

Third Report of Implementation Phase

Information Context for Biodiversity Conservation

Project No. 5052



Submitted to



by

Union of International Associations
World Conservation Monitoring Centre
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AIDEnvironment

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1 Introduction

This is the third 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 January to June 1999, inclusive. It is online, selectively edited, at <http://www.uia.org/projects/i2000rep3.htm>

Selected portions of previous progress reports of this project are available at the above web location, files [i2000rep1.htm](#) and [i2000rep2.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 deliverables marked * in the following table, as specified in Form INF4 of the contract.

Note: shaded Work Packages (WPs) have already been delivered, in whole (dark) or part (light); WPs scheduled for delivery later than 30 June are not shaded.

Unique ID No.	WP No.	Description	Status	Expected Date of Delivery*	Revised Date of Delivery	Actual Date of Delivery
5052-1	I	Progress Report No 1	Restricted	31-08-98		30-06-98
5052-2	I	Progress Report No 2	Restricted	30-04-99		28-02-99
*	I	Progress Report No 3	Restricted			30-09-99
*5052-4	II(i)	Review of User Needs	Public	31-02-99	30-11-99	
	II(ii)	Recommendations for design: interactivity on the Internet	Internal	31-01-99		28-02-99
	II(iii)	Recommendations for design: user searches	Internal	31-01-99		28-02-99
	II(iv)	Recommendations for design: language-related issues	Internal	31-01-99		28-02-99
5052-5	II(v)	Draft Report: Product Design and Development Plan	Restricted	30-06-98		30-06-98
*5052-6	III(i)	Web module: species of conservation concern	Public	30-11-98	Final delivery 30-06-99	Partial 30-11-98 Full 30-06-99
*5052-7	III(ii)	Web module: national parks and reserves	Public	30-11-98	Final delivery 20-12-99	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 delivery 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 Final version***
*	V(i)	Draft Report on integration of information	Internal	30-11-98		30-09-99
*	V(ii)	Draft Report on feedback loops	Internal	31-12-98		30-09-99
*	V(iii)	Draft Report on information on habitats	Internal	31-01-99		30-09-99
*5052-13	IV(ii)	Final Report on integration of biographies	Public	30-09-98	30-11-99 (30-06-99)	
*	V(v)	Final Report on links to other information services	Internal	30-04-99		30-09-99
	VI(i)	Draft Report on multimedia visualization	Internal	29-02-98	Draft 23-04-98	30-06-98
*5052-16	VI(i)	Final Report on multimedia visualization	Public	30-06-99	30-12-99	
*5052-17	VI(ii)	Report on mapping national (country) information	Public	30-06-99	30-11-99	
	VI(iii)	Draft Report on virtual reality (VRML) 3-D displays	Internal	29-02-98	Draft 23-04-98	30-06-98
*5052-18	VI(iii)	Final Report on virtual reality (VRML) 3-D displays	Public	30-06-99		30-09-99
5052-19	VII(ii)	Report on upgrading CD-ROM software	Public	31-03-98	Draft 23-04-98	30-06-98
*	VIII(i)	Guided tour of product/service using HTML facilities	Public	Renewed periodically		Last revised 15-05-99
*5052-20	VIII(ii)	Report on subsidy and sponsorship options	Public	30-06-99	30-12-99	
*5052-21	VIII(iii)	Report on on-line charging options	Public	30-06-99	30-10-99	Draft report 30-09-99
	VIII(iv)	Revised draft marketing plan	Internal	30-05-98		25-03-98
	VIII(iv)	Revised draft marketing plan	Restricted	31-12-98		28-02-99

3 Progress on scheduled tasks

3.1 Interim Report of Review of User Needs

Deliverable 5052-4

Final delivery date postponed to 30/11/99

The start of this work package, to work with users and evaluate their needs, has been delayed due to delays in full online access to the databases. Certain functions, such as full online editing, are still in test mode. Some of the stages in this preparatory process are outlined below. The reader could also see background texts on:

- distinguishing uses of the Encyclopedia (<http://www.uia.org/encyclop/16intent.htm>)
- intended uses (<http://www.uia.org/encyclop/17usage.htm>)

We commenced the activity in July 1999. A pool of around 10-15 cooperation partners (users) is being created. The type of user ranges from “environmental professional” to “student” and “educated unemployed” to “NGO”. We expect to have significant results to report by 30 December 1999.

