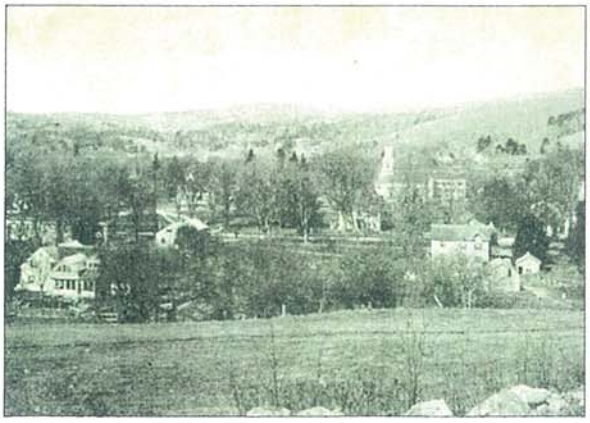
Wetland Resources

Land Use History

It is of interest to note that historically Cornwall has apparently never heavily depended upon its rivers for much other than occasional power. Town histories do not mention fishing or transportation as key assets of the watercourses. Rather, the natural resource value was in the woodlands where land-based charcoal making, which resulted in a deforestation of the land every 20 to 30 years, and iron making became important industries.

Photographs provide a means for land use comparison through the years. The sepia tone photograph below was taken sometime between the years 1890 and 1930. Though difficult to discern, the farthest hills are barren of trees. Only the few conifers that appear as dark patches stand out. By comparison, the color image from the spring of 2007 shows approximately the same area from a slightly different angle. The hills in this second photograph are completely wooded.

The historic growth and harvesting of the woodlands allowed for a fairly normal water cycle across the decades. The scarcity and/or lack of dammed rivers, extensive mill ponds, and channeled waterways helped preserve the wetland systems that Cornwall enjoys today.



Drainage Systems

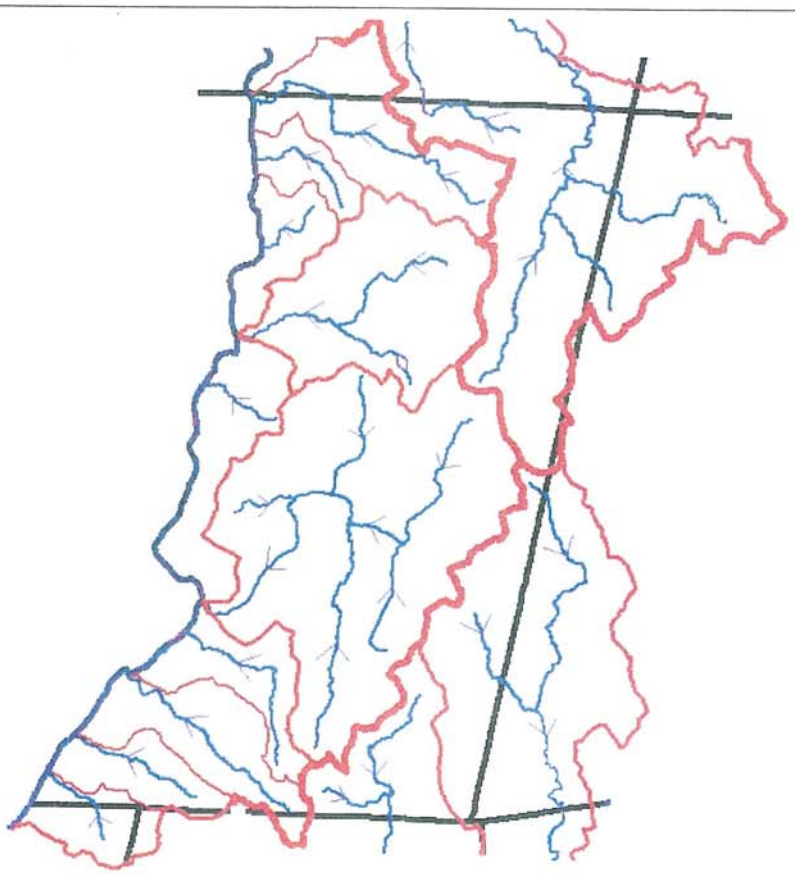
Knowing the boundaries of the watersheds is imperative to the understanding and long term maintenance of wetland health. For only in the knowing of the boundaries of the wetland systems can the planning to preserve them come about.

