CHAPTER 7. SOURCES OF POLLUTION
C. FORESTRY AND FOREST PRACTICES

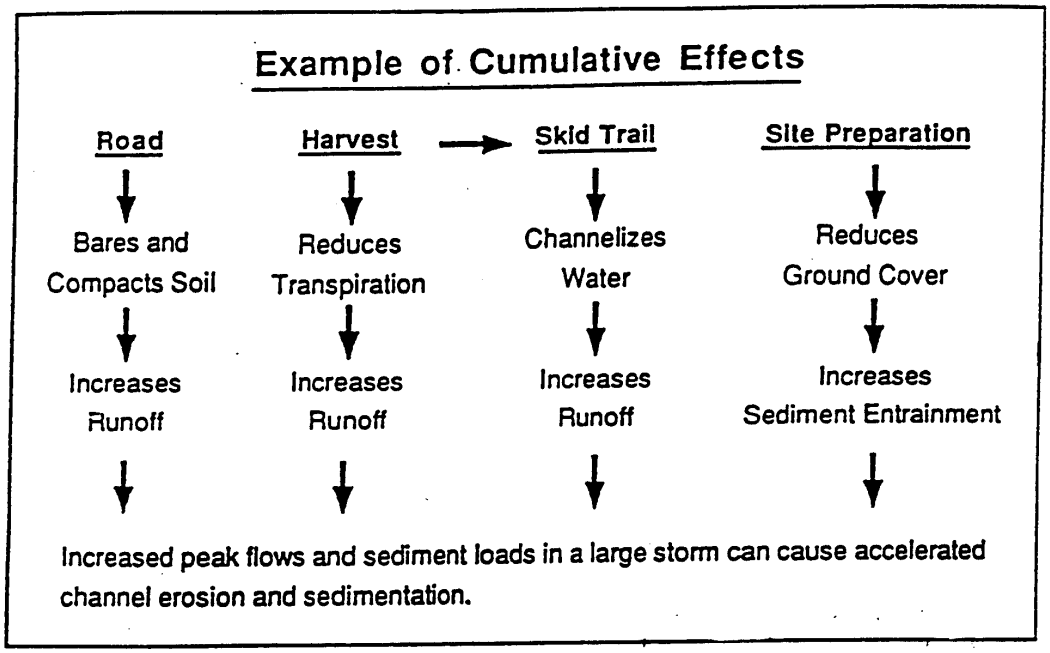
SUMMARY
Forest lands are among the best types of land use for protecting water quality. Because forests are natural filters, it is in the best interests of lake water quality to maintain forest cover. However, with the maturation of timber stands since the early 1900's, timber harvesting is occurring throughout the watershed. Although timber harvesting Best Management Practices (BMP's) are available, the private landowner, who controls the bulk of forest lands in the watershed, may or may not employ these BMP's to stop erosion and sedimentation from reaching Seneca Lake. Public information and education as well as timber harvesting registration or regulation are needed to allow economic use of the forests without compromising water quality.

INTRODUCTION
Forests protect water quality. Tree roots lessen erosion by holding soils in place and purify shallow groundwater by removing dissolved nutrients. Forest tree-tops and leaf litter intercept precipitation and lessen its erosive impact on the ground below. The layer of organic matter or "duff" on the forest floor traps runoff and increases the infiltration of surface water into the ground. Even when trees fall during ice or wind storms, water quality benefits; the "pockets" left by root masses trap surface water and promote infiltration to groundwater.

Forestry activities have been an integral part of the history of the Seneca Lake watershed. In the early years of settlement from 1790 to 1840, the forest was simply removed to make way for agricultural activities and few forest products were sold outside the area. During the period of the most rapid growth of upstate cities, roughly from 1860 until 1910, a regional market for wood products developed. Whether carried out to clear farm land or to market wood products, deforestation of the Seneca Lake watershed reached its peak between 1880 and 1890. Since 1890, about one-half of the previously cleared lands have been allowed to return to forests. A small percentage of previously cleared lands has been re-planted, mostly with conifers.

