

DRAFT  
**ACTION PLAN  
FOR PRESERVING  
CANDLEWOOD LAKE**

**SUPPLEMENT 2:**

**RECOMMENDATIONS  
FOR SHERMAN, CT  
APRIL, 2003**

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# INTRODUCTION

The Candlewood Lake Authority's (CLA) 2001 Economic Evaluation of Candlewood Lake estimated that Lake community related property values would fall by about 30% if the Lake were ever to become unsuitable for swimming or boating. By way of introduction, it is interesting to note that the five lakeside communities have been participating in several major strategies to prevent such a situation from ever occurring.

In 1999, at the cost of \$2,000,000 to power utility customers, a conservation restriction was purchased from NGC that prevents the lowering of Candlewood Lake's water level during a drought to a point where recreational boating would be negatively impacted. The present or future Lake owner must spend whatever amount is necessary to run the Rocky River pumps to prevent boating or lakeside recreation from being hurt.

Then in 2000 the CLA, Housatonic Valley Council of Elected Officials (HVCEO), Housatonic Valley Association and other area organizations become participants in the federal relicensing of Candlewood Lake. The basis of this process relates to the fact that as public waters are being used for private profit, the public is entitled to receive some benefit, essentially a small part of the profits.

The requests made by these groups to the Federal Energy Regulatory Commission focused primarily upon funding for preservation of both the Lake's aesthetics and water quality. FERC's decision as to the extent of benefit to grant is expected in 2003.

This current effort, a review of municipal regulations to insure protection of Lake water quality, follows the recent conservation restriction and FERC relicensing efforts as a major preservation strategy. It is just as important as them, if not more so.

Slightly impaired water quality, starting even a few percentage point decline in property values, is totally unacceptable to all parties. To avoid such a decline is a primary motive behind this and the other recent efforts.

To start the regulatory review process, during 2002 the CLA completed a research report entitled "Action Plan for Preserving Candlewood Lake." The scientific documentation in this large report was designed to serve as an exhibit during public hearings for upgrading water quality related local regulations around the Lake, in New Fairfield, Sherman, New Milford, Brookfield and Danbury.

This current report, "Supplement 2: Recommendations for Sherman, Connecticut", extends the larger base report by providing the specific regulatory recommendations, first for the watershed as a whole, then specifically for Sherman.

The Housatonic Valley Council's state mandated regional plan views Candlewood Lake as a potential future drinking water supply, thereby encouraging mechanisms to prevent water quality degradation.

One of the primary purposes of the Sherman Town Plan of Conservation and development and its land use and Health Code requirements is protection water quality and the need to avoid sewers in the Town. This plan which is specifically designed to the protect water quality in the Candlewood Lake watershed is consistent with these purposes.

It goes without saying that all who enjoy Candlewood wish to protect its recreational value and water quality. But according to the 2002 Action Plan, these assets will be diminished if the Lake continues with excessive invasive water plant and algae growth, and if development trends on adjacent land adversely impact water quality. The fact that local regulatory mechanisms are found lacking is not a question of placing blame, for the comprehensive look in the Action Plan is being made available to these communities only for the first time.

The municipal representatives to the Candlewood Lake Authority are not the only public guardians concerned with this issue. The Connecticut Department of Environmental Protection provided much of the funding for the preparation by CLA staff of the 2002 Action Plan.

Then the Housatonic Valley Council of Elected Officials provided much of the funding for the preparation of this Supplement, for which consultant planner Thomas A.J. McGowan, AICP of Litchfield, CT was engaged, he being a long

established expert on Connecticut planning and zoning and especially their relationship to water quality.

Will Candlewood Lake's water quality and clarity improve or continue to decline over the next ten years? The answer to this question rests primarily with the members of the local commissions in the five communities that make up the Lake's watershed; Brookfield, Danbury, New Fairfield, New Milford and Sherman.

In addition to its compilation of scientific water resource and land-water relationship data, the 2002 Action Plan assessed the risk factors in each lakeside municipality that must be addressed to protect Candlewood's water quality and resultant property values.

The results were sobering. The regulatory situation is far from ideal, with significant improvements needed in many "risk factor" categories in all five communities, including Sherman.

Ten risk factors were identified in the Action Plan. These are listed below in order of importance for all five municipalities in the Candlewood Lake Watershed:

**TOP FIVE RISK FACTORS:**

1. Sewer Avoidance, Septic Tank Cleaning and Inspection.
2. Stormwater Management and Impervious Surface Standards.\*
3. Regulatory Buffers and Minimum Lot Area Requirements.\*
4. Soil Erosion and Sediment Standards.\*
5. Plan of Conservation and Development upgrade.

**OTHER RISK FACTORS:**

6. Clear Cutting, Excavation and Grading Standards.
7. Preambles of Zoning Regulations in Addressing Lake Protection.\*
8. Residential Underground Fuel Storage Tanks.
9. Floodplain Management.
10. Household Hazardous Chemical Storage.

\*Each of these factors relate to zoning regulation at least in part. The "Preambles of Zoning Regulations" is ranked seventh because it is limited to the preamble part of the regulations. The adequacy of zoning regulations as a whole is one of the most important risk factors.

It is recommended that the first priority for Sherman as well as the other watershed communities be to focus on the top five risk factors listed above.

Progress in these categories will produce both the greatest short term and long-term improvement in Candlewood. At public hearings on the recommendations, the 2000 Action Plan will be placed on record as the authoritative technical documentation supporting the proposed changes.

