Proposal

MEASUREMENT OF STEWARDSHIP INDICATORS IN THE LAKE ONTARIO ECOSYSTEM

Produced for the

Lake Ontario Responsible Stewardship Subcommittee

of the Bi-National Ecosystems Objectives Work Group

by

Barbara A. Knuth, Cornell University
Lester Milbrath, University at Buffalo
Janet Hatcher Roberts, Health and Welfare Canada
Jennifer Rae, Health and Welfare Canada

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I. BACKGROUND

Ecosystem Objective for Stewardship

The Ecosystem Objectives Work Group developed a goal and objective related to Lake Ontario Stewardship. The goal is that "we as a society shall recognize our capacity to cause great changes in the ecosystem and we shall conduct our activities with responsible stewardship for the Lake Ontario basin." The stewardship objective is that "human activities and decisions shall embrace environmental ethics and a commitment to responsible stewardship." The goal and objective imply important indicators will include measures of (a) the extent to which members of society are aware of, and accept responsibility for, the ecosystem effects caused by human activities; (b) the type and extent of adoption of certain ethical environmental beliefs held by decision-makers (individuals and groups in government and non-government spheres); (c) human activities that may reflect stewardship; and (d) commitment to stewardship. We recognize that stewardship commitment may be different than actual behavior (human activities). That phenomenon is discussed below.

The ability of the Parties (governments) to meet the set of Lake Ontario ecosystem goals and objectives depends to a large degree on development of common understandings and partnerships between the Parties and the publics they serve. The proposed Stewardship Indicators Project will assist the Parties in monitoring progress toward widespread stewardship ethics and behavior in the Basin, and progress toward partnerships and common understandings between Party representatives and the citizens of the Basin.

Without a citizenry that has adopted a responsible stewardship ethic, political, financial, and institutional support for programs implementing the Lake Ontario Toxics Management Plan and the Lake Ontario Lakewide Management Plan will not exist. It is critical that the Four Parties understand (and do not just assume they understand) the current environmental ethic of Basin citizens.

The Stewardship Indicators Survey will provide measurement of consequential, socially- and politically-relevant indicators. How these indicators change over time will be a powerful assessment of the success of efforts of the Four Parties to achieve ecosystem management in the Lake Ontario Basin. The Stewardship Indicators Survey will also assess the accuracy of perceptions held by the Four Parties about the environmental attitudes and behaviors of citizens in the Basin and about the attitudes and approaches of key leaders in various sectors. The goal of the Four Parties should be to achieve over time a match between their perceptions of citizen attitudes and behavior and actual attitudes and behavior. Without such an understanding, the Parties may be making policy that cannot be implemented for lack of support, or that may be weaker than would have been supported, or that may be in conflict with the citizens for whom they are supposed to be working.

Defining Stewardship

What is stewardship? It is the moral obligation to care for something and undertaking the behavior necessary to provide the care. Behavior that accidentally

supports something would not be thought of as stewardship unless the person undertaking the behavior felt obliged (responsible) to do the caring thing. Conversely, feeling the obligation to care but not doing anything to provide the care would not be thought of as responsible stewardship.

Stewardship (or the lack of it) is a moral activity that only humans undertake. Humans are responsible for much of the degradation of the Lake Ontario ecosystem. Only they can remember the past and foresee the future and thus are equipped to imagine, plan, carry out, and evaluate stewardship activities. Other creatures devastate ecosystems at times (usually by reproducing at epidemic rates), but we never "blame" them, nor do we expect them to have the foresight or stewardship that would allow them to correct the damage they caused.

It is now obvious that humans have greatly degraded the Lake Ontario ecosystem and, if it is to be restored to higher integrity, humans must take responsibility for carrying out remedial action programs and for insuring that its ecosystem is maintained with high integrity far into the future.

How can stewardship be measured? The moral obligation part of the phenomenon is "in the head" and can only be inferred from verbal or nonverbal behavior observed by the researcher. Although researchers can observe nonverbal behavior that might be stewardship, it is still necessary to infer whether it is accidental or the result of purposeful care. If it is not purposeful care, it is not stewardship.

