

Soil & Water Conservation Society of Metro Halifax (SWCSMH)

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Ref.: PH_Draft3RP2006 (6 pages & 3 DVD+R disks)
To: **Mayor Peter Kelly and the Regional Council, HRM**
From: S. M. Mandaville Post-Grad Dip., Professional Lake Manage., Chair and
Scientific Director
Date: May 09, 2006
Subject: **Public hearing on Draft #3 of the Regional Plan**

We are a scientific society specializing in the **biotic integrity** and **biodiversity** of freshwaters and parts of the marine ecosystems! We have received accolades from some leading international Governments and scientific authorities. Select professional staff of HRM and some of its leading consultants contacted us over the last decade for advice and for our scientific studies on a *pro bono* basis.

This submission is in addition to the 85-page printed submission that we had made directly to the Regional Planning office on January 30, 2006! The DVD+R disks have vast scientific info as well as several of the educational Tv shows that we produced all of which have direct relevance to `holistic planning`!

A. Our prime eight (8) recommendations all of which fall under the domain of sound Governance and science-based watershed management:

1) Set up a Lakes Authority staffed with two qualified applied limnologists.

Accreditation is available from independent international scientific societies who will scrutinize one's graduate-level education as well as relevant experience.

Examples of recent failures were the severe impacts on Sandy Lake, Hammonds Plains in the Glen Arbour area (see the last page, 6), and possibly at Russell Lake, Dartmouth. There were several other cases which we had summarized in Exhibit-B of our submission to Regional Planning.

2) Lake water sampling and the futility to track the incremental impacts of new developments, especially in shallow and/or coloured lakes which could be macrophyte driven.

To reliably ascertain incremental inputs from new developments, outflows of major storm pipe outlets, in-situ devices (e.g., CDS, Stormceptor, Vortech), constructed wetlands outlets, have to be monitored regularly, and pollutographs have to be developed.

“Among the limitations of relying solely on chemical and/or physical parameters to assess ecological health and sustainability is the fact that existing environmental quality guidelines (EQGs) only consider a toxic response to single chemicals, and therefore cannot account for the cumulative impacts from multiple chemical discharges (a “cocktail” of compounds) which may be coupled with physical changes in the environment.” (CCME, 2006)

3) The CCME's (2004) policy on cultural eutrophication should be strictly adopted by HRM as a regulatory tool. This policy is nothing new since the relevant science in it has been known from as far back as 1981 to scientists who are `current' in research!

As the year-2004 CCME Policy on Phosphorus (TP) clearly narrates that, not adhering to the reference/background (i.e., the natural pre-development value) + 50% maximum increase concept, even if they fall within the reference trigger ranges, could result in significant changes to the `COMMUNITY STRUCTURE'!

4) Enact a Lawn Fertilizer Bylaw restricting use of phosphorus containing fertilizers similar to the City of Minneapolis as extensively noted by the UNEP's committees. Other municipal units in North America are also showing interest.

5) Carry out DNA fingerprinting before making public statements on the fecal sources.

Bacterial Source Tracking (BST) is a state-of-the-art methodology that is being used in advanced jurisdictions to determine the sources of fecal bacteria in environmental samples (e.g. from human, livestock, or wildlife origins).

- 6) Mandate total stormwater treatment systems capable of removing the myriad of post-development stressors, not silt/soils and/or phosphorus alone, in new major developments.**

