UNEP

CONVENTION ON
MIGRATORY
SPECIES

Distr.
GENERAL

UNEP/CMS/Conf. 8.12
15 August 2005

ORIGINAL: ENGLISH

on the move to
2010

EIGHTH MEETING OF THE
CONFERENCE OF THE PARTIES
Nairobi, 20-25 November 2005
Agenda item 15 (a)

Review of GROMS (Global Register of Migratory Species)

Introduction

1.   GROMS is an information system designed to satisfy the needs of the CMS and its related Agreements concerning the scientific information on migratory species and their populations. Originally based on an initiative by the CMS Secretariat, it was launched in 1998 with financial support from the German Ministry of the Environment through the Federal Agency of Nature Conservation. The rationale behind GROMS is mainly based on the fact that although many databases include migratory species, scientific information on details about their migration behaviour, routes and seasonal distribution was scattered. Therefore, summarising knowledge about migratory species within one information system was among the main objectives of the GROMS information system, which should serve as a tool for fact finding and decision making by CMS and its related Agreements. Details on the history and products of the GROMS project are given in the enclosed annotated publication list (Annex A) and the GROMS website (www.groms.de).

2.   GROMS was handed over officially to the CMS Secretariat after publication of the Final Report. Further action was requested by the Secretariat at COP7, within an extensive document on the "Future of the Global Register of Migratory Species (GROMS)" (UNEP/CMS/Conf. 7.7, 2002). Requested action suggested under paragraph 7 consisted of:
-   further development and maintenance of the database
-   search for additional funding and cooperation with international governmental and non-governmental organisations
-   advise by the Scientific Council for future development of GROMS as an integral component of the Information Management System (IMS).

3.   The Secretariat pursued these goals through successive Letters of Agreements (LoAs) with the Zoological Research Institute and Museum Alexander Koenig (Bonn), where GROMS is presently hosted and managed. Financing of approximately 40,000 € p.a. came from Germany's annual voluntary contributions.

Independent Evaluation of GROMS - April-July 2005

4.   In accordance with the decisions of the CMS CoP7, the CMS Secretariat established a process for the evaluation of the Global Register of Migratory Species (GROMS). The evaluation was coordinated and evaluated by an independent consultant and is conducted through a wide consultation. The full evaluation text is enclosed (Annex II) and served as a base for actions and recommendations outlined within this document.

5.   According with the independent evaluation of GROMS, analysis of the CMS's Information Management Plan and the Strategic Plan (2006-2011) has shown that GROMS is likely to be of great help for implementing the Convention. But it can only do this if the actions required for its finalization are carried out. Furthermore, it is necessary to direct GROMS's future development towards better integration within the databases network and other information systems developed by other organisations and shared on Internet. In this way, GROMS will become an element in this network, enabling it on the one hand to satisfy the CMS's specific information needs and, on the other, act as a portal facilitating the access to other information sources.

6.   **For it to fully carry out its functions, it is strongly recommended that GROMS be integrated within the CMS Secretariat and harmonized with the IMS now run by UNEP-WCMC, whose 'species' element duplicates that of GROMS. The Convention, and the Agreements would benefit most from GROMS.**

7.   Up to now, GROMS concentrated on vertebrates, of which 4,350 have been identified as migratory according to the GROMS definition. In addition, GROMS provides digital distribution maps for about 1,300 species, which allows automatize listing of Range States and combination with Geographic Information Systems, permitting overlay and intersection with maps on land use, environmental data, satellite images or any other data set available in digital format. Through the identification and mapping of migrants, individual listing of species hitherto included as entire families on CMS Appendix II (e.g. *Muscicapidae*) was possible. According to this analysis, 860 species are listed on CMS Appendix I and/or II. However, distribution data are contradictory or insufficient for a number of species (particularly *Muscicapidae).*

8.   One of the main advantages of the GROMS relational database is that it supports expert queries which allow to identify knowledge gaps and contradictory data, particularly with respect to Range States. In addition, the database contains textual information on migration behaviour for most species, based on a comprehensive bibliography of more than 5,500 entries.

9.   Further details on the rationale behind GROMS, the focus of the GROMS team, the actual information content and details on software tools and web interfaces are given in the evaluation (Annex B).

10.   GROMS provides links to many other information systems on species. Some of these links are sufficiently optimized to enable users to go directly to the information they are looking for. This kind of optimized link is now available on GROMS for the site of the IUCN Red List of species, for FishBase, for the CMS's IMS (managed by UNEP-WCMC) and for the Global Biodiversity Information Facility (www.gbif.org), which provides specimen and observation point maps.

11.   The evaluation process should also investigate options for the future of GROMS and provide estimates concerning the amounts of resources necessary to maintain and possibly further develop GROMS. The evaluation highlights strengths and weaknesses of GROMS**.** It emerges from the various points of view collected, and the detailed analysis of GROMS content made by the consultant, that this information system has great potential to satisfy the information requirements of the CMS and some of its Agreements and to play an important part in achieving the objectives of the 2006-2011 Strategic Plan. However, in its present form GROMS has handicaps that reduce its potential. Indeed, it has not yet achieved the degree of development necessary for the upkeep and upgrading operations alone to suffice for its long-term maintenance. Another phase is still necessary to fully exploit what has already been achieved:
- a quality control of the data contained in the database;
- establishment of a Scientific Board for GROMS that will ensure the system's scientific pertinence and reliability over the long term;
- Integration of GROMS to be further integrated within the world network of web-based species information systems;
- Improvement of user-friendliness of the website & CD-ROM. It is recommended that information on conservation measures (legal, institutional and other) should be added to GROMS.

12.   Generally speaking, scientists specialising in groups of species think that GROMS is duplicating the work of existing databases and thus adds nothing of value, whereas people working on species conservation and implementing the CMS believe that, on the contrary, GROMS does not overlap with or duplicate other information systems. With respect to GIS maps, it should be noted that at present the GROMS is among the very few readily available map sources. On the other hand, biologists still seem to be reluctant to use Geographic Information Systems.

