# NEWS AND COMMENTS

## African Raptor Databank (ARDB) facility now online for vulture observers

### Rob Davies[1*] & Munir Z Virani[2]

[1]Habitat INFO, Rookwood Studios, Llanunwas, Solva, Haverfordwest, Pembrokeshire, SA62 UJ, United Kingdom

[2]The Peregrine Fund, P.O. Box 45111-00100 Nairobi, Kenya

*rob.davies@habitatinfo.com

A barn in West Wales may seem a far cry from the plight of vultures in Africa but we have a project kicking off here which we hope will be of benefit to vultures and vulture observers across Africa. The barn houses a GIS lab (geographic information systems) and a small company, which specialises in the management of spatial data, called Habitat Info. Under the stairs we have installed a monster server, which is now receiving data points from mobile devices around the continent representing real-time sightings of African raptors. Next to the server is a little sculpture of a Taita Falcon done by Michael Kumako who looks after a well-known Taita site in South Africa and we have named the server after Simon Thomsett's favourite Taita site in northern Kenya (this rare African raptor serves to remind us what it is all about!). Our little barn has an adequate broadband connection to handle the point records but we also relay those records that are safe to show everyone to a web map hosted by ArcGIS Online to take advantage of fast background mapping.

We have a viewing interface for all (public) ARDB records at

**http://gis.habitatinfo.com/java/ardb_viewing**

and an editing interface for all personal observations at

**http://gis.habitatinfo.com/java/ardb_editing**

But you will need to register first with the database before submitting and editing records so that we can protect any sensitive information. Full details on the registration process and the latest available recording applications for your phone or mobile device may be found at:

**http://www.habitatinfo.com/ardb**

We are currently in the process of launching a free app for android phones that will work offline thanks to help received from CMS (Raptors MoU) and an anonymous donor in the USA. The database already holds 57547 records as of 6 January 2014.

ArcGIS is a suite of software provided by ESRI, Environmental Systems Research Institute, who do a lot for conservation and kindly agreed to The Peregrine Fund applying under a grant scheme to access this state of the art facility at a fraction of its normal cost. The Peregrine Fund have very generously agreed to cover the cost of the software licence for a five year period of building the database and Habitat Info have done the hardware. We are now in a position to make this facility freely available to you to handle the management of observations, photographs, sounds for identification in a mapping context and to support the rapid accumulation of information and knowledge that is now occurring through the highly successful African Raptor list server and website (www.africanraptors.org).

The African Raptor Databank project or ARDB is envisaged as more than a web facility for the raptor recording community. It offers database management tools to receive data in all sorts of formats, even good old-fashioned excel spreadsheets, and to synchronise the data across regional offices in southern Africa (coordinated by Andre Botha, Bird of Prey Working Group, EWT), East Africa (Munir Virani & Darcy Ogada, The Peregrine Fund), West Africa (Ralph Buij & Joost Brouwer, Niger Bird Atlas Project), and North Africa. (Hichem Azafzaf, AAO) We also hope to be able to appoint focal points in each African country for relaying results to national agencies at a later stage.

The project has a strong conservation focus that will go beyond monitoring species in the process of decline. After a five year data gathering period we plan to

analyse the extent and status of the habitat required by each species of African raptor and publish these as a continually updated online conservation atlas. Habitat loss is a primary concern for conservation in Africa, especially in the higher human population density areas, and GIS now offers us high resolution datasets of forests, deserts, mountains, treecover, land use systems and climate change projections across the whole of the continent. These datasets combined with a knowledge of what each species requires will put us in a position to measure species conservation status in an accurate geographical manner and offer a big improvement on current species status assessments.

As we know from the Peregrine Falcon / DDT link and the recent precipitous declines of south Asian vultures, raptors at the top of food chains are often the first to go when environmental problems occur. When present in good numbers, raptors invariably signal healthy and intact ecosystems, of benefit to biodiversity as a whole. Raptors are also highly noticeable, popular with birders, and occur at relatively low density so recording them is not too onerous. For these attributes, we wish to promote raptors as subjects for a continent-wide monitoring

programme to indicate the health of Africa's habitats and ecosystems. In addition to habitat loss, raptor declines may flag up many different types of environmental problems, including those not yet fully appreciated or understood.

