

EcoLogic Memorandum

TO: Lakes Committee, Town of Lewisboro
FROM: Mark Arrigo
RE: **Response to Comments on Draft and Final Reports - Lewisboro Town-wide Comprehensive Lakes Management Plan**
DATE: 02/06/2009

EcoLogic, LLC (EcoLogic) submitted two versions of the Town of Lewisboro Town-wide Comprehensive Lakes Management Plan to the Lakes Committee – a Draft dated October 2008, and a Final dated November 2008. Comments have been received from the Committee on both submittals. This memorandum serves as EcoLogic’s Response to Comments on both documents.

1. Comments on Draft (October 2008) report, received on November 6, 2008.

Comment: One-The development map around Timber Lake, as I stated before, unless I'm misunderstanding it, in my opinion is still incorrect. That would lead to incorrect calculations of loading.

Response: In reference to the land cover data (Figure 3 of the Timber Fact Sheet), there is a scale issue in that the land cover data that is available is at a coarse scale compared to the size of the Timber Lake Watershed. In reviewing the “Developed-Open” area, it appears to match up roughly with the location of structures in the watershed. We feel this is an adequate representation of the watershed for our purposes. A finer resolution GIS mapping effort would result in a finer resolution estimation of phosphorus load allocation but we do not think that the conclusions would be significantly altered.

A second issue, which has previously been brought to our attention, is that the GIS maps indicate that most of the roads around the lake are paved when in fact they are not. The designation of paved or unpaved was made by the County personnel responsible for creating the GIS layers. We cannot change them, but would urge the appropriate personnel be made aware of the error. The concern here appears to be in relation to our estimated phosphorus load. The loading calculations are estimated from land use (ex. developed vs. forest). Areas with roads are lumped into the overall developed land use category. The type of road is not considered. Therefore, even if the roads were correctly depicted in the GIS files we received, the loading estimate would remain the same. Both paved and un-paved roads contribute phosphorus to lakes albeit in different ways. Paved roads are impermeable and rapidly transport water and anything that is carried in the flow over the surface to storm drains, while un-paved roads allow for infiltration but contribute additional sediment and have higher erosion rates. In our professional opinion the primary concern in Timber Lake is septics not the road type. For example, a watershed with only un-paved roads but no septics or other development would likely have low phosphorus levels. However, a watershed with paved roads and the level of devolvement and septic load estimated from Timber would have elevated phosphorus levels.

Comment: The first page of the lab's sediment analysis for Timber Lake is missing.

Response: Attachment 2 (laboratory data and sampling location maps) revised and corrected.

Comment: For them to recommend, primarily, that the Town should conduct a cost/feasibility study for a sewer system within the Croton Watershed is so far from reality as to cast suspicion on all of their secondary suggestions.

Response: The community around Peach Lake is also within the Croton Watershed and has completed a cost/feasibility study and is currently in the process of installing sewers.

Comment: Fig. 3 p. 13 of 16 for Timber Lake the map is incorrect about the level of development around our lake. It's someone else's mistake that's visually quoted here, but a mistake nonetheless.

Response: See response to first comment.

Comment: P. 10 of 16 "1008 survey" should read 2008 survey (a typo).

Response: Corrected.

Comment: P. 12 conclusions are wrong as related to the graph.

Response: We have reviewed the graph and associated text. The text as written is a reasonable interpretation of the graph.

Comment: Metals analysis of the Lab Pages A2-69-70 (p. 245 or 244 or 246 is MISSING.

Response: Attachment 2 (laboratory data and sampling location maps) revised and correct.

Comments From Jan Anderson – Three Lakes

Comment: Enjoyable report, a lot of the chart formats are great.

Response: Thank-you

Comment: Table of contents – pagination is unclear. All sections start on page 1? For this comment document, the pages as shown on the pdf frame are used.

Response: We have added a cover sheet at the beginning of each fact sheet. The cover sheets will stay consistent with the report page numbering. The actual fact sheets will still each start on page 1 so that they can be easily used as a separate document by each lake association. The PDF page numbering is not linked to the report format so it only indicates total number of pages.

Comment: P 5 phosphorus – define limiting nutrient? Eg something like: "Phosphorus is most often the limiting nutrient for primary productivity and algal biomass in inland lakes of the Northeast. Limiting nutrient means that the addition of more of this nutrient will trigger additional eutrophication. This finding has focused lake restoration and..."