13.   Today GROMS contains a considerable amount of information basically generated by 7 years of work, thanks to funding from the German Government via the BFN, and subsequently through the Secretariat. This period was sufficient to create a coherent basic core of information. However, the initiative still requires a completion phase, to attain the aims for which it was undertaken. This completion phase requires resources that are modest compared with the funding allocated to the previous setting-up phases. This phase is to be implemented over an 18-month period and it requires an additional funding estimated at about 70,000 Euros (US$ 84,135).

At the end of the completion phase, GROMS will be a reliable tool, able to carry out the following functions, according to the decisions that will be made about it by the Contracting Parties:
-       A tool giving access to the information necessary for evaluating the status of species covered by the Convention and potential candidates for inclusion in its Annexes
-       An information source and entry portal to get the pertinent information for migratory species that is available in the many information systems found on the web
-       A tool for calculating certain biodiversity indicators, like the Species Population Trend Indicators
-       A tool to feed rapid assessment processes with information on migratory species that is likely to promote taking migratory species into account in such processes

14.   CMS and each of its related Agreements have rather different types of needs concerning scientific information on species. Thus, the Secretariats have adopted differing approaches to satisfy their information needs, which is analyzed in the evaluation. The issue of the availability of reliable, precise scientific information is one of the greatest challenges the CMS is confronted with today, after 25 years of existence.

15.   This appears clearly in the Strategic Plan for 2006-2011, since the first of the four stated objectives of the Plan is *'to ensure that the conservation and management of migratory species is based on the best* available *information'*. In this context, it is obvious that GROMS as an information system on migratory species can play an important role. The table below shows how GROMS could help achieve the Strategic Plan's objectives regarding the availability of scientific information on species.

Objective 1: *To ensure that the conservation and management of migratory species is based on the best available information*	
Targets*	**Potential and possible role for GROMS in achieving the targets**
1.1 Review of status of and conservation actions for App I and II species published at regular intervals	GROMS could be used as a tool for preparing assessment reports on species status. To this end, the improvements suggested in Section 8 of the present Report should be put into effect
1.2 Up to date list of range states of App I and II species presented to each COP	GROMS already incorporates a tool for establishing lists of 'range states'. This tool could be refined to make it more reliable
1.3 Indices for measuring the status and trends of migratory species at global, regional and national levels developed	In its present form, GROMS is not able to directly help measure trends for species. But it is one of the tools the CMS possesses that is best placed to evolve towards integrating such a function

1.4 Reviews of major threats to migratory species and obstacles to migration completed at regular intervals and guidelines for appropriate actions developed	GROMS will not be able to directly help conduct such reviews. It could be indirectly useful if it integrates more data on threats
1.5 Criteria, indicators and guidelines for assessing the success of conservation actions for priority migratory species developed	Once the indicators have been elaborated and adopted, GROMS will be very useful for the periodic calculation of indicators. It should be said that GROMS does not at present have an element for calculating indicators. Incorporating this is one of the improvements suggested in Section 8
1.6 Research and monitoring priorities for App I and II species identified and recommended to appropriate institutions for action	N/A
1.7 Standards and effectiveness of commissioned research and CMS published reports improved	N/A
1.8 User friendly information management system integrating the best available data on migratory species operational and regularly up-dated	Once the improvements suggested in Sections 8.1 and 8.2 have been made, GROMS can be one of the central elements in the Information Management System that is the subject of this target (1.8)

* as stated in the text or the CMS Strategic Plan 2006-2011

Conclusions

1.   GROMS can serve as a special database for defined purposes under CMS. These could include, the CMS Information Management Plan as well as the informational needs of the CMS Agreements and MoUs, their accompanying action and conservation plans as well as CMS programmes and projects.

2.   GROMS should fulfil important service functions for CMS and the CMS Scientific Council, thereby facilitating an ever-growing workload. These functions could include:

    2.1   **Contributing to the implementation of the CMS Information Management Plan**, as currently developed and thereafter implemented by or with the assistance of UNEP-WCMC. This includes linkage with the UNEP-WCMC species information system;

    2.2   **Providing information** to authorities of Parties and non-Parties, scientific and administrative bodies on migratory species-oriented questions related CMS implementation or, more generally;

    2.3   **Completing and regularly updating the reference list** of migratory animals, using the best available information to update and refine the records on migratory status for all taxa, including subspecies and populations;

    2.4   **Adding** scientifically agreed **common names in other languages**, starting perhaps with the UN languages.

3.   This could lead to more harmonised common names for species in multinational languages; GROMS should be further developed, regularly updated and adapted to the state of the art in information technology. These include update and maintenance of GROMS, access and data handling. An analysis of feedback given by users of the published GROMS database will help to solve these problems. According the resolution approved for the **Working Group** (Appendix 3) and under the direct responsibility of the CMS Secretariat, GROMS should be integrated within the CMS Secretariat and harmonized with the IMS run by UNEP-WCMC.

Publications from the GROMS project

Full-text versions of most publications, additional technical reports and presentations can be downloaded at http://www.groms.de/groms/publications.html

Riede, K. (2000) Conservation and modern information technologies: The Global Register of Migratory Species (GROMS). Journal of International Wildlife Law and Policy 3(2), pp. 152-165

Riede, K. (2001) The Global Register of Migratory Species (GROMS): Present Status and Perspectives In: Riede, Klaus (Ed.): New Perspectives for Monitoring Migratory Animals - Improving Knowledge for Conservation. - Münster (Landwirtschafts-verlag), pp. 33 - 42.

Riede, K. (ed.) (2001) New Perspectives for Monitoring Migratory Animals - Improving Knowledge for Conservation. Proceedings of an International Workshop on behalf of the 20th Anniversary of the Bonn Convention. - Münster (Landwirtschaftsverlag), 166 pp.

Riede, K. (2001) Global Register of Migratory Species. Weltregister wandernder Tierarten. Database, GIS Maps and Threat Analysis. With bird species accounts by Katja Kunz. 404 pp. + CD-ROM.

Riede K. (2003) Biodiversity Informatics in Germany: ongoing projects and their possible contribution to the Global Taxonomy Initiative (GTI). In: Junko Shimura (ed): Global Taxonomy Initiative in Asia. National Institute for Environmental Studies, Japan, pp. 294-300.

