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Report of the workshop to discuss the
establishment of a Carolinian node for
the Mixed Wood Plain ESC

Oak's Inn, Wallaceburg, and Walpole Island Heritage Centre
February 16-17, 1994

Sponsored by

State of the Environment Reporting
Environment Canada

NOTE TO READERS

The development of an Ecological Science Centre in each of Canada's ecozones and the network which connects them is evolving. Consequently, so is the terminology! The Ecological Monitoring and Research Initiative (or Network) has become the Ecological Monitoring and Assessment Network. There is movement to change "Ecological Science Centre" to "Ecological Science Cooperative" to reflect the current direction towards partnerships. "Anchor Site" is being replaced by the term "node". They are both used to designate an ESC long term monitoring and research site (which may have an associated cluster or cooperating monitoring and research sites). In this text, anchor site will be replaced by the term node after the first use.

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EXECUTIVE SUMMARY

A Workshop on the Mixed Wood Plain of southwestern Ontario was hosted by the Walpole Island Heritage Centre February 16-17, 1994. It was one of a series initiated and supported by State of the Environment Reporting (SOER), Environment Canada to establish ESCs in the ecozones of Canada and link them in a national network. The timing of the workshop coincided with the announcement that responsibilities for the implementation for the ecosystem monitoring and research program would be shifted from SOER to the Ecosystem Conservation Directorate of Environment Canada. A new unit of this Directorate, the Ecological Monitoring Coordinating Office (EMCO), is being established in Burlington. Dr Tom Brydges is the Director.

Participants to the workshop were drawn from local universities, federal departments and agencies, an environmental cooperative sponsored by major chemical firms, non-governmental organizations, Walpole Island First Nation, and the International Joint Commission. Chreod Ltd. assisted the Walpole Island Heritage Centre in organizing the workshop.

The Workshop identified the basic characteristics required for an ESC node (formerly "anchor site"). It would have the following characteristics:

- The capability, or track record, of relevant work at different levels or scales (local to global, etc.)
- Existing or evolving long-term ecological management activities.
- The ability to comprehend both academic and action-oriented priorities.
- Local community involvement in environmental management.

It also suggested the ESC node be established with sites in urban, agricultural and protected areas. It set out the following list of "measures of success" for judging activities:

- Active participation by institutions and individuals in building the network;

- Evident contribution by the ESC to environmental knowledge and state of the environment reporting;
- Responsiveness of the ESC to community and other requests for information;
- Evidence of influence on the shaping of public policy and management interventions;
- Ability to translate complex issues into a format understood by non-specialists;
- Encouragement of public awareness and empowerment;
- Respect for indigenous and similar information sources, as evidenced by their incorporation into the knowledge base. This would include citations.

Data management, including harmonization and the preparation of a meta-database, was the subject of considerable discussion. One participant volunteered to undertake preliminary work on the design of a meta-database during the next few months.

Environment Canada was requested to set up the steering group to turn the proposals and recommendations into an operational activity. The steering group would be replaced by a permanent body. This might be a "Board of Governors" that would exercise overall management of the Carolinian node of the Mixed Wood Plain ESC.

The participants in the workshop saw the Mixed Wood Plain ESC as very different from those in other ecozones. These differences include:

- the critical nature of the environmental issues in the area;
- special problems unique to the area that the Carolinian node would have to address; and
- the "critical mass" of scientists and institutions which should be available to undertake whatever ecological monitoring and research that is necessary.

In light of this, the workshop recommended that:

1. A node of the Mixed Wood Plain ESC should be established in the Carolinian area of southwestern Ontario. The sites that would comprise the Carolinian node should be representative of areas managed for agricultural, industrial, and urban purposes, as well as of protected natural areas. A minimum of three sites should be selected in the first instance. Walpole Island, Long Point Biosphere Reserve, Point Pelee National Park, Rondeau Provincial Park, the city of Hamilton, and the agricultural research stations at Harrow, London Research Facility, Ridgetown and Guelph were suggested for consideration.
2. A meta-database on Carolinian area ecological information should be created. It should contain pertinent facts about the location, quality, contacts, etc, of the available information, and not the information itself. Collection of information from non-conventional sources, and use of existing communication channels should be encouraged.
3. The Carolinian node of the Mixed Wood Plain ESC should encourage ecological monitoring and research projects at the individual sites, develop explicit lists of the criteria/ protocols for governing each activity that are in harmony with other Mixed Wood Plain ESC nodes, forecast the expected impacts, and ensure that the responsibilities are accepted by the institution or other "parent" of each activity. The ESC should encourage the adoption of standardized data reporting formats.
4. The organizational structure for the Carolinian node should be the minimum required to get the job done, and should involve both the scientific research community and the local communities.
5. An ad hoc Steering Committee should be created to establish a "Board of Governors" for the Carolinian node of the Mixed Wood Plain ESC. Environment Canada (EMCO) should take the lead in establishing this committee.
6. The Steering Committee should initiate the following institution-building tasks (knowing that the Board would subsequently undertake the responsibility of carrying out the work):
 - scoping issues, defining products, and similar planning and preparation;
 - creating and nurturing the networks of information, people and institutions that would be the core of the Carolinian node of the Mixed Wood Plain ESC;
 - establishing inventories of people, data and organizations;
 - developing an initial budget, including identification of sources, mechanisms of cost-recovery, etc.

BACKGROUND

A workshop hosted by the Walpole Island Heritage Centre, was held at the Oak's Inn, Wallaceburg, and at the Walpole Island Heritage Centre on 16 and 17 February 1994. The purpose of the workshop was to consider the establishment of a Mixed Wood Plain Ecological Science Centre (ESC) node in the Carolinian area of southwest Ontario (see Annex 1: Agenda).

The Carolinian area of southwestern Ontario, bounded by lakes Huron, St Clair, Erie and Ontario, is characterized by intensive agriculture, petrochemical industry, and major urban centres (e.g. Windsor, Kitchener-Waterloo, London, Hamilton and Guelph). The distinctive flora and fauna which characterized the area at the time of European settlement are now restricted to sites that represent only a small proportion of the land area.

Their presence indicated high fertility, which attracted the original settlers, the agricultural development and consequent industrial development patterns.

This workshop was one of a series initiated and supported by State of the Environment Reporting (SOER), Environment Canada to establish ESCs in the ecozones of Canada. Participants were drawn from local universities, federal departments and agencies, an environmental cooperative sponsored by major chemical firms, non-governmental associations, Walpole Island First Nation and the International Joint Commission (see Annex 2: List of Participants). Dr Ian Jackson of Chreod Ltd. assisted the Walpole Island Heritage Centre in Workshop organization.

WORKSHOP OBJECTIVES

The Carolinian workshop had three principal goals:

- It would provide an overview to the effort to improve ecological monitoring and research throughout Canada; consider goals and objectives of an ecological Science Centre for the Mixed Wood Plain ecozone; and identify the potential significance of an anchor site or node in the Carolinian portion of this ecozone.
- It would enable a first review of the diversity of monitoring and research in the area. Who is doing what? What data and analyses are available, and in what form? What are some of the priorities for future work?
- Finally, it was hoped that the workshop will take the first steps towards the organization and management of a Carolinian node of the Mixed Wood Plain ESC.

OPENING PLENARY SESSION

On behalf of Chreod Ltd. and Walpole Island Heritage Centre, Dr Jackson thanked participants for accepting the Workshop invitation. As he had emphasized in a number of individual meetings with participants in January, the Workshop was one of a series being sponsored by Environment Canada across the nation. Each Workshop faced a distinctive situation in its own region. Participants should focus on this situation without worrying unduly about how the outcome of the Workshop would be reconciled with the results from others in the ecozone.

Dr Jackson regretted that, for a number of reasons, it had proved impossible for U.S. invitees to be present. They could have provided information on two similar initiatives in the U.S.A.: The National Science Foundation's Long-Term Ecological Research Program (LTER) and the Environmental Protection Agency's Environmental Mapping and Assessment Program (EMAP). He noted, however, that these programs were outlined in Environment Canada's *Proceedings of the National Ecological Monitoring and Research Workshop*, copies of which were available for participants.

