Second Progress Report of Implementation Phase

Information Context for Biodiversity Conservation

info 2000

Project No. 5052

Submitted to

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AIDEnvironment

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WORLD CONSERVATION
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1. Introduction

This is the second Progress Report for the Implementation Phase of the project called *Information Context for Biodiversity Conservation.* The project is developing an integrated information package for biodiversity conservation using a variety of software for Internet and CD-ROM delivery; search, translation, visualisation and mapping techniques; user workshops and feedback programmes; product testing and marketing; and long-term project financing and commercialisation.

The project partners are:
- Union of International Associations, Brussels, Belgium (UIA)
- World Conservation Monitoring Centre, Cambridge, UK (WCMC)
- Nordic Innovation Centre, Norwegian School of Management, Oslo, Norway (NSM)
- AIDEnvironment, Amsterdam, Netherlands (AIDE)

The project is co-funded by the European Commission's INFO2000 programme, (Directorate-General XIII). Contract No INFMM5052 – 22895/0.

The project is of 24 months duration, commencing 1 January 1998. This document reports the six months of work July to December 1998, inclusive. It is online at http://www.uia.org/projects/i2000rep3.htm

The *First Progress Report of the Implementation Phase* of this project is available at http://www.uia.org/projects/i2000rep1.htm. For further information on the project achievements during its Definition Phase in 1997, see *FINAL REPORT OF DEFINITION PHASE, Information Context for Biodiversity Conservation*, INFO2000 Project No. 5052, at http://www.uia.org/projects/i2000rep.htm.

2. Project Deliverables

This report is intended to satisfy the contract requirements for the following deliverables, as specified in Form INF4 of the contract:

Unique ID No.	WP No.	Description	Status	Expected Date of Delivery*	Revised Date of Delivery	Actual Date of Delivery
5052-2	I	Progress Report No 2 on Implementation Phase	Restricted	30-04-99		28-02-98
	II(iv)	Recommendations for design: language-related issues	Internal	31-01-99		28-02-98
5052-6	III(i)	Web module: species of conservation concern	Public	30-11-98	Final delivery 30-06-99	Partial delivery 30-09-98
5052-7	III(ii)	Web module: national parks and reserves	Public	30-11-98	Final delivery Undetermined	Partial delivery 30-11-98
5052-8	III(iii)	Web module: implementation of international agreements	Public	30-11-98	First draft 30-06-99 Final draft undetermined	Partial delivery Beta test mode 30-12-98
5052-9	IV(i)	Web module: conservation issues, actions, treaties and feedback loops	Public	30-11-98	Final delivery 30-06-99	Beta version 31-01-99
5052-13	IV(ii)	Final Report on integration of bibliographies	Public	30-09-98	30-06-99	
	VIII(iv)	Revised draft marketing plan	Restricted	31-12-98		28-02-98

3. Progress on scheduled tasks

3.1   Draft Report on integration of information

3.1.1   Interactivity on the Internet

The UIA made considerable progress in implementing the user interaction facility with its databases during the reporting period (see implementation via http://www.uia.org/data.htm). Interactivity may be understood in five distinct ways:

Interfaces: During the reporting period a single **dynamically** generated interface was developed. Access to it is provided by an introductory **static** web page. Several such static introductory pages can be envisaged to respond to different user needs and languages. The introductory page may also provide a location from which individual user preferences may be set for the dynamic interface and subsequent pages.

The dynamic interface offers or excludes users from certain facilities. It is notably designed to allow for a range of users from "Guests" to "Editors". Many opportunities for the further development of these pages are envisaged . These could include **third party** interfaces whereby other bodies design interfaces for their own users to interact with the data. Initial steps in this direction with UIA data have already been made by educational bodies (and will be reported in the Final Report).

User search and inspection of data: This facility now allows web users in a test mode to explore a range of databases of which the cores ones are the Problems and Strategies databases. These are extensively hyperlinked both internally and between each other, and now increasingly to third party web sites. Links from UIA data have been made to WCMC data as part of the integration process. Wherever possible, extensive use has been made of query links generated dynamically. The features associated with this facility continue to be developed. Technically the consulted databases are now maintained on a dedicated server separate from the LAN on which the UIA maintains the originals. It is intended that the originals are copied over periodically.