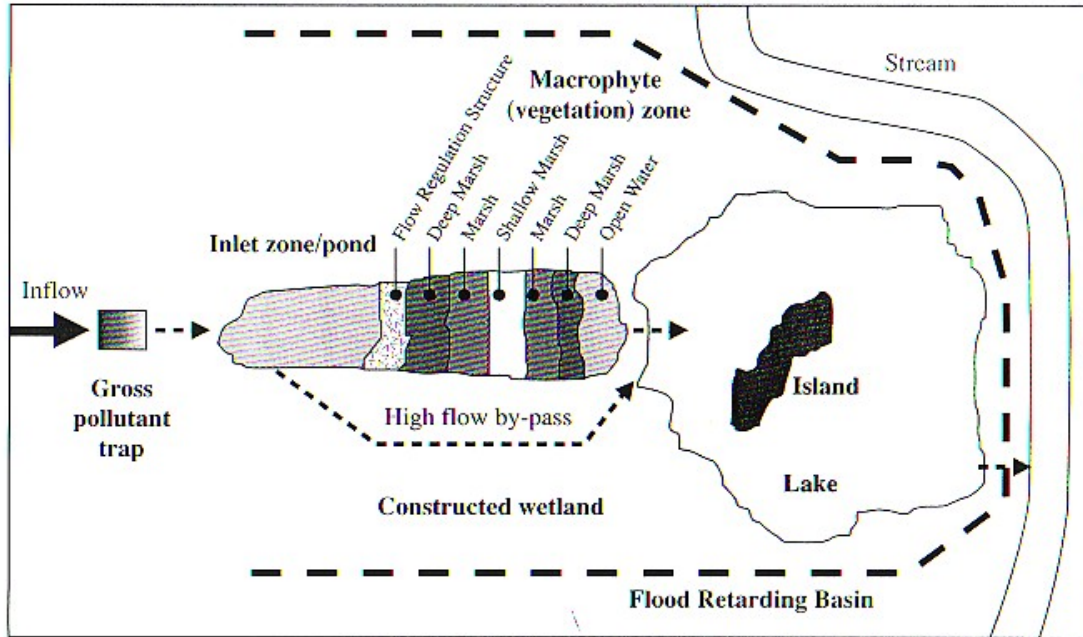


Figure 1: Modular elements in an integrated stormwater management system

- 7) Investigate the endocrine disrupting compounds (EDCs) in the effluents of sewage treatment plants (STP) discharging into lakes and rivers. Scientists believe that fish might be the first to absorb any dangerous chemicals that might later affect humans.**

Impacts on fish: There is evidence elsewhere that the synthetic estrogen, ethinyl estradiol (EE2), used in birth control pills is causing the feminization of male fish in these downstream waters. Some male fish are actually producing eggs.

Impacts on humans: A recent survey of cancer in Hardy County, where some residents get drinking water from the South Branch of the Potomac River in Washington, found rates of cancer of the liver, gallbladder, ovaries and uterus that were higher than the state average. All four cancers can in some cases grow faster in the presence of estrogen or chemicals that mimic it, cancer experts said.

8) Consultations regarding lake and river management should not be confined to appointed committees and boards alone. Public round table discussions should take place similar to the *modus operandi* followed by scientific authorities. In this manner, HRM may be able to build meaningful partnerships with those that it is supposed to serve in any enlightened democracy!

B. Our direct/indirect contributions (\$400,000 to \$500,000) to the HRM including its formal municipal units and about our international scientific team

We received sixty (60) or more unsolicited emails and detailed phone calls from present and recent staff of the HRM consulting us on a variety of science-related aspects as well as asking us for donations of scientific literature and predictive models. Example emails can be found in the accompanying DVD+R disk under "Our dealings with Government agencies". The aforementioned 60 emails are over and above any that accrued as a result of our emails.

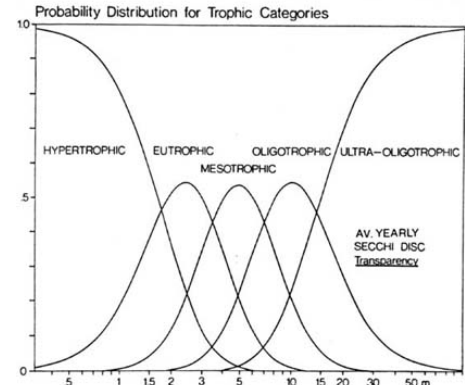
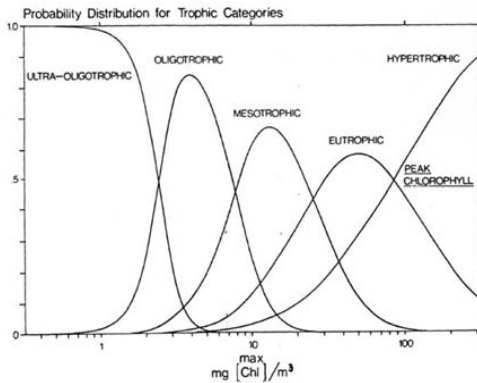
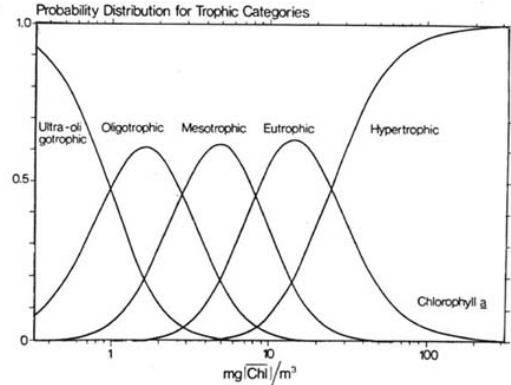
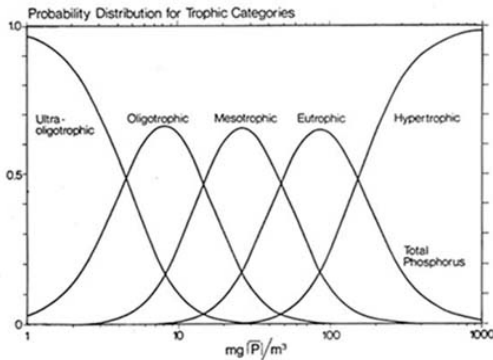
We have also been receiving requests from some of your regular consultants for info and input as a *pro bono*!