Three current developments were noted by Dr Jackson as very relevant to the Workshop objectives:

1) In the six weeks since the beginning of 1994, there had been ten accidental chemical spills into the St. Clair River, the source of all drinking water on Walpole Island. These incidents underlined the close linkage between environmental quality and human actions and impacts;

2) During the Workshop, the International Joint Commission would release its Seventh Biennial Report on Great Lakes Water Quality; this was expected to include major statements on the health effects of persistent toxic substances. Copies would be available for Workshop participants;

3) Lastly, Environment Canada's management of the ESC program itself was being changed as the Workshop was taking place. A new office (outside State of the Environment Reporting), the Ecological Monitoring Coordinating Office (EMCO) was being established at Burlington to coordinate the activities of the ESCs and link them nation-wide. The network which had been projected for the ESCs would be known as the Ecological Monitoring and Assessment Network (EMAN). This change would influence the discussions. However, the reverse was also true: the Workshop itself was well-timed to help shape the future of EMAN.

Dr Patricia Roberts-Pichette outlined the background to the monitoring and research initiative and the role of the ESCs locally, regionally, nationally and internationally. She explained that there would be one ESC per ecozone. Each ESC would be made up of one or more nodes where long-term ecological monitoring and research. The integration and interpretation of results would take place first within the node. The ESCs would be concerned with such ecological processes as energy flux, nutrient cycling (including sources and sinks) and population dynamics, and the explaining the effects of environmental change (eg changes in biodiversity, toxic chemicals, climate change, etc.) on these processes.

In the context of ESCs, human beings are part of the ecosystem. They cause changes in the environment, and may be both negatively and positively affected by those changes. It is important in addressing any issues of concern that

the changes being studied include those affecting humans as well as other biota.

Since no one agency or government department has the means or the expertise to address the complexities of ecosystem change, it is essential that strategic alliances are built among all stakeholders. The integration of existing information—including traditional ecological knowledge, old-time surveyors' reports, settlers reports and other "grey" literature—is essential to build up a profile of the ecozone. In preparing such a profile, major gaps in knowledge would be identified. These can be used to identify research needs.

SOER planned to establish ESCs in four to six ecozones in 1993/94. A successful outcome of this workshop would be the establishment of the first node of the fifth ESC - the Mixed Wood Plain ESC. Dr Roberts-Pichette emphasized that organization, management and research priorities of ESCs and their constituent nodes were individual and established according to local needs within the overall national framework. The Atlantic Maritime ESC where the first node was established in March 1993, was furthest ahead. It now had two nodes and a third was expected to be added in March 1994. The overall management structure for the ESC is being built on an existing Environment Canada coordinating committee (being expanded to include other federal and provincial representatives). It is in effect the ESC steering committee concerned with overall organization and planning. Further, one node centred in Kejimikujik National Park, has set up its own local "users committee" (which includes representatives of provincial departments, Queens County school board, Queens County Hospital, and two timber companies), and a scientific advisory committee. The other, the Greater Fundy Ecosystem node, has a different organizational structure but is compatible with the whole.

Now that the first ESCs had been established in the Atlantic Maritime, High Arctic, Boreal Shield ecozones, and the groundwork for their establishment in other ecozones were well laid, activities would now shift to making EMAN fully operational. The establishment of ESCs in other ecozones would also continue.

Dr Brydges, who would become director of the new Ecological Monitoring Coordinating Office April 1, 1994, noted that this federal initiative needed to be closely integrated with similar provincial activities, particularly in Ontario. He suggested that EMAN with its constituent ESCs, needed effective links with the expanding LTER program in the United States, and with the European-North American networks dealing with global change. He saw EMAN as providing concrete nation-wide data and research results and as providing the foci for their integration. Such integration is required for understanding ecological change and for providing the base federal and provincial governments need when dealing with the high priority issues of toxic contaminants, biodiversity, ultraviolet-B (UV-B) radiation, and climate change.

A general view of the Carolinian zone, from an avowedly agricultural perspective, was presented by Dr Bruce MacDonald. He reminded the participants that, for better or worse, southwestern Ontario is a managed ecosystem. The land area is dominated by highly productive industrial agriculture, with urban and rural patterns of human settlement a very significant element. ESCs in other Canadian ecozones might be able to focus on "natural" anchor sites or nodes. In southwestern Ontario, ecological monitoring and research has to reflect the profound and irreversible changes that human development patterns had brought about over most of the land area. These changes have had and continue to bring about vast changes on the biota, on surface and subsurface water, and in the atmosphere, impacts that are not only local, but also distant in both time and space.

An integrated approach, Dr MacDonald suggested, should focus on understanding three principal aspects of the regional ecosystem:

- distributions and interactions of different ecological elements;
- ecological state: especially the current health of the agro-ecosystem;
- ecosystem dynamics: rate, direction and magnitude of changes, and whether such changes are uniform, oscillating or cyclical in character.