User commentary on specific entries: This facility now allows qualified web users in a test mode to comment on entries and parts of entries. Users can choose to inspect comments made on a Problem or Strategy profile in isolation or have the comments integrated into the display of the profile. By registering their email address, users can also choose to interact with each other. The features associated with this facility continue to be developed. The ability to provide commentary is seen as fundamental to the interaction process through which users provide new material to develop the system and themselves develop into interactive editors (see below). Technically the comments are maintained in files parallel to the databases. This process functions somewhat like a topic focussed listserver.

User editing of specific entries: This facility is to be built following the reporting period; it is currently in a test mode. It will enable qualified editors, operating via the web at a distance, to improve the quality of entries (and potentially their hyperlinks), whether by adding in new material or processing the material supplied in the form of commentary (see above). Technically the edited items (paragraph fields) would be maintained in files parallel to the databases. If present, they would be called in to substitute for corresponding paragraph fields from the database when items are displayed from that database. The issues of reconciling updates made on the LAN version as against the dynamically served version remained to be resolved.

User interaction via non-text displays: The virtual reality opportunities were presented in the original proposal in a test mode. Further work awaits termination of the preliminary implementation of the dynamic system. Java-based graphic and GIS displays are also being considered and seem to be relatively easy to implement. Such work is scheduled to progress during the next reporting period.

3.1.2   Challenges

User interaction over the web with a server brings with it to challenges.

Dynamic server response time: The quality of user interaction over the web is strongly related to the response time. Despite installing a well-rated server based on professional advice, the response time has been unsatisfactory. Because the response time is determined by a range of factors, it has take several months of testing to determine what was slowing down responses. It was finally determined that this was due to a combination of factors relating to the ASUS motherboard, the SCSI controller, use of a mirrored RAID system, and the network cards. This particular combination had built in incompatibilities. Following substitution and/or reconfiguration of these items, a much more satisfactory response has been achieved. This is consistent with the aim of encouraging participative editing over the web.

Security issues: It is to be expected that the data, and the participative approach, will invite the attention of hackers. Further work is required on the integrity of the system, which calls for external advice.

3.1.3   User searches

Considerable progress on enabling user searches was made by the UIA during the reporting period. The UIA LAN DOS-based search facility was adapted successfully to a Windows-Web environment. Users now have access to the following features in test mode (http://www.uia.org/data.htm):

Keyword searches: The keywords are those in the title fields of profiles (Organizations, Problems, Strategies, etc). These include non-English words in the case of Organisations. Simple boolean logic may be used to combine searches.

Subject searches: Using the UIA 150,000 word thesaurus, subjects under which a given keyword is grouped may be searched. This may also be used to formulate queries in languages other than English, even though the responses are only available in English. Simple boolean logic may be used to combine searches.

Phrase search: This new feature has been implemented but has not been fully tested.

Results display: The system has been designed to list hits in a variety of forms, and further possibilities are envisaged, notably switching to alternative language titles in the case of International Organizations. These include:

- Main title of profile
- Main plus alternative titles of profile (many profiles have a plurality of titles)
- Titles (main or with alternative) plus analytical information giving summary information on the profile (number of cross-references, links to websites, position in networks of linkages)

Network display: Web users can now request the display of entry profiles (with or without alternative titles) in hierarchies (up to 7 levels) or in functional networks. This provides a powerful overview of the context of any Problem or Strategy profile.

Web query links: Extensive use is being made of web query links to search engines These are generated dynamically on the basis of information in the profile titles. It is planned to offer users a choice of common search engines, or to specify a little known preference. Links can thus be generated for web documents on a problem, for books, maps, or other kinds of information resource, including organization links to relevant ".org" websites. These techniques are being explored in a test mode relation to the UIA link to WCMC conservation information.

3.1.4   Interactive update of information

WCMC has established a prototype website on protected areas information for the South Pacific with the aim of having the information updated by protected areas managers in the region. This facility has been set up in collaboration with the *South Pacific Regional Environment Programme*. WCMC is also experimenting with allowing users of its plant information to directly submit comments on the database by email.