# **PRIORITY 1: SEWER AVOIDANCE, SEPTIC TANK CLEANING AND INSPECTION**

## **PRIORITY 1 RECOMMENDATIONS FOR WATERSHED AS A WHOLE**

This is the top priority because soils in the Candlewood Watershed are generally not well suited for septic installation and operation, there are a number of older intensively developed residential communities on the Lake's shore with marginal conditions for septic system operation, and many summer cottages on small lake shore lots have been expanded and converted to year round use.

A majority of soils in the watershed are rated "severely limited" for on site septic system installation and operation. This finding was cited in a Candlewood Lake Watershed study conducted by the Connecticut Department of Environmental Protection back in 1983. That study documented severely limited soil types as common along the Lake shoreline, including numerous residential developments on small lots with homes served by on site septic systems.

Ratings for soil suitability for septic waste treatment consider a variety of factors. A soil type has a "severe" limitation rating for septic treatment if it exhibits one or more of the following conditions:

- Water moves through the soil either too rapidly or too slowly (excessive permeability or poor permeability)
- There is not sufficient depth of soil between the bottom of the septic field and the groundwater below it
- Presence of bedrock or extreme stony conditions
- Excessively steep slopes and
- Frequency of flooding

As the decades pass the presence of a pattern of soils with "severe limitations" for septic use along the Lake shoreline heightens the risk of septic failure, just where these failures can most readily harm Lake water quality.

There are numerous pockets of older resort residential developments with small lots near the Candlewood shoreline. Many originally modest “summer cottages” in these developments have been converted and expanded for year round use, placing greater pressure on septic fields.

Conversions to year round use typically also result in adding impervious surfaces, such as paved driveways, that shed stormwater. It also means there is less natural vegetation on the lot to help absorb stormwater runoff. In sum, the process of converting a summer cottage to year around use means the Lake will suffer from increased stormwater runoff and a greater risk of septic failure.

Accordingly, septic system management has arisen as a primary focus of the Candlewood Lake protection program. Fortunately, there is considerable confidence that the State Health Code and local requirements in each of the five Lake towns adequately govern the installation of new septic systems. Sherman has rigorous local Health Code requirements that exceed the State's minimum requirements for well and septic system installation.

But of the five, only Brookfield and New Fairfield have a local septic management and sewer avoidance program that include requirements for septic installation, septic systems pump out, and a health department septic field inspection program.

Brookfield’s “On Site Sewage Disposal System Ordinance” establishes a permitting system for septic systems serving single and two family residential dwellings. It requires that these systems be pumped by a licensed septic operator not less than once every four years.

The Brookfield health director is authorized to inspect septic fields and systems. If a malfunctioning system is detected, the health director is required to issue a notice of violation and an order requiring immediate abatement.

All septic systems in New Fairfield must be pumped once every three years and all properties are subject to an on site inspection not less than once every three years. These are strong forces for water quality.

New Fairfield’s septic management and sewer avoidance program identified and corrected almost 500 failing systems between 1990 and 2000. New Fairfield and Brookfield have clearly demonstrated that an aggressive septic management



program can reduce the threat of septic waste pollution into groundwater and ultimately into Candlewood Lake.

Almost all of the 26,000 acre Candlewood Lake Watershed depends upon on site septic tank and leaching field systems for treatment of sanitary wastes. A septic management program like New Fairfield's or Brookfield's should be in place in each of the watershed towns, especially in the areas of the Lake shoreline with a high density of housing and septic fields.

*All local septic regulations should require that upon completion of a new septic installation, a certified "as built" drawing be submitted showing the location and construction of the septic tank and field for each property. Any conditions or limitations associated with a septic permit should be shown on the "as built" plan. This plan should be kept on file both in the local health department and in the planning and zoning office.*

For its part, the Candlewood Lake Authority will support a watershed septic and sewer avoidance program by providing educational material to land use boards on sewer avoidance and to lakeshore property owners on the proper procedures for operation and maintenance of their septic systems.

## **PRIORITY 1 RECOMMENDATIONS SPECIFIC TO SHERMAN, CT**

While Sherman has done an exceptional job of overseeing the proper installation of septic systems more can be done to protect water quality in the watershed.

The Sherman Health Code is designed to "reduce the probability of water pollution" and to avoid sewers (see Sect. 4.01 Public Sewers: Public Sewers shall not be permitted.")

Key specific requirements of the Sherman Health Code are:

- All Code requirements apply to both new construction and additions, alterations or changes of use to existing buildings.
- No portion of any subsurface disposal system shall be located within 200 horizontal feet of Lake Candlewood.
- It defines Areas of Special Concern such as shallow to bedrock conditions, high ground water conditions, slopes over 10% all of which require "special investigation and special design" prior to septic system approval.

- Percolation rates slower than 1 inch in thirty minutes are "not acceptable for sewage disposal systems in Sherman.
- Septic system leaching fields are not permitted on slopes over 20% and where slopes are over 10% a minimum of 66" of original soil must be present for construction of a septic system.

The Code also establishes administrative procedures for processing applications and correcting failing septic systems.

By adding a requirement for regular septic pump out and establishing an septic inspection program to the Sherman Health Code it is anticipated that Sherman like Fairfield and Brookfield, will be able to identify failing septic systems at a much earlier stage avoiding considerable potential pollution and lake water quality degradation.

Without its tough policies, the high number of failing systems between 1990 and 2000 in New Fairfield and Brookfield would have contributed significant pollution to the groundwater and Candlewood Lake, possibly leading to a State order to New Fairfield mandating installation of sewers. Since inception of the septic inspection and pumping program the rate of septic failures in New Fairfield has dropped in half.