Because the ecosystem in the region is essentially a managed ecosystem, such an understanding involves a recognition of the influence of often arbitrary boundaries within the region: census districts, township and other cadastral and political units, etc., which have been set up for administrative purposes. They may have little congruence with boundaries and units that emerge from consideration of ecological and physical characteristics.

Dr MacDonald mentioned various examples to emphasize that (again in contrast with the situation in other ecozones) there is a substantial inheritance of and many current activities in research and monitoring in this part of Canada. Several of these programs have had a major influence in stimulating cross-disciplinary and integrated ecological and environmental work. Two of particular significance in the past were:

1) PLUARG (International Reference Group on Great Lakes Pollution from Land Use Activities); which during the 1970s established the scientific basis for the ecosystem approach adopted in the 1978 Great Lakes Water Quality Agreement; and

2) SWEEP (Soil and Water Environmental Enhancement Program), a Canada-Ontario initiative from 1985 to 1993 designed to improve agricultural productivity and reduce phosphorus input to the Great Lakes through conservation tillage and erosion control.

Given this substantial volume of activity, Dr MacDonald suggested that the main value of an ESC for the area would be in:

- in creating a readily-accessible source of information on the availability, character and quality of monitoring and research data and analysis;
- the opportunities and mechanisms for short, medium- and long-term monitoring. This would involve evaluation of appropriate sites (intensive vs. extensive; manipulated vs. undisturbed, etc.).

ISSUE IDENTIFICATION

To speed up the process of decision-making at the Workshop, participants were organized into three breakout groups. Following the scene-setting opening plenary, the breakout groups met for the first time. The topic for discussion by all three groups was "Research and monitoring issues and perceived needs in the Carolinian area". This first session was expected to encourage wide-ranging discussion that would assist more focused questions to be taken up during subsequent sessions. The following is a summary of the reports from each group:

Group A

The group identified the following broad issues that need to be addressed by an ESC that would serve the Carolinian region:

- Agricultural centre or ecological centre?
- How to create an "institutional memory" for ephemeral projects?
- Establishing cause-effect linkages between human actions and environmental responses
- How to define the ecosystem and characterize the processes involved. A base of integrated information could be created for use in public and private decision-making regarding resource management
- Linking monitoring processes and results to adjacent human communities: giving people a sense of ownership in the work
- Designing monitoring systems that address a spectrum of problems from local to global

The group identified the following ecosystem stresses as being of particular significance in the region:

- Habitat and "natural area" loss and degradation
- Ground water contamination and movement
- Spills of toxins

- Loss of biodiversity and landscape diversity
- Wildlife population and species imbalances, including population excesses and the effect of exotic species.
- Airborne toxins
- Loss of ecological self-regulation

The group also noted that several current monitoring projects had broad ecosystem implications, and that they needed to be better known throughout the region. Examples were the mussel watch and amphibian biogeographical projects at the University of Windsor, and the extensive traditional knowledge of the Walpole Islanders, especially with regard to marshland ecology.

Group B

This group saw itself as "consumers" rather than "creators" of ecological information. They saw the proposed ESC as a useful element in the basic process of converting a problem or "question" (which may often arise in the non-scientific world) into a scientific investigation. It could assist in 'filtering' the question (i.e. identifying its scientific and researchable elements). The ESC could also play a useful role in identifying issues that should be tackled through specific research and those that have wider implications, which suggests the need for a monitoring program.

The ESC was envisaged as a network for integration and coordination, a "one-stop information access system". It therefore saw the principal activities of the ESC as communication, facilitation, and reality-checking. It would provide a mechanism for integrating existing research sites and datasets into a larger network; it should also be the means through which crises or "hot spots" (the Hagersville tire fire was mentioned as an example) could be followed up scientifically.

The group suggested that, from a time-dimension standpoint, there were two major response requirements for the ESC. It should be able to

cope with emergencies, and it must also be able to track the long-term evolution of the regional ecosystem. This however suggested a potential conflict that would need to be resolved: should the ESC be "use-driven" or "characterization-driven"?