As a general approach to this work activity, we recognise that web users have become highly active and continue to develop new behaviours and needs in response to new facilities. In particular, those accessing information are often overloaded and the overload is growing exponentially. This project assumes that there will be a backlash against information *per se* and a rapid call for meaningful patterning of such information over which users have some interactive control in the light of cultural and other preferences (eg for complexity, colour, sound, etc). The emphasis in other parts of this project on "information visualisation" tools, may also be understood as the need for knowledge, as opposed to information (or data).

We are not assuming that users are stationary targets whose future information behaviour is the same as their current behaviour. Nor are we simply predicting movement of users in a particular direction (a first derivative) when it is their flexibility and manoeuvrability which is changing -- as the past few years of internet usage have shown. This project's “stakeholder-as-participant” approach encourages and taps the development of this phenomenon in a fully interactive manner.

3.2 Interactivity on the Internet

Following the previous reporting period, the UIA made further progress in implementing the user interaction facility with its databases during the reporting period (see implementation via <http://www.uia.org/data.htm>). With respect to the five distinguished forms of interactivity:

Interfaces: Several static introductory interfaces were developed to meet the needs of different clusters of users. These provided access to distinct dynamically generated search interfaces to carry through the identity of the interface through which the user entered. Access to it is provided by an introductory static web page. Many more static introductory pages can be envisaged to respond to different user needs and languages.

The static introductory page may also provide a location from which individual user preferences may be set for the dynamic interface and subsequent pages.

A cookie-based logon facility was developed to replace the simpler experimental system. This also increased security facilities.

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”. As “Guests”, users are offered access to a simpler search facility than as “Registered” users or higher categories of distant “Editor” users. 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 members/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: The facility allowing web users to explore a range of databases (of which the cores ones are the Problems and Strategies) databases has been extended. The various types of page presented to the user are interlinked as alternative views of the data. Links from UIA data have been made to WCMC data as part of the integration process. Linking to third party web sites remains an active concern. 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. The originals are copied over periodically.

User commentary on specific entries: This facility now allows “Registered” web users 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 now operational in a test mode. However effective use awaits a more robust use of the comment facility. It enables 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) are maintained in files parallel to the databases. If present, they are called in to substitute for corresponding paragraph fields from the database when items are displayed from that database. Users may opt to have the original displayed. Editors can explore previously edited versions back to the original. The issues of reconciling updates made on the LAN version as against the dynamically served version remained to be implemented.

User interaction via non-text displays: The virtual reality opportunities were presented in the original proposal in a test mode but have been partially superseded by

spring map techniques. Considerable progress has been made with the Java spring mapping applet generated on the fly from the databases under user control. In addition to an alternative view of the hyperlinked data, these offer users an alternative mode of access to text profiles.

3.2.1 Challenges

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

Dynamic server response time: This problem, discussed in the previous report, has been satisfactorily addressed for the moment. The remaining concern is how the system will respond to multiple sessions, and at what point this becomes a problem.

Security issues: Further work has been done on the security aspects to safeguard the integrity of the system. However it remains a concern what level of security is appropriate and whether this can be achieved.

E-commerce issues: These have not yet been addressed. It is however clear that the simplest level can already be initiated by issuing passwords and invoicing.

3.2.2 User searches

Further progress has been made on enabling user searches by the UIA during the reporting period. Users now have access to the following features via <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. This facility has been extended in the case of the Problems and Strategies databases to include marked keywords in the body of the text.

Subject searches: As indicated previously, 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 feature has been implemented.

Special features: Additional tools have been developed for “Registered” users to enable them to detect Problems and Strategies at top of hierarchies, or as functional source or sink. Mapping features are now accessible from the search screen as an alternative to conventional listing of hits.

Browsing titles alphabetically: This feature has been implemented by using the index to static pages, notably in the case of the Problems and Strategies databases.

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.

Other features are envisaged, as noted in Appendix 2 of the previous report.

3.2.3 Interactive update of information

In addition to the progress made by UIA on “User editing of specific entries” (above), 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 during the period between now and the next South Pacific Congress on Protected Areas in two years time. This facility has been set up in collaboration with the South Pacific Regional Environment Programme (SPREP), although its full implementation has been delayed because of a change of staff at SPREP. WCMC is also experimenting with allowing users of online plant databases to directly submit comments on the database by email.