What is the best (most valid) basis for making inferences of stewardship? Researchers typically infer what is occurring "in the head" from seeing how persons respond to questions put to them by the researcher, or they observe nonverbal behavior believed to be relevant (e.g., expenditures, votes, programs, political action) and make inferences about the meaning of the behavior. Which evidence is best?

Evaluating Validity of Inferences

Inferences about the way people think, value, and behave are unavoidable. It is impossible to interact with other people or think about public policy without using such inferences. Regrettably, many people carry such inferences as background assumptions and do not raise them to consciousness for careful examination. It is sometimes said that everyone has an implicit theory of social change. Every decision about a contemplated political action, even the decision not to be active, is based in a person's operative theory of social change. A first step in our discourse, then, is to raise our implicit assumptions, our theories of social change, to full consciousness so they can be scrutinized for validity.

As we evaluate the validity of inferences, two general rules should be kept in mind. First, keep the inferences as short as possible; each additional step in the inference adds error. Second, beware of unspoken (and unanalyzed) assumptions that play a role in the inference; such assumptions must be analyzed for validity.

For example, it is often said that what people do is a better guide to what they think (believe, value) than what they say. Is it? This assumption may have some validity when applied to a candidate for public office who you believe is telling people what he thinks they wish him to say in order to win their votes. It may also be relevant for concepts or views that society highly proscribes or honors. For example, very few people today will readily declare, in private or public, that they are racist or anti-

environmental. These barriers to being candid, however, are special circumstances that do not apply to many contexts in which people express their values and beliefs.

We can tease out a better understanding of validity of inferences by examining a case that is central for our concern. Most survey studies of environmental thinking report that a high percentage of people express deep and sustained concern about environmental problems, yet these same studies also report that most of these people take no overt action to improve the environment. How do we resolve this seeming contradiction? One possible interpretation is that people do not really mean what they say. Another is that people do mean what they say but an additional set of factors shape what they do. What could those additional factors be?

Action carries time, effort, and money costs that are far greater than expressing an opinion. These costs bring other values into consideration such as needing to rest to relieve fatigue, spending time with one's family, giving time to other causes, having other purposes for one's money, and so forth. A belief that one does not have the proper skills (typically verbal skills and appropriate information) is also a considerable barrier to action. Being at ease socially is nearly a prerequisite for political action. A person with concern may also believe that her government does not respond to her action; therefore, why waste energy, money, and time on something that will not result in change? Finally, occasions for action (a meeting, a public hearing, etc.) are episodic and often not very visible to the average person; people cannot take action if they do not cognize the possibility.

Given all these confounding influences on behavior, it is obvious that feeling concern is only one of the possible antecedent factors determining if, when, and how people act. It is much more straightforward to recognize that concern is one thing and behavior is another and that they are loosely linked. The antecedents of behavior constitute a very complex set that is seldom possible to thoroughly explore in a study.

Tracing back from observed non-verbal behavior (especially the lack of it) to infer concern (or lack of it) involves a complex chain of reasoning and indefensible assumptions. Asking people if they are concerned leads to a much more parsimonious and defensible inference of concern.

A similar critique can be made of inferences about value when only economic behavior is observed (e.g., inferring the value of a park from people's expenditures to get there). Many people have recently sent money to a campaign to preserve the Arctic National Wildlife Refuge in Alaska where the U.S. DOE would like to drill for oil; surely most of them have no intention of ever going there. Should we infer that those who gave money highly valued the refuge and that it was their main motive? Should we infer that those who did not give money to fight DOE have no value for the refuge?

As another example, fighting for the preservation of the ozone layer is a struggle for a public good. Should we infer that those who do not join the struggle have no value for having an ozone layer? A much more defensible way to measure value is to simply ask people if they value something and to indicate the strength of their value. When values are clearly in conflict, it is possible to ask people to trade them off and thereby obtain an indication as to how values compare in strength.