Response: Excellent recommendation. We have added the following text: "A limiting nutrient is one that is essential for algal growth, but can be present in amounts smaller than required. Once the limiting nutrient (phosphorus) is exhausted, the algal community stops growing. If more phosphorus is added, algal growth will continue until growth is

again limited by lack of phosphorus or by other limiting environmental factors (example, decreased sunlight and/or temperature).”

Comment: P 6. 2. Hector to acre conversion not right. 56 hectares something like 140 acres??

Response: *Corrected.*

Comment: P6. Table 2.1 – the extent of what’s in Connecticut only becomes clear later. Maybe put a footnote after Oscaleta and Truesdale that says x% and y% of watershed area is in CT and therefore not reflected in structures count.

Response: *Done*

Comment: P. 7 Fact sheet section – it’s not clear what the order for the lakes is – areal size? Maybe state that?

Response: *Added the following text to the Fact Sheet introductory paragraph “The fact sheets are ordered by surface area (largest to smallest).”*

Comment: Maybe add for each of the lakes a brief section on 2007 or 2008 chemical treatments and targets. Also which lakes annually drawdown their lake levels and by how much.

Response: *This is a good recommendation. We are aware of these activities from the web sites, but do not have detailed historical info. If you would like this information in the fact sheets, we would like to request that the respective lake associations please provide a bulleted history of drawdowns and lake treatments.*

Comment: I really like the 100 meter maps around surface water – what’s the science for 100 meters (as opposed, say, to 150 meters or 50 meters?) It would be enough to quote a study, just let us know it’s not totally random.

Response: *This is based on Soranno, P. A., S. L. Hubler, S.R. Carpenter, R. C. Lathrop. 1996. Phosphorus loads to surface waters: a simple model to account for spatial pattern of land use. Ecological applications, 6(3):865-878. This report indicated that P loading within 100m of a waterbody was significantly higher than from other areas not near a waterbody.*

Comment: P 11. Waccabuc is a Class A lake

Response: *Corrected*

Comment: Maximum depth 14.2 (NYS DEC - CSLAP – consistent depth found over past several years)

Response: *According to Cedar Eden report (2004), maximum depth was 44 feet (13.4 meters), which was derived from a 1967 bathymetric map. In the database, the maximum depth listed was 14.3 meters (4 measurements); 80% of measurements were between 13.5 and 14.5 meters; Of individual measurements, 10% were 14.1 meters. 14.2 seems like a reasonable compromise, Table changed.*

Comment: P 16. I'm pretty sure the aerators were installed in 1973.

Response: *We used the Cedar Eden reports timeframe of "around 1970" in the fact sheet. A literature search found that Union Carbide's reports indicate that aerators were indeed installed in 1973. The Fact Sheet has been changed to reflect this.*

Comment: P. 17 Phosphorus inputs are available for Waccabuc Creek (western stream) inputs to Lake Waccabuc. Paul has them.

Response: *The information shown in the tables on page 17 (and similar tables in all the other lake Fact Sheets) are the summaries of our watershed loading models based on land use and septic contribution. If the Waccabuc Creek data are actual annual loading estimates collected with side by side concentration/flow data over an entire year or more then we could use these as a check of our load estimates for reasonableness. If they are concentration data without accompanying flows or are composed of only a few data points then they would not be useful here. Although we tried to limit the fact sheets to in-lake data only, if you wish, we could provide a summary of these data in a separate table in the fact sheet.*

Comment: P. 19 show chart of August DO over years?

Response: *Waccabuc – added August DO profile graphic to fact sheet section*

Comment: P .64. Input to Lake Oscaleta – add the Rippowam Creek at east end of lake (see map on p. 77).

Response: *Added the reference to Rippowam Creek to the fact sheet.*

Comment: Lakeshore communities – series of camps - many are now year round homes. Beach is "community" beach, NOT public beach.

Response: *Text edited.*

Comment: P 67. Historical – depths range from 0 to 10M (not 12 meters)

Response: *We checked the database and depths ranged from 0-11 meters. Updated paragraph accordingly.*

Comment: P 71. August DO over time – why not do that for other lakes with lots of data? Why not show 2007 DO changes over summer as for Waccabuc & Rippowam?