Housatonic River - The most noticeable of Cornwall's water resources is the Housatonic River which forms the 11.7 mile western boundary of the town. It is undammed in its north to south run but features rapids in three prominent places: West Cornwall, downstream of West Cornwall and due west of Green Mountain, and further south in the bend west of the Calhoun Cemetery. And while the water quality of the Housatonic itself is impaired, this is not the case with the tributaries that rise in, or pass through, Cornwall on their way to the main stem.

The Housatonic has abutting or riparian land use that is dominated by rail beds which parallel the river very nearly its entire length through town. Topographically, the riparian lands alternate between steep-to-the-waters-edge and flat floodplain. Four steep areas are: 1) Rugg Hill; 2) just above Cornwall Bridge; 3) west of Calhoun Corners, and 4) in the southwest corner of town. In a few places agricultural fields fill the floodplain as at: 1) west of Tarradiddle Hill, and 2) where Millard Brook enters the Housatonic. But mostly woodlands and rail beds abut the river.

Housatonic River Tributaries

The following graphic depicts Cornwall's eight primary drainages that feed the Housatonic. The heavy red line that runs from the top center of town to the east boundary and down to the bottom center marks the east/west drainage divide. All of the area west of the line drains to the Housatonic.



This graphic depicts the primary drainages in the town along with their direction of their flow.

As can be seen, the predominance of water that is shed by the Cornwall hills drains west into the Housatonic River.

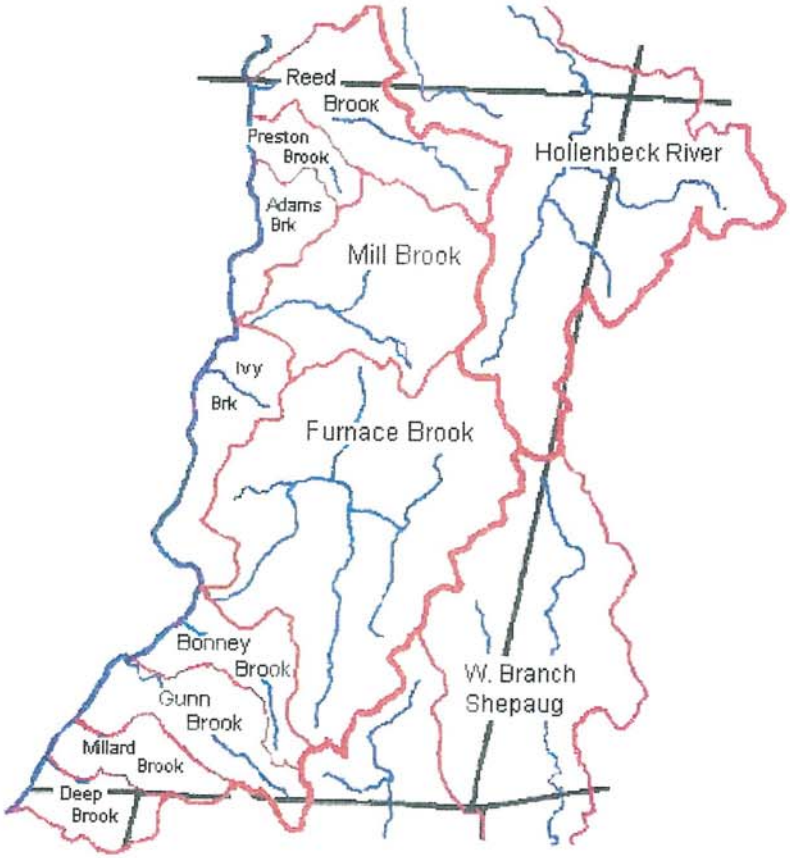
The town measures 46.43 square miles of undulating topography. In the graphic above, west of the red line, ~33.4 square miles (72 per cent) of town sheds water into the Housatonic River. East of the line, the remaining ~12.9 square miles (28 per cent) of town, drains into the Hollenback River to the north and the Shepaug River branches to the south.

Cornwall's various drainages are the result of its rolling topography which gives rise to a wide variety of wetlands and watercourses. Thus, the drainage lines define the boundaries and extent of the individual wetland *systems*.