Group C

This group set its discussions within the context of "Southwest Ontario as an economic engine of growth". This situation created a number of "burning issues" from an ecosystem standpoint, including:

- Loss of habitat; loss of species.
- The need for knowledge to be communicated to decision-makers, recognizing the continuing difficulties caused by scientific uncertainty.
- What might be described as the "chipping away syndrome". The regional ecosystem continues to be vulnerable to such human activities as urbanization, intensification of agriculture (including changes in agricultural management and techniques), increasing industrialization, pressure on sensitive sites and zones (e.g. wetlands), and decisions and activities that were/are based on too short time-horizons.

Other factors complicate the sensible resolution of such issues, and were often themselves in conflict with one another. Traditional values (such as those of First Nations) were often at odds with contemporary economic values; political considerations at all levels affected the region's ecosystem, as did job creation and other socio-economic priorities. Overall, there was evidence that a "sense of community" was declining in the region.

The group therefore saw the overall task facing an ESC as responding to the "burning issues" in a way that emphasized restoration and remediation. The group concluded by asking "Is there an audience for an ESC? Who is it?"

Plenary Discussion

The reports of the breakout groups provided the basis for a vigorous discussion in plenary.

Although the development of a mechanism for cooperation and coordination of monitoring and research in the area was widely supported, some of the implications were clearly unwelcome to one or two participants. Their view was that environmental data from a source funded by the chemical industry was necessarily suspect, to the point of being unacceptable. This view did not appear to be widely shared. It was pointed out that the source in question welcomed inspection of its monitoring methods and data, and that its reports were routinely peer-reviewed before publication. The majority saw ESCs as serving a useful function as "neutral areas" where such questions of data quality and integrity could be reviewed and discussed.

A running theme in this plenary discussion, and in the Workshop as a whole, was the place of the agricultural landscape in the work of an ESC. Many of the participants were oriented professionally towards agricultural and other "managed ecosystem" issues. Others were primarily focused on ecological problems that involved areas that had escaped, or partially escaped, agricultural conversion (e.g. Long Point, Point Pelee, Walpole Island).

There was general recognition that a Mixed Wood Plain ESC node in southwestern Ontario would not be credible if it did not include the intensively managed ecosystems that dominate the area. It was evident to most participants, that compared to other areas of Canada, design and operation of the Mixed Wood Plain ESC would involve special problems.

This was only one of three distinctive features of the ecozone that would shape the character and work of the ESC node. The other two are: (a) the fact that, as nowhere else in Canada, there is a critical mass of scientists and institutions that should be able to undertake whatever ecosystem research and monitoring is needed; and (b) the argument that environmental issues in this part of the country are more critical than they are elsewhere. This is due to human population pressures on a highly productive natural ecosystem that had already led to vast ecological change which was continuing an ever increasing rate. Further, human activities in the Carolinian area are also creating impacts in areas distant in time and space.

WALPOLE ISLAND: A PERSPECTIVE ON ECOSYSTEM MANAGEMENT

When the Workshop plenary resumed the following morning at the Walpole Island Heritage Centre, Dean Jacobs, the Centre's director, provided a perspective on the geographical setting and ecosystem of Walpole Island that illustrated many of the topics that had emerged during the previous day's discussions. He commenced his presentation by showing a video prepared by children at the Walpole Island School showing their perception of life on Walpole Island in the year 2000.

Mr Jacobs explained that because of its situation, water, land and air quality and management all directly affect the First Nation's society, economy, and the members health. Walpole Island Heritage Centre is engaged in air monitoring (for Environment Canada). It participates in the EAGLE (Effects on Aboriginals of the Great Lakes Environment) project, in which Health & Welfare Canada is the lead federal agency. It has also accumulated an enviable body of both scientific and traditional knowledge about the open water, marshland, prairie and woodland that constitute Walpole Island.

Walpole Island has been continuously occupied by Indian peoples for 6000 years. Currently, the First Nation operates an 1821 ha. (4500 acres) farm; it leases 4444 ha. (10,982 acres) of marshland (two-thirds of the total) to six hunt clubs during the duck hunting season. Dean Jacobs emphasized that the marshland and the fishery are as vital to Walpole's economy as they are to the maintenance of its heritage; the economic returns are comparable to those from Walpole's agriculture.

