PROMOTING EFFECTIVE MONITORING AND CONSERVATION THROUGH ONLINE DATABASING: AN AVIAN PERSPECTIVE

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ABSTRACT

The need for information on biodiversity is increasingly becoming a necessity due to threats at global, national and local levels. Adequate, correct, timely and accessible Information can be used for effective planning and formulating realistic conservation priorities. The Kenya Birdfinder, an internet based electronic database facilitates collection of current and updated records of bird observation as a source of information to monitor birds. A lot of information on birds exist as grey literature and museum specimens and never re-utilized after results' publication for conservation actions. The system communicates major findings of submitted records to relevant authorities concerned with conservation and advocacy thus contributing to a much wider sharing and dissemination of important aspects while contributing to avifaunal conservation. Through networking the system provides a highly attractive and authoritative, scientifically rigorous analysis and presentation of data. The records added to the system provide a comprehensive picture on what is happening to Kenya's avifauna while providing baseline information for their conservation.

Key Words: Information, Biodiversity, Conservation, Kenya Birdfinder, Data

INTRODUCTION

The ever increasing need for information on various aspects of biodiversity has necessitated the innovation of myriad avenues for data access. Access to online information has recently become very popular making it increasingly possible to explore the most current issues through web based publications and online databases. Due to fast and efficient flow of information through the web researchers and individuals with other various interests currently can access a lot of information. The Internet through the web has revolutionized the way all types of research is undertaken. As a result, researchers in various parts of the world are equally getting connected and can now publish their works online and make it accessible to a wider audience.

Threats to biodiversity at the global, national and local levels resulting from human population increase and related activities have necessitated the need for information (Sutherland, 2000) that would provide the baseline information for monitoring and conservation for species and their habitats. However, for this information to contribute meaningfully and effectively to conservation of our dwindling biodiversity it has to be adequate, correct and timely and accessible to fulfill our interests in conservation and for effective planning. In the recent past a number of biodiversity

monitoring databases have been established and have proved very effecting in contributing information for conservation of species.

Information in all facets of life is necessary in formulating realistic conservation priorities (Sutherland, 2000). For this information to contribute to realistic decisions then effective tools for management have to be applied. Electronic data-basing is a tool for data management that could be very effective in contributing to the formulation of realistic conservation priorities. The *Kenya Birdfinder* is one such tool currently being used in the management of bird data being collected across the country. This is an internet based electronic data basing toolkit that enables ardent/avid birdwatchers, avian biologists, amateurs and tourists to provide information on bird observations. The system draws on a world-wide group of supporters, wildlife clubs, tour guides, conservation organizations, lobby groups, ornithologists and bird watchers.

Kenya Birdfinder seeks to record bird observations as a source of information to help us understand birds on a local, national and international scale (Roberts, 2005). This has not been possible in the past in Kenya because a lot of information on birds exist as Grey literature and museum specimens or is stored away by many researchers and never re-utilized after results' publication. Hence with the introduction of the Kenya Birdfinder database duplication of efforts will be reduced. The database allows storage and management of individual observations, viewing, downloading or printing reports, checklists or maps of own choice while making a contribution to bird conservation in Kenya.

The need to introduce Kenya Birdfinder is to promote sharing of information related to birds. Information on birds can be used to select priority sites for biodiversity conservation. Birds are excellent indicators of biodiversity and flagships of conservation (Koskimes, 1986, Bennun & Njoroge, 1999). The system communicates major findings to relevant authorities concerned with conservation and advocacy. In addition the system will play a key role in sharing bird-related information with relevant stakeholders, thus contributing to a much wider sharing and dissemination of important aspects. The system encourages the power of networking to provide a highly attractive and authoritative, scientifically rigorous analysis and presentation of data collected by a global family in a global network.

OBJECTIVES

The main goal of the program is to contribute to effective conservation of birds and biodiversity worldwide by facilitating the collection, analysis and presentation of data

In order to achieve the above three strategic objectives for the program are as below;

1. Harness data previously unavailable to conservation while encouraging information sharing that will contribute to effective bird conservation in Kenya.