The static online pages of the UIA, already available on the web in test mode as demo pages, allow users to comment on particular texts and feedback their comments via e-mail. These messages are addressed in such a way that they can be filtered for handling in a particular way. One challenge is to relate the feedback to the data where it is useful for the improvement of texts. Features discussed above, now enable users to identify problems and strategies of interest to them and feedback (a) via e-mail (b) as "comments" optionally appended to profiles displayed at user request, (c) as "edited" revisions replacing the original text (available only to an editor category). The challenge beyond this is to work out the logistics of integrating such information back into the core database. The more interesting challenges have to do with security issues in general and data adulteration in particular.

3.1.5   Language-related issues

The UIA has been able to adapt the language facilities of its LAN based system and indexes to the Windows-Web environment.

Search facilities: As noted above, Web users can access profiles via a variety of languages commonly used by international organizations. Such searches work at the keyword level in the case of Organizations with non-English titles. They work at the subject level for all databases, using languages such as English, French, German, Spanish, Italian, Dutch, Nordic, Portuguese, and some transliterated cyrillic.

Interfaces: The possibility of designing non-English interfaces is envisaged but has not been treated as a priority in this reporting period. It does not constitute a problem.

Hits: The possibility of displaying the results of title searches with non-English titles is envisaged for international Organizations but has not been treated as a priority in this reporting period. It does not constitute a problem.

Contextual explanations: The possibility of generating dynamic pages on which the contextual and explanatory comments are provided in non-English text is envisaged but has not been treated as a priority in this reporting period. It does not constitute a problem but does make already complex programs cumbersome.

Commentary explanations: The possibility of providing static pages with commentary explanations (criteria, methodology, etc) in non-English versions is envisaged but has not been treated as a priority in this reporting period.

3.1.6   Links to other information services

Collaboration with the European Environment Agency
WCMC met with representatives of the EEA and the ETC/NC in Paris in August to discuss future collaboration in delivery of information services on the Internet. WCMC works with the EEA and the Council of Europe on the Common Database on Designated Areas, for example, and wishes to ensure access to this information over the Internet as an extension to information services already being developed. A plan for future work on the database was outlined, and WCMC is drafting proposals for providing access to the information. Discussions also covered aspects of the species databases and information on compliance with international agreements.

3.2   Web module: species of conservation concern (Deliverable 5052-6)

Partial delivery; Revised date for final delivery: 30 June 1999

Following review of the WCMC species databases, a technical specification was drafted for developing an integrated species database that would be accessible over the Internet. As WCMC lacked the in-house expertise to implement this specification in full, the work has been contracted out and is currently in progress. We expect to have a working version of the database available by the end of April for staff to work with, and the database available on the web by the end of June.

During this period the *World Database of Threatened Trees* has also been completed and placed on the WCMC website (http://www.wcmc.org.uk/cgi-bin/SaCGI.cgi/trees.exe), and certain parts of the animals' database have been reviewed systematically in preparation for integration of the species databases and their incorporation in the new integrated database.

3.3   Web module: national parks and reserves (Deliverable 5052-7)

Revised date for delivery: yet to be defined

WCMC protected areas database
It had been intended to develop the WCMC protected areas database at the same time as that for species, working in collaboration with a leading computer software company. Unfortunately this collaboration has yet to come about, and if progress is not made soon alternative arrangements will have to be made. This is disappointing, as we hoped for significant "in kind" support. Revised date for delivery of the new protected areas database on the web is yet to be defined.

World Heritage Information Network
Following the critical review of this information service, WCMC has now installed new Internet search software *Muscat* with substantial discount from the supplier. This is currently being tested alongside the previous service. As soon as this is proved to be reliable, re-launch of the information service will be planned and we will begin work on development of a *partnership* of national organizations delivering information on World Heritage sites. The date for public access to the revised WHIN site is expected to be the end of April 1999.

3.4 Web module: implementation of international agreements (Deliverable 5052-8)

Partial delivery; Revised date for first complete draft: 30/06/99; final date for complete draft undetermined

During the last six months WCMC has worked with international agreement secretariats on various information management projects including efforts to harmonize information management and reporting across the five global biodiversity-related treaties. This is leading to the development of common approaches to web sites, development of a metadatabase of reports and publications, ideas for development of common approaches to national reporting, and development of mechanisms for exchange of experience. WCMC has also been working on an *Information Management Plan* for the Convention on Migratory Species, and some of the results of this work will be directly relevant to development of information services on the Internet.

