Paul T. Gremillion, Civil Engineering Dept., Union College (October 1999).

¹² *2001 CSLAP Annual Report*, Prepared by NYSFOLA and NYSDEC (April 2002).

¹³ *2001 CSLAP Annual Report*, Prepared by NYSFOLA and NYSDEC (April 2002).

¹⁴ *2001 CSLAP Annual Report*, Prepared by NYSFOLA and NYSDEC (April 2002).

¹⁵ *Invasive Species Fact Sheet*, Prepared by Ann F. Rhoads and Timothy A. Block, available at <http://www.paflora.org/Myriophyllum%20spicatum.pdf>

¹⁶ *Invasive Species Fact Sheet*, Prepared by Ann F. Rhoads and Timothy A. Block, available at <http://www.paflora.org/Myriophyllum%20spicatum.pdf>

¹⁷ *Invasive Species Fact Sheet*, Prepared by Ann F. Rhoads and Timothy A. Block, available at <http://www.paflora.org/Myriophyllum%20spicatum.pdf>

¹⁸ *Queechey Lake Management Plan*, Prepared by the Queechey Lake Club (July 2000).

¹⁹ *Invasive Species Fact Sheet*, Prepared by Ann F. Rhoads and Timothy A. Block, available at <http://www.paflora.org/Myriophyllum%20spicatum.pdf>

²⁰ *Invasive Species Fact Sheet*, Prepared by Ann F. Rhoads and Timothy A. Block, available at <http://www.paflora.org/Myriophyllum%20spicatum.pdf>

²¹ *Queechey Lake Management Plan*, Prepared by the Queechey Lake Club (July 2000).

²² *Queechey Lake Management Plan*, Prepared by the Queechey Lake Club (July 2000).

²³ *The State of Queechey Lake Report*, Prepared by Paul T. Gremillion, Civil Engineering Dept., Union College (October 1999).

-
- ²⁴ *The State of Queechey Lake Report*, Prepared by Paul T. Gremillion, Civil Engineering Dept., Union College (October 1999).
- ²⁵ *Queechey Lake Stormwater Improvements*, Prepared by Clark Engineering & Surveying, P.C. for the Queechey Lake Club, December 16, 2003.
- ²⁶ *Queechey Lake Stormwater Improvements*, Prepared by Clark Engineering & Surveying, P.C. for the Queechey Lake Club, December 16, 2003.
- ²⁷ *Invasive Species Fact Sheet*, Prepared by Ann F. Rhoads and Timothy A. Block, available at <http://www.paflora.org/Myriophyllum%20spicatum.pdf>
- ²⁸ *Queechey Lake Stormwater Improvements*, Prepared by Clark Engineering & Surveying, P.C. for the Queechey Lake Club, December 16, 2003.
- ²⁹ *Queechey Lake Stormwater Improvements*, Prepared by Clark Engineering & Surveying, P.C. for the Queechey Lake Club, December 16, 2003.
- ³⁰ *Queechey Lake Stormwater Improvements*, Prepared by Clark Engineering & Surveying, P.C. for the Queechey Lake Club, December 16, 2003.
- ³¹ *Queechey Lake Stormwater Improvements*, Prepared by Clark Engineering & Surveying, P.C. for the Queechey Lake Club, December 16, 2003.
- ³² *Queechey Lake Stormwater Improvements*, Prepared by Clark Engineering & Surveying, P.C. for the Queechey Lake Club, December 16, 2003.
- ³³ *Queechey Lake Stormwater Improvements*, Prepared by Clark Engineering & Surveying, P.C. for the Queechey Lake Club, December 16, 2003.
- ³⁴ *Queechey Lake Stormwater Improvements*, Prepared by Clark Engineering & Surveying, P.C. for the Queechey Lake Club, December 16, 2003.
- ³⁵ *Queechey Lake Stormwater Improvements*, Prepared by Clark Engineering & Surveying, P.C. for the Queechey Lake Club, December 16, 2003.
- ³⁶ *Queechey Lake Stormwater Improvements*, Prepared by Clark Engineering & Surveying, P.C. for the Queechey Lake Club, December 16, 2003.
- ³⁷ *Queechey Lake Stormwater Improvements*, Prepared by Clark Engineering & Surveying, P.C. for the Queechey Lake Club, December 16, 2003.
- ³⁸ *Queechey Lake Stormwater Improvements*, Prepared by Clark Engineering & Surveying, P.C. for the Queechey Lake Club, December 16, 2003.
- ³⁹ See *First English Evangelical Lutheran Church v. Los Angeles County*, 482 U.S. 304 (1987); See also *Tahoe-Sierra Preserv. Coun. v. Tahoe Regionl Planning Agcy.*, 535 U.S. 302, 330 (2002).
- ⁴⁰ 33 U.S.C. § 1344.
- ⁴¹ 33 U.S.C. § 1344.
- ⁴² N.Y. EDPL § 101 (2003).
- ⁴³ N.Y. EDPL § 101 (2003).
- ⁴⁴ U.S. CONST. amend. V.
- ⁴⁵ *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 1015 (1992).
- ⁴⁶ *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 1015 (1992).
- ⁴⁷ *Tahoe-Sierra Preserv. Coun. v. Tahoe Regionl Planning Agcy.*, 535 U.S. 302, 330 (2002).
- ⁴⁸ *Tahoe-Sierra Preserv. Coun. v. Tahoe Regionl Planning Agcy.*, 535 U.S. 302, 336 (2002).
- ⁴⁹ *Tahoe-Sierra Preserv. Coun. v. Tahoe Regionl Planning Agcy.*, 535 U.S. 302, 336 (2002).

⁵⁰ *Tahoe-Sierra Preserv. Coun. v. Tahoe Regional Planning Agcy.*, 535 U.S. 302, 327 (2002).

⁵¹ *Tahoe-Sierra Preserv. Coun. v. Tahoe Regional Planning Agcy.*, 535 U.S. 302, 337 (2002).

⁵² *Tahoe-Sierra Preserv. Coun. v. Tahoe Regional Planning Agcy.*, 535 U.S. 302, 330 (2002).

⁵³ *Penn Central Transportation Co. v. New York*, 438 U.S. 104 (1978).

⁵⁴ *Penn Central Transportation Co. v. New York*, 438 U.S. 104, 124 (1978).

⁵⁵ 33 U.S.C. § 1344.

⁵⁶ *Zabel v. Tabb*, 430 F.2d 199, 213-14 (5th Cir. 1970).

⁵⁷ *Zabel v. Tabb*, 430 F.2d 199, 213-14 (5th Cir. 1970).