It was clear from Mr Jacobs' presentation that environmental and ecosystem quality is a crucial element shaping the present and future of the people of the Walpole Island First Nation. He noted that Walpole Island was pressing Ontario and Canada in regard to the First Nation's territorial claims. These claims are intimately related to Walpole Island's plans for a sustainable future based on its environmental resources. He mentioned that, since negotiations appeared to have stalled, the First Nation had, the previous day, initiated legal proceedings to resolve the land claims.

CHARACTERISTICS OF THE CAROLINIAN NODE

Workshop participants received copies of the International Joint Commission's report on Great Lakes Water Quality which raised a number of issues bearing on activities of an ESC. One passage may be quoted here, since it illustrates dramatically the significance of environmental issues for the population of southwest Ontario:

"... the Commission poses a number of ... specific but very fundamental questions:

What if, as current research suggests, the startling decrease in sperm count and the alarming increase in the incidence of male genital tract disorders are in fact caused in part as a result of in utero exposure to elevated levels of environmental estrogens?

What if, as current research suggests, the epidemic in breast cancer is a result in part

of the great numbers and quantities of estrogen-like compounds that have been and are being released into the environment?

What if the documented declining learning performance and increasing incidence of problem behaviour in school children are not functions of the educational system? What if they are the result of exposure to developmental toxicants that have been and are being released into the children's and parents' environment, or to which they have been exposed in utero?

The implications of any of the above questions being answered in the affirmative are overwhelming. The implications of all of the above questions being answered in the affirmative are catastrophic, in terms of human suffering and the potential liability for that

suffering and attendant health costs. Mounting evidence points to the latter possibility."

Before the breakout groups commenced their deliberations, there was a wide-ranging discussion on the experience already gained at other workshops, and how other ESCs were being organized. Each breakout group was asked to address a specific topic and to report on its conclusions in the closing plenary session.

Group A: Mixed Wood Plain ESC node in Carolinian Canada: requirements and opportunities

The group was asked to make specific recommendations on a site or sites, or to indicate what problems need to be resolved before any site could be identified.

In its report, the group set out the criteria that it believed are appropriate in recommending anchor sites in the region:

- The capability or track record, of relevant work at different levels or scales (local to global, etc.)
- Existing or evolving long-term ecological management activities.
- The ability to comprehend both academic and action-oriented priorities.
- Local community involvement in environmental management.

The group suggested that a minimum of three sites should be designated, to ensure both representativeness in an ecologically diverse area, and to enable replication. On this basis, the following were candidate sites in terms of an emphasis on ecosystem stewardship: Walpole Island, Long Point Biosphere Reserve, Point Pelee National Park, Rondeau Provincial Park. Hamilton should be a candidate site in terms of urban ecosystem remediation; similarly the agricultural research stations at Harrow, London Research Facility, Ridgetown and Guelph should be among candidate sites/institutions in terms of agricultural ecosystem remediation. This list is not exclusive, but rather a first cut at identifying a cluster of sites

which together would make up the southwestern Ontario node of Mixed Wood Plain ESC - the Carolinian node.

Group B: The role of an ESC in data management, information exchange, dissemination and publication

The group was asked to consider what an ESC could produce in the near-term that would help to meet the widespread demand for reliable but understandable information on the environment of southwest Ontario. Three types of need for exchange of monitoring and research information were defined:

- Reciprocal exchange between the scientific community and the general public.
- Exchange among members of the monitoring and research community itself.
- Active communication among the public, researchers and decision-makers to meet the needs of "managers" in both government and private sectors (e.g. in developing regulatory mechanisms, compliance, emergency support, etc.).

The group identified and discussed a number of key questions:

- Should the ESC use (rely on) electronic means of communication among participants and with the public?
- Alternatively, should it utilize multiple (all available) means of managing, analyzing and communicating information?
- What role should it play in regard to the continuity of information over time? (This is not so much a matter of data preservation as of ensuring that one set of measurements taken at one time are in fact comparable with another set at a different time.)
- What is the ESC's role in regard to the integrity of information?

These questions led to the group to ask whether the ESC should seek to acquire the original data on which analysis is based, or whether it should focus on providing information about the location, quality and other aspects of data. The group preferred the latter approach, and consequently the creation by the ESC of what it termed a "meta-database" of such information. The group recognized that this in turn raised other questions that would need to be resolved, e.g.

- Should the meta-database be a source for all relevant ecological information in the region, or only for designated anchor sites?
- How was a meta-database be financed? Should it operate on a cost-recovery basis, for example?