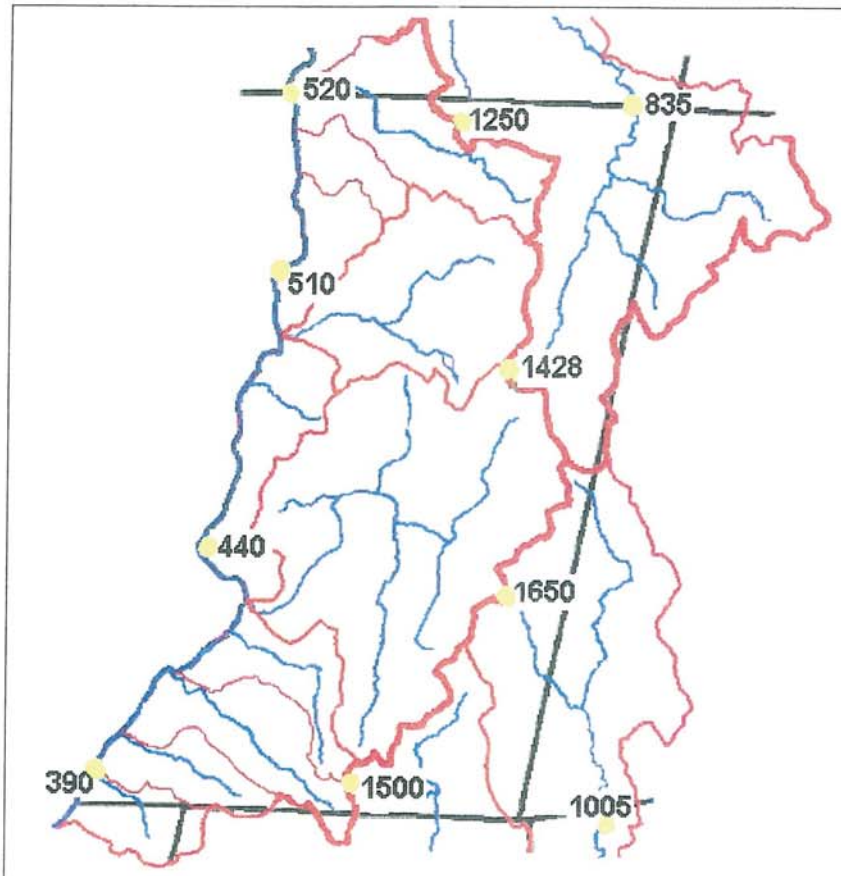
The largest single drainage system completely within town limits is the Birdseye/Tanner/ Furnace Brook watershed which dominates the central/south portion of town. It measures ~8,525 acres in size (29% of the town's land surface). The second largest is the Mill Brook drainage in the north central part of town. It abuts the Furnace Brook drainage to

the north. Mill Brook drains ~3,651 acres (12% of the town's land surface). Other smaller drainages such as the Reed, Preston and Adams brook drainages in the northwest and Bonney, Gunn, Millard and Deep Brook drainages to the southwest make up the drainage on the west side of the divide.

East of the divide Cornwall's hills give rise to watercourses that flow through many other towns. The Hollenback which rises in northwest Cornwall passes through Canaan before empting into the Housatonic. Southeastern Cornwall gives rise to the east and west branches of the Shepaug which pass collectively through Goshen, Litchfield and Warren.



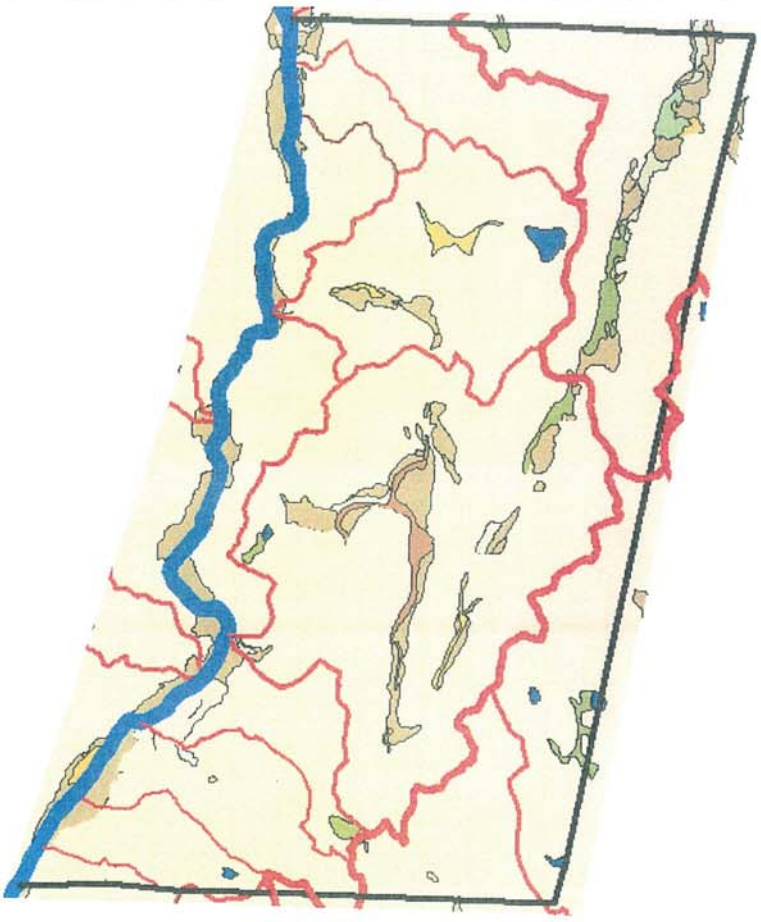
The diagram above shows the twelve major drainages that bound Cornwall's wetland systems. Of the twelve, six are completely within the town boundaries: Preston, Adams, Mill, Ivy, Furnace, and Bonney brooks. All of these drain to the west into the Housatonic.