WCMC has also been doing significant work on the reporting requirements for international agreements, and there is potential for linking information on these requirements to the strategies and agreements within the UIA databases (see below), to the reports themselves on the different agreement websites, and to information in the WCMC databases (see web pages following:

http://www.biodiv.org/sbstta3/sbstta3-i16.html
http://www.ecnc.nl/doc/projects/desisite.html
http://www.wcmc.org.uk/convent/treaties.htm
http://www.grida.no/prog/cee/enrin/htmls/ukraina/kiev_rep.htm

3.5 Web module: conservation issues, actions, etc (Deliverable 5052-9)

Delivered in beta test mode, except for feedback loops (see below) and treaties (see above) Revised date for final delivery: 30/06/99

Progress on this deliverable was steady but has been delayed by server and software difficulties and work on prior features (see Interactivity Challenges, above). This web module is delivered in beta mode at http://www.uia.org/data.htm. Quantative progress regarding content is shown at "Statistics on Organization Strategies" http://www.uia.org/strategy/stratcon.htm#stats and "Statistics on World Problems" http://www.uia.org/problems/probcom.htm#stats.

Feedback loops
No work has been done directly with feedback loops since this depends on completion of other features of the system. Nonetheless, a major step towards this work has been the contextual listing of Problems and Strategies on user request relating to a selected node. This provides a rich pattern of information in which loops are signalled if they are detected. However since loops are relatively rare, a different technique (previously explored in a DOS environment) will need to be implemented. It is hoped to improve the algorithm through which such loops are detected to make it easier to explore them dynamically rather than in a batch mode as at present. A mathematician is currently looking at this question. It is also hoped to relate loop presentation to a Java graphics application. This is currently being explored.

3.6   Final Report on integration of bibliographies (Deliverable 5052-13)

Revised date for delivery: 30/06/99

UIA has continued to develop its bibliographic data file, notably with recent publications by international organisations concerning biodiversity conservation.   The UIA "References" database of bibliographic references has been made available over the Web. Discussions have advanced with WCMC about the respective organisation needs for "integrating" their bibliographies.

WCMC has begun review of its library catalogue with a view to making the information more readily accessible over the Internet. At present there is an in-house catalogue and index, and a subset of this has been made available on the Internet for test purposes. A software review will be carried out early in 1999 and new software and services implemented by mid-1999.

3.7   Development of UIA web server facility

The planned implementation of web-based operations beyond those demonstrated at the prototype stage was achieved during the reporting period in a test mode. The UIA already had a considerable web presence with some 11,000 **static pages** currently accessible. This information is held on the UIA's service provider that is located in an office within the UIA building independently of the UIA's own intranet server. The service provider is in fact a cooperative of which the UIA is a founding member.

In June 1998, the UIA purchased its own NT web server and necessary web serving software (O'Reilly). This server is directly linked (outside the UIA's own firewall) to the ISP. A series of databases have been accessible from the web in a test mode. Work continues on security, search and presentation issues. Work has not yet been started on the commercial features, although these are to a large degree anticipated by the design of the security features.

(a) Dynamic page generation (software requirements): In order to enable dynamic page generation from the UIA data several software components were required:

- **OpenInsight** (Windows-based version of the UIA's Advanced Revelation database software): The 3.5 release of this product was obtained (and upgrade to the 3.7 release). It allows simultaneous access to parallel copies of the databases by the DOS-based users on the UIA's LAN. It also allows for web delivery through CGI script processing. The merit of this technique is that the script can be written in the programming language that extensively overlaps the older DOS-based product, which has been used by UIA for its databases for over a decade. In fact a number of index look-up routines could be ported across with relatively little modification, permitting extensive exploitation of the investment in the DOS-based indexing.
- **O'Reilly Website** 2.0 which offers a professional range of facilities for web delivery, including appropriate security and commercial features. This was obtained and successfully installed in a test mode on a standalone machine to interface with the OpenInsight software.