C. Scientific definition of trophic status and many are making significant errors

"Trophy of a lake refers to the rate at which organic matter is supplied by or to the lake per unit time." (Wetzel, 2001)

Trophy, then, is an expression of the combined effects of organic matter to the lake! As developed originally and as largely used today, the trophic concept (e.g., TP, Cha, SD, and TN) refers to the limnetic (i.e., open water or pelagic) zone-planktonic portion of the lake ecosystem. The littoral flora and its often dominating supply of autochthonous organic matter to the system, were, and usually still are, ignored.

Implement the 16-year peer-consensus research of the 18-country OECD (Organization for Economic Co-Operation and Development) as regards the probability distributions shown below along with one of our case histories:



Percentage Probability Classification of 1990 lake trophic states based on the "OECD" probability distribution curves. Classifications based on yearly averages for total phosphorus, chlorophyll a and Secchi disc readings. UO= Ultraoligotrophic, O= Oligotrophic, M= Mesotrophic, E= Eutrophic and HE= Hypereutrophic.

Lake	Based on Total Phosphorus					Based on Chlorophyll a					Based on Secchi Disc				
	UO	O	M	E	HE	UO	O	M	E	HE	UO	O	M	E	HE
1 Albro	5%	55%	36%	4%	0%	51%	44%	5%	0%	0%	3%	34%	50%	11%	2%
2 Banook	14	66	18	2	0	59	38	3	0	0	0	12	50	35	3
3 Beaverbank	2	37	55	6	0	22	61	17	0	0	0	4	37	51	8
4 Bell	32	61	7	0	0	74	24	2	0	0	2	27	53	16	2
5 Bissett	0	17	65	18	0	0	14	62	24	0	0	0	4	38	58
6 Chocolate	35	60	5	0	0	93	7	0	0	0	32	54	14	0	0
7 First	4	46	46	4	0	0	19	63	18	0	0	0	13	52	35
8 Hubley Big	4	47	45	4	0	8	55	34	3	0	0	3	33	51	13
9 Kearney	22	65	13	0	0	93	7	0	0	0	2	31	51	13	3
10 Kinsac	4	46	46	4	0	8	55	34	3	0	0	8	45	40	7
11 Loon	22	65	13	0	0	82	18	0	0	0	-	-	-	-	-
12 Maynard	17	65	15	3	0	21	61	18	0	0	2	31	51	13	3
13 MicMac	4	47	45	4	0	5	50	42	3	0	2	19	53	24	2
14 Miller	22	65	13	0	0	63	34	3	0	0	0	0	45	40	7
15 Morris	4	46	46	4	0	22	61	17	0	0	0	3	33	51	13
16 Nicholson	14	66	18	2	0	34	56	10	0	0	-	-	-	-	-
17 Osthill	2	43	51	4	0	3	33	56	8	0	0	12	50	33	5
18 Papermill	19	65	14	2	0	22	61	17	0	0	0	8	45	40	7
19 Portuguese Cove	2	43	51	4	0	20	60	20	0	0	0	0	13	52	35
20 Rocky	17	65	15	3	0	59	38	3	0	0	5	44	44	6	0
21 Sandy	5	55	38	2	0	25	60	15	0	0	0	12	50	33	5
22 Second	5	55	36	4	0	20	60	20	0	0	2	19	53	24	2
23 Settle	0	20	65	15	0	0	11	58	29	2	0	0	4	38	58
24 Springfield	4	54	39	3	0	22	61	17	0	0	0	8	45	40	7
25 Third	35	60	5	0	0	20	60	20	0	0	0	12	50	35	3
26 Tucker	10	63	26	1	0	3	33	56	8	0	0	3	35	51	11
27 Williams	17	65	15	3	0	20	60	20	0	0	5	44	44	6	0

D. Sandy Lake model with field data (4th vers.)