If survey studies provide insightful information for inferring what is going on in people's heads, why is there so much resistance to them? For example, one frequently hears politicians or reporters saying that they really do not trust polls. Persons who disparage polls, however, cannot avoid making some assumptions about how people

think, value, and behave if they are trying to understand or to influence political activity and public policy. Therefore, they are leaving unsaid, and probably unexamined, the assumptions that they use for making their inferences. They are using even shakier evidence for inferences than the evidence they could draw from polling data. We suspect people disparage polls because they have not examined their own hidden assumptions that guide their personal interpretation of the way the world works.

II. Stewardship Indicators: Concepts and Operationalization

Information needs for successful Lake Ontario ecosystem management that can be met through this study include: identification of factors that motivate stewardship; identification and measurement of actions that reflect stewardship; assessment of intentions to take stewardship actions; and assessment of barriers that prevent stewardship. Perceived barriers are important to identify, so we can interpret why stewardship intentions are not always carried out (and to counter arguments that "people do not care"), and offer suggestions as to how barriers to stewardship might be removed or lessened.

The conceptual framework for the stewardship study will have four major components: (1) motivators of stewardship; (2) intentions to engage in stewardship; (3) stewardship actions and behavior; (4) barriers to stewardship. Analysis of sociodemographic influences on each of the components will be included. These components are described below, with examples of specific indicators that could be measured.

The quantitative endpoints of most of the stewardship indicators will be either the percent of the population responding positively to a certain concept, or a mean score for the entire population or a specific subpopulation. An example of a "percent" endpoint is the percent of the population of the Lake Ontario Basin that believes Lake Ontario is important or very important for their future welfare (see Milbrath, 1984). An example of a "mean score" endpoint is the mean score (on a scale of 1 to 7) for a question such as "What is your responsibility to improve the quality of the Lake Ontario region?", with 1 = no responsibility and 7 = very great responsibility (see Milbrath, 1984). Reference values may not exist for many of the potential stewardship indicators, but target values could be identified for each (e.g., 0% or 100% depending on the item; mean score above scale midpoint, or above the third quarter, etc.). Agreement on appropriate target values should be reached through discussion between representatives of the Four Parties. Individual indicators can be combined into an index, with corresponding changes in the interpretation of endpoints (e.g., Dunlap and Van Liere, 1978). Development of the complete list of indicators that would be measured will take time and discussion and will be done as part of the project to be funded.

Components of Stewardship

(1) Stewardship Motivators. These include (a) values and normative beliefs placed on personal and family health, ecosytem health, and natural vs. artificial systems; (b) perceived responsibilities to be stewards; (c) perceived responsibilities to future generations; (d) potential benefits from the Lake Ontario ecosystem; (e) knowledge and perceptions about the quality of the environment and the current condition of Lake Ontario and the ecosystem, uses of Lake Ontario, and risks and problems associated with Lake Ontario; (f) personal concern that something be done to restore the Lake; (g) perception about the relationship of the Lake Ontario ecosystem quality to stewardship behavior, and the relationship of global biospheric problems to

Lake Ontario; and (h) information sources used to learn about Lake Ontario. For many or all of these indicators, it will be desirable to analyze progress toward targets by subpopulations (e.g., persons age 35 or under).

Example indicators:

1. Extent to which people believe they are an integral part of the Lake Ontario ecosystem, rather than apart from it, measured on a 7-point scale. Target value will be determined (e.g., mean scale score of 7).

2. Extent to which people hold the view of the dominant social paradigm (Dunlap and Van Liere, 1978) that society depends upon unfettered environmental exploitation, measured on a 4-point scale with 12 separate items for a total possible score of 12 (holding this view) to 48 (opposing this view). Target value will be determined (e.g., mean composite scale score of 48).

3. Extent to which people score correctly on knowledge questions related to the types and potential negative effects (e.g., on human health, on wildlife) of anthropogenic chemicals in the Lake Ontario ecosystem (e.g., Connelly et al., 1992)

(2) Stewardship Intentions. Includes (a) what people would like to do to fulfill their stewardship responsibilities; and (b) people's willingness to devote money, time, political support, and share jurisdictional authority for improving and managing the Lake Ontario ecosystem.