With these elements, it proved possible to develop an HTML form through which dynamic generation of pages could be requested directly from the UIA DOS-based data (copied over from the intranet for security reasons). Minimum effort was invested in design, the object being to ensure that functionality could be built in for a range of databases with adequate performance. This was achieved.

(b) Dynamic page generation (licensing requirements): During the reporting period the OpenInsight software provider imposed a licensing requirement for web delivery of UIA data that contradicted statements in previous correspondence on this matter dating back over a year. These exchanges had established that this, as yet rarely used, feature of the OpenInsight software would NOT be subject to additional licensing costs. The company developed a change of heart, notably in the light of the UIA interest in this feature, and imposed this requirement as a matter of general policy, and was unwilling to make an exception in the light of the UIA's pioneering work in this area. Although this decision could have been disputed in the courts, it was clear that it would be cheaper to incur the one-time licensing cost rather than pursue legal possibilities. Whilst this has been clarified issues for the OpenInsight releases, it has been impossible to obtain clarification on the licensing constraints with respect to the planned Java-oriented versions to be released later in 1999. Discussions on these matters were a source of some delay in implementing the test version on the web during the reporting period.

(c) Dynamic page generation (hardware requirements): Since the UIA's service provider operates in a UNIX environment, it was considered necessary for the UIA to invest in a dedicated NT server appropriate to the O'Reilly and OpenInsight software. This is directly connected to the service provider's UNIX machine. Significant delays were incurred in determining an optimum configuration for such a server, bearing in mind the safety and redundancy features, and the costs. The specifications of the server can be provided. The server was delivered and installed during the period late June/early July on the intranet side of the firewall for testing prior to connection to the service provider. It was subsequently switched outside the firewall and directly connected to the ISD. Immediate challenges are to clarify the access / security features in relation to various levels / domains of user group, and to explore the commercial / payment issues in relation to such user groups. These are overlapping features of O'Reilly and NT.

Copies of the full range of databases were made accessible over the web in test mode (to restricted users) during the reporting period. The process of clarifying the security and commercial issues will give detailed form to the marketing options and product design opportunities.

Of special interest for the immediate future will be to ensure an appropriate match between static pages (open to web search engine indexing) and the dynamic pages that can be called from them. This will allow comprehensive lists of problems and strategies to continue to be made available as indexes, but will in future ensure that they offer access to dynamic pages.

3.8   Multimedia and virtual reality visualization

Work on this front has continued to focus on tracing valuable software packages, and people, that could in some way be used to present the data in new and more meaningful ways. The possibility of allowing users to employ such visual displays as entry points to text data has been confirmed. The obvious constraints continue to be the exorbitant prices of commercial packages, many of which offer only marginal cognitive advantages in relation to the data.

It remains clear that the most striking advances at minimal cost lie in the area of using either VRML or Java in relation to HTML pages, since these can be most closely related to planned delivery of data. Such work also has the advantage of being least locked into licensing arrangements and most open to further adaption. The planned release of a Java-oriented version of OpenInsight in 1999 is very welcome.

The constraints with respect to VRML remain those of acquiring competence in VRML 2.0 beyond that acquired in VRML 1.0, notably in relation to the new browsers. It has been irritating to discover that colour values on work already done, that were very satisfactory in VRML 1.0 have been lost in VRML 2.0. The challenge of generating VRML on-the-fly for web users of the data appears to have been solved.

The constraints with respect to Java are due to the fact that Java compatibility across browsers is far from satisfactory. Steps have been taken to acquire some facility with Java or the adaption of Java packages. However the challenge of linking Java programs to data on-the-fly remains to be addressed.

3.9   Other Tasks (additional to the original work programme)

3.9.1   Internet Map Server

Significant testing and prototyping work has been undertaken on development of an Internet Map Server for information managed by WCMC. Much of the technical work has been done in collaboration with IPIECA, the International Petroleum Industry Environmental Conservation Association, and WCMC is working with IPIECA on marine and coastal information.

The testing phase has also involved the development of maps which illustrate distribution of internationally designated areas, and as part of this work direct links have been made between the interactive maps and descriptions of each of the World Heritage Sites. This prototype has then been used in discussions with other international agreements covering designated areas.