Response: *Added Oscaleta graphic of 2007 DO profiles to fact sheet section*

Comment: P 78. Phosphorus inputs are available for Rippowam creek (eastern stream) inputs to Lake Oscaleta. Paul has them

Response: *The information shown in the tables on page 78 (and similar tables in all the other lake Fact Sheets) are the summaries of our watershed loading models based on land use and septic contribution. If the Rippowam Creek data are actual annual loading estimates collected with side by side concentration/flow data over an entire year or more then we could use these as a check of our load estimates for reasonableness. If they are*

concentration data without accompanying flows or are composed of only a few data points then they would not be useful here. Although we tried to limit the fact sheets to in-lake data only, if you wish we could provide a summary of these data in a separate table in the fact sheet.

Comment: P 80. max depth in Rippowam for many sampling sessions is 5.7 meters

Response: According to Cedar Eden report (2004), maximum depth was 20 feet (6.1 meters), which was derived from data collected by volunteers using a handheld GPS unit to mark locations and either a tape or a fathometer to measure depth. There was no maximum depth specified in the CSLAP reports. In the database, the maximum depth listed was 6.25 meters (1 measurement); 70% of measurements ranged from 5.6 to 5.7 meters.

Comment: P. 85 show chart of August DO over years?

Response: Added Rippowam graphic of August DO over time to fact sheet section.

Comment: P133. Waccabuc is an outlier on residence time / flushing rate. Does this make a fundamental change, like inflows are more important on this lake because they never go out? Is there something that would help in this case (eg hypolimnetic withdrawal?)

Response: Yes, this fact is important since lakes with a longer residence time will usually have a greater period of time to grow algae, particularly after storm events. Unfortunately there is not much that can be done unless an outside source of water could be diverted to the lake to increase inflow.

Comment: P 136. 5% of the systems failing – give some reason that number is assumed. You may have pushback on the 5% assumption but there should be some data that shows it's a realistic number. (I've seen studies as high as 30% but that is some "camps" in Finger Lakes.)

Response: This number was based on our approach for similar projects in Oneida Lake New York, and Harwich and Chatham Ponds in Massachusetts. We could not find any studies of failure rates for the Town of Lewisboro. EPA indicates that on average New York septic failure rates are about 4%. The 5% is a conservative estimate (i.e. we did not want to overestimate septic contribution). The Peach Lake Sewer Cost/Feasibility study conducted by Stearns & Wheler found a 28% failure rate for dye tests and a 71% failure rate for percolation tests. If the failure rates in the Lewisboro Lakes are similar to the Peach Lake watershed then we can assume septic systems are an even greater contributor to the Lakes problems than we estimated. This would only make our recommendation to install sewers more urgent.

Comment: P 145. Consider making the fertilizers a separate bullet from the stormwater – it's related but increases its importance. Explain what is meant by storm basins, street sweeping, and erosion controls. Put in more storm basins? Clean storm basins? How do you know when street sweeping is required? What is meant by erosion controls?

Response: Fertilizer made into a separate bullet. The information in this table is only used as an example of the types of measures available for reducing phosphorus. It is all probably obvious to Lake Committee members but we decided to put this in the report for those that are less informed. We do not think adding specific detail here would be helpful.

Comment: P145. How do you test for failed septic systems? Is this something that the town can do or is it retained by the state/county DOH? Require upgrade – to current standards or best available technology? I think more detail here would be helpful.

Response: *Two methods are dye tests and percolation test. These were used in nearby Peach Lake. In the Oneida Lake watershed a study of septic failure rates was conducted by the Health Department. As stated in our response to the last comment this table is only meant to be viewed as a generic list of potential actions that could be taken to reduce phosphorus loads and should not be taken as our final recommendations for the Lewisboro Lakes, those are located in Section 7.*

Comment: P145. This is really a rich page. Do you have sample ordinances that would help for something like “require homeowners to maintain a vegetative buffer... how wide, what is a buffer (lawn, wood chips, no mow, garden, ??) If you detail this later say so here.

