



New York State College of Agriculture and Life Sciences
a Statutory College of the State University
Cornell University

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MEMO TO: Lake Ontario Stewardship Indicators Subcommittee Members (Members who did not attend the 2/8/93 meeting in Buffalo)

FROM: Barbara A. Knuth *Barbara A Knuth*

RE: Attached Memo

DATE: 9 February 1993

Based on the results of our November, 1992 meeting, I prepared the attached memo for discussion at the 2/8/93 meeting of the EOWG Subcommittee on Lake Ontario Stewardship Indicators. Unfortunately, we did not have time to discuss the memo at our meeting. I thought you might want a copy to keep your records complete.

As the meeting ended, Lois New and I expressed the desire for Joel O'Connor to arrange a conference call among some subset of Subcommittee members to discuss and move forward with this proposal for four stewardship indicators (as described in the attached memo and the 11/92 proposal by Knuth, Milbrath, Hatcher Roberts, and Rae). If you have a desire to be part of that process, you should contact Joel O'Connor.

I look forward to seeing you (and meeting those I have not met) at our next Subcommittee meeting, scheduled for 3/31 in Toronto.



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MEMO TO: EOWG Stewardship Indicators Subcommittee
FROM: Barbara A. Knuth
RE: Expansion of Ideas from November 1992 Proposal
DATE: 8 February 1993

At our November, 1992 meeting, we discussed the proposal by Knuth, Milbrath, Hatcher Roberts, and Rae, "Measurement of Stewardship Indicators in the Lake Ontario Ecosystem." The following builds on the base established in that proposal. Four indicators are described. I have also included thoughts on how these indicators will be of use to the EOWG and to agencies, how the techniques necessary to quantify the indicators can be developed, and how the baseline (current) values for each indicator can be established as the first data point on the indicator graphs desired over the long term.

I. Four Stewardship Indicators

Four stewardship indicators include: (1) **stewardship motivators**; (2) **stewardship intentions**; (3) **stewardship behavior**; and (4) **stewardship barriers**. Each of these indicators will be measured on a 1 to 10 point scale. Techniques must be developed, however, to be able to measure each of these indicators meaningfully on such a scale, as described below. The "acceptable endpoints" on these scales will be approaching a value of 10 for indicators of stewardship motivators, intentions, and behavior, and approaching a value of 0 for the barriers indicator.

The stewardship motivators indicator will be derived from several measures relating to normative values and beliefs, perceived responsibilities to future generations, personal concern, and perceptions about ecosystem relationships. The stewardship intentions indicator will be derived from several measures relating to what people seek to and are willing to do to fulfill their stewardship responsibilities. The stewardship behavior indicator will be derived from several measures relating to what people are doing (and how often) to fulfill their stewardship responsibilities. The stewardship barriers indicator will be derived from several measures relating to why personal behaviors do not equal intentions.

Example measures for each of the four indicators were included in the November, 1992 proposal. Specific measures that will be used to calculate each of the four indicators must be developed (see Section II).

Meaning for Agencies. The stewardship objective is that "human activities and decisions shall embrace environmental ethics and a commitment to responsible

stewardship." In an April, 1992 memo, J. O'Connor noted that "stewardship indicators can be expected to evoke action through clarifying unacceptable disparities between where we are and where we want to be, thereby prompting change in both public policy and actions of the entire Basin community." In order to work towards the stewardship objective, we therefore need to have indicators of **human activities** (stewardship behavior), **environmental ethics** (stewardship motivators), and **commitment to responsible stewardship** (stewardship intentions). If any of these indicators are less than the acceptable endpoint, **barriers** must be identified that stand in the way of attaining these objectives (stewardship barriers). Research and theory on human behavior indicates that behavior is linked fundamentally to intentions, motivators, and barriers. If agencies seek to influence behavior, they need to understand what causes Lake Ontario stewardship behavior, identify which of these forces they can influence, and then take actions to influence behavior (directly) or its related elements.

Bertram and Reynoldson (1992, JAEH) noted that ecosystem objectives "should be incorporated not only into agency programs but into public expectations." Thus, it becomes critical for public policymakers at all levels (not just the 4 Parties) and for key citizen leaders and teachers to have an understanding of the stewardship intentions, motivators, barriers, and resulting behaviors of the Lake Ontario citizenry. Without such an understanding by the 4 Parties, agencies will be ineffective working with and responding to the needs of the citizenry with which they seek to develop partnerships. Without such an understanding by other government and citizen leaders, it will be difficult for the 4 Parties to enlist the assistance that will be needed to foster long-term stewardship by the Basin's citizenry.

Bertram and Reynoldson noted that the entire EOWG guiding principle demands that "no activity of our present society will impair the use and enjoyment of Lake Ontario by future generations." How will this be possible to ensure if the 4 Parties do not work toward understanding and fostering desirable stewardship intentions and behaviors among the citizens of the Basin (our "present society")?