Sherman's Health Code requires that upon completion of a septic installation the "applicant shall provide the Sherman Department of Health with a sketch to scale acceptable to the Director of Health that includes the location of all existing structures, proposed building modifications and the exact location of the septic tank and leaching field system and well." This is an important requirement but it will serve its intended purpose effectively if the requirement for a sketch plan is changed to a "certified as - built plan".

*Modifications to Sherman's Health Code to add a pump out and inspection program can be modeled after the New Fairfield and Brookfield ordinances.. It is recommended that the Lake Authority establish an annual educational program for Candlewood Lake communities on sewer avoidance and septic management.*

# **PRIORITY 2: STORMWATER MANAGEMENT AND IMPERVIOUS SURFACE STANDARDS**

## **PRIORITY 2 RECOMMENDATIONS FOR WATERSHED AS A WHOLE**

In recent years lake scientists have conclusively demonstrated the direct correlation between the percentage of impervious surfaces in a watershed and lake or stream water quality. However, as reported in the 2002 Action Plan, the Candlewood Lake communities generally have not yet recognized this relationship by establishing impervious surfaces limits in their regulations.

Given documented trends in Candlewood Lake water quality, clearly now is the time to lead the public towards the changes needed, backed up by the research in the 2002 Action Plan.

An impervious surface is a paved road, a house or any other structure that allows no penetration of rainwater into the ground. Roofs, concrete, asphalt and compacted soil prevent rain from soaking into the ground where the runoff pollutants it carries can be treated naturally as they move through root systems and soil layers.

As the area of impervious surface increase in a watershed, so do the rate of stormwater movement and the flow of untreated water reaching a lake or feeder streams. For example, it is estimated that a one acre parking lot will produce sixteen times more water run off than a one acre undeveloped meadow (Schueler, T. 1994 article "The Importance of Imperviousness", Center for Watershed Protection).

Watersheds with low levels of impervious surfaces have sufficient areas of natural vegetation and soil surface to filter and treat stormwater by natural processes. Increased levels of impervious surfaces in a watershed can result in:

- Greater fluctuations in water body water levels,
- Degraded lake and stream habitat,

- Warmer water and loss of sensitive cold water fish habitat,
- Decline in aquatic insect diversity,
- Decline in fish diversity,
- Reduced spawning of fish.

A recent review of over 300 watershed studies by a nationally recognized lake scientist indicates that the potential for declining water quality begins when impervious surfaces reach only 10% of a lake watershed. As the level of impervious surface increases above 10%, the risk to water quality grows (Schueler, T. 2002, unpublished paper, Center for Watershed Protection).

The Summer 2002 issue of “Lake Line”, the Journal of the National American Lake Management Society, reviews lake shoreline protection requirements and recommends “10% to 15% as an impervious cover limit for residential lots in a shoreline protection area.”

On this crucial priority issue there is a bright spot in the watershed, for the Danbury Zoning Regulations do address this factor under zoning site plan requirements. These regulations require that site plan maps show areas that will remain in a “natural state.” The regulations require that a “construction limit line” be shown and that all areas outside it remain undisturbed.

In addition, Danbury alone has a comprehensive zoning regulation requirement for stormwater management.

*The other four Candlewood Lake municipal regulatory systems need to both limit the total amount of impervious surfaces allowed on lots proposed for development in the watershed and also to establish comprehensive stormwater management requirements. Over the long term, these two controls alone can greatly reduce the “risk” of accelerating lake decline.*

A comprehensive stormwater management strategy should include stormwater planning and design standards, “best management practices” (BMPs) and land use regulation requirements. Development can be conditioned to work properly rather than being stopped.

These should be developed in reference to the recommendations and strategies offered by the Connecticut DEP and the University of Connecticut’s Cooperative Extension System’s Nonpoint Education for Municipal Officials (NEMO) program.

It should be noted that Connecticut's NEMO educational program is a nationally recognized leader in stormwater management. NEMO educators with support from the Candlewood Lake Authority can help lake communities understand and select the strategies that will be most acceptable and suitable for their circumstances.

## **PRIORITY 2 RECOMMENDATIONS**

### **SPECIFIC TO SHERMAN, CT**

**2A. SHORELINE VEGETATIVE COVER.** Maintaining lake and tributary shoreline vegetation cover along with limits on impervious surfaces are the two best insurance policies against lake water degradation.

Studies of shoreline areas and water quality show that a vegetative buffer as little as 25 feet in width will benefit water quality. But in order to remove a high percentage of nutrients from stormwater runoff, the buffer should be at least a 75 feet deep.

State and local land use regulations in lake communities in other states increasingly require deep setbacks for homes and septic systems from drinking water wells and lake shorelines and retention of natural vegetation in these sensitive areas.

Fortunately, the Candlewood shoreline up to the 440 foot contour level is owned and competently managed by the Northeast Generating Company (NGC), formerly the Connecticut Light and Power Company. The NGC lake shoreline protection program affects all lakeshore property owner and all property owners with a deeded right of access to Candlewood Lake.

The deeds to these lots prevent landowners from making all but certain limited improvements in the Lake and on the land up to the 440 foot topographic contour line around the Lake. All improvements within this regulated area are subject to approval from Northeast Generation. Improvements in this deed protected area are limited to:

- Removable docks and floats and moorings subject to specifications to size, length and total area. (Note: It is estimated that there are 2,500 docks on Candlewood Lake.)
  
- A small removable storage structure, such as for lawn chairs, tools, etc.

— Existing septic fields located below the 440 foot topographic contour line may remain but must be removed when no longer in service.