Response: *Specific recommendations are detailed in Section 7. To avoid confusion we have added wording to page 144 that says, “specific recommendations to restore/protect the Lewisboro lakes are presented in Section 7.”*

Comment: P 145. Septics. Inspection – this would be stronger if you gave a recommendation for the frequency – you do in the later pages, do it here too – recommend inspection of those not near water bodies – is this within the watershed but not within 100 meters or is this townwide or ?? Do you really mean prohibit construction of new septic systems or do you mean prohibit additional septic impacts (no house development or expansion?) Wouldn't you want an upgrade as much as possible with any transfer or expansion?

Response: *See responses to last three comments.*

Comment: P 145. Want to recommend LID (low impact development) standards?

Response: *LID is a relatively new and upcoming strategy. It looks promising. We have added a bullet for LID under the development bullets. Keep in mind however, that even with LID, new development will still result in additional phosphorus load to the lakes, albeit at lower levels than if LID had not been used. Later in the recommendations we caution about implementing phosphorus reductions on one hand while allowing new sources in the watershed on the other.*

Comment: P 145. What are the topics for public outreach & education? What's the best way to reach people?

Response: *This is covered in Section 7.5*

Comment: P 145. There are dirt roads around some of our lakes. Can you assess the amount of phosphorus that might be contributed by dirt roads? Is that something that you would recommend investigating?

Response: *Given the large proportion of phosphorus entering the lakes from septics it seems very unlikely that dirt roads are a significant contributor. Paved surfaces also contribute phosphorus. In addition, phosphorus carried in with sediment is often the inorganic form that is adsorbed to sediment particles. This form is usually not immediately biologically available. If the Town reaches a point in their restoration activities that septics are no*

longer an issue and BMPs have been fully implemented then investigating the role of minor sources such of these would be warranted. The primary focus presently needs to be on septics.

Comment: P145. On Three lakes & Truesdale, we're goose egg oiling, should that be a town wide initiative, including the town park waterbodies, etc'?

Response: *Yes, this is a good point that we overlooked because there are no quantified data on geese impacts to the lakes. We have added a new recommendation under Section 7.5.*

Comment: 146 – prohibit new development “near” – how far? In watershed? within x feet? In poor soils and within ?? feet?

Response: *Answered in section 7.3 of the report*

Comment: P 148. I'm not sure what the purpose of the historical recommendations are, and certainly Three lakes has had more recommendations than x'd on this chart. For example, we've recommended hand harvesting and benthic barriers for weed control. If you want a more complete set of recommendations we can provide. This seems like something that could be used to provide a future template and maybe some statement of which of these can be effective against the problem (phosphorus) and which are used against the effects (eg,treat weeds with herbicides). Or is this to show there is plenty of recommendations for lakes and it's time for town wide action?

Response: *The objective of this table is to collect in one place the recommendations that have already been made for each lake. It was designed to show a reader who is not familiar with your efforts the incredible amount of work that has already been done by the individual lake associations.*

We acquired the information for this table from the individual reports we have obtained. If there are activities we missed or that were not included in the report and that you would like to incorporate into the table please provide us with the information and we will add to the table.

Comment: P 152. “it may be a feasible alternative in the less eutrophic lakes; Waccabuc, Rippowam, Oscaleta, and possibly Kitchawan, where the phosphorus reductions are less than other lakes. “ Insert the word “required” or “recommended” in front of “phosphorus reductions”.

Response: *Done*

Comment: P 152 second check mark – problem is that Westchester County DOH does not currently allow alternative septic technologies such as composting toilets. Also, if you have a composting toilet, do you put the results into the trash? If not, if it's “composted” in the back yard, it stays in the watershed.. is it still as likely to migrate to the water?

Response: *If this is a direction the Town would like go in, then discussions with the Health Department would need to take place prior to implementation. The Health Department is likely to require additional permitting. Other County Health Departments (Madison County for example) allow for alternative technologies to be used, but require additional permitting.*

Compost could be discarded in the trash or used as yard compost. If compost were used within the watershed some of it could potentially reach the water. However, much of the nutrients would be utilized by the plants that the compost was being used on, resulting in significantly less phosphorus entering the water than was originally making its way to the water through septs. The use of composting material would likely fall under our recommendation for fertilizer restriction near waterbodies. Given the generally poor conditions for septic suitability in the watershed, utilizing compost in the watershed is still a better alternative than allowing that waste water to be discharged through the septic system.

Comment: P153. Stormwater – is there any way to disconnect storm drains that empty into the lakes? Has anyone done anything like that? Could we instead build a retaining pond back from the lakes...?