This graphic displays ten elevation points which have been sited with yellow dots.

Taken individually, the sites show the variety of elevation within the town. Taken in combination, they show the nature of the drainage ridge that runs through town as the crest from which everything else is down slope.

While the information in the geologic section of this review discusses the literal underpinnings of Cornwall's landscape, a more recent event (in geologic time) has had great effect on the land surface, and thus the wetlands, of today. The melting of the most recent glaciation 16,000 years ago left us today's landscape. For within the glacier there was a great jumble of all types of accumulated earth material. These unsorted materials included sands, rocks, silts, cobbles, even boulders and were all amassed chaotically within the ice. When the ice finally melted, that mixture (known as glacial till or simply till) settled onto the landscape and provided the surface materials we have today. Those surface materials, in combination with topography, help define the nature of the wetlands in the town.



In this image of the glacial materials that cover the town, till is the sand color, and is by far Cornwall's most dominant surficial material. Other earth tone colors represent water-sorted materials such as sand and gravels, along with alluvium, that follow existing water courses or, in some cases, followed the historic glacial meltwater courses of long ago.

In general, most till is not very permeable. That is, water set on top of till takes a longer time seeping into the soil than, for example, if the water was on top of sand.

Thus, taking the factors discussed so far: that there are many individual watersheds in town and that they sit atop not-very-permeable till which dominates the landscape, we can better understand the wetlands.

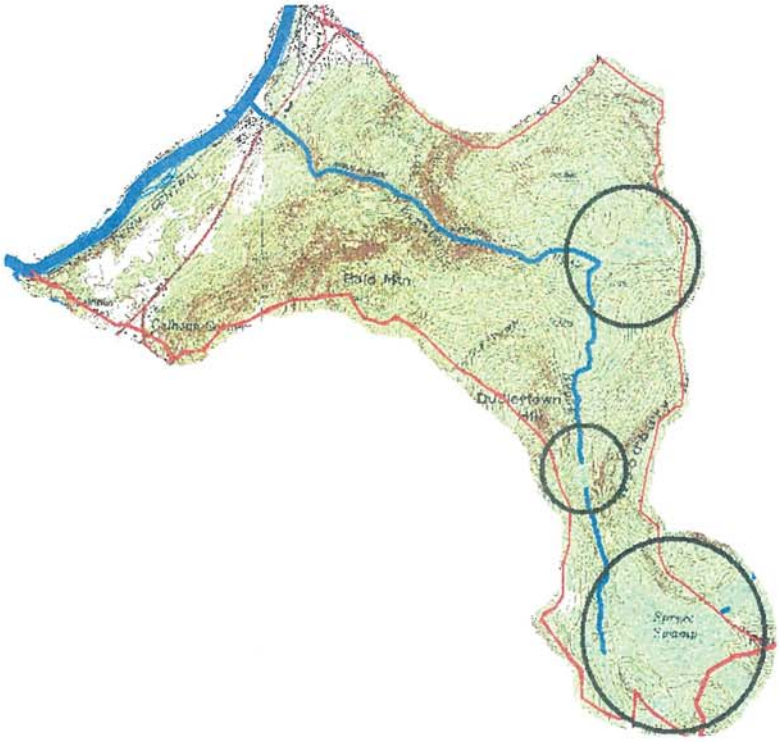
Wetlands and Watercourses

In the driving tour of the town it was very apparent that the wetlands the Team was exposed to showed a very high level of ecological integrity. In this vein it is clear that as

of this writing, regarding wetlands, there is far more right in the town of Cornwall than there is wrong.