3.9.2   Metadatabases

Following completion of work on the UK Clearing-House Mechanism, WCMC has done further work on the metadatabase for the *Biodiversity Conservation Information System* to ensure that it is (a) fully compliant with international protocols such as Z39.50 and (b) accessible to all common types of browser. This is essential experience in ensuring our ability to deliver information and access to information to the widest possible range of users.

Following discussions between UIA and WCMC, and between UIA and EEA, the possibility of using a Z39.50 server is under investigation by the UIA. The advantage for the UIA is that data in all its databases effectively has a common, normalized meta-structure. The disadvantage at this time is that it uses a proprietary file structure, which may require significant investment to adapt to delivery through a UNIX-based server. These issues are discussed in position papers developed by both WCMC and UIA.

4. Outreach and Marketing

The project group has been active in several areas of outreach. Many meetings have taken place with potential partners, providers of specialist services and for the purpose of publicising the project.

4.1   6th World Wilderness Congress (Bangalore, 24-29 October)

Nadia McLaren participated in this congress, the latest in a series convened every four years by the International Conservation Union. It should have been an ideal venue to connect with professionals involved with biodiversity conservation. This congress was less relevant to our European focus than was expected. Attendance was largely South Asian (previous congresses have been more international). Nonetheless very useful perspectives were gained and a variety of valuable contacts made. Travel to this conference was linked to project development work (including securing of matching funds) for application of the work in India as a pilot for developing country applications (see below). Therefore, the full value of this effort should become apparent later in the project period.

4.2   *info*Dev and Development Alternatives (New Delhi and Bangalore, 19-30 October)

Development Alternatives (DA) is an Indian-based organisation, which designs appropriate technologies and institutions for the creation of sustainable livelihoods. It also has an extensive information network under development.

Within the project requirement to secure matching funding for the EU funds provided under the INFO2000 programme, the UIA has made a joint application with DA for funding by the World Bank under its *info*Dev (Information for Development) programme. The proposal documents are confidential but have been distributed internally to the INFO2000 project group and the DGXIII project officer, Michel Brochard. A description of the project is available at the World Bank's *info*Dev site
http://wbln0018.worldbank.org/infodev/infodev.nsf/f470dd78a9d8a1e28525660800679cca/5bad6366640bcf3a852565fd00639c6e?OpenDocument.

The reasons for this European project to seek involvement in India are several:

1. Our INFO2000 project is globally focused. It is designed to deliver services globally via the Internet and through other means. It is important to assess the user needs and service demand in parts of the world other than Europe.

2. India a good pilot country for testing the more general features of this product (those capable of replication in other developing countries) for the following reasons:

*   India holds a unique position amongst developing countries with respect to information technology. It is highly competent, with an unusually large domestic production and consumption of computing products and services. Nonetheless, it has many of the features characteristic of developing countries, notably cultural and language diversity, general poverty, undeveloped telecommunications infrastructure, etc.

- There is a lack of timely, reliable and user friendly information on environment and development issues in India. Substantive query response and customised information services on environment and development themes are very few in India.

- India has between 30,000 and 100,000 NGO-type organisations. A good proportion have adequate working knowledge of English. Full internet service delivery for most such organisations is infeasible for at least ten years. However, telephone services are already adequate for considerable expansion of basic automatic services, for a progressive increase in frequency of use and their facilitated interface with more automated systems such as the Internet.

The *infoDev* activity aims to accelerate the transition of this significant market segment of telephone, fax and basic email users towards fully automated information services during a decade when most would not have this opportunity. It will increase access and exposure to networked communication services in India and build capacity for its use by NGO groups. Though endemic restrictions will limit most from having direct access to full internet, many will have the benefits of a lower-bandwidth facilitated interface with the internet.

An extension of these local partnerships for *info*Dev will be involvement of Indian actors who volunteer themselves as potential users of the INFO2000 services and products. Some Indians contacts have already been made as a result of attendance at the IUCN World Wilderness Congress in Bangalore this October (see above).

4.3   Discussions with Monsanto (Brussels, 7 September 1998)

UIA has had discussions with the coordinator of Environmental Services, Monsanto Europe, concerning possible sponsorship of the product. The discussions and possible collaboration are seen as a model for approaches to other companies.