3.2.4 Language-related issues

As indicated previously, the UIA has been able to adapt the language facilities of its LAN based system and indexes to the Windows-Web environment. Additional progress has not been made on the following:

Search facilities: As noted above, Web users can already 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.

3.3 Web module: Species of Conservation Concern

Deliverable 5052-6
Partial delivery 30-11-98
Further partial delivery 30-06-99
Revised date of final delivery 31-12-99

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 was contracted out. A working version of the database was delivered before the end of this reporting period, and testing by WCMC staff was underway before making the module available on the web.

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>). The database itself was developed in collaboration with the IUCN Species Survival Commission, and with the support of the Dutch Government. The INFO2000 project has helped to ensure that availability of the resulting database on the web.

Also during this period, 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.

3.4 Web module: National Parks and Reserves

Deliverable 5052-7
Partial delivery 30-11-98
Revised date of delivery of draft deliverable 20-12-99
Revised data of final delivery 28-2-00

Protected areas database: The initial intention of redeveloping the protected areas database in collaboration with a leading computer software company fell through because of the inability of the company concerned to commit fully to the project during an acceptable timeframe for WCMC. This led to reassessment of both the timetable and objectives for the work towards the end of the reporting period.

WCMC is currently carrying out several projects that use and build on the protected areas database, and has other projects in initial stages that require additional data fields and outputs. WCMC is in the process of reviewing all of these requirements, and discussing a programme for upgrade of the database with the consultants who developed the previous version.

During the next project period the database will be designed and built, then exhaustively tested with data for eight countries. It is expected that this test phase will be completed

and all of the data transferred to the new database by the end of 1999. Testing of web access to this database will have begun, but full access is unlikely until February 2000 (although bearing in mind that access to a prototype is already available).

This work is also supported by projects being implemented in collaboration with the IUCN World Commission on Protected Areas, the WWF/World Bank Forest Alliance, and FAO (in the context of their Forest Resources Assessment).

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 was tested alongside the previous service, and once it proved to be reliable the previous service was replaced. There have been various initial problems, largely arising from configuration issues. A major re-launch of the information service is being planned with the UNESCO World Heritage Centre, and plans are being prepared for development of a partnership of national organizations delivering information on World Heritage sites. (<http://www.wcmc.org.uk/whin>)

Protected Areas Virtual Library: The list of URLs on the Protected Areas Virtual Library is being reviewed, and the addition of a search facility across these sites is being considered. (http://www.wcmc.org.uk/protected_areas/pavl/)

3.5 Web module: Implementation of International Agreements

Deliverable 5052-8
Partial delivery, Beta test mode, 30-12-98
Revised date of delivery of draft 31-11-99
Final date for completion undetermined

WCMC continues to work closely with a number of agreement and programme secretariats on issues relating to information management and reporting, and especially on harmonization of the work of the different agreements and programmes so as to increase synergy and reduce duplication of effort.

WCMC has a specific mandate to develop periodically the United Nations List of National Parks and Protected Areas, and it is WCMC's intention to use the next cycle of information collection and management to collaborate more closely with the secretariats of international agreements and programmes that recognise individual sites, and to make available information on these networks of sites from a single focal point on the web.

WCMC has begun the process of drafting webpages to integrate access to information on these networks of sites, and this will be available about November 1999. It is then intended that WCMC will work further on these pages with the different secretariats, in order to foster the sort of collaboration described above. It is difficult to predict when this work will be completed, although it is intended that it should be by Easter 2000.

3.6 Web module: Conservation Issues, Actions, etc

Deliverable 5052-9

Delivered in beta test mode, except for feedback loops (see below) and treaties (see above)

Delivered with feedback loops (see below) 04-04-99

Revised date for final delivery: undetermined

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>.

3.7 Draft Report on Feedback loops

Further experiments were done with feedback loops on the Problems database. Some 15 million chains of Problems were searched to detect those that looped back on themselves within 7 links maximum. Some 6,000 of these were detected and were used as a valuable source to be scanned for potential errors and hyperlink redundancy.

The results of this work were integrated into the facilities offered to web users. Loops are flagged in the hit index. They can now be visualised as an integral feature of the spring mapping facility.