Riede, K. (2004) Global Register of Migratory Species - from Global to Regional Scales. Final Report of the R&D-Projekt 808 05 081.329 pp. + CD-ROM.

Gerkmann, B. & Riede, K. (2005) Use of satellite telemetry and remote sensing data to identify important habitats of migratory birds (Ciconia ciconia [Linnaeus 1758]). In: B.A. Huber et al. (eds.): African Biodiversity. Springer. Printed in the Netherlands. pp. 261-269.

Riede, K. (2005) Migration within and out of Africa: Identifying knowledge gaps by data-mining the Global Register of Migratory Species. In: B.A. Huber et al. (eds.): African Biodiversity. Springer. Printed in the Netherlands. pp. 245-252.

**Report of the evaluation
of the Global Register of Migratory Species (GROMS)**

Evaluation of the Global Register for Migratory Species
Preliminary Report

Contents

Annexes

Summary of the conclusions and the recommendations

Today GROMS contains a considerable amount of information basically generated by 4 years of work, thanks to funding from the German Government via the BFN. This period, and this funding, were sufficient for creating the structure of this information system and elaborating a coherent basic core of information. But this initiative still requires a finalisation phase to enable it to attain the aims for which it was undertaken. In terms of the means needed, the finalizing phase requires resources that are modest compared with the funding allocated to the previous setting-up phases. This phase is to be implemented over an 18-month period and it requires an additional funding estimated at about 70,000 euros.

At the end of the finalization phase, GROMS will be a reliable tool, able to carry out the following functions, according to the decisions that will be made about it by the Contracting Parties:
- A tool giving access to the information necessary for evaluating the status of species covered by the Convention and potential candidates for inclusion in its Annexes
- Acting as an information source and entry portal to get the pertinent information for migratory species that is available in the many information systems found on the web
- A tool for calculating certain biodiversity indicators, like the Species Population Trend Indicators
- A tool to feed rapid assessment processes with information on migratory species that is likely to promote taking migratory species into account in such processes

Analysis of the CMS's Information Management Plan and the Strategic Plan (2006-2011) has shown that the GROMS is likely to be of great help for implementing the Convention. But it can only do this if the actions required for its finalization are carried out. Furthermore, it is necessary to direct the GROMS's future development towards better integration within the databases network and other information systems developed by other organisations and shared on Internet. In this way, the GROMS will become an element in this network, enabling it on the one hand to satisfy the CMS's specific information needs and, on the other, act as a portal facilitating the access to other information sources.

For it to fully carry out its functions, it is strongly recommended that the GROMS be integrated within the CMS Secretariat and harmonized with the IMS now run by UNEP-WCMC, whose 'species' element duplicates that of the GROMS. The Convention, Eurobats and ACCOBAMS would benefit most from the GROMS. As to the other members of the CMS family, some have alternatives that are better suited to their needs (AEWA and the Marine Turtles IOSEA), and others have limited information needs.

Today the GROMS is very little used and relatively little known. Some scientists who are specialists in species or groups of species think that it has no added value and that it duplicates existing databases. Nevertheless, most of the answers to the questionnaire circulated as part of the evaluation say that the GROMS is a useful tool for implementing the CMS. These answers come from representatives of the Parties in the CMS's Scientific Council, and thus reflect the Parties' need for the GROMS. There are not enough of these answers for precise conclusions to be drawn in this respect.

The aim of making the GROMS a central information system for migratory species is unrealistic. Anyway, centralized information systems are proving to be increasingly inappropriate and useless, given the existence of the many databases that are available on internet and offer a high degree of specialisation.

1.   Aims of the evaluation

This evaluation was done to implement Resolution 7.2 of the COP 7 of the Contracting Parties, which invited the CMS Secretariat to undertake an evaluation of the GROMS with a view to deciding how far it could be useful for the CMS. The objectives of the evaluation were:

Key Objectives:
-   Assess the suitability of GROMS to respond to the information needs of (i) Parties and (ii) the broader CMS/Agreements constituency (eg Secretariat, Scientific Council, NGOs, Scientists) and produce the relevant outputs, also in comparison to other existing tools, both within and outside CMS. User-friendliness will be a key criterion for the future of GROMS.
-   Make recommendations on the future development of GROMS in terms of, inter alia:
    -       Information coverage (core and optional)
    -       Desirable outputs
    -       Relevance to CMS role in Meeting 2010 WSSD/CBD targets for biodiversity
    -       Potential financial/technical resources
    -       Long-term sustainability

Secondary Objectives:
-   Assess the quality of the information currently available in GROMS in terms of its completeness, accuracy and update
-   Assess the complementarity and possible overlap of GROMS with other CMS information tools, notably the Web-based CMS Information %Management System (IMS) developed by UNEP-WCMC, as well as with other relevant, freely available existing databases
-   Assess the consistency and compatibility of GROMS with the IMS and the possibility of further integration of the two systems
-   Estimate the amount of resources necessary to maintain and possibly further develop GROMS

The results of this evaluation will be submitted to the Scientific Council and then to the Contracting Parties at their Eighth Conference (COP 8 in Nairobi, November 2005).

2.   Methodology

For the purposes of this evaluation, an independent consultant was recruited by the CMS Secretariat. He was given the task of analysing the pertinent existing documentation, and contacting the key experts and organisations to get their respective points of view. The consultant also elaborated a questionnaire which was circulated to all the members of the CMS Scientific Council and Focal Points; it was also circulated via the Internet discussion group associated with the GROMS website (Migration).

Also, making use of the fact that a meeting of the ACCOBAMS Scientific Committee was taking place during the evaluation period, it was possible to include on the Meeting's agenda (Cairo, 14-16 May 2005) a session devoted to the GROMS evaluation.

The consultant visited three times the GROMS facilities at the Museum Koenig and had meetings with the team currently working there (June 2005). He also evaluated the GROMS website and the CD-ROM version, analysing their respective structures and the method used to develop these. As part of the assessment, he analysed the CMS's Information Management Plan (IMS) and Strategic Plan (for 2006-2011) (discussed at the 28th Meeting of the Standing Committee) to study how far the GROMS could be used for implementing the IMS and attaining the aims of the Strategic Plan.