Response: *Unless the stormwater is completely diverted to another waterbody it cannot be “disconnected” from the lake. However, retaining ponds/basins can and have been used as a Best management Practice. Most of the water still enters the lake but are designed to allow sediment to settle before it enters the lake. The basins have to be periodically dredged to remove accumulated sediments. This can result in a decreased phosphorus load. The location of ponds/basins would have to be determined after a complete survey of discharge points is completed and prioritized.*

Comment: P 153. Fertilizer – on farms – we have llama farms, etc. How about saying on farm cropland?

Response: *Changed to indicate farm cropland*

Comment: P 154. I really like the idea of a report card. But what measures are on it? Do we use the % of summer readings with chlorophyll a readings over 15? Secchi disk readings less than 1.5 M? Phosphorus readings over x? number of storm drains cleaned? Number of septic systems upgraded? And then town-wide items, like education, regulations, etc?? I'd be glad to work with ecologic or ?? to get something in place.

Response: *There are many ways to format a report card document. We will send some examples of documents we have produced which may be helpful. Any of the topics listed in the comment would be appropriate. Depending on the project, we tend to try to emphasize long term trends in pertinent water quality variables: phosphorus, clarity, chlorophyll-a etc., and also summarize watershed efforts.*

Comment: P.154. What is routine bacteriological testing and why did you choose some sites and not others? Eg Waccabuc – Waccabuc country club has a beach camp, Oscaleta has a community beach ... shouldn't that also get bacti tests? This might be a place you'd talk about dirt roads too, if you care.

Response: *Fecal coliform bacteria are used as indicators of the potential presence of pathogenic (disease-causing) microorganisms. This class of bacteria is currently used by NYSDEC as an indicator of microbiological purity. The Environmental Protection Agency is strongly encouraging states to base their assessment of recreational suitability of freshwater on the presence and abundance of a second indicator organism, E. coli. Studies have shown that E. coli levels are more closely associated with human health impacts of contact recreation, particularly incidence of gastrointestinal illness. This*

recommendation was made because of the significant septic contribution to the lake, which can be a source of disease causing bacteria.

After consideration we have now changed our recommendation and added bacteria monitoring for all lakes and deleted specify location references. At a minimum, mid-lake samples should be collected. If individual communities have health concerns they could initiate testing at their beaches.

Comment: P 156. We call ‘em lakes, not ponds! Lake monitoring – if continued under CSLAP, who is the person who should consolidate / prepare the report card? I would suggest that be a role of the lake committee but they may disagree. Maybe rotate the role thru the lakes?

Response: *Ponds changed to lakes. We agree that the Lakes Committee should be the primary source of information.*

Comment: P 156. I like these more concrete recommendations.

Response: *This section was intended to be the primary section for recommendations. The previous sections were more general indicators of methods that can be used.*

Comment: P 164. 1.1.3. Want to recommend a model pooper scooper law? ... We don't have one in the town and it would be good to have that addressed.

Response: *Seems like this is more of a public nuisance issue than a water quality one.*

Comment: P 172. septic – the town generally considers that septic is not their issue, it belongs to the county. If you could cite a NY or Westchester town that regulates septics, it would be very helpful. Can you cite the towns referred to under testing and certification, and septic disposal?

Response: *The Town of Cazenovia in Madison County regulates septics within 500 feet of Cazenovia Lake (Part 5 Cazenovia Lake Watershed Zone [Adopted 2-9-2004 by L.L. No. 1-2004] ARTICLE XXIV Uniform Wastewater Management.) For example septics within 500 feet of the lake are required to be pumped at least once every five years.*

The Town of Lake George, New York is the Town cited in the code review section of the report (Page A1-11 of the report, or page # 172 when looking at the PDF numbering), the exact wording of their code is: “ In the case of all lakes, ponds, rivers and streams (permanent or intermittent) or any swamp, marsh or wetland, the minimum setback of any on-site sewage drainage field or seepage pit shall be 100 feet from the mean high-water mark irrespective of the zoning district or land use area classification.”

Although sewer/septic issues do tend to be organized at the County level, the magnitude of the septic problems in the Town of Lewisboro as they relate to water quality makes this issue a priority for the Town. The Town may not necessarily be the primary regulator in this case but they will need to take the lead if the septic issues are to be alleviated.