Because it gives rise to so many watersheds, Cornwall, as a result, has many headwaters wetlands. It is typical of Cornwall's watersheds that the principal watercourse has, as its headwaters, a wetland. Inspection of the topographic map shows that, for example, both Bonney Brook and Reed Brook have headwaters wetlands. Adams Brook, south of Reed Brook, does not because of its very steep nature. Its main tributary, however, does. It is important to note that from a planning perspective, headwaters wetlands are a most sensitive and important part of the overall wetlands system.

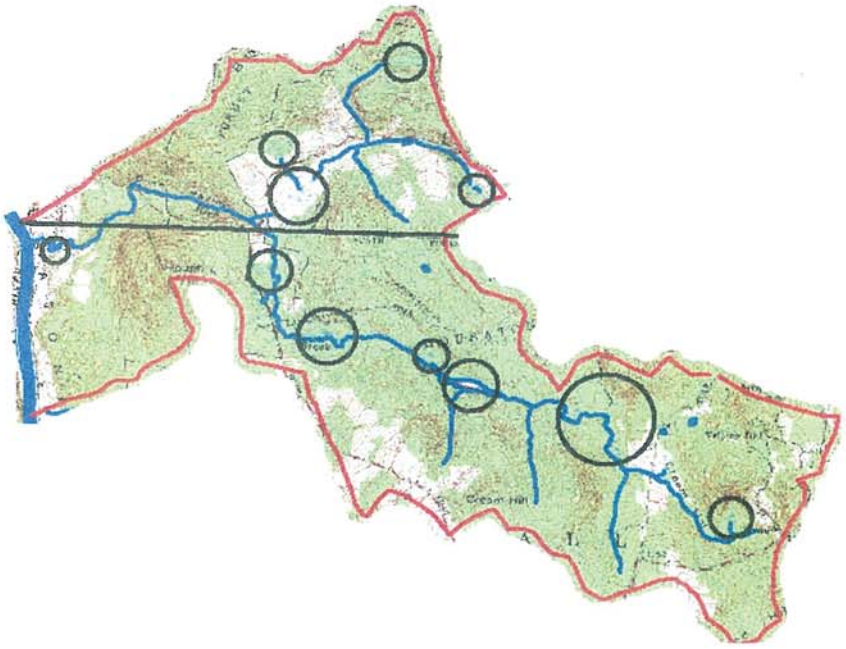
Following any of these watercourses downstream, where the topography allows (IE: not too steep), it is typical that the watercourse connects a series of wetlands.



Pictured on the left is a simplified depiction of the Bonney Brook watershed (red outline). Circled in black, like pearls on a string, are three wetlands connected by the watercourse. Easily visualized is the fact that degradation in the upstream wetlands will quickly pass down-stream and affect the others.

Because of the rural nature of land use/development in town, the many headwaters wetlands are very much intact and in a good state of health. The ecological integrity mentioned above provides for a high value for wildlife habitat. The diversity of both the finfish and the wildlife that makes use of these wetlands speaks to the condition of both the habitat, the water quality, and the wetland extent.

In a fashion similar to Bonney Brook, the Reed Brook watershed along the northern border of town is even more extensive and, as a result, shows a more diverse network of wetlands that feed the main stream and its principal tributary.



The Bonney Brook wetlands are circled in black.

Moving downstream in Cornwall's wetland and watercourse systems, the flood storage function of wetlands is intact because the wetland edge and watercourse riparian zones have experienced such little impact from development. This flood storage/protection function is one of the key values, and valuable assets, lost in suburban and urban wetland systems.

Cornwall's wetlands and watercourses have reached a dynamic steady state. Sitting on till based soils they are physically extensive and their many functions provide much value to the town. As developmental pressures occur and homeowner and town park lawns are constructed right up to the shorelines, erosion, impervious surfaces, road sand sedimentation, and new or replacement (larger/smaller) culverts will all eventually impact the wetland's health. Often not one development has impact enough to foster major changes in the wetlands system. However, *incremental wetland impacts*, up and down the watershed, will be like straws accumulating on the camel's back.

Other Wetlands - Vernal Pools

While it is beyond the scope of the ERT to inventory and assess all wetlands, a not-to-be overlooked part of the town wetland resources is their vernal pools. An effort must be made to document these pools and their contributing areas so future planning may provide for their longevity.

In densely populated and highly developed areas this is almost impossible. That is because the largest integral part of the vernal pool ecosystem is the upland area which neighbors the pool – and all too often is taken up by house yards and roadways.