Moreover, a working group was set up to review the preliminary results of the evaluation process and guide the consultant in making recommendations for the Parties as to the future of the GROMS. The list of the members of the working group appears in the Annex 1 to this report.

The present Report was prepared by the consultant on the basis of the analysis made and the collection of views gathered through contacts, meetings and the questionnaire. It was submitted for review to the working group, which met on 1 July 2005 in the premises of the CMS Secretariat in Bonn.

The professionalism of the staff of the Secretariats and the other people contacted as part of this evaluation greatly facilitated the task of the consultant, who was able to access the pertinent information available without any difficulty.

The content of the present Report should be taken as it stands; reading between the lines to find some hidden agenda should be avoided.

3. Brief description of GROMS

3.1 Overview of the History of GROMS

The GROMS is an initiative of the Secretariat of the CMS, which in 1997 suggested to the German Government giving financial and scientific assistance to create an information system on migratory species. Preparations for starting the GROMS began in late 1997 and the project effectively took off in early 1998. In all, 3 German scientific institutions took a part in elaborating the GROMS: the Zoological Research Institute, the Alexander Koenig Museum and the University of Bonn. The Koenig Museum hosted the GROMS databases on its server as soon as they were created, and currently hosts the small GROMS team. From 1998 to 2002, GROMS was a project funded and supervised by the German Federal Agency for Nature Conservation (BFN). In 2002 at the occasion of the COP 7 of the CMS, the German Government handed the GROMS over officially to the CMS Secretariat.

3.2 Rationale behind the GROMS

In accordance with its original aim, the GROMS was intended to become a unique and specialised tool for the decision-making of the bodies of CMS and associated Agreements. It was planned to make available in a single system information related to migratory species. This information exists abundantly on the Internet and in various other types of publication (books, articles, theses, etc) but it is scattered and thus not easy to access. The idea behind the GROMS was therefore to offer the various actors who implement the Convention and/or its Agreements access to a database that centralises basic information on migratory species, their populations and their migration patterns.

Originally, the GROMS was then intended to be a centralised database elaborated by compiling information taken from scientific publications on migratory species. The definition of migratory species used differs from that given by the CMS Convention1. Until 2002, there was no wide consultation about the GROMS's objectives, structure, content and openness onto other information systems. The information gathered in the context of the present evaluation shows that the GROMS team gave most importance over the period 1999-2002 to the work of collecting, compiling and processing data. This period enabled the GROMS to accumulate and process a considerable quantity of information, which constituted a real gain.

3.3 What does GROMS consist of today?

In its two currently available versions (June 2005) on Internet and as a CR-ROM, GROMS is a package of relational databases with information on 4,350 migratory species. This includes the

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1 According to CMS, Migratory species" means the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries. (paragraph (a) of Article 1.1 of CMS). while GROMS focuses on 'true migrants' covering more than 100 km, or crossing from sea to freshwater.

scientific names of species (often taking into account possible synonyms) and data on their distribution and migratory movements. Also available is information on the possible inclusion of each species on the IUCN Red List and the Annexes to the relevant Conventions and Agreements. A determining tool for the list of "range states" is available in the CD-ROM version. GROMS information is mainly given in English, with some data in French, German and Spanish.

3.3.1 The web version

The web version of the GROMS is currently available at the address "www.groms.de"; it is hosted by two servers, one containing web pages in HTML format, the other containing the database (MySQL Format) and PHP scripts for querying the databases and displaying the results. It consists of 3 main elements: the 'species' database, the bibliographical database, and the GIS server. It also has accessories: Satellite Tracks and News.

Furthermore, the system is equipped with an interface for processing and updating the data in the databases. Obviously, access to this interface is restricted to the team managing the GROMS.

3.3.2 The CD-ROM version

The latest version of the CD-ROM dates back to March 2004. It is composed of Microsoft Access databases driven by a Visual Basic Application (VBA). The CD-ROM version can thus only be used on computers with Microsoft Access. It consists of 2 main elements: the 'species' database and the bibliographical database. It also has a tool for finding species by geographical area and calculating the range states.

3.3.3 Types of information available in the GROMS

The GROMS covers about 4,350 migratory vertebrate species providing digital maps of migration routes and distribution for about 1,100 of them. It also includes a comprehensive bibliography of more than 5,500 entries. The breakdown of the species currently covered by GROMS is as follows:
- Mammals: 295 species
- Birds: 2159 species
- Reptiles: 10 species
- Fishes: 1886 species

The alphanumeric databases are structured to contain the following information:
- Taxonomic classification
- Vernacular names (multilingual)
- Conservation status (according to IUCN, CITES, CMS and other relevant treaties)
- Range territories
- Populations
- Literature
- Useful links

The GROMS is not a database that describes species and their biology; only information on the status and migration of species, sub-species and populations is available in the GROMS. But it is possible, through the links it has with other information systems, to gain access to files that do describe a species and its biology. The GROMS content has developed greatly in 2005. Now, its linkage enables users to land directly on the species file without going through other phases. These links currently exist for FishBase, RedList 2000, GEBIF and the IMS of CMS.

3.4 Information sources:

Various information sources were used to elaborate the databases of the GROMS, especially publications whose quality is acknowledged. For certain species a limited number of information sources was used. This is the case for example for the birds (The Handbook of the birds of the world

of Del Hoyo *et al*.) and certain types of cetaceans (notably Forcada J., 2002 - Distribution Encyclopaedia of marine mammals).

3.5   The GROMS equipment

The GROMS has a relatively small but sufficient equipment. It does not have its own servers, it benefits from the backing of the Koenig Museum, which hosts on its servers the GROMS website and MySQL databases. Currently (June 2005) the equipment available for GROMS is made of 3 main computers, printers and scanners.

3.6   The GROMS team

During the phase of developing the system, the project team consisted of four people, one of them working full-time. In June 2005, the GROMS team consisted of two part-time staff. The tasks were to make some improvements, particularly to strengthen the link with other information systems such as FishBase.