Comment: P 183. You might give the website where all the CSLAP data for the lakes can be found -- <http://lakelist.nysfola.org/>

Response: *Done*

2. Comments on Final (November 2008) report received on January 13, 2009.

Comment 1: The report itself should be broken out into two parts; the report and appendices.

Response: Done, we will separate the PDF into two Parts.

Comment 2: I assume you will be presenting this report to the Town Board. We suggest that the presentation be held sometime from mid February into Mid March. We would like to see the following; an executive summary highlighting the key elements of the study which could be used in your 30 minute presentation, along with a PowerPoint presentation.

Response: An executive summary and powerpoint presentation will be prepared for the presentation to the Town Board.

Comment 3: Because our committee will be advocating town wide lake improvements, we would like to see your recommendations as how to move forward in implementing some of the ideas. One person called it an “Activist Note”. We would like to make your report a living thing that will not die on a shelf somewhere.

Response: The Activist Note is included as a separate memorandum.

Comment 4: Included would be what are realistic things the Town Board could do. We know that constructing sewage treatment facilities at each of the lakes will help, but the monies involved and paper work to get sewer districting may be unrealistic, so highlighting some of the other suggestions to get us going would be desired. Perhaps discussion on alternate septic sewage systems, such as Puraflo” by Bord Na Mona (just one of many suitable systems), to be used for septic repairs. Perhaps the oldest systems or failing systems can be slowly converted using some of these new technologies, in lieu of a 20 million dollar sewage treatment facility. Provide information on new technologies for treating house hold waste or septic systems.

Response: We have added text to section 7.1.2 regarding alternative on-site wastewater systems. Essentially we state that in the absence of sewers these technologies may be of use in the watersheds of lakes that are currently not severely impacted. We also make clear that these technologies are primarily designed to treat for bacteria, not phosphorus. In particular these technologies do not appear to be effective at removing soluble reactive phosphorus (the portion that grows algae). The expense of permitting, installation and maintenance of these systems to the individual homeowners will likely be great and the anticipated affects to lake water quality minimal. There will also likely be animosity from some homeowners if only a minority of households (those with failing or old systems) install these systems.

Comment 5: Because we know that 85% of the phosphate comes from septic systems, perhaps a discussion explaining which house hold products not to use in the Lake community that gets disposed of into the septic system that contains phosphates.

Response: Text added to section 7.1.2 discussing need for public education regarding garbage disposals and phosphate containing detergents. In addition we added a recommendation for the Town to consider banning the sale and use of phosphate containing dishwasher detergents in the watershed.

Comment 6: Another note regarding our towns leashing law is that it does not address dog waste on property not owned by the dogs owner.

Response: This seems like it would be better handled at the Town level. We don't feel adding additional detail on this subject to the report will result in beneficial impacts to the lakes.

Comment 7: Suggested funding sources to continue the Town Wide Lake improvements.

Response: Added potential funding sources section to the report.

Comment 8: We know that this report had to generalize soil types and their characteristics pertaining to septic suitability. Is it possible to identify the value of further study of more specific, individual sites to try and find smaller areas of more suitable soil?

Response: We have added a section on data gaps and recommended areas of study as Section 5.2. The first recommendation is to conduct a watershed wide septic failure study. This will be of greater benefit than trying to determine soil suitability of smaller parcels.

Comment 9: What would EcoLogic recommend if you were to be asked to provide further studies or information?

Response: We have added a section on data gaps and recommended areas of study as Section 5.2. There are four recommendations for possible further study:

- 1) Failing septic rates for each watershed*
- 2) Comprehensive groundwater study*
- 3) Determine priority storm water sources*
- 4) Determine importance of internal phosphorus loading.*

Comment 10: Include recommendations regarding the advantages of leaf pickup and disposal by the town in Lake communities. The Town had been providing these services but this fall this service was discontinued, leaving a lot of leaves within the watershed.

Response: Added to Section 7.2 Stormwater Runoff Recommendations because stormwater is the conduit which leaves and yard waste make it to the lakes.

Comment 11. Include recommendations reading the advantages of cleaning storm drain structure sumps of accumulated sediments.

Response: Added to Section 7.2 Stormwater Runoff Recommendations