4.4   Discussion with members of Contact Consortium (Rotterdam, 5 July 1998)

Tony Judge and Nadia McLaren had discussions with members of the Contact Consortium , notably Gerald de Jong, Beautiful Code B.V. (Rotterdam) with regard to use of Active Worlds and Struct virtual reality technologies.

4.5   MyTown (Sydney, 30 December 1998)

Nadia McLaren initiated discussions with the MyTown consortium, based in Melbourne, Australia. MyTown is an online empowerment resource for local community development. It is currently in pilot planning phase, under the support of major corporate sponsors. The INFO2000 integrated knowledge system could become part of a disseminated and participative knowledge structure serving sustainable community development. It was agreed that these discussions would continue, with another meeting together with Microsoft early in 1999.

4.6 World Academy of Art and Science (Vancouver, 25-27 October)

Tony Judge made a presentation at the assembly of the World Academy of Art and Science referring to the INFO2000 project. The title of the presentation was "Advances in Graphics Technology". It drew upon some of the development work of the UIA funded by the INFO2000 project.

4.7 Developments in WCMC internal marketing policy and practice

During the last six months WCMC has appointed a new head of business development who has been reviewing sponsorship and marketing of WCMC products and services. This is not a part of the *INFO 2000* project, but the experience gained is directly relevant to the project and can be applied to products and services developed by UIA and WCMC based on the *INFO 2000* project.

5. Complementary project work

5.1 Interactive Health Ecology Access Links - Europe

The UIA has recently begun a complementary development of environment and health-related components of its knowledge base as part of a new EC-funded project.

Interactive Health Ecology Access Links - Europe (IHEAL-Europe) is an information network that is continually developed through public access to environment and health data and concerns.

It enables people and communities to:

- Access information about environmental health concerns and strategies
- Openly share grassroots environment and health information via interlinked data bases
- Communicate their knowledge and experience of their community environment
- Map relationships and uncover patterns in community health
- Deploy geographic information systems (GIS) on the locational implications of environmental health
- Understand relationships between health and the world we live in – the ecology of health
- Advance community monitoring of the dynamics of environmental health of Europe.

This is an open process of cooperation among non-governmental organizations working within the context of the Aarhus Convention on Public Participation. IHEAL-Europe notably supports the Pollution Release and Transfer Registry (PRTR) and National Environment and Health Action Plan (NEHAP) pan-European initiatives.

The initiators are UNED-UK (coordinator), International Campaign for Responsible Technology (I-CRT), Union of International Associations (UIA), Right to Know Network, and Environmental Partnership of Central and Eastern Europe (EPCE).

IHEAL-Europe will be previewed at the European EcoForum meeting in Moldova (April 1999). It will be launched at the *Third European Conference on Environment and Health* (London, June 1999)*,* convened by the World Health Organization (WHO/EURO), and its parallel *Healthy Planet Forum.*

Initial financial support for IHEAL-Europe has been provided by DGXI of the European Commission. Matching funds and resources contributed by the UNED-UK, I-CRT and UIA.

5.2 EU-India Economic Cross-Cultural Programme

Meetings have been held with Roberto Carpano, Director of the Programme (Brussels, 8 September 1998) and with Domenico Nicoletti, Enterprise Project Officer (New Delhi, 29 October). Project concepts have been discussed which are complementary to INFO2000 activities. It is intended that a proposal for funding project activities relating to water be submitted in the first half of 1999 under the second call of this programme.

5.3 AEAW website

WCMC has worked with the African-Eurasian Waterbird Agreement to develop a prototype website on the species covered by the Agreement. This website incorporates text, photographs, maps and sounds for a few species at present, but will be added to significantly

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over the next few months. There is potential to develop similar information services for other agreements based on this experience.

5.4   EC Clearing-House Mechanism

WCMC is one of a consortium of organizations that bid for and won a tender for working with the EEA in development of the EC Clearing-House Mechanism in the context of the Convention on Biological Diversity. The series of tasks to be carried out by WCMC in the first phase of the project includes the review of options for various web-based activities. The results of these reviews of options will also be directly relevant to development of information services in the context of the *INFO2000* project.