3.7   Who are the current users of GROMS?

An analysis of the statistics of connection to the server hosting the GROMS's MySQL databases (Annex 2) shows a connecting activity (during the 4 first months of 2005) of 30,000 to 50,000 hits a month originating from many countries.

However, it emerges from our survey that GROMS is currently used very little for the purposes of implementing the CMS. Most of the people contacted as part of the evaluation (members of staff of the Secretariats of the CMS and of its Agreements and of the Scientific Council and the Standing Committee of the CMS) did not mention GROMS as one of the information systems they use.

Several of the species specialists contacted said that the level of information detail provided by GROMS was insufficient for their information requirements. This is largely due to the fact that GROMS covers a great variety of species (birds, mammals, reptiles, etc.) and is therefore unable to include in the system sufficient data to cover the needs of specialists in the species or group of species in question.

3.8   Who does the GROMS belong to?

Started up as a project of the German Federal Agency for nature conservation (BFN), GROMS is managed by the Alexander Koenig Museum in Bonn. At the COP 7 of the CMS, the German Government handed the GROMS over officially to the CMS Secretariat. So GROMS can now be seen as belonging to the CMS. According to the GROMS heads, there is no copyright problem linked to its content. But an analysis of the bibliographical element provided on the CD-ROM shows that for certain scientific publications, the complete text of the publication is available on CD-ROM in the form of extracts (in pdf format) taken from scientific journals. It is strongly recommended that an agreement in writing from the holders of the copyright of the said journal be requested.

3. 9   Links with other information sources
GROMS offers links with many other information systems on species. Some of these links are sufficiently optimized to enable users to go directly to the information they are looking for without passing through the home page of the web site consulted. This kind of optimized link is now available on the GROMS for the site of the IUCN Red List of species, for FishBase, for the CMS's IMS (managed by UNEP-WCMC) and for GEBIF.

3. 10   Funding sources

The GROMS was funded between 1998 and 2002 by the German Government via the federal Agency for Nture Conservation (BFN), to the tune of a total 523,000 euros.

This funding was used both for acquiring the necessary equipment and paying staff expenses, and for organising some workshops and events linked to the GROMS and its main products. When the funding from the BFN stopped in 2002, although it had achieved a very advanced stage of development, the GROMS was not totally complete. In 2004, the CMS Secretariat has entrusted the Koenig Museum with the task of making a number of improvements via a contract paid using the voluntary contribution from Germany to the CMS. The total amount of this contract is 29,000 euros; this covers the period up to October 2005.

4.   Analysis of the GROMS quality and functionality (Strengths and Weakness of the GROMS)

It is clear that an enormous amount of work has gone into developing the GROMS. An analysis of this information system shows the vast size of the mass of information collected and the effort made to compile it and integrate it within the databases. But this is also one of its weaknesses. Even one of its main heads thinks it would have been more rational to focus the work on a smaller number of species.

As for the software, the web version has no outstanding weaknesses and functions relatively rapidly despite the great number of species considered. The CD-ROM version is also sufficiently optimised, with almost no bug2. But this is not an independent platform that can be installed or used on any PC. It requires the presence of Microsoft Access. This dependence should be avoided in the next versions by developing an independent system.

GROMS seems to have been developed (at least in its first years) without taking the CMS's objectives into account sufficiently. The approach used actually favoured academic reasoning, sometimes at the expense of the CMS's needs. This is well illustrated in the choice of a definition of a migratory species that differs significantly from that adopted in the CMS context, appearing in paragraph (a) of Article 1.1 of the Convention. This was not negligence, but a well-considered choice that was well-argued in the documents and outputs of the GROMS.

It emerges from the various points of view collected, and the detailed analysis of the GROMS content made by the consultant, that this information system has great potential to satisfy the information requirements of the CMS and some of its Agreements and to play an important part in achieving the objectives of the 2006-2011 Strategic Plan. But in its present form, the GROMS has handicaps that reduce its potential. Indeed, it has not yet achieved the degree of development necessary for the upkeep and upgrading operations alone to suffice for its long-term maintenance. Another phase is still necessary to fully exploit what has already been achieved in the GROMS. This phase is aimed at allowing:

- a quality control exercise to be done on the data contained in the database;
- to establish a Scientific Board for the GROMS that will ensure the system's scientific pertinence and reliability over the long term;
- the GROMS to be further integrated within the world network of web-based species information systems; and
- the website and CD-ROM to be made more user-friendly. It is recommended that in the context of this phase, information on measures (legal, institutional and other) for the conservation of the species covered be added to the GROMS structure.

5.   Overlap with other systems

Right from the start of the evaluation process at the level of the Secretariats of the CMS and of the Agreements, there was perceptible tension about the GROMS; it was linked to the existing or potential overlapping and competition with the CMS's information system and other information

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2 However, the site and the CD-ROM are not optimized for frequent, prolonged use. This is seen in the fact that the windows remain open after use and the Desktop of the user's PC is quickly invaded by a vast number of windows.

systems used by the CMS family. The consultant believes that this tension acted against the GROMS's being integrated within the CMS and against the GROMS's taking the CMS's needs fully into account.

The IMS and the GROMS were developed simultaneously and apparently with no real coordination between these two information systems, which handle the same subjects on several issues. On the basis of contacts and talks with several members of the CMS staff as to why this lack of IMS-GROMS coordination existed, one reaches the conclusion that the two systems are seen as rivals rather than as dovetailing. It seems that this situation has meant that there have been no real attempts to harmonize them. The situation is irrational and harmful to the CMS. It is therefore strongly recommended that they no longer be kept separate.

The basic ideas underlying the GROMS and the IMS are very different. According to the person in charge of the IMS at UNEP-WCMC, this is designed to be a hub, not for storing information but for acting as a link between several information sources, to give the user the possibility of accessing information generated by specialist actors. Although the UNEP WCMC has a good experience in maintaining and managing such a hub for species information, for the IMS element that gives information on species, the hub function does not seem very clear, since it acts rather like a database that centralises information coming from many sources. That is exactly what the GROMS does.