Increasingly, as Lake lot septic systems fail, property owners are requesting Northeast to permit construction of replacement septic fields in the protected area. However, NGC's policy is that it will "consider" such requests provided the landowner presents a certification from a qualified registered engineer that a septic system cannot be designed and installed outside of the 440 foot contour area without regard to cost or convenience.

*These Northeast Generation lakeshore deed protections are critical to the continued quality of the Lake. Local land use regulations should be revised to reflect the limits established in lakeshore deeds.*

*All shoreline zoning regulations should allow only removable docks and floats and a small temporary and removable storage shed below the 440 foot contour on Candlewood Lake.*

Buffer planting recommendations are also soon to be forthcoming from the CLA staff.

**2B. STORMWATER MANAGEMENT PLAN.** *The Sherman zoning regulations need to be amended to include a new section specifying standards and requirements for the preparation of a Stormwater Management Plan. It is recommended that a Stormwater Management Plan be required for all lots in the watershed where total impervious surfaces (lot coverage) exceed 10%.*

*The Stormwater Management Plan should also be required prior to issuance of a zoning permit for a new building or addition or for a paved area on any shoreland lot on Candlewood Lake within 300 feet of the ordinary high water mark where the total proposed impervious surface exceeds either 4,000 square feet or the existing or proposed impervious surface on the lot is 10% or more.*

*The Stormwater Management Plan should address the entire lot as well as the section proposed for development. The Stormwater Management Plan should recommend a variety of techniques promoting infiltration and filtration of stormwater designed to mitigate the impact of stormwater runoff to the lake.*

These could include for example:

- Vegetated buffer strips,
- Level spreader,
- Infiltration basins (such as for roof runoff), and
- Vegetated drainage swales.

The University of Connecticut's Cooperative Extension Service's NEMO program's Fact Sheet # 7 entitled "Reviewing Site Plans for Stormwater Management" and its "Connecticut Stormwater Quality Manual," Chapter 9 "Developing a Site Stormwater Management Plan" provide guidelines and criteria for designing a stormwater management plan.

It is also important that Sherman remain informed of new U.S. Environmental Protection Agency requirements for stormwater permits on land development projects. More stringent EPA stormwater requirements will take effect in March of 2003 for Connecticut towns with populations of over 10,000. They will require a stormwater permit for any development creating a disturbed area of more than one acre.

# **PRIORITY 3(1): REGULATORY BUFFERS**

## **PRIORITY 3(1) RECOMMENDATIONS FOR WATERSHED AS A WHOLE**

Throughout the country, new setback and buffer land use rules are being applied on lake shorelines to protect water quality. The dream of lakeside living proceeds happily, but with more creative thinking during the site development process.

Residents anxious about preserving their investment are discovering that a protected lakeshore “buffer” is the first line of defense against stormwater runoff. In the Candlewood Watershed, New Milford’s and New Fairfield’s Inland Wetland buffer requirements are already good examples of forward looking lake, stream and wetland protection.

Zoning regulations in Candlewood Lake communities require open spaces or landscape buffer areas between different land uses.

But with the exception of Danbury, the five sets of zoning regulations do not require a protective landscape buffer on the shoreline of water bodies. Danbury’s alone define and regulate “environmentally sensitive areas” including “areas located within one hundred (100) feet of any inland wetland or watercourse.”

In contrast to zoning buffers, inland wetland commissions in all five lake communities extend their regulatory review to buffer areas adjacent to wetlands and watercourses, including Candlewood Lake. By establishing this buffer review area, local inland wetland and watercourse commissions acknowledge that the land on the waterbody shoreline is environmentally sensitive.

These wetland buffer rules permit the wetland commission to review all shoreline development proposals and to deny or modify any plan that would have a negative impact on Candlewood or another waterbody.

But the regulated inland wetland buffer boundary on Candlewood Lake is not uniform along the five shoreline communities. However, the most common



Candlewood Lake boundary is a setback of 200' from the Lake's high water mark.

The inland wetland regulations in New Fairfield, New Milford and Danbury establish standards for review of development proposals within the Lake buffer. There are no specific standards in Sherman or Brookfield.

*It is recommended all five towns establish a common boundary line for a lake shoreline buffer and adopt common standards or guidelines for review of development proposed in the lakeshore buffer area.*

*A 200 foot uniform buffer from the Lake's ordinary high water mark matches the current local trend and is consistent with recommendations of lake scientists. The New Milford buffer definition could be used as a model. Ideally each municipality would also establish a uniform buffer setback boundary from all streams in the Candlewood watershed.*

## **PRIORITY 3(1) RECOMMENDATIONS SPECIFIC TO SHERMAN, CT**

**3(1)A. INLAND WETLAND REGULATIONS.** The Sherman Inland Wetland and Watercourse Regulations establish a review buffer of 50 feet from Candlewood Lake and all other watercourses and inland wetlands.

The State Health Code requires that all septic systems be 50 feet from the top of a bank of any watercourse. On the Candlewood Lake shoreline, the "top of bank" is the ordinary high water mark. However, in Sherman the local Health Code requires that any part of septic systems shall set back a minimum of 200 horizontal feet from Candlewood Lake. It also limits the location of septic fields to areas that have a slope of less than 20%. The Health Officer may require additional studies and information on a septic system proposed on slopes over 10% or in other areas of "Special Concern". (See discussion under Sewer Avoidance).

It is recommended that the Sherman Inland Wetlands and Watercourses Commission amend its regulations to create a 200 foot regulated buffer area from the high water mark of Candlewood Lake. This amendment would be consistent with the 200' septic setback requirement in the local Health Code and the prevailing inland wetland regulated buffer requirement in other Candlewood Lake communities.