Limited information is available to assess the impact of forest harvest activities on water quality in the watershed, although studies of other watersheds in the Northeast (such as Hubbard Brook) suggest that harvest activities, particularly logging road construction, have dramatic short-term impacts on water quality through the introduction of nutrients and sediments to surface water. Timber harvest areas are usually not of sufficient magnitude to affect long-term water quality, though the cumulative impacts of numerous harvests on discrete, privately-owned, wooded parcels have only been preliminarily studied (*see Fig. 7.C.1*).

Fig. 7.C.1 Example of Cumulative Effects- Cobourn



METHODS

A review of available documents pertaining to forests and forestry activities and interviews with individuals and agencies involved with the forest industry were used to develop the information in this report.

DISCUSSION

Limited information about forest resources and forest practices is available in the Seneca Lake watershed. During the process of delineating land uses from 1994-1996 aerial photographs for entry into the Generalized Watershed Loading Function (GWLF), forest land was characterized. Acres of forest land in each of the twenty-nine subwatersheds or direct drainages have been recorded and the percentage of land in forest cover has been calculated . (*See Figure 7.C.2*). Soil and slope information for forest land allows the projection of sediment and nutrient loads from forest land within various subwatersheds (*see Table 7.C.1*)

Such a process can tell us where the forests of the watershed are but says little about their condition or management. Generally, in the northern watershed Towns of Geneva, Seneca, Benton, Torrey, Fayette, Varick, Romulus and Ovid, intense agricultural use of the nineteenth century cleared all land except that too steep or wet to farm. The remaining predominately soft maple and ash forests of this area, isolated in tracts of farmland, have been harvested in recent years for firewood or timber.

The Towns of Milo on the west side and Lodi on the east side mark a natural cusp between forest and agricultural use.

Table 7.C.1 Forested Land of the Seneca Lake Watershed by Subwatershed

SENECA LAKE WATERSHED
GWLF MODEL ESTIMATES FOR EROSION, SEDIMENT AND NUTRIENTS FROM FORESTED LAND.

NAME	SUB#	Total Area Acres	Forest Area Acres	% Forest	Erosion from For Tons	Sediment Delivery Ratio	Sediment from Forest Tons	Total N Tons	Total P Tons
Catharine Creek	1	79,532	46,376	58%	13,626	8.94%	1,218	4.3	1.8
Reading DD	2	12,269	6,343	52%	1,412	14.53%	205	0.7	0.3
Rock Stream	3	4,883	2,619	54%	466	16.66%	78	0.3	0.1
Big Stream	4	23,578	10,297	44%	1,879	12.37%	232	0.8	0.3
Starkey DD	5	11,982	4,218	35%	939	14.34%	135	0.4	0.2
Plum Point	6	3,741	1,576	42%	618	18.68%	115	0.4	0.2
Long Point DD	7	9,323	2,592	28%	1,500	15.25%	229	0.7	0.3
Keuka Lake Outlet	8	19,434	3,437	18%	1,744	13.05%	228	0.7	0.3
Benton DD	9	5,251	944	18%	244	17.47%	43	0.1	0.1
Kashong Creek	10	19,657	3,805	19%	539	13.03%	70	0.3	0.1
Reed Point DD	11	5,407	825	15%	147	17.37%	26	0.1	0.0
Wilson Creek	12	11,275	2,231	20%	262	14.83%	39	0.1	0.1
Geneva DD	13	11,898	2,367	20%	242	14.47%	35	0.1	0.0
Sunset Bay DD	14	3,477	657	19%	135	19.09%	26	0.1	0.0
Reeder Creek	15	3,109	662	21%	35	20.00%	7	0.0	0.0
Wilcox Creek DD	16	3,405	860	25%	80	19.67%	16	0.1	0.0
Kendaia	17	2,441	788	32%	109	14.29%	16	0.1	0.0
Sampson State Park DD	18	3,427	1,794	52%	232	33.33%	77	0.1	0.1
Indian Creek	19	5,599	2,076	37%	296	17.02%	50	0.2	0.1
Simpson Creek	20	2,137	440	21%	147	21.21%	31	0.1	0.0
Sixteen Falls Creek DD	21	7,460	2,123	28%	841	16.13%	136	0.4	0.2
Lodi Point	22	1,211	358	30%	104	25.00%	26	0.1	0.0
Mill Creek	23	6,143	2,718	44%	472	16.18%	76	0.3	0.1
Lamoreaux Landing DD	24	6,516	2,431	37%	920	16.98%	156	0.5	0.2
Valois DD	25	6,909	3,366	49%	674	16.47%	111	0.4	0.0
Sawmill/Bullhorn Creek	26	4,129	2,422	59%	690	18.92%	131	0.4	0.2
Satterly Hill DD	27	5,426	2,997	55%	680	17.74%	121	0.4	0.2
Glen Eldridge	28	4,846	3,610	75%	579	18.18%	105	0.3	0.1
Hector Falls Creek	29	8,038	5,876	73%	1,596	15.71%	251	0.8	0.3
TOTAL		292,502	120,810	41%	31,207	17.13%	3,987	13.1	5.2