Example indicators:

1. Extent to which people are willing to stop buying products that are especially harmful environmentally (e.g., Maloney et al., 1975). Target value to be determined.

2. Extent to which people are willing to pay a "pollution tax" to aid environmental remediation activities or limit future pollution (e.g., Maloney et al., 1975). Target value to be determined.

3. Extent to which people are willing to participate in beach cleanups. Target value to be determined.

(3) Stewardship Behavior. Includes analysis of (a) what people are doing to fulfill their stewardship responsibilities; and (b) how often they are taking these actions. Topics may include consumption levels, waste disposal, land use activities, and ways in which people use the Lake.

Example indicators:

1. Extent to which people purchase given products specifically because they have a lower-polluting effect (e.g., Maloney et al., 1975). Target value to be determined.

2. Level of care in disposal of hazardous materials (e.g., used motor oil, antifreeze, pesticides). Target value to be determined.

3. Membership statistics for selected environmentally-oriented organizations throughout the Lake Ontario Basin. Target numbers or percent of population to be determined.

4. Extent to which people keep track of their elected representatives' voting records on environmental issues (e.g., Maloney et al., 1975). Target mean score or percent of population to be determined.

(4) Barriers to Stewardship. Involves analysis of perceived reasons why personal behaviors do not equal intentions. Barriers include sociodemographic and economic characteristics, knowledge of stewardship and the Lake Ontario ecosystem, and other elements from each of the other major components of the study. Other barriers may include elements such as perceived access to decision-making structures and processes.

Example indicators:

1. To help illustrate the concept of barriers, note that the Human Health Subcommittee has proposed developing a Public Perception Indicator that could be incorporated into the Stewardship study. The Health Subcommittee's purpose was to "gauge if people are not using certain resources because of perceived health risks." An example of one of the human health perception indicators proposed was the extent to which people keep and eat the fish they catch from Lake Ontario. Considering the barriers to fish consumption that might exist, however, a more indicative indicator might be a comparison of what people actually eat versus what people would like to be eating if contaminants in the system were not a problem. The target for such an indicator would be a 1:1 ratio.

2. Extent to which people know where the water (and wastes) in their local sewer and drainage systems ultimately travel. Target value to be determined.

3. Extent to which people perceive they have access to information and persons with authority to make and implement changes in government at all levels. Perceived low access will be indicative of a barrier to stewardship.

(5) Sociodemographic and Economic Characteristics. These include employment, family status, length of residence in community, regional mobility, age, gender, education, etc. Format for gathering these data will be coordinated for comparability with U.S. and Canadian statistics.

Importance to the Four Parties

We propose using this conceptual framework for two major reasons. First, the framework allows us to measure progress toward the Stewardship Objective. Stewardship motivators, intentions, and behaviors are all implied by the Stewardship goal and objectives. Second, stewardship behaviors are what the Four Parties are ultimately interested in promoting. Policy initiatives to promote stewardship behavior will not be possible to develop unless the Parties have an understanding of the precursors of stewardship behavior (motivators, intentions) and the barriers that exist to

stewardship behavior. Examination of disparities between measured values and target values for stewardship indicators will help identify what kinds of actions are necessary to promote Lake Ontario stewardship. Disparities between public perceptions and key leader beliefs about public perceptions will demonstrate the need for improved understanding and partnerships (that will enable more effective collaboration) between the Parties and the public.

III. Survey Design and Implementation

We propose this project be conducted through the Human Dimensions Research Unit in the Department of Natural Resources at Cornell University. The University has the capability to conduct this research, and the Human Dimensions Research Unit (HDRU) is known nationally for social science research on environmental and natural resource issues.

The general approach will involve a set of mail surveys, following the standard operating procedures of the HDRU. This approach includes a 4-wave mailing (cover letter and questionnaire; reminder letter; reminder letter and replacement questionnaire; reminder letter) and a telephone survey with a sample of nonrespondents from the mail survey (if needed). This approach may be modified for some of the target populations. For example, to reach the sample of key leaders from the Lake Ontario policy community, wave 1 may consist of a facsimile sent to the leader, with wave 2 following with a letter and questionnaire.