**3(1)B. PROPOSED LAKE SHORELAND PROTECTION ZONE.** It is recommended that Sherman consider amending its Town Plan of Conservation and Development to propose a Lake Shoreland Protection Zone similar to that proposed in the recent New Fairfield Town Plan of Conservation and Development.

The New Fairfield plan recommends creating a new Candlewood Lake zone (referred to as the “Resort Residential Zone”) which is perhaps best described as a “Lake Shoreland Protection Zone.”

This new zone would encompass the existing intensely developed portions of the Candlewood shoreline in New Fairfield including Candlewood Isle and Candlewood Knoll.

Sherman has similarly developed shoreline area where lots are typically much smaller than in the rest of Sherman. Within these shoreline resort communities lot sizes in some cases average 1/4 acre compared to a two-acre minimum requirement in Sherman and most of New Fairfield.

These small lake lots are “non-conforming” under the zoning regulation because they do not meet the requirement for lot area. Many have other “non-conforming” situations. For example, some are also “non-conforming” in location because the house or an accessory building does not meet the zoning regulation requirement for building setback (also referred to as the “yard” requirement).

The proposed Lake Shoreland Protection Zone would have lot size and setback requirements more in keeping with the prevailing norm on the Lake shore. This would substantially reduce the number of the “nonconforming” zoning conditions, a comforting change for property owners.

However, impervious surfaces will continue to be a water quality issue within these intensely developed Lake shoreline residential communities. Small lakeshore lots are typically intensely developed and have a high percentage of impervious surfaces (another form of nonconformity).

*It is recommended that in the Sherman consider creating a new Lakeshore Protection Zone with a maximum impervious surface limit of 20%, which would substitute for the existing maximum building coverage requirement of 15%.*

But flexibility is also possible. An exception to this coverage limit could be permitted in the new zone under the nonconforming section of the zoning regulations. Existing small lots that do not meet the minimum lot area requirement and exceed the maximum impervious surface requirement could be given a way to expand under special permit requirements designed to protect the Lake.

This special permit regulation could be drafted allowing the owner of a small lot to exceed the 20% limit, provided the applicant can demonstrate that the impact of stormwater runoff from the lot will be reduced under special design and stormwater management solutions. Growth remains possible, with a little extra work.

*For example, under this regulation, an applicant could seek approval for a home addition that would increase the impervious surface on a lot to 25%. The applicant would need to demonstrate that the total runoff would be reduced or maintained at pre-addition runoff conditions, and compared to pre-addition conditions, stormwater runoff will be better treated before entering Candlewood Lake or groundwater. Reasonable options for meeting these standards would include:*

- Replacing a lawn area with a vegetative buffer strip of natural vegetation designed to absorb stormwater,
- Removing a beach area and replacing it with natural shoreline vegetation,
- Removal of an accessory building to compensate for a home addition, and
- Installation of on site systems for retaining and treating stormwater.

# **PRIORITY 3(2): MINIMUM LOT AREA REQUIREMENTS**

## **PRIORITY 3(2) RECOMMENDATIONS FOR WATERSHED AS A WHOLE**

A zoning regulation that relates to and complements the recommendation on the septic, stormwater and buffer risk factors is the zoning requirement for minimum lot area.

Zoning regulations set the minimum area requirement for a proposed development lot in each zone in the community. In the Candlewood Watershed, residential zones must have a minimum lot area of sufficient size with soils types and slope suitable for the construction of a house, driveway, septic systems and drinking water well.

Recently New Milford adopted a zoning rule stating that the calculation of the minimum lot area shall not include the area of inland wetlands and watercourses on the lot or the area of lot that has slopes of 25% or more.

In adopting this requirement, New Milford is recognizing that the portion of a proposed lot that is in wetlands, watercourses or steep slopes is generally not suitable for development. Other area towns including Ridgefield, Newtown and Bethel have adopted similar conditions to their lot area requirement. Sherman does not permit inland wetland and watercourse areas as part of the calculation of minimum lot size but slope limits only apply to septic field placement.

Towns in the Candlewood Lake Watershed should examine and consider adopting the New Milford lot area calculation requirement, recently upheld by the Connecticut Supreme Court. It provides a valuable safeguard to insure that each lot will have sufficient “good” land for building, as well as septic systems that support the goal of protection of water quality in the decades ahead.

## **PRIORITY 3(2) RECOMMENDATIONS SPECIFIC TO SHERMAN, CT**

As for specifics for the Town of Sherman, the primary zones in the Town's portion of the Candlewood Lake watershed are residential zones with a minimum lot area requirement of 80,000 sq. ft.

The Sherman zoning regulation "maximum building coverage" requirement limits the footprint of all buildings on a lot to 15% of the total lot. *There is no requirement in Sherman's residential zones limiting total impervious surfaces on a lot. This needs to be added.*

The key regulatory factors for both the Residence Zone A and B in Sherman are shown in the table below:

Minimum Road Frontage	200 feet
Front Setback	50 feet (or 75' from the road pavement center line)
Side Setback	25 feet
Rear Setback	25 feet
Maximum Building Coverage	15%
<i>Max. Total Impervious</i>	<i>No Standard</i>

In interpreting the above, please note that in Sherman a building is defined as "any structure having a roof supported by columns or by wall and intended for the shelter, housing or enclosure of persons, animals or chattels."

Accordingly the only impervious surfaces limits in residential zones in Sherman is the percentage of the footprint of buildings on a lot to the total lot area (uncovered porches, steps or terraces are not subject to the building coverage rule.)