Bertram and Reynoldson concluded their article by stating that "because the critical role of public participation has been recognized and is being used during the development of both the ecosystem objectives and the environmental management plans, public support for these programs and expectations for achieving the ecosystem objectives should (emphasis added) remain high." It is naive for the 4 Parties to assume that simply because they are using what they consider to be adequate public participation that public support in fact is or will remain high. A rigorous assessment and continual monitoring of public support and stewardship is needed to identify if the 4 Parties need to make changes in their policies and actions.

Relationship to Other Stewardship Indicators. This Subcommittee began with a set of 18 potential indicators and is now discussing a subset of those for final adoption. The four indicators proposed here either encompass or complement the other indicators being discussed for adoption as follows:

- (1) Effectiveness of Interactions Among the Public, Industry, and Governments -- Stewardship Barriers.
- (2) Toxics Inventory -- the Corporate Volunteerism portion of this indicator could be assessed through the "key leaders" involved, using the indicators of Stewardship Behavior and Stewardship Intentions.

(3) Toxicant Loss from Manufactured Products. Relationship to four proposed stewardship indicators is unclear.

(4) Environmental Volunteerism by the Public -- Stewardship Behavior, Stewardship Motivators (would help explore the information needs noted by S. Lerner to understand the meaning behind any fluctuations in numbers of volunteers).

(5) Other indicators that have been discussed by the Subcommittee at various times are also related to the proposed four indicators as listed below.

- (a) Public Response to Government Leadership (Stewardship Barriers)
- (b) Government Response to Lakewide Needs (Stewardship Behavior)
- (c) Degree of Public Access (Stewardship Motivator, Stewardship Behavior)
- (d) Budget Assessment (Stewardship Intentions (e.g., budget proposals), Stewardship Motivators (e.g., tax incentives) Stewardship Behavior (e.g., actual budgets))
- (e) Municipal Behavior (Stewardship Behavior)
- (f) Perception of Health Risk (Stewardship Motivators)
- (g) Corporate Environmental Audits (Stewardship Intentions, Stewardship Behavior)
- (h) Environmental Values (Stewardship Motivators)
- (i) Household Environmental Audits (Stewardship Behaviors)

II. Developing Measures to Calculate the Four Indicators

As discussed at the November meeting, a mail survey would be the primary technique for measuring the four indicators. In an April, 1992 memo, J. O'Connor summarized the criteria judged by the Subcommittee as important for judging the indicators. These criteria included: (1) must be scientifically defensible; (2) must be quantitative; and (3) must provide information useful to environmental managers/policymakers and the public.

To be scientifically defensible, measures for calculating these four indicators should be based on a solid and rigorous review and synthesis of literature (theory and empirical studies) on measures of environmental stewardship. Second, the measurements for the four indicators should reflect items of importance to environmental managers/policymakers and the public. To meet these criteria, a thorough review of the literature will be necessary to ensure these indicators are based on well-grounded measurements, possibly with the potential for comparison to other geographic locations or demographic groups. As discussed at the November meeting, a pilot test of a draft survey instrument would be necessary to guarantee that the measurements are appropriate for developing the desired indicators. To ensure the indicators provide useful information to environmental managers/policymakers and the public, these groups would be invited to review draft survey instruments. The draft

budget below reflects the costs involved with literature review; draft questionnaire development, review, and revision; implementation of the pilot survey based on an approximate 400 sample size distributed between "public" and "leaders" as described in the November proposal; and final revision of the survey instrument. Travel is not included, but it is assumed necessary travel would be supported by the EOWG.

Draft Budget. These figures are draft (1993) U.S. dollars for discussion purposes only, and are based on assumptions that instrument development will be conducted through Cornell University.

Salaries	
Principal Investigator	\$ 5,000
Research Support Specialist	8,000
Research Aide	2,000
Administrative Assistant	1,000
 Fringe Benefits (36%)	 5,760
Supplies	1,000
Printing and photocopying	1,000
Computer expenses	600
Telephone	500
Total Direct Costs	24,860
Indirect Costs (59%)	14,670
TOTAL COSTS	39,530

III. Measuring the Indicators' Baseline (Current) Values

As described in the November, 1992 proposal, an explicit sampling approach to sample the general public and key leaders would be needed. The revised survey instrument developed (Section II) would be used to gather information leading to quantification of the baseline (current) values for each of the four indicators. See the November, 1992 proposal for anticipated costs and details of the methods. Because the measurement instrument would be developed (Section II), salary costs outlined in the November proposal would be reduced. Measurement would be repeated on a 5 to 10 year basis to monitor trends in stewardship indicators and motivate social and institutional change.