For some years now we have been seeing the birth of many databases and other information systems on species. Several are available free on Internet and are excellent tools for the exchange and dissemination of information. In this context, if its role is merely to centralize and/or summarize information that is available in other systems, the GROMS would add little of value and would even run counter to trends that are increasingly recommended – developing decentralized database networks. In its latest versions, the GROMS has improved greatly as regards its relationship with other information systems, to give added value by directing its input towards information on migration.

On this issue of GROMS's overlapping with and duplicating the work of other information systems, opinion gathered in the context of this evaluation was divided. Generally speaking, scientists specialising in groups of species think that the GROMS is duplicating the work of existing databases and thus adds nothing of value, whereas people working on species conservation and implementing the CMS believe that, on the contrary, the GROMS does not overlap with or duplicate other information systems.

Up to 1999, the CMS did not have a programme concerning scientific and technical information. In 1998, the COP 5 adopted the Information Management Plan. This started to be implemented in 1998, particularly by setting up the Information management System of CMS (IMS) managed by the UNEP-WCMC in Cambridge. The IMS includes an element that provides information on species. This element is duplicated by GROMS, since it contains the same kind of information.

6. Results from the questionnaires

When this Report was finalized, out of the 324 people asked to give their opinions on the GROMS by filling in the questionnaire, only 21 replied. This did not surprise the CMS Secretariat and the consultant because the answer rate for questionnaires in this kind of consultation is known to be usually low.

However, it is surprising that the GROMS evaluation did not spark off any reaction from the members of the discussion list established by the GROMS. Only 4 members of the list sent in answers to the questionnaires, whereas there are 421 members of the discussion list.

70% of the answers to the questionnaire received stated that the GROMS is useful for the CMS implementation, but only 40% stated that the content of GROMS was up-to-date.

7. Information needs of the CMS family and how far the GROMS is useful for satisfying them

The aim of this part of the Report is not to provide comprehensive information about the CMS family's information systems. It is rather to provide the necessary information for easy understanding of the following sections on the present and potential role of the GROMS in satisfying the CMS's information requirements.

The CMS and each of its related Agreements have rather different types of needs as regards scientific information on species. Thus, the Secretariats have adopted differing approaches to satisfy their information needs.

To assess how useful the GROMS is for each member of the CMS family, each Secretariat's approach was analysed as part of the GROMS evaluation process, on the basis of interviews with members of the Secretariat staff and, where possible, the pertinent documents. A summary of this analysis appears below.

7.1 The Convention

As for the other species conservation conventions and Agreements, the availability of reliable information is a key factor for implementing the CMS and its Agreements and MOUs. Information must be available, for example for assessing the status of the species covered and also those species whose inclusion in the Annexes to that convention and/or Agreement is being considered. In 1999, the Secretariat, in collaboration with the UNEP-WCMC, made a detailed analysis of the information needs emerging from the texts of the Convention and the Agreements and the Resolutions of the Meetings of Parties. This evaluation also considered the information needs of Parties, Secretariats and various bodies (scientific councils/committees, technical committees, standing commites, etc.). On the basis of this evaluation, an information management plan for the CMS (IMP) was elaborated and presented to the COP6, which decided on a certain number of actions to implement the IMP. These actions are dealt with in Resolution 6.5. The GROMS, by virtue of its starting aims and its present content, is in line with several of the actions advocated in Resolution 6.5. But it should be noticed that the GROMS is not the only tool the CMS now possesses, since from 2000, the Secretariat has been developing an Information Management System that currently includes two main elements: the CMS Information System and the National Reporting System (Synthesis of Party Reports and the New Reporting Format). As stressed in Section 5, the CMS Information System duplicates work done by the GROMS since it contains the same kind of information.

The issue of the availability of reliable, accurate scientific information is one of the greatest challenges the CMS is confronted with today, after 25 years of existence. This appears clearly in the Strategic Plan for 2006-2011, since the first of the four stated objectives of the Plan is '*to ensure that the conservation and management of migratory species is based on the best available scientific information*'.

In this context, it is obvious that the GROMS as an information system on migratory species can play an important part. But it must be better adapted to suit the CMS's needs. Particularly, it must incorporate an element on conservation and management measures for each species. The table below shows how the GROMS could help achieve the Strategic Plan's objectives regarding the availability of scientific information on species.

Objective 1: To ensure that the conservation and management of migratory species is based on the best available scientific information	
Targets*	**Potentialities an possible role for GROMS in achieving the targets**
1.1 Review of status of and conservation actions for App I and II species published at regular intervals	The GROMS could be used as a tool for preparing assessment reports on species status. To this end, the improvements suggested in Section 8 of the present Report should be put into effect
1.2 Up to date list of range states of App I and II species presented to each COP	The GROMS already incorporates a tool for establishing lists of 'range states'. This tool could be refined to make it more reliable

1.3 Indices for measuring the status and trends of migratory species at global, regional and national levels developed	In its present form, the GROMS is not able to directly help measure trends for species. But it is one of the tools the CMS possesses that is best placed to evolve towards integrating such a function
1.4 Reviews of major threats to migratory species and obstacles to migration completed at regular intervals and guidelines for appropriate actions developed	The GROMS will not be able to directly help conduct such reviews. It could be indirectly useful if it integrates more data on threats
1.5 Criteria, indicators and guidelines for assessing the success of conservation actions for priority migratory species developed	Once the indicators have been elaborated and adopted, the GROMS will be very useful for the periodic calculation of indicators. It should be said that the GROMS does not at present have an element for calculating indicators. Incorporating this is one of the improvements suggested in Section 8
1.6 Research and monitoring priorities for App I and II species identified and recommended to appropriate institutions for action	N/A
1.7 Standards and effectiveness of commissioned research and CMS published reports improved	N/A
1.8 User friendly information management system integrating the best available data on migratory species operational and regularly up-dated	Once the improvements suggested in Sections 8.1 and 8.2 have been made, the GROMS can be one of the central elements in the Information Management System that is the subject of this target (1.8)

* as stated in the text od the Strategic Plan

7.2   The African-Eurasian Migratory Waterbirds Agreements (AEWA)

The main data needs of AEWA are about (i) the population sizes and monitoring trends in populations and (ii) identifying sites of special importance for the bird species covered by the Agreement.