*Perhaps the single most important watershed wide Candlewood Lake protection recommendation for Sherman is to amend the zoning regulations to define "impervious surfaces" and establish a maximum impervious surface requirement for lots in the residential zones.*

*It is recommended that a new definition titled "maximum lot coverage" be established to substitute for the "maximum building coverage" requirement as follows:*

*“Lot Coverage: The percentage of the aggregate area of all buildings and all impervious surfaces (surfaces that do not allow the penetration of water) on the lot to the total lot area.”*

*It is recommended that the existing 15% maximum be retained under this new definition. (No change is proposed for the commercial zone, as this is not a major factor to the Lake.) This new definition establishes a total impervious surface limit for residential lots in the Town and the watershed.*

*It is also recommended that the Zoning Regulation be amended to include a new section on “Site Plans” and that this include the requirement that all site plans show the “location, dimensions, total area of all buildings and paved areas on the lot and the percent of lot coverage.” (Note: The Sherman Zoning Regulations require a site plan with a Special Permit application or as part of an Erosion and Sedimentation Control plan. However, these requirements do not cover all instances of residential development either new or those involving major additions. A new section on Site Plans will insure the Planning and Zoning Commission has the basic site information it needs to assess water quality impacts and to demonstrate compliance with the “lot coverage” requirement.*

*Also, where development on a lot approaches the maximum lot coverage limit, the zoning regulations should authorize the zoning administrator to require an “as built” drawing of the site prior to issuance of a Zoning Certificate of Compliance.*

On and near Candlewood’s shoreline there are numerous small lots that do not meet Sherman's minimum lot size requirement. Many of these lots are already nonconforming in terms of the impervious surface coverage and the new limit will increase the degree of nonconformity.

However, the majority of watershed lots are two acres or greater in area. A new 15% maximum impervious surface requirement on an 80,000 square foot lot permits 12,000 square feet of impervious surface coverage. *A home with a large footprint, typically sized accessory buildings and a long paved driveway would not come close to reaching this limit. Accordingly it is anticipated that such a change to the zoning rules will create few new non-conforming lot coverage situations in the majority of the Town where lots are 80,000 square feet or more.*

*The Candlewood Lake Authority advises that this impervious surface recommendation, in combination with up an update of the stormwater management plan and erosion and sediment control requirements in all zones, is critical to protection of Candlewood Lake's water quality and associated property values.*

# **PRIORITY 4: SOIL EROSION AND SEDIMENTATION STANDARDS**

## **PRIORITY 4 RECOMMENDATIONS FOR WATERSHED AS A WHOLE**

A seven county study in Wisconsin determined that runoff from urban and suburban construction sites contributed 35% of the sediment and 28% of the phosphorous entering inland lakes and streams. Another Wisconsin study concluded that construction sites without adequate erosion and sediment control practices can have soil loss rates of 30 to 200 tons/acre/year, 10 to 20 times that of cropland.

*Each Candlewood Lake community must revise and update its local soil erosion and sediment control regulations to be consistent with the “2002 Connecticut Guidelines for Erosion and Sedimentation Control”.*

But even the best designed erosion and sedimentation control plan is useless unless there is adequate town staff to insure erosion measures are established and maintained in the field. *Therefore, it is recommended that additional local land use staff time be allocated to focus on development review especially in the sensitive lake shoreline area. A cost effective method would be to appoint a part time deputy land use enforcement officer shared by the five towns to work only on Candlewood Lake Watershed projects.*

Each town could authorize this person to serve as a deputy to the town zoning and/or inland enforcement officer. The deputy would be authorized to conduct on site development inspections and file reports with the local land use enforcement officer. Decisions on enforcement actions would remain with the lead local enforcement agent.

The Candlewood Lake Authority could assist by providing training and technical assistance to such a deputy. *Support for this part-time or “as needed” consultant position would be shared by the five towns who under state statutes may charge a fair land use application fee to offset 100% of enforcement expenses.*



For details see the 1/2000 HVCEO Bulletin #100 entitled "Funding Municipal Reviews", which provides the Bethel, CT example and the legal background for town's hiring special technical consultant assistance for complex project reviews, with 100% of the cost borne by the applicant.

## **PRIORITY 4 RECOMMENDATIONS SPECIFIC TO SHERMAN, CT**

*The Sherman Zoning Regulations requirements on erosion and sedimentation control and must be updated to reflect the recently published model "2002 Connecticut Guidelines For Soil Erosion and Sediment Control" (hereinafter known as "Guidelines") issued by the CT DEP. This will provide Sherman with the most up-to-date standards for control of erosion and sedimentation.*

It is important to stress that the new Guidelines recommend that large construction sites be designed in phases and according to an approved construction sequence. A "large" construction project involves extensive earth moving, drainage work or land grading with earth moving equipment or when construction involves more than one construction season.

Under the Guidelines a project site with a total disturbed area of 5 acres or more is considered "large." Smaller sites may also require sequencing, particularly if they involve large cuts or fills, sensitive sites, or complex construction activities.

Recommendations for phasing and construction sequencing on large project sites are set forth in the 2002 Guidelines. These state Guidelines were developed with assistance from erosion and sedimentation control specialist Jack Deering of Bethel, CT, a volunteer CLA committee member for development of the 2002 Action Plan research as well as these recommendations. The 2002 Guidelines and Mr. Deering's procedures should be adopted for all "large" projects.

Filling and grading within the Candlewood Lake shoreline area must be carefully controlled because these activities near the Lake have a high potential to:

- Increase the delivery of phosphorous rich sediment to the lake,
- Accelerate erosion on shorelines where grading involves removal of brush and shoreline vegetation, and
- Adversely affect shoreline habitat and aquatic communities.