One member of the group, Dr A. K. Dewdney, volunteered to undertake preliminary work in the design of a meta-database during the next few months.

Two additional recommendations for the ESC were made by the group:

- There is a need to recognize the value of, and to organize the collection and use of, non-conventional sources of ecological information: traditional ecological knowledge, old-time surveyors' records, and the grey literature for example.
- The ESC node should use existing communication channels, with which people are already comfortable. Examples include the agricultural extension service; trade journals; the ESC Newsletter and other SOER publications.

Finally, the group raised the question of the extent to which existing university and government libraries and databases such as CISTI (Canada Institute for Scientific and Technical Information) can be utilized by the ESC.

Group C: Management, organization and linkages (with rest of ecozone, other ecozones, local communities, partnerships, etc.)

This group was asked to suggest the stages through which the development of an ESC should pass during the next 3-5 years.

On the basis of what had emerged earlier in the Workshop, the group assumed that the primary roles of the ESC would be those of 1) archiving information; 2) defining ecozones and sites; 3) communicating information about those zones and sites; 4) maintaining stewardship of long-term monitoring and research sites; 5) analyzing long-term changes; and 6) generally acting as a facilitator among stakeholders.

The group recommended that the ESC should encourage monitoring and research projects at anchor sites to develop explicit lists of the criteria involved in each activity, the expected impacts, and the responsibilities accepted by the institutional or other "parent" of each activity. The ESC should also encourage the adoption of standardized data reporting formats.

The group was strongly of the opinion that the appropriate organizational structure for the ESC should be the minimum required to get the job done. It should not appear to be "controlling" activities more than absolutely necessary, and it should actively involve both the scientific research community and the local communities.

The basic management structure that therefore seemed appropriate to the group is one that would be 'flattened' rather than pyramidal. The group envisaged a 'board of governors' for the ESC node, with representation from the various constituencies and stakeholders involved in its work and the use of its material.

The group offered a list of "measures of success" for the ESC. These included:

- Active participation by institutions and individuals in building the network;
- Evident contribution by the ESC to environmental knowledge and state of the environment reporting;
- Responsiveness of the ESC to external requests for information;
- Evidence of influence on the shaping of public policy and management interventions;
- The ability to translate complex issues into a format understood by non-specialists;
- An increase in public awareness and empowerment with respect sustainable management of their environment;
- Respect for traditional ecological knowledge and similar information sources, as evidenced by incorporation into the knowledge base. This would include citations. Finally, the group suggested how these proposals could be developed in the near-term future, in building an ESC node that would serve the Carolinian area of southwestern Ontario. Over the nine to twelve months from mid-February 1994 (i.e. during a period appropriate to most funding cycles), the group suggested:

- Creation of an ad hoc Steering Committee. The primary function of this committee would be to establish a Board of Governors for the ESC node. When the board was in place, the Steering Committee would dissolve itself (though some of its members might themselves become governors).
- The Steering committee would initiate the following institution-building tasks, though the Board would subsequently undertake take responsibility for these, and carry out most of the work:
 - Scoping issues, defining products, and similar planning and preparation.
 - Creating and nurturing the networks of information, people and institutions that would be the core of the ESC.
 - Establishing inventories of people, data and organizations.
 - Developing an initial budget, including identification of sources, mechanisms for cost recovery, etc.

CONCLUSION

As the Workshop drew to a close, the majority of participants agreed that it had achieved its objectives (see above) and that the suggestions and recommendations from the breakout groups were consistent with one another and provided an adequate basis on which to proceed.

The principal decision facing the plenary was therefore how to create the recommended Steering Committee. In view of the lead role that had been taken by Environment Canada/SOER in sponsoring

this and other workshops, and recognizing the organizational changes taking place in SOER, the participants decided that Environment Canada should take the initiative. In creating the Steering Committee, it should draw on the Workshop participants and others, and keep Workshop participants informed of progress.

The Workshop ended with a vote of thanks to the Walpole Heritage Centre for organizing the workshop and for its hospitality.

RECOMMENDATIONS

The participants in the workshop saw the Mixed Wood Plain ESC as very different from those in other ecozones. These differences include:

- the critical nature of the environmental issues in the area;
- special problems unique to the area that the Carolinian node would have to address; and
- the "critical mass" of scientists and institutions which should be available to undertake whatever ecological monitoring and research that is necessary.