The AEWA Secretariat uses particularly the database of wetland International (IWC) to assess the status of AEWA species. In addition, the database of Birdlife International (IBA) is used. The staff of the AEWA's Secretariat is satisfied by the nature and quality of the information provided by these databases.

These two information systems are recognised all over the world for the quality of the information they contain; they are regularly updated thanks to a vast network of partners around the world. These databases are available on the Internet and their use is currently free. It should be noted that the AEWA Secretariat has not yet established an official agreement with BirdLife International or Wetland International concerning the use of their databases. It has thus no control over the future development of these databases, or whether they will continue to be available free. It is likely that in the near future the AEWA Secretariat, along with other MEAs, will be asked to make a financial contribution to developing and keeping up these databases.

7.3   The ASCOBANS

According to its Executive Secretary, ASCOBANS does not need to develop an information system at Secretariat level, since the Secretariat can easily access available data in the institutions of the countries that are Parties to the Agreement. He believes, therefore, that GROMS is not likely to give added value. Also, the ACCOBAMS budget does not contain an item under which information

systems or databases would come. At its Meeting in Brest (April 2005), the ASCOBANS Advisory Committee, looking into the possibility of making a contribution to another database (Europhlukes), concluded that the Agreement cannot make a financial contribution in 2005.

7.4 The ACCOBAMS

The ACCOBAMS Secretariat thought that it was urgent to give the Agreement an information system that collect and compile relevant data in order to provide the Agreement's stakeholders with the information they need on the biological, ecological and legal aspects of the conservation of species and populations covered by the Agreement. At their Second Meeting, the Parties to ACCOBAMS adopted the capacity-building strategy presented by the Secretariat that includes, among other things, setting up a CHM for cetaceans (CETA-CHM). It is planned to start developing this CHM in the second half of 2005.

Although its structure and content have not yet been defined, it is extremely likely that some elements of the CETA-CHM will contain similar information to that contained in the GROMS regarding cetaceans. It should be noticed that several members of the ACCOBAMS scientific committee, consulted in the context of the present evaluation process, stressed the fact that the GROMS offers no information of interest to specialists. Some see the GROMS as a useful awareness tool for the public and the "decision makers" who handle several species simultaneously and who are not specialists in all these species.

7.5 Eurobats

For Eurobats, it is particularly useful to have an information system that enables making rapid lists of 'range states'. Since it has no information system on bat species or on the areas covered by the Agreement, the Eurobats Secretariat envisages close collaboration with GROMS to use it to satisfy information needs.

For the Eurobats Secretariat, GROMS already contains a lot of data on bats. But this is information taken from published works and is not really up-to-date. In the Eurobats context, a working group was set up to collect data on bat habitats, particularly caves. It is expected that the group's work will be completed in April 2006 and will then be published and suggested for integration within the GROMS. There will, however, be a requirement that the geographical information made available on the GROMS will not be such as to enable users to deduce the precise geographical coordinates of the caves, so as not to encourage the development of uncontrolled and illegal frequentation of bat sites, this kind of tourism having already harmed bat habitats.

Eurobats is not asking for major changes in the GROMS, apart from posting on the first introductory page a link giving rapid access to data on bats.

The Eurobats Secretariat has not at present the resources to enable it to make a financial contribution to the GROMS. It will, however, suggest at the next Meeting of Parties (September 2006) that part of the budget should be set aside for this purpose. But it should not be expected that this sum will be more than a few thousand euros.

The Secretariat confirmed that for bats, no information systems available on internet are at present offering similar information to the GROMS information in terms of data and exhaustiveness.

7.6 The Agreement on the Conservation of Seals in the Wadden Sea

The "Precautionary approach" is one of the basic principles explicitly chosen for implementing the Agreement. It implies "to take decisions on the basis of the best available information". But the slight geographical and specific range of this Agreement means that the information needs are relatively simple, particularly as concerns numbers of the seal population.

7.7   Agreement on the Conservation of Albatrosses and Petrels (ACAP)

ACAP's information needs, and means of satisfying them, resemble to a great extent those of the AEWA, discussed above.

7.8   The MOU on the conservation of Marine Turtles of the Indian Ocean and South-East Asia

The Secretariat of the MOU for marine turtles has developed an information system that is quite well elaborated and suited to the conservation of the species covered. The system is so far advanced that the GROMS is not specially useful as a source of information for implementing the MOU. But it would be extremely useful to establish links between the two information systems. Such a link does not at present exist, but setting it up should present no particular technical problems.

7.9   The other MOUs agreed under the CMS auspices

Given that it is the CMS Secretariat that coordinates these MOUs, the information needs for their implementation have to be satisfied according to the methods used by the CMS Secretariat (see Section 7.1 above).

8.   Suggestions for the future of GROMS

8.1   The finalisation phase

As was mentioned in Section 4, the GROMS still needs a finalization phase; otherwise it will not be of sufficient quality to help the CMS cope with the challenge of availability of reliable and accurate information. The finalisation phase should build on the huge achievements of the previous phases to make the GROMS an information system of worldwide scope. Its duration is estimated at about 18 months. The activities to be undertaken within the framework of the finalisation phase are:
-         Data Quality Control
-         Improving the friendliness and the usability of GROMS
-         Further elaboration of GROMS: Implementing the changes to be decided by the Scientific Board and adding information on the conservation measures (legal, etc.)

Why is data quality control necessary?
It is always recommended while in the process of developing databases to plan for a stage during which the data entered into the base is checked to make sure it contains no errors and is sufficiently precise not to mislead database users. It is clear that much has been done to make sure the GROMS content is based on the best information available, but the information has been compiled by a very small number of scientists while the GROMS covers several groups of species. Working as a small group of scientists has been very positive as regards content homogeneity and harmony. But several species specialists contacted in the context of the present evaluation have pointed out that the GROMS content on each group of species must be reviewed by specialists in that particular group of species, to further refine the information presented, make it more precise and (in some cases) update it.