*Within 300 feet of the ordinary high water mark of Candlewood Lake it is recommended that a "Filling and Grading Special Permit" be required where it exceeds the following:*

- Filling and grading occurs on slopes of more than 20%,
- Filling and grading involving more than a total of 4,000 square feet.

#### Standards and Requirements for a Filling and Grading Special Permit:

- A Site Plan shall be submitted with topographic contours at two foot intervals based upon field survey map showing the vegetation of the shoreline area affected, the soil type affected, the surrounding drainage patterns, and the proposed alterations to the land.
- A detailed description of the proposed project shall be provided including existing and proposed vegetation, soil types and limitation, drainage impact and plans for handling any spoils.
- The applicant shall document that the area affected does not serve as a nesting or spawning area for wildlife or as a habitat for any rare or endangered plant or animal species.
- Filling and grading shall be performed using appropriate standards, methods and best management practices as specified in the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control and under the zoning requirements for erosion and sedimentation control.
- All earth disturbances, except water line rip rap, shall be reclaimed by vegetation. Earth disturbances shall not be allowed where the resulting slopes would be too steep to be stabilized with vegetation. (Note: The limitation on use of structural methods of stabilization shall not apply where there is on-going bank erosion and such methods are shown to be the only feasible means of stabilization).
- Time limits for exposure of bare ground shall be set based upon the premise that the smallest amount of bare ground shall be exposed for the shortest time feasible.
- Provision shall be made for use of temporary ground cover.
- Where appropriate use of sediment traps such as diversion terraces and silting basins and rip rap or other stabilizing techniques shall be provided.
- Provision shall be provided for permanent ground cover in reference to the recommendations regarding "Vegetative Buffer Strips" (provide as part of the regulation).
- Permits shall be valid for 60 days unless an extension is granted.

# **PRIORITY 5: PLAN OF CONSERVATION AND DEVELOPMENT UPGRADE**

## **PRIORITY 5 RECOMMENDATIONS FOR WATERSHED AS A WHOLE**

All five communities recognize the need to protect Candlewood Lake in their current municipal plans. However, these plans but do not fully address all the “risk factors” discussed in the 2002 Action Plan.

The Danbury and New Milford plans include many important Candlewood protection recommendations. New Fairfield’s recent draft town plan update now joins them by providing a comprehensive and up-to-date set of Candlewood watershed protection recommendations. *It is recommended that the draft New Fairfield plan serve as a model for town plan revisions for all lake communities.*

Local planning and zoning commissions may propose additions or modifications to a town plan at any time. Each town should review the Candlewood Lake elements of its town plan in comparison to the recommendations in the New Fairfield draft plan and this report.

Each town plan should show the areas of the watershed that need to be protected as open space or in order to protect water quality. Key areas are inland wetlands, especially large wetland-water recharge areas, stream belts, lake shore buffers and steep slopes.

Protecting these especially sensitive lands will help avoid excessive soil erosion, stormwater runoff and other nutrient loading activities that will harm Lake water quality.

## **PRIORITY 5 RECOMMENDATIONS SPECIFIC TO SHERMAN, CT**

(Note: I need a copy of the revised Sherman plan to review in order to complete this section

# **PRIORITY 6: CLEAR CUTTING, EXCAVATION AND GRADING STANDARDS**

## **PRIORITY 6 RECOMMENDATIONS FOR WATERSHED AS A WHOLE**

Limiting clear cutting of trees, controlling excavation and grading in sensitive areas of the watershed, especially near the lake shoreline and adjacent to tributary streams, is a very important Lake protection requirement.

Development in the shoreline area is reviewed by the inland wetland commission as part of the recommended uniform 200 foot lakeshore buffer review area. This can also be addressed under special shoreline filling and grading regulations in the zoning regulations.

*All towns should adopt zoning site plan requirements such as Danbury's, which require delineation of the "limits of construction" and maintaining vegetation outside this line.*

*Commercial clear cutting of trees in the watershed should be made subject to a permit from the inland wetland commission.*

*Erosion and sedimentation control requirements in local zoning regulation should be revised to follow the new state guidelines. This will provide for guidelines that will better protect against soil loss and protect vegetation in sensitive areas.*

## **PRIORITY 6 RECOMMENDATIONS SPECIFIC TO SHERMAN, CT**

See recommendations for all five municipalities directly above.

# **PRIORITY 7: PREAMBLES OF ZONING REGULATIONS**

## **PRIORITY 7 RECOMMENDATIONS FOR WATERSHED AS A WHOLE**

Zoning commissions or combined planning and zoning commissions are in the best position to affect land based measures protective of water resources, since they set limits for the location and uses of lands as authorized by state statute (Zizka, 1997).

They have both regulatory and prohibitory powers, and thus are able to provide strong protective measures. Connecticut statutes specifically authorize zoning regulations to “protect property values.”

In local zoning ordinances, definitions and delineations of land districts, overlays, uses and prohibitions are established in accordance with what is in the best interests of the community.

Chapter 1 (also found as Article 1 or Section 1) of local zoning ordinances contain language listing the purposes, intents and objectives for those regulations. It is an important section in that it sets an early and important tone for the remainder of the regulations.

There are common elements including the provision and protection of public health, safety and general welfare, guidance for future growth and development in accordance with the municipality’s plan of conservation and development, provision of basic infrastructure needs, and determining appropriate uses of lands.

Some local zoning commissions incorporated environmental objectives into their regulations by including language specific to environmental issues. Having environmentally protective language in this first section can be particularly useful if there are important environmental resources the community wishes to protect

and if there is a desire by the community to improve regulations for better protection of those natural resources.