Figure 7.C.2 Percentages of Forest Cover in Subwatersheds of the Seneca Lake Watershed

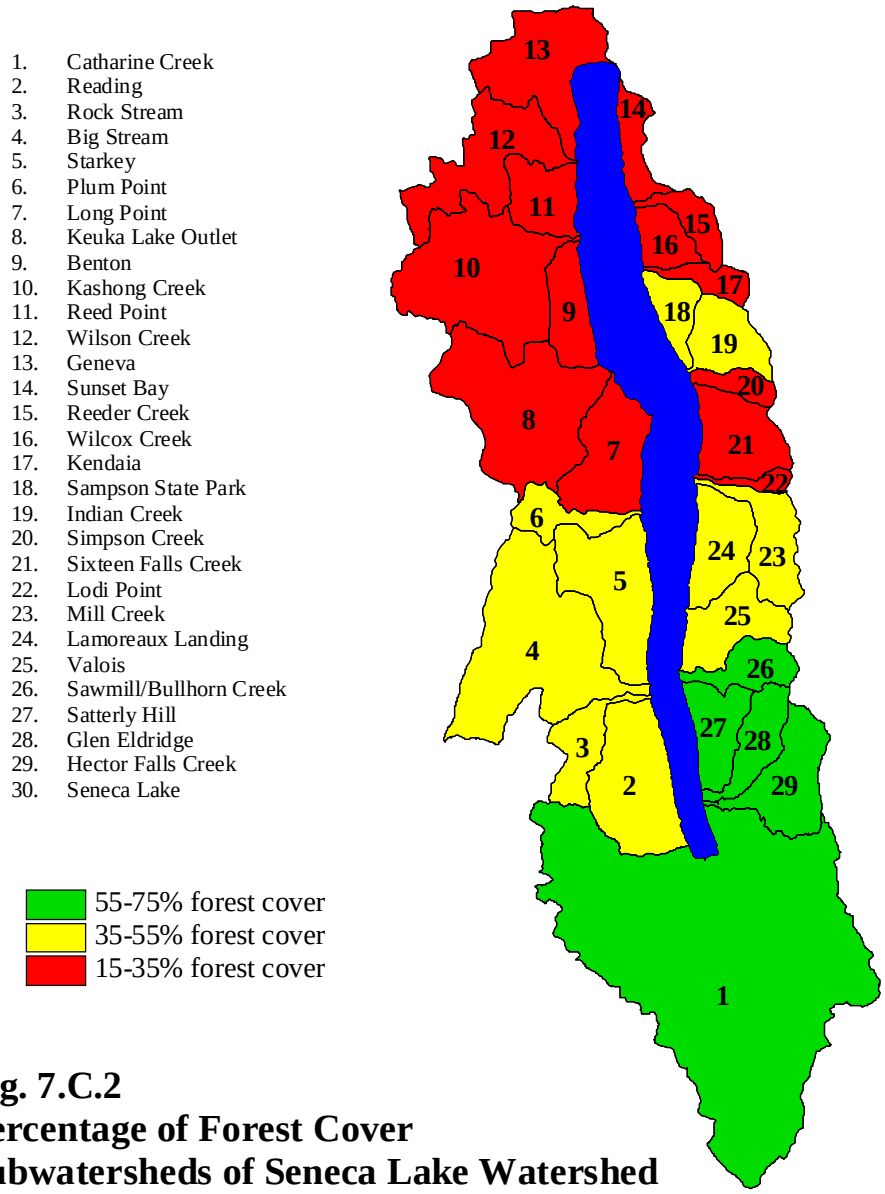


Fig. 7.C.2
Percentage of Forest Cover
Subwatersheds of Seneca Lake Watershed

In the southern watershed Towns of Catlin, Veteran, Catharine, Montour, Dix, Orange, Tyrone, Reading, Hector, Starkey and Barrington, substantial tracts of land were cleared for agricultural use, which proved unsustainable. Since the 1890s, these areas have been gradually removed from agricultural use. Approximately fifty percent of the watershed lands once used for agriculture have been replanted with softwoods or are in the early to middle stages of natural succession. The forested lands are also in the areas of steepest slopes.

LARGE PUBLIC HOLDINGS OF FORESTED LAND

Finger Lakes National Forest

The 16,036 acre Finger Lakes National Forest (FLNF) lies on a ridge between Seneca and Cayuga Lakes principally in the Seneca County Town of Lodi and the Schuyler County Town of Hector. Between 1938 and 1941 over 100 farms were acquired by the Federal government and constituted the "Hector Land Use Area," which became the FLNF in 1983. Two-thirds of the FLNF is forested, and the other one-third is grassland/pasture. About one-half of the FLNF lies in the Seneca Lake watershed. The FLNF is managed for multiple uses, including timber harvest, recreation, grazing, education and research, and wildlife. Woodland is managed to improve the vigor of future forests, provide wood products, and enhance wildlife habitat and visual quality. No

specific water quality objective is listed in the FLNF management document.

For more information on the national forest, contact: Finger Lakes National Forest, 5218 State Route 414, Hector, NY 14841; Telephone: (607) 546-4470

State Forests

The 937 acre Texas Hollow State Forest is located between Texas Hollow and Stream Mill Roads in the Schuyler County Towns of Hector and Catharine. It is located entirely within the Seneca Lake watershed. It does not have a management plan as yet.