This work could be done by a Scientific Board that would be set up, and that should be made up of 10 to 12 top-level scientists in the fields of migration, population assessment and species conservation (birds, ungulates, marine mammals, reptiles, etc.). Members of this Scientific Board must also be chosen for their knowledge of populations at geographic level. It is suggested that the Scientific Council appoint from among its members a working group to act as the GROMS's Scientific Board, that will meet at the occasion of the meeting of the Scientific Council. The members should agree on a procedure for continuously updating the GROMS.

The financial resources needed to implement the actions required for this phase are estimated at 70,500 euros (Table 3).

Table 3: Cost estimates for the finalisation of GROMS

Activity	Action	Responsible organisation/ To be done by	Cost estimates (euros)
Data Quality Control	Establishing the Scientific Board	Scientific Council of CMS CMS Secretariat	-
	Meetings of the Scientific Board at the occasion of the meetings of the Scientific Council of CMS	CMS Secretariat/ (the information Officer and the Scientific and Technical Support Officer)	12,000
Improving the friendliness and the usability of GROMS	Improving the user-friendliness of the web version of GROMS	CMS Secretariat/ Web designer (1 P/M)	2,200
	Elaboration and testing of a software for the CDROM Version	Museum Koenig/ (2 P/M, Student)	2,000
Further elaboration of GROMS	Adding information on the conservation measures (legal, etc.)	CMS Secretariat/ IUCN ELC (Bonn) or Senior legal consultant (15 P/M)	13,500
	Implementing the changes decided by the Scientific Board	Museum Koenig/ 8 P/M junior staff 4 P/M Senior Staff	17,600 23,200
		Total	**70,500**

8.2 Integrating the GROMS within the structures of the CMS

There have been some attempts to harmonize IMS and GROMS, which led to the setting up of a linking system that allowed the user to pass from IMS to GROMS and vice versa. But this linking system does not eliminate duplication by the two systems. The need to remedy this situation by completely integrating the two systems within a single unit should be stressed. There is no sense for the CMS in keeping this duplication, which may give rise to confusing or even contradictory information and generates waste of resources. The options 2, 3 and 4 presented hereinafter require the integration of GROMS with the component of the IMS providing information on species.

8.3 Options for the future of GROMS

The consultant presented in his preliminary report the following four options for the future of GROMS:
Option 1: Fully integrate GROMS within the CMS structure in order to use it as an information tool for implementing the CMS and offering a contribution by the CMS to the global network of information systems on biodiversity
Option 2: Make GROMS an entry portal for accessing information on migratory species
Option 3: Use the GROMS as a tool for raising public awareness on the conservation of migratory species
Option 4: Stop the GROMS initiative and not use it for the CMS needs

Option 1 derives from the analysis of the CMS Strategic Plan with a view to identifying subjects for which GROMS could be productive. Obviously, the aim of the analysis is not to try to find a role for the GROMS but rather to see subjects where GROMS could have the potential to back up the development of the work of the CMS on the subjects in question. Options 2, 3 and 4 derive from proposals received by the consultant from some experts contacted as part of this evaluation process.

The consultant stressed in his preliminary report that by choosing Option 4 the CMS will lose the opportunity of benefiting from the work done in the GROMS. Option 4 was presented in the consultant's preliminary report only for the sake of impartiality since in the view of some experts contacted the GROMS was useless. They considered that improving it is not an easy task and they believe that the project should be abandoned.

In its meeting (Bonn, 1 st of July 2005) the working group for the evaluation of the GROMS considered the four options and agreed to select Option 1, which consists of fully integrating the GROMS within the CMS structures

8.4   How to fully integrate GROMS within the CMS structure in order to use it as an information tool for implementing the CMS and offering a contribution by the CMS to the global network of information systems on biodiversity

This option requires the implementation of the finalising phase suggested in Section 8.1 and that GROMS be put under the direct responsibility of the Information Officer of the CMS Secretariat. Building on its current version, the GROMS should be further oriented towards achieving the targets of the 2006-2011 Strategic Plan of the CMS - in particular those related to Objective 1 (To ensure that the conservation and management of migratory species is based on the best available scientific information). The GROMS must be further adapted to the need of the CMS and use a definition of migratory species that allows species that make short migrations to be covered (This specific point must be submitted to the Scientific Council). The main objective of adapting the GROMS to the needs of CMS is to use it as a tool for the Secretariat to:

- provide the Contracting Parties with regular assessments of the status of species
- establish lists of 'range states' of Appendix I and II species to be presented at the COPs
- help calculate Indices for measuring the status and trends of migratory species
- help calculate biodiversity indicators
- provide information on migratory species for "Rapid assessment" exercises and Environmental Impact Assessments
- consolidate the IMS, which could be offered by the CMS as a node for GEBIF and the CHM of the CBD.

Some of the above functions are likely to strengthen the role of the CMS in meeting the 2010 WSSD/CBD targets for biodiversity**.**

As regards the usefulness of the GROMS to the CMS Agreements, it is clear that GROMS cannot satisfy the information needs of the AEWA Secretariat and Parties. However, trying to adapt the GROMS to fit the needs of the AEWA is not a rational option in terms of cost-efficiency, particularly since adequate information sources do exist (in particular, the BirdLife and Wetland International databases).

The situation is different for Eurobats and ACCOBAMS. Both Agreements could benefit from GROMS for developing the information systems they envisage setting up.

As for the practical details of how the GROMS will function in the future, the CMS Secretariat should take the necessary steps with the GROMS's present administration to make sure the GROMS is integrated within the CMS. The GROMS databases and equipment should remain at the Koenig Museum in Bonn and be maintained by one permanent staff member working on a part-time basis, with temporary assistance from students where necessary. It is strongly recommended that the Secretariat of CMS (i) establish remote links between the GROMS and the other components of the IMS and (ii) jointly with the Koenig Museum encourage the GROMS to be involved in projects likely to provide fresh data on migratory species.

The Secretariat should report on the status of the GROMS to the meetings of the Scientific Council, which will examine those activities that have been carried out and will give directives for future activities

The annual costs of maintaining the GROMS according to the above arrangements are evaluated at 25,000 euros (22,000 euros for the salary of the permanent staff member (part-time) and 3,000 euros for running costs).