There are data issues with casual observations of wildlife in that the records often reflect the movements of the recorders more than the distribution of the subjects. But they are empirical data nonetheless and provide direct evidence of species occurrence. The patchiness of the recorder effort may be overcome by distribution modelling which is something we wish to do in order to assess the exact habitat requirement of each species. We conducted a pilot study on this for Madagascar raptors with the University of Pretoria (Jacollete Adam) and The Peregrine Fund. Again raptors are eminently suited to this method because they occur at low density and many exhibit strong territorial spacing behaviours. With adequate input data models such as 'maxent' or 'biomapper' can reveal for us all parts of Africa that are, for example, more than 50% suitable for a particular species. These extents may then be measured accurately and used to assess the niche or population space and then what is happening to this space in terms of

human impact. The project can be expected to return a ranking from those species reliant on tiny and dwindling habitats through to those with large ranges based on resilient habitats. The exercise may be expected to help nation states in Africa gauge the continent-scale importance of their habitat conservation programmes.

Vulture species are also found in particular habitats across Africa, which can hopefully be identified and then measured, but these habitat relationships may not be as closely-bound as for raptors which need to catch their prey in a particular vegetation structure. As we learnt so alarmingly at the Pan African Ornithological Congress in Arusha in October vulture populations are now declining drastically in large parts of Africa and these declines are not necessarily attributable to habitat loss. Primary causes are considered to be the muthi or juju trade, the use of poisons to control carnivores, and the spread of power lines and wind turbines. These causes are not due to the loss of a particular land cover but relate to people directly and their land use practices. It may be more difficult to obtain good spatial data on the distribution of these harmful practices but it is certainly something we will try to do in the hope that geographic solutions may

be found for vultures just as for other declining raptor populations. We are introducing a mortality module to the live apps which will at least enable us to plot incidents. Above all the ARDB should serve a useful monitoring role in maintaining crucial population data for these birds.

We made a formal launch of the ARDB at the last PAOC but one of the immediate concerns was how to protect sensitive information such as nest sites. And with the drastic rate of decline of vultures in great parts of Africa it was felt that all vulture observations should be viewable only to the observer who recorded them for the moment, except for historical low resolution records. It's a great shame not to use the full potential of the facility for sharing everything but it would be prudent not to place the birds at further risk to the Juju trade etc. Hopefully when the database is much larger and vultures are recovering, it will be safe to release more information to the public on vulture distribution and the models can certainly be shown at low resolution. Fortunately ESRI provide a function with ArcGIS Server called ownership-based editing which has enabled us to restrict recorders to editing and deleting only their own records, and we have made nest

records and vulture sightings only visible to the person who made the observations.

The database structure has been designed to accommodate all sorts of raptor data including road counts, ad hoc sightings, fixed point counts, satellite track routes, foot transects, nest records, mortality data, museum specimens, etc. You wouldn't want all the fields to appear on your mobile device so we are simplifying the data collection into different modules for each type of record. Recording the altitude that raptors fly at may also prove useful in mitigating the threat of wind turbines so we include this field in most modules. Using these modules in the field with a GPS enabled smart phone or tablet will automate and validate data recording and take away all the headache and errors that often arise when making a record of coordinates and map projections. But for those of you who don't like gadgets we will still be very grateful for spreadsheet data or even copies of old notebooks with which to build the database when we can.

The project can be described as a citizen science initiative and as the technology has developed it has swung away from the domain of mad mappers into the hands of any raptor observers and the general public. At a later stage we hope to link the modules to identification guides and capitalise on the education potential of public involvement especially schools. It is largely a voluntary endeavour and we are fortunate to have had three interns here at Habitat Info to help start the database. Zoe Taylor digitized all 15,607 records in the Snow Atlas to provide a wonderful historic record of sub-Saharan species and Sarah Wigley has helped to develop the database with datasets received from Andre Botha (a huge dataset of southern African records from cybertracker!), Niger Bird Atlas Project, Tim Wacher and colleagues for Chad, Simon Thomsett and Laila Bahaa el Din from their trans-Africa raptor road count, Tanzanian Bird Atlas, Darcy Ogada & Munir for East Africa, a field trip to Zambia, Clive Barlow for The Gambia and Joseph Heymans. Morgan Commins, on a remote sensing course at Aberystwyth University, has been helping us to extract the likely locations of large cliffs across the African continent using a method based on Grant Benn's, and the dataset looks as though it holds a lot of potential for predicting and measuring the distributions of cliff-nesting and mountain-dwelling species.

The African Raptor Databank has got off to a flying start with more than 57 thousand raptor records from across Africa including many vulture observations. So please sign up and help us fully develop this facility fully for the benefit of African vultures.

\*\*\*\*\*