2. provide a simple list-based monitoring scheme

3. to update knowledge on birds distribution through mapping

4. encourage collection of new data in a more systematic and repeatable way

METHODOLOGY

Data sources for birds in Kenya

Data are submitted to the online system from a wide range of both voluntary and professional surveys, including casual

records from the field which involves taking GPS locations for the purposes of mapping. Initial submission of records requires online registration by logging in to www.worldbirds.org/kenya and registering of personal details to gain access to all the sites, pages and range of tools as provided in the system. All the options of starting up and operating the system are provided. Once received records are validated on a regular basis so that the end users or the public gets the right information. These records are then collated and analyzed to provide status and breeding performance information, and trends of rare birds in the country.

Data preparation for mapping

Data is downloaded from www.worldbirds.org/kenya as excel spreadsheets. The spreadsheets are then exported to GIS software (ArcViewGIS3.2) as relational files i.e., database files (dbf). Relational databases connect different files or tables (relations) without using internal pointers or keys. Instead a common link of data is used to associate records. This is the most popular database file model for GIS.

Displaying sightings

With geographical co-ordinates it is possible to transfer the data to a Geographical information system (GIS) to produce species maps. Geo-referenced bird data can be mapped as families, species (common/scientific name), data owner, location or habitats in general. This information can then be linked to other files describing sites or giving details of a species (as in table 1). GIS will also allow for display using photo files using HOTLINK TOOL to observe species and habitat images. The system allows for exploration of different locations around Kenya and find out what birds have been seen and when and where they were recorded. The bird records added to the system provides a comprehensive picture on what is happening to Kenya's avifauna in terms of their abundance, trends and distribution.

RESULTS AND DISCUSSION

The system has played a major role in capturing bird observations (records) from ornithologists and birders all over Kenya both local and visiting which would otherwise have been lost. It has also encouraged sharing of information amongst different individuals. In the past, some of it has always ended up in shelves and never reach the relevant stakeholders involved in conservation and advocacy. Thus the system has a great potential in contributing to a much wider sharing and dissemination of important issues while it provides very valid and quantifiable data that could be useful for monitoring our avifauna.

The results have so far given us a clear picture of what parts of the country are visited base don the information in the database. This kind of information is very crucial in monitoring these sites. It is however noted that birding visits are centralized in specific areas. Very few or no visits occur in the Northern and North Eastern parts of the country. There's therefore need to devise efficient ways to ensure records for the little visited areas are added in the database in order to include this fragile ecosystems in monitoring. The system through the data generated from the Kenya Birdfinder database also has a great potential in providing most recent information whenever needed. This has mad it much easier to download species checklists for specific areas of interest thus providing an efficient & cheap information carrier.

An important aspect of the system has been exhibited in the assessment of the state of completeness of information,

showing existing gaps to avoid duplication of efforts in addition to keeping information out of marginal sources to enable availability & accessibility of data. Any attempts to translate information from the system on subjects such as species distributions into recommendations to policy makers will definitely lead to enhanced bird conservation. The Kenya Birdfinder has great potential in developing a surveillance schemes which

may include annual or periodic assessment of population size and distribution while allowing for assessment of trends and eexamining relationship between long-term trends in the proportion of day-list on which a species occurs and long-term trends in abundance (Roberts, 2005, 2007).

Table 1 : An example of a record database file structure from the Kenya Birdfinde

Field Name	Description
Species	Scientific name of species
Family name	Name to which a species belongs
Species/ Family code	The family or species number to enable to enable indexing in taxonomic order
Common name	Local/country name for the species
Locality	Name and description of recording area
Co-ordinates	Geographic co-ordinates of the locality
Observers	Names of persons submitting records
Notes	Other unique observations etc

This may provide comprehensive coverage of common and rare species in both breeding and non-breeding seasons. Some surveillance schemes are tailored to provide site-based information that is essential to identify, monitor and manage protected sites (Danielsen, 2005). The system has already exhibited a great potential in this by complementing the already ongoing important bird area and the world bird data base. The potential of the system *in Monitoring* population trends and priority Conservation Sites using selected East African Endemics has been exhibited *(*Wambugu Mwangi, 2004). The data collected through this online database can be used to predict population trends in bird communities and in monitoring trends over years in addition to mapping species distributions (Adhiambo and Mugode, 2004). This therefore provides a basis of simple and efficient global biodiversity

monitoring tool. The frequency of data collection monitoring and the duration of collection characterized by the online database are very essential especially for purposes of monitoring species trends and abundance.

This provides baseline data that would be important in understanding the changes in the species of interest.