The 9085 acre Sugar Hill State Forest (SHSF) is located in the Towns of Orange, Tyrone, Reading and Dix in Schuyler County. Only a small portion of the northeast corner of the SHSF is located in the Seneca Lake watershed. SHSF is managed under the December 1998 "Six Nations Unit Management Plan" which not only specifies the use of timber harvest best management practices but include a short section on "Watershed Resource Objectives". SHSF is managed to fulfill multiple uses.

The 613 acre Catlin State Forest is located off Sawdey and Chambers Roads in the Chemung County Town of Catlin. It is entirely within the Seneca lake watershed. It does not have a management plan as yet.

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For more information on state forests, contact: NYS Forests, NYS DEC Region 8, 7291 Coon Road, Bath, NY 14810; Telephone: (607) 776-2165

NYS Wildlife Management Areas
The 11,600 acre Connecticut Hill Wildlife Management Area is located on the edge of the Seneca Lake watershed in the Town of Catharine, Schuyler County and is managed by NYS DEC Region 7, P O Box 5170, Cortland, NY 13045.

The Catharine Creek Wildlife Management Area along Catharine Creek between Watkins Glen and Montour Falls in the Schuyler County Towns of Dix and Montour and Villages of Watkins Glen and Montour Falls. Presently it is 560 acres and may expand to as much as 882 acres if planned purchases are carried out. Mostly it is wetland habitat, and its few trees are willows and cottonwood. The 1984 Catharine Creek Wildlife Management Area Management Plan provides for no timber harvest.

For information on the state wildlife management areas, contact: NYS DEC Region 8, 7291 Coon Road, Bath, NY 14810; Telephone: (607) 776-2165

State Parks
The 774 acre Watkins Glen State Park is located in the Village of Watkins Glen and the Town of Dix in Schuyler County. The 141 acre Seneca Lake State Park is located in the City of Geneva, Ontario County and Town of Waterloo, Seneca County. The 12.4 acre Lodi Point State Park is located in the Town of Lodi, Seneca County. The 1905 acre

Sampson State Park is located in the Seneca County Town of Romulus. The Havana Glen State Park is located in the Town of Montour, Schuyler County.