This upland area typically extends away from the vernal pool uphill or upslope to drier soil types. The slopes often vary from gentle to steep. It is in these slopey areas that amphibians spend over 90% of their adult lives. They travel up hill to the well drained soils to burrow. In places, some usable slopes can approach 45 or more degrees. The drainage areas for these pools are typically located on till-based soils and measure 2-3 to 5-6 acres. With such small watersheds, local impacts can be dramatic and damaging to the vernal pool ecology, especially since vernal pools are fed primarily by surface water runoff (precipitation and snowmelt).

There is extensive information in print about vernal pools. Much of it points to the fact that the reduction of more than a certain percentage of critical adjacent upland habitat will have telling impacts on the pool's breeding ecology. A greater understanding of the amphibian's land-based needs may be obtained by mapping each pool's contributing watershed.

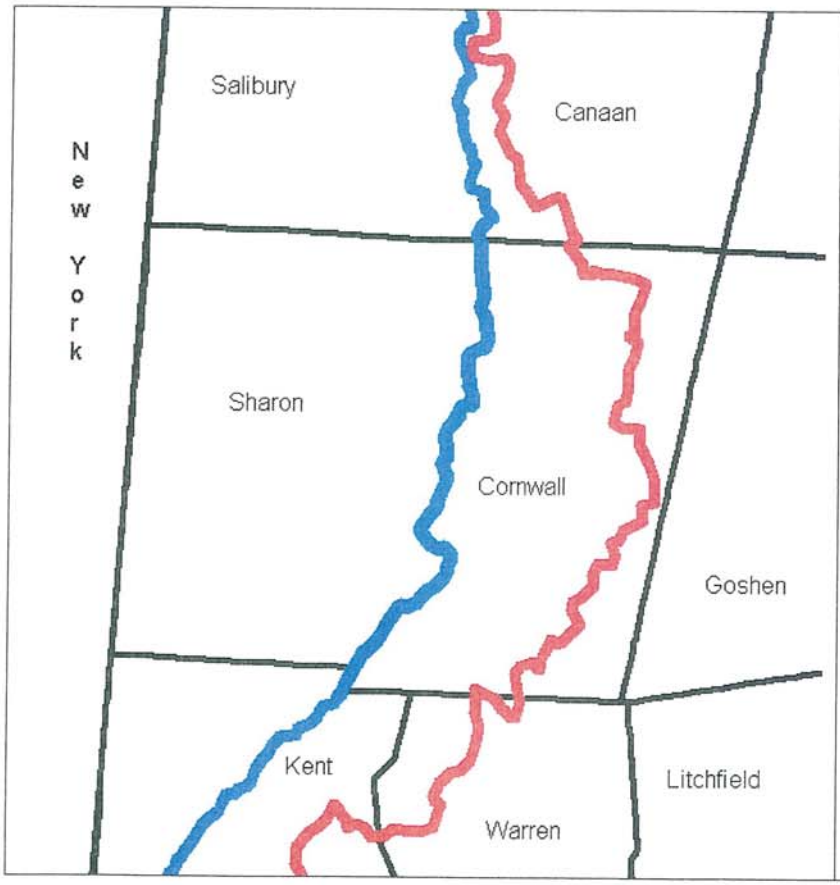
Dr. Michael Klemen's recent book, co-authored with Dr. Aram J.K. Calhoun, entitled: "*Best Development Practices – Conserving Pool Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States*" is currently one of the go-to resources for setback recommendations and vernal pool mapping procedures.

Ridge Top Protection

As described above, Cornwall has an extensive number of headwaters wetlands within its boundaries. Because of their sensitive nature a plan for protecting ridge tops, and subsequently the headwaters wetlands, should be pursued. It is noteworthy that the ridge that plays such an important role by giving rise to the many watersheds within the town does not end at the town boundary. Rather it continues north into Canaan and south into Warren and Kent.

The Farmington River valley's ridge tops have no protection and have become the home sites for many families. Towers also help break up the once scenic hill crest.

Protecting the ridge top/drainage divide would be similar to the intent of the 1998 Metacomet Ridge Conservation Compact that preserves the Metacomet Ridge though 17 towns in central Connecticut. A copy of the Compact may be viewed on the Town of Guilford Web site. Within their Natural Resources Inventory, see Appendix H2a.
http://www.ci.guilford.ct.us/



This graphic shows the Housatonic River in blue and the dividing ridge top in red. This same ridge which passes through Cornwall continues north into Canaan and south into Warren and Kent - two towns that may have similar environmental concerns.