As previously indicated, 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 has been looking at this question.

The non-web standard editing software has been augmented to detect local link redundancies and errors.

3.8 Draft report on Integration of Information

Deferred to 30 December 1999.

3.9 Draft Report on Information on Habitats

A review of habitat classifications systems has been made. WCMC’s mapping section and library provided many of the resources. The next step is to enter the systems into the database using the “overlapping hierarchy” method.

3.10 Final Report on Integration of Bibliographies

Deliverable 5052-13

Revised date for delivery: 30-11-99

As noted in the previous report, several components of this workpackage have been completed prior to this reporting period:

- 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.
- WCMC and UIA have had several rounds of discussion about “integrating” their bibliographies.

Delay in finalising this work package is necessary because WCMC has considerable literature holdings that needed special attention. A number of limitations of the existing cataloguing software have been identified over the years and these have become increasingly serious as information technology advances. The selection of alternative software was delayed for a number of reasons, principally resource constraints, until the beginning of 1999.

During this reporting period, several further steps have been taken.

- WCMC has reviewed its library catalogue with a view to making the information more readily accessible over the Internet.
- WCMC has reviewed and purchased new software, which offers many suitable features, including automatic web publishing capabilities.
- Trials of the software and training are underway.

It is now expected that testing will be completed by October 1999 and there should be full delivery by November 1999.

3.11 Links to Other Information Services

Collaboration with the European Environment Agency: WCMC is continuing to collaborate with the EEA and the ETC/NC in Paris on the Common Database on Designated Areas, although there is still no official agreement in place. This helps to ensure the quality of information available on European protected areas.

Collaboration with the CBD Clearing-House Mechanism: WCMC is working on several projects that are concerned with implementation of the Clearing-House Mechanism (CHM), and regularly attends official meetings at both the global and European levels (WCMC is a contractor on the EC CHM project managed by the EEA).

Country profiles: There is a significant number of country profiles available on the Internet, and similarly a number of national reports to international bodies. WCMC has developed a webpage that facilitates location of these reports, and is considering the development of search tools for improving access to content.
(http://www.wcmc.org.uk/information_services/other/country.htm)

3.12 Final Report on Multimedia Visualization

Deliverable 5052-16
Deferred until 30-11-99

This report is deferred due to unexpected delays arising with the work of the third-party contractor.

3.13 Report on Mapping National (country) Information

Deliverable 5052-17
Date of delivery 31-12-99

Protected areas database: The new WCMC protected areas database will incorporate the ability to deliver maps “on the fly” locating each of the areas in the database based on the latitude and longitude held in the database.

Protected areas maps: WCMC has continued to digitize maps of protected areas at a nominal scale of one to a million as part of a number of projects (particularly funded by WWF and FAO). These are incorporated into the WCMC Biodiversity Map Library, and in future will be available in a generalised form over the WCMC Internet Map Server.

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. A prototype site on the Mediterranean region has been well accepted. (<http://ims.wcmc.org.uk/ipieca/index.html>)

Marine turtle mapping: Working in collaboration with the Convention on Migratory Species, WCMC has developed a website that delivers mapped information on the distribution of marine turtles in the Indian Ocean region.
(<http://www.wcmc.org.uk/marine/mturtle/>)

World Heritage site prototype: WCMC has maps available locating sites in a number of international networks, including, for example, World Heritage sites and wetlands of international importance. Information on world heritage sites have been made available over the Internet through a prototype Internet Map Server, with links to other information on each of the sites that can be accessed through clicking on the map.
(<http://ims.wcmc.org.uk/wh/wh2.html>)

3.14 Final Report on Virtual Reality (VRML) 3-D Displays

Deliverable 5052-18

This report is deferred until December 1999 because of the significant progress made on the parallel initiative involving development and testing of a Java applet to provide mapping facilities which may affect the way in which any VRML work is completed.

3.15 Report on Subsidy and Sponsorship Options

Deliverable 5052-19

This report is deferred until December 1999 because of significant changes in the organization of information services within one of the partner organizations (WCMC), and the appointment of a staff member with a specific marketing mandate. It is anticipated that this individual will draft the report during the next reporting period. It is proposed that this report and the following one are combined as one report.

3.16 Report on Online Charging Options

Deliverable 5052-20

Draft report, awaiting additional sections due 1 November 1999

Note that it is proposed that this report and the previous one are combined as a single report on funding options.