So far results indicate that the system has a great potential in contributing to the effective conservation of birds and biodiversity worldwide by facilitating the collection, analysis and presentation of data by mapping individual species sightings spatially (fig 1&2) while allowing for quick retrieval of records for other purposes from relational files. This will also allow for analysis of all visits and statistics to species of priority. The captured bird observations from the database will provide a source of

information to help us understand birds on a local, national and international scale (Roberts *et al*, 2004) and make a contribution to bird conservation in Kenya. The database has enabled storing and managing bird observations, viewing, downloading or printing reports, checklists or bird distribution maps as one of the main outputs (Roberts *et al*, 2004). The system will therefore preserve valuable bird information and increase our knowledge of the distribution, dynamics and conservation status of Kenya's birds. It is therefore apparent that the resulting bird data especially sightings can be put into maps for analysis, presentation, and display as both spatial and non-spatial data as has already been demonstrated.
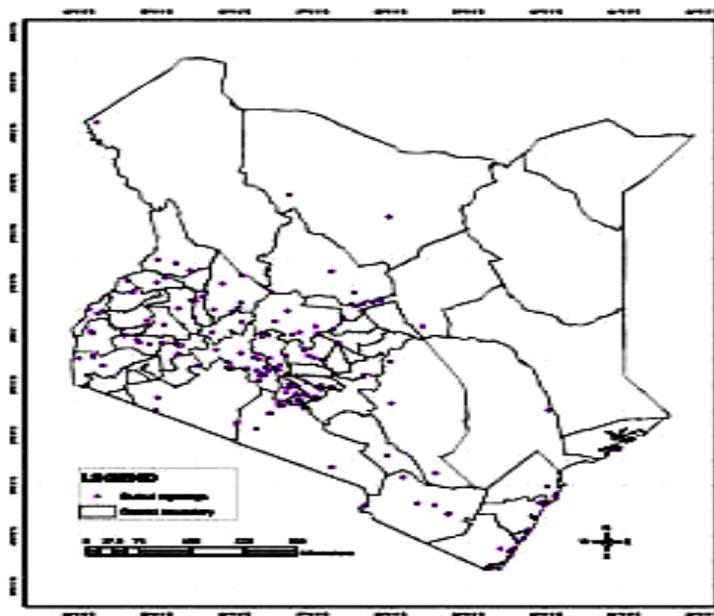
Figure 1: Showing sightings of the common bulbul, *Pycnonotus barbatus* in Kenya
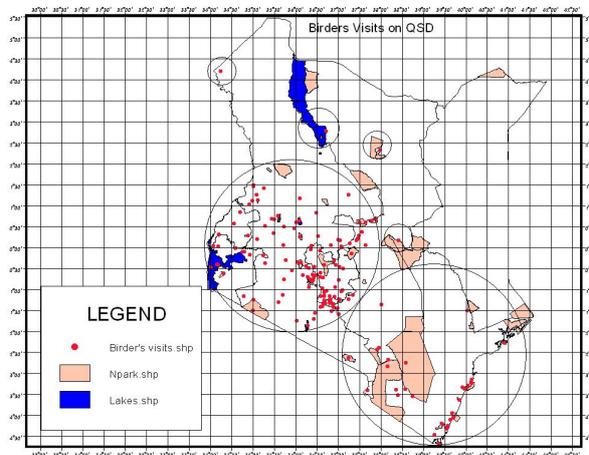

Figure 2: Bird sightings shown on Quarter Square Degrees

CONCLUSIONS AND RECOMMENDATIONS

Biodiversity monitoring is criticized for being insufficiently relevant to the needs of managers and ineffective in integrating information into decision-making. Effective monitoring schemes need to involve local communities as beneficiaries in order to be adopted. For the scheme to have great impacts it must incorporate the needs of the users in terms of logistics both financially and considering the technical inputs that would be involved. Resource availability especially for developing countries is a great issue for consideration for purposes of sustainability of any monitoring schemes. The urgent need to develop simple and effective methods for monitoring bird populations that are cheap to deploy in resource-poor countries led to the development of the Kenya Birdfinder that would provide a platform for the collection, storage and retrieval of new and existing data from bird observations recorded in Kenya. This Internet-based database, Kenya Birdfinder which is part of the global network of bird databases has already exhibited great potential in capturing field lists and *ad hoc* sightings routinely gathered by individuals observing birds recreationally and professionally. Huge numbers of lists have been collected on regular basis and this could provide information on population trends spanning many years. The records already collected in the database have shown that the system is a valuable resource with the potential to map and monitor bird distributions and estimate trends in species abundance.

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