In light of this, the workshop recommended that:

1. A node of the Mixed Wood Plain ESC should be established in the Carolinian area of southwestern Ontario. The sites that would comprise the Carolinian node should be representative of areas managed for agricultural, industrial, and urban purposes, as well as of protected natural areas. A minimum of three sites should be selected in the first instance. Walpole Island, Long Point Biosphere Reserve, Point Pelee National Park, Rondeau Provincial Park, the city of Hamilton, and the agricultural research stations at Harrow, London Research Facility, Ridgetown and Guelph were suggested for consideration.
2. A meta-database on Carolinian area ecological information should be created. It should contain pertinent facts about the location, quality, contacts, etc, of the available information, and not the information itself. Collection of information from non-conventional sources, and use of existing communication channels should be encouraged.
3. The Carolinian node of the Mixed Wood Plain ESC should encourage ecological monitoring and research projects at the individual sites, develop explicit lists of the criteria/ protocols for governing each activity that are in harmony with other Mixed Wood Plain ESC nodes, forecast the expected impacts, and ensure that the responsibilities are accepted by the institution or other "parent" of each activity. The ESC should encourage the adoption of standardized data reporting formats.
4. The organizational structure for the Carolinian node should be the minimum required to get the job done, and should involve both the scientific research community and the local communities.
5. An ad hoc Steering Committee should be created to establish a "Board of Governors" for the Carolinian node of the Mixed Wood Plain ESC. Environment Canada (EMCO) should take the lead in establishing this committee.
6. The Steering Committee should initiate the following institution-building tasks (knowing that the Board would subsequently undertake the responsibility of carrying out the work):
 - scoping issues, defining products, and similar planning and preparation;
 - creating and nurturing the networks of information, people and institutions that would be the core of the Carolinian node of the Mixed Wood Plain ESC;
 - establishing inventories of people, data and organizations;
 - developing an initial budget, including identification of sources, mechanisms of cost-recovery, etc.

ANNEX 1 AGENDA

WEDNESDAY 16 FEBRUARY: OAK'S INN,
WALLACEBURG

First Plenary Session, 14.00h - 16.00h

Welcome and introduction to the purpose of the workshop. Dr
Ian Jackson

Scene-setting 1: The need for more integrated and long-term
ecosystem monitoring and research, progress in establishing
Ecological Science Cooperatives (ESCs): Implementation
progress. Dr Patricia Roberts-Pichette

The new organization of the ecosystem monitoring and
research initiative. Dr Tom Brydges

Scene-setting 2: Carolinian Canada an overview with emphasis
on agriculture. Dr Bruce MacDonald

First Breakout Group sessions, 16.00h - 17.30h (Same topic for all three groups)

Topic: Research and monitoring issues and perceived needs in
the Carolinian area.

Second Plenary Session, 19.00h - 21.15h.

Scoping a Mixed Woods Plain ESC "node": Summary reports
from the breakout groups and discussion on opportunities,
priorities, resources and potential sites in Carolinian Canada

**THURSDAY 17 FEBRUARY
WALPOLE ISLAND HERITAGE CENTRE**

Third Plenary Session, 9.30h - 10.40h.

Scene-setting 3: Walpole Island First Nation: its setting and current situation; the Heritage Centre's activities in ecosystem monitoring and research. Dean Jacobs

Organizing and managing and ESC: what is needed, and what is happening elsewhere. Patricia Roberts-Pichette

Second Breakout Group sessions 11.00h - 13.30h

Each breakout group reconvened (with an interval for lunch) to discuss a specific topic.

Topic 1: An anchor site in Carolinian Canada: requirements and opportunities. Keyword: substance.
Chair: Tom Brydges; Rapporteur: Tom Whillans.

Topic 2: Role of an ESC in data management, information exchange, dissemination, and publication. Keyword communication.
Chair: Bruce MacDonald; Rapporteur: Christian Pupp.

Topic 3: Management, organization, and linkages (with local communities, within the ecozone, with other ecozones, partnership relations, etc.). Keyword: organization.
Chair: Marty Bratzel; Rapporteur: Alan Tomlin.

Fourth Plenary Session, 14.00h - 15.45 h.

Refining the scope of the Carolinian "node" of the Mixed Woods Plain ESC:

- a) Reports and recommendations from the breakout groups
- b) General discussion on where do we go from here.

Closure of the workshop

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