3.17 Other Tasks (additional to the requirements for this reporting period)

3.17.1 Development of UIA web server facility

The planned implementation of web-based operations beyond those demonstrated at the prototype stage was achieved during the previous 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 previous 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.

The approach to further development at the close of this reporting period has been to use the static page indexes to Problems and Strategies as hyperlink entry points to pages generated through the dynamic server. This means that users find the dynamic page site through regular web search engines – a considerable marketing advantage.

3.17.2 Metadatabases

It was reported in the previous report that the consortium has had discussions with the European Environment Agency on the possibility making the content of this project available to the EIONET system based on the Z39.50 metadata protocol. Issues were discussed in position papers developed by both WCMC and UIA.

During this reporting period, the UIA has initiated development of a Linux server as a basis for further work on Z39.50.

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. Whilst not all the activities were part of the INFO2000 project (workpackages and/or budget), the experiences gained and contacts made are directly relevant to the project and can be applied to products and services developed by UIA and WCMC based on the INFO 2000 project. Significant activities are briefly described below.

4.1 Discussions with World Bank

Washington, 21 -22 January 1999

Whilst in Washington, Tony Judge and Nadia McLaren followed up previous contacts made with Rolf Carriere, for head of UNICEF Bangladesh and now UNICEF Liaison at the World Bank and Jose Furtado, a consultant within Economic Development Institute of the Bank.

Introductions were made to Linda McGinnes, Co-Manager of the World Links for Development (WorLD) Program, a programme personally established by James Wolfensohn, President of the World Bank. This programme aims to establish a global learning network linking thousands of students and educators around the world. WorLD is seeking to establish partnership with online providers of knowledge bases suitable for education purposes. We are continuing the dialogue.

4.2 Discussions with Danyal Sattar, INAISE

Brussels, 26 February 1999

The International Association of Investors in the Social Economy (INAISE) is a global network of socially and environmentally oriented financial institutions. The Brussels office is exploring the use of web databases for the promotion of sustainable development and the social economy through case studies. We discussed possible collaboration.

4.3 NGO Environmental Health Action Group meeting

Soesterberg, 7-8 February 1999

As a direct consequence of their involvement with this INFO2000 project, Nadia McLaren and Anthony Judge had been invited as members of the Environmental Health Action Group, which met for the second time in Soesterberg, Netherlands. Certain members of the group continued meeting on the subject of a related information project, part EC-funded through UNED-UK, called Interactive Health Ecology Access Links - Europe (IHEAL-Europe). For further information, see 4.10 below.

4.4 NGO Internet Fiesta

Vienna, 19-20 March 1999

The World of NGOs organized this event at the UN Centre in Vienna. Nadia McLaren provided an online demonstration of the INFO2000 project. She highlighted that this project has enabled UIA to make its databases available on the Internet (<http://www.uia.org/data.htm>) in an interactive format in beta-test mode. This means that people can comment on the information, suggest improvements and add new material. Their comments are instantly registered and available to other users. She also talked about the procedures now being refined for the online editing of the data. This will enable accredited editors to change the entries remotely, notably incorporating new materials, updating and building interrelationships between entries. The objectives are to use the capacities of the internet to further open the process of information collection and sharing, enable the widest access to the information, and encourage interaction and debate on issues important to NGOs. Ms McLaren also participated in the workshop "International Resources, Global Co-operation and Networks", focusing on the potential of international information resources and the urgent need of structuring on the Internet.

4.5 Workshop: *Integrated Planning at Different Scales: Policy and Practice*

Perth 7-9 April 1999

Graham Bennett presented information on our project at this workshop, organised by Scottish Natural Heritage. The workshop was concerned with sharing expertise and experience on integrated planning and management of natural resources at national, regional and international levels.

4.6 Pan-European Eco Conference on Public Participation

Moldova, 17-18 April 1999

Allan Howard of UIA attended this conference, which addressed the role of NGO's within the UN ECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (the Aarhus Convention 1998).

Besides participating in conference workshops and contributing to the conference's final statement, Mr Howard had meetings with representatives of the US Agency for International Development (Europe & NIS), the Regional Environmental Center for Central and Eastern Europe (REC), the European Environmental Bureau (EEB), the European Union Tacis programme and representatives of environmental projects in Russia, Moldova, Turkey and Africa.