Of the five municipalities surrounding Candlewood Lake, Sherman and Brookfield, the Town with the smallest part of the watershed, have perhaps the best language in its zoning ordinance's statement of purpose.

Components that interpretively have meaning with regards to Candlewood include the provision to protect and conserve the character and the environment of all parts of the Town, and to encourage the orderly and beneficial development of the Town.

Definitive language in the Sherman and Brookfield zoning preambles are almost identical in addressing protection of water resources. The Brookfield preamble includes provisions to prevent the pollution of watercourses and wetlands, safeguard the water table, avoid hazardous conditions and excessive damage resulting from storm water runoff throughout the Town, and conserve the Town's natural beauty and topography in such a way as to preserve the integrity, stability and value of land and buildings.

## **PRIORITY 7 RECOMMENDATIONS SPECIFIC TO SHERMAN, CT**

Sherman's Zoning Regulations Article I Purposes, Section 119 is very similar to Brookfield's. It reads: "To prevent the pollution of ponds and streams, safeguard the water table and encourage the wise use and sound management of natural resources throughout the Town in order to preserve the integrity, stability and beauty of the community and the value of the land."

*This Purpose statement should be modified to address the importance of Candlewood Lake perhaps the Town's premier water resource, to recognize the need to protect public water supplies and prevent pollution resulting from stormwater runoff.*

*A significant portion of the land area of Sherman is located in a public water supply watershed serving a drinking water source in New York State. The Connecticut General Statutes require that a community with a public water supply water shed shall enact provisions to protect these public water supplies.*

*Section 119 could be modified to read: "To prevent pollution or degradation of the water quality of all water resources in the community including Candlewood Lake, and all ponds, streams and inland wetlands, to protect public drinking water supplies, to protect against pollution resulting from stormwater runoff,"*

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# **PRIORITY 8: RESIDENTIAL UNDERGROUND FUEL STORAGE TANKS**

## **PRIORITY 8 RECOMMENDATIONS FOR WATERSHED AS A WHOLE**

The threat of water pollution from residential underground fuel storage tanks is well documented in the main Action Plan report. *All five municipalities should take measures to insure that leaking tanks will be detected and older tanks removed in a timely manner.* The Chesprocott Health Districts (serving Cheshire, Prospect and Wolcott, CT) regulations on underground storage tanks can be used as a guideline for the Candlewood communities.

## **PRIORITY 8 RECOMMENDATIONS SPECIFIC TO SHERMAN, CT**

See recommendations for all municipalities directly above.



# **PRIORITY 9: FLOOD PLAIN MANAGEMENT**

## **PRIORITY 9 RECOMMENDATIONS FOR WATERSHED AS A WHOLE**

Each town has zoning requirements or a special ordinance that meets or exceeds federal and state standards for flood plain protection.

## **PRIORITY 9 RECOMMENDATIONS SPECIFIC TO SHERMAN, CT**

The Sherman Zoning Regulations do not have Flood Hazard Zone requirement which should be incorporated in accord with the minimum standards of the Federal Emergency Management Agency

# **PRIORITY 10: HOUSEHOLD HAZARDOUS CHEMICAL STORAGE**

## **PRIORITY 10 RECOMMENDATIONS FOR WATERSHED AS A WHOLE**

Each municipality has a program for the collection and safe disposal of household hazardous waste. Brookfield, New Milford and Sherman hold a collection event each fall in New Milford. Danbury and New Fairfield hold a collection event each fall in Danbury.

*Towns need to continue and expand the educational element of their household hazardous waste program and provide more opportunities for safe disposal of these wastes.*

The Candlewood Lake Authority can assist by providing information on the do's and don'ts of household hazardous waste handling and disposal. Information can be distributed in cooperation with the many lake associations on Candlewood.

*Local zoning regulations should prohibit use of hazardous materials associated with any permitted home occupation in the lake watershed or require a management plan.*

## **PRIORITY 10 RECOMMENDATIONS SPECIFIC TO SHERMAN, CT**

See recommendations for all above. Sherman Zoning Regulation requirements for Special Permit Approval (Section 340) should be amended to require that any application for a special permit must submit a plan of operation including declaration of any hazardous materials other than common household type of cleaning materials which would be stored or used on the site. This regulation should also specifically provide the Commission with the authority to require special safeguards for the use and storage of hazardous materials. A provision should be added specifically providing the Commission the right to deny any application which the Commission determines poses a threat to water quality due to its use or storage of such materials.



# **COMPREHENSIVE PRIORITY: LAKE AND WATER QUALITY PUBLIC EDUCATION**

Education is a part of each “Action Plan” risk factor and overall is perhaps one of the most important tools in Lake protection.

Citizens in the five towns, especially lake watershed and lake shoreline land owners, must realize that how they manage their property has a direct bearing on the Lake’s water quality. Local Sherman educational programs need to be continued and or where inadequate should be expanded on hazardous waste disposal, lawn and garden fertilizers and chemicals, sediment runoff, septic maintenance, yard composting, resource recovery/recycling, marine waste disposal and similar issues.

It is fortunate that the many neighborhood associations on Candlewood have joined to form a “Candlewood Lake Association of Associations”. In cooperation with this group local conservation commissions and the Candlewood Lake Authority can design and carry out ongoing educational programs for Lake shoreline and watershed residents.

This program should include providing information through the Candlewood Lake Authority newsletter and presentations to the Association of Lake Associations. Perhaps with the assistance of the Cooperative Extension Service’s Center for Land Use Education and Research (“CLEAR” program), illustrated materials could be developed showing the effect of inadequate land and waste management practices and proper methods for land management.