Two major sampling approaches will be needed, one to sample the general public audiences, the other to sample key leaders in federal, state, and local governments, the business community, environmental organizations, education, and research institutions. A general public sample will be purchased (e.g., Survey Sampling, Inc.). A list of key leaders will be compiled with assistance from selected informants (e.g., Niagara Institute, environmental consultants). The sample will be of sufficient size to ensure completed replies from 1,000 public respondents on each side of the border (1,000 in New York; 1,000 in Ontario) who live in the basin. In addition, we will sample nongovernment key leaders on each side of the border in the following categories, aiming for completed replies as follows: 200 business leaders from each side (e.g., manufacturing industries, chambers of commerce), 200 environmental leaders from each side, 200 scientists from each side, and 200 educators from each side. We will sample government leaders on each side of the border in the following categories, aiming for completed replies as follows: 100 elected local on each side, 100 appointed local on each side, 100 elected county on each side, 100 appointed county on each side, 100 elected state/provincial on each side, 100 appointed state/provincial on each side, 100 federal on each side (i.e., 700 government leaders from each side). The total final target of respondents would be 2,500 on each side (5,000 total). To achieve that number of completed replies, we will have to draw a sample of about 8,330 people who would be asked to participate (assuming an approximate 60% response rate overall).

To develop the sample, we will define the Lake Ontario ecosystem of interest to include "any political jurisdiction that is 1/2 or more in the Lake Ontario watershed, including the Niagara River watershed." This description defines our sampling frame.

Each of the sampled respondents will be contacted with the standard mail survey techniques noted earlier. Key leaders are an important part of this study. They will be asked, similar to general public participants, to respond to the stewardship indicators survey from their own perspective to allow assessment of stewardship by key leaders.

In addition, however, key leaders will be asked to indicate how they believe the public will respond to key questions from the stewardship survey. With this information, we will be able to identify discrepancies that exist between public opinions and the perceptions of public opinion held by leaders in the Lake Ontario policy community. For logistical reasons, we will likely place these questions (perceptions of public opinion) immediately following the corresponding questions about the key leader's opinion.

Because of the binational and multiple agency involvement in the Stewardship Indicators project, we emphasize the importance of clear, close, and frequent communications with governments and sponsors at all stages of the Stewardship Study. We will build into the project timeline and study design collaborative development and review of draft survey instruments, development of data analysis plans, data interpretation, report writing, and information dissemination.

IV. Draft Budget

These figures are draft (1993 U.S. dollars), for discussion purposes only, and are based on assumptions that the research project will be conducted through Cornell University. Other assumptions include a sample size of 8,300, time needed for coordinated interagency review of survey instruments and draft reports, and assistance with sample selection.

Salaries	
Principal Investigator	$10,000
Research Support Specialist	25,000
Research Aide	12,000
Administrative Assistant	6,000
Fringe Benefits (36%)	19,080
Purchase of sample	2,000
Supplies (cover stock, paper, envelopes, postage, etc.)	14,400
Printing and photocopying	7,200
Computer expenses	3,000
Telephone	5,000
Travel	3,500
Total Direct Costs	107,180
Indirect Costs (59%)	63,240
TOTAL COSTS	$170,420

NOTE: This is a draft budget for the Lake Ontario Stewardship Indicators research project. A Great Lakes Basin-wide indicators research project would not be 5 times this cost, because many of the activities would not have to be done anew once completed for one lake. For example, salaries include design and pretest of the

questionnaire, deisign of coding, and analysis procedures. These elements would not have to be created again for other lakes once in existence for Lake Ontario. As a rough estimate, add in $70,000 for each additional lake to be surveyed (assuming initial sample size of 8,000 per lake). For the entire Great Lakes Basin, a rough estimate of cost would therefore be $450,420.

V. Literature Cited

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