All of these state parks are located entirely within the Seneca Lake watershed. Although large portions of the larger parks are forested, no timber harvest is allowed. The only forest improvement practices followed are re-forestation, selective cutting of hazardous trees, and cutting to obtain recreation objectives.

For information on the state parks, contact: NYS Office of Parks, Recreation and Historic Resources, Finger Lakes Section, Trumansburg, NY 14886; Telephone:
(607) 387-7041

PRIVATE HOLDINGS OF FORESTED LAND
Most forested land in the Seneca Lake watershed is privately owned in parcels of less than two hundred acres. Most of the privately owned forested land lies in Schuyler and Chemung Counties. Though Chemung County has attempted to interest towns in regulation of timber harvest, few municipalities have timber harvest registration or regulation in place. An excellent publication from the Chemung County Soil and Water District, Best Management Practices During Timber Harvest Operations, is available and applicable to conditions in Chemung and Schuyler Counties.

A number of sources of information on forestry practices are available to private property

owners. Forest landowners may participate in the Master Forest Owners Program and the New York Forest Owners Association, which will provide them with training. Forest owners may also receive harvesting advice from the forestry offices of the NYSDEC and, to a lesser extent, staff of the Soil and Water Conservation Districts in each county. The NYSDEC also can provide information about the Cooperating Consulting Forester and Cooperating Timber Harvesters programs, which assures property owners that foresters and harvesters have received and follow some training. A more formal arrangement with the NYSDEC under Public Law 480A provides for property tax benefits to forest owners who follow an approved management plan.

FOREST PRODUCTS

Hardwood lumber is a major product from forests of the Seneca Lake watershed. Although there are no major forest product companies located within the watershed, there are good markets for the timber locally and regionally. Hardwoods harvested from the watershed include sugar and red maple, ash, red and white oak, and hickory. Some softwoods such as hemlock and white pine are also harvested. Most of the hardwood lumber is used for furniture, molding, paneling, flooring and pallets. Many of the veneer quality logs are exported to foreign markets. Softwood lumber from watershed forests is usually used locally for construction of homes, barns, sheds and other structures.

CONCLUSIONS

With only 41% of the watershed in forest, Seneca Lake watershed has less forest than many other Finger Lakes. In recent studies, the percentage of forest cover in watersheds of Honeoye (80%), Keuka (54%), and Canandaigua (47%) were ascertained. Problems associated with lack of forest cover such as increased intensity of stream flow, increased erosion rates, increased stream bank instability, prolonged periods of no-flow, and decreased infiltration of groundwater may accompany the lower percentage of forest cover in the Seneca Lake watershed.

Publicly owned forested land is managed by professionals from the USDA Forest Service and the NYSDEC, who will enforce the application of best management practices on timber harvests. These harvests and practices can be used as models and teaching tools. Only a small portion of forested land in the watershed, however, is in public ownership.

Most forested land in the Seneca Lake watershed is in private hands. Decisions to harvest or not to harvest and how to harvest are largely made by private property owners.

Decisions about when and how to harvest timber are made based on many factors. Market factors are extremely important. Timber may be liquidated when other income sources, such as farm prices, are low. Additionally, when timber prices are high, loggers actively recruit. Actual timber harvest probably involves 1-2% of the forest lands per year, depending on the markets.

The most significant problem with timber harvest relative to water quality is the lack of

application of best management practices to the actual harvest.

FOREST MANAGEMENT OPTIONS:

1) Deny/Ignore the existence of water quality problems associated with timber harvest.

2) Acknowledge problems and try to solve them. Private property owners and loggers need more and better information about timber harvest practices.

3) Provide incentives to encourage the use of timber harvest best management practices. For example, certification that wood products are produced using Best Management Practices (BMP's) may prove attractive during marketing of such products.

4) If education and incentives prove too difficult, regulation of timber harvest may be necessary. Regulation proceeds in two steps: a) registration and b) permits. Registration simply requires that the owner/logger of a property to be harvested notify municipal officials. Registration is normally done to allow highway superintendents to exercise their existing powers to protect public roads.

   Permitting requires the preparation of a timber harvest plan on which best management practices may be detailed. Enforcement of such permits will be necessary.