4.7 4th International Expert Seminar on Environmental Management

Surfers Paradise, 19 -25 April 1999

Nadia McLaren was invited to present at an international conference in Australia concerned with environmental indicators and local government. The conference was followed by three round-table seminars in Brisbane, Canberra and Batemans Bay. The meeting was funded by the host and enabled further discussions with potential partners in Australia. Return through Canada also enabled meetings in Montreal (below).

4.8 Convention on Biodiversity and Biodiversity Clearing House Mechanism

Montreal, 7 May 1999

Nadia McLaren had a series of courtesy and research meetings with people in the Convention on Biodiversity office in Montreal. Of special significance were discussions with Marc Auer, the Programme Officer at the Clearing-House Mechanism. Under the Convention, the Clearing-House Mechanism is the official place for international information exchange on biodiversity conservation. It is important that it be made aware of our project and we begin consideration how the two resources might work together. This work of informing has been done in part in the past by Jerry Harrison of WCMC, when he has met with officers of various agencies concerned with biodiversity conservation.

4.9 Fifth Framework Seminar, East-West Collaboration in Developing Interactive Media Production

Budapest, 8-11 May 1999

Anthony Judge attended this meeting, sponsored by DG-XIII. Contacts made on this occasion have set the stage for collaboration with potential partners in Prague and Budapest, together with a partner in the UK. These are part of discussions for two separate UIA-initiated consortia based on work related to the Problems and Strategies databases.

4.10 WHO/NATO Expert Workshop on Environmental Health

Varna, 17-23 May 1999

Nadia McLaren was invited to present insights on the role of NGOs in local planning of environment and health and on environmental indicators. The INFO2000 project was presented as a example of using interactive technologies for capturing contributions from citizens on matters of community concern.

4.11 Healthy Planet Forum and 3rd Meeting of European Health and Environment Ministers

London, 14-22 June 1998

A team of UIA personnel was based in London during the Ministerial Conference and its concurrent NGO Forum. At the Forum, they made available a continuous presentation of the interactive online facilitates developed during the course of this project.

5 Complementary project work

The following list of projects is not exhaustive but illustrative of the types of projects that UIA and WCMC in particular are carrying out that are relevant to the aims of the INFO2000 project, and which contribute to its implementation.

5.1 *infoDev* Programme of World Bank

The project proposal for complementary funding has been approved by the World Bank's *infoDev* (Information for Development) programme. This project is, in effect, an extension of the methodology and data of the INFO2000 into a developing country context. The project, Interactive Contextual Environmental Planning Tool for Developing Countries (INTERCEPT), is now listed on *infoDev*'s "Highly Ranked Proposals" -- List of approved projects awaiting funding at:

<http://wbln0018.worldbank.org/infodev/infodev.nsf/Web+Files/HighlyRankedProposals?OpenView>

Due to various reasons, such as the Kosovo crisis, the programme fund has not been replenished. We are informed that it is now unlikely that the project will be able to commence until later this year or very early next.

5.2 IHEAL Europe Interactive Database

(IHEAL-Europe) was launched at the Health Planet Forum (4.10 above). (IHEAL-Europe) is an information network that is continually developed through public access to environment and health data and concerns. 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 website is at <http://www.iheal.org/>

5.3 EU-India Economic Cross-Cultural Programme

The second call for this programme, expected early in 1999, has still not been made.

5.4 AEAW website

WCMC has continued to work with the African-Eurasian Waterbird Agreement on development of their 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 developed further over the next few months. It will also be reviewed at the first Meeting of Parties to the Agreement, which will be held in South Africa in November.

5.5 EC Clearing-House Mechanism

WCMC is one of a consortium of organisations 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 carried out by WCMC in the first phase of the project included the review of options for various web-based activities. The results of these reviews of options are directly relevant to development of information services in the context of the INFO2000 project.

5.6 IPIECA Internet Map Server

WCMC is working with IPIECA, the International Petroleum Industry Environmental Conservation Association, and ESRI (who make the ARC/INFO GIS software) on the development of an Internet map server. As IPIECA is particularly interested in marine areas because of the importance of rapid information responses in the case of oil spills during transportation, initial work has been on the Mediterranean, and will continue on the Caribbean.