ARGOS FORUM # 77

11/2013

BIRDS AND ARGOS
a worldwide journey

ENVIRONMENTAL MONITORING

CLS
COLLECTE LOCALISATION SATELLITES

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EDITORIAL

By Hiroyoshi Higuchi
Professor Emeritus at the University of Tokyo, Project Professor at Keio University

The most exciting message about using the ARGOS satellite network to track bird migration is that migratory birds connect not only nature but also people in different countries along the migration routes.

Each autumn and spring, migratory birds visit stop-over areas along their migration routes. These unique ecosystems are far away from each other, but are linked by the birds. In addition, migratory birds also link people along the routes. Each day during the migration season, hundreds or thousands of people watch migrating birds at different sites, near mountains, capes or islands. These people include not only keen bird watchers but many members of the general public as well, who while they may not be able to identify different bird species do enjoy watching them and imagining their long journey during migration. All these people living in different countries share the same experience along the migration routes, which have been identified by tracking the birds via the ARGOS satellite system.

From Autumn 2012 to Summer 2013, our research team invited the general public to watch the satellite-tracking via ARGOS of migrating Oriental Honey-Buzzards (Pernis ptilorhynchus) on a Keio University SFC (Shonan Fujisawa Campus) web-site. The site automatically displayed the migration process with only a slight offset in time, while also providing ecological and geographical information. Tens of thousands of people enjoyed watching the migration routes being displayed and exchanged information in various ways. This outreach project linked people in Japan, Korea, China, Thailand, Malaysia, Singapore, Indonesia and many other East Asian countries. Westerners living in England, Germany and the USA also joined in.

Next year, from 18-24 August 2014, the International Ornithological Congress will be held in Tokyo, Japan (http://ioc26.jp/) with the participation of more than 1,000 ornithologists. During the congress, many scientists who are studying migration patterns will be delivering presentations of their work.

It will be a unique opportunity to share information and deepen friendships.

All ARGOS publications are available at:
www.argos-system.org

USER PROGRAM

UNDERSTANDING MOVEMENTS OF AVIAN SCAVENGERS
ON BOTH SIDES OF THE EQUATOR

Wing-tagged Turkey Vulture flying on the Falkland Islands. (Photo by Alain Henry)

By Keith L. Bildstein, Marc Bechard and David R. Barber / Hawk Mountain Sanctuary

Turkey Vultures

the most common and widespread of all avian scavengers, have a complicated, series of site-specific migration systems the understandings of which have alluded traditional scientific study for decades. Like many birds of prey the species is a facultative, or partial migrant in which individuals in some parts of the species range migrate, whereas in other areas they do not. Unfortunately our understanding of the movement ecology of Turkey Vultures has been hampered by an international ban on traditional leg banding in the species resulting from the species' habit of urinating on its legs, and the possibility that accumulated urine on leg bands could hobble and otherwise impair individuals. Wing tagging and, most recently, satellite tracking throughout the Americas, are now revealing the complex and flexible nature of the species' migration behavior, which may explain the species' widespread distribution both north and south of the Equator.

The curious nature of Turkey Vulture migration

With a range of more than 100 degrees of latitude stretching from Canada to Tierra del Fuego in the New World, Turkey Vultures rank as the world's most common and widespread avian scavenger.

Method used

During the past decade we and our colleagues have used satellite tracking to monitor the movements of 30 individuals breeding in three countries, Canada, the United States, and Argentina. At the beginning of our work in 2003 it was believed that vultures breeding in and around Pennsylvania, USA overwintered mainly in the southeastern US, including peninsular Florida. And indeed half of the twelve birds we have tracked by satellite from east-central Pennsylvania have followed that pattern. The other half, however, remained much farther north, overwintering in southeastern Pennsylvania, Maryland, and southern New Jersey. Intriguingly several of the birds that traveled the farthest from Pennsylvania weighed the most when they were trapped and fitted with PPTs prior to their movements. Recent tracks of eight adults breeding in abandoned farmhouses in south-central Saskatchewan demonstrate that breeders from that population migrate more than 7000 kilometers one-way to overwintering areas in northern Venezuela; and that three birds breeding in the Pacific Northwest travel about 3000 kilometers one way to overwinter in Mexico and Guatemala. More recently 400 Turkey Vultures wing tagged on their wintering grounds in northwestern Venezuela were later re-sighted in the interior of North America as far south a Texas and as far north as Alberta and Ontario, Canada, confirming the representative nature of the breeders we had tracked by satellite from Saskatchewan. In addition, observations at visible migration at raptor-migration watchsites indicate that more than two million Turkey Vultures moving south along the coastal plain of Veracruz, Mexico in early autumn, and more than a million individuals migrating through southern Costa Rica and central Panama later in autumn, suggesting that intercontinental vulture "conga-line" between North and Southern America represents the most spectacular long-distance movement of avian scavengers on the planet. That Turkey Vultures manage to do so without regularly feeding en route is testimony to the species exceptionally efficient soaring flight during migration.

Although most of the vultures that we have tracked, which include several individuals followed for more than five years, have been relatively faithful to their migration tracks and wintering areas, one vulture tracked from the Pacific Northwest spent the first half of one winter in southernmost Baja Mexico, before reversing course north back into California and then turning sharply south and spending the remaining half of the winter in central Guatemala.

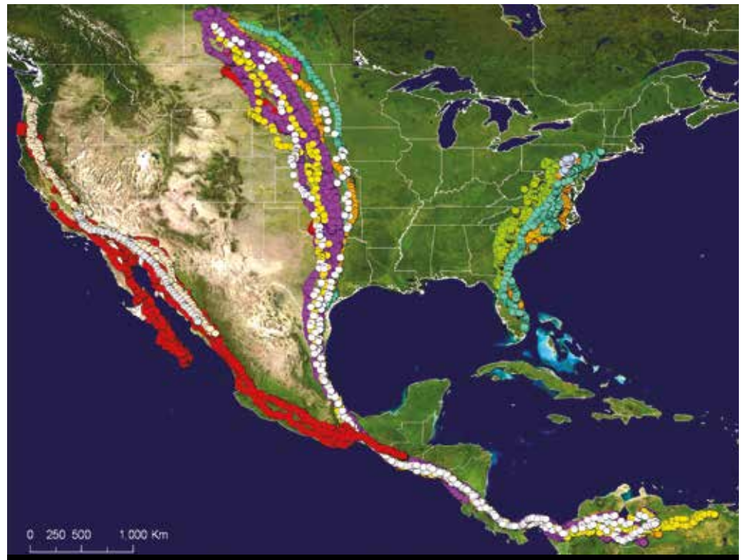
The new frontier of South American vulture movements

Although satellite tracks of North American breeders have largely confirmed and quantified the movements of Northern Hemisphere breeders, our more recent tracks of their South Hemisphere counterparts are now providing important new information on the "Black Box" of South American migration in the species. To date, we have placed a total of six units on individuals breeding in and around the pampas of central Argentina. Although ornithologists knew that these birds left the region in Austral or southern autumn and returned again in southern spring, they had no idea where the birds overwintered each year. Having studied the movements of these birds for up to three years via satellite tracking we now know that vultures breeding in the region travel an average 2700 kilometers north each autumn and over winter principally in central Bolivia and south central Brazil and that their outbound travels in southern autumn take about 24 days to complete, and that their return travels in spring take about 14 days. This compares with 32 days in autumn and 16 days in spring for our Northern Hemisphere East Coast migrants, which are migrating only about half as far. Migration in the Southern Hemisphere then is both similar and different to that in the Northern Hemisphere, most likely due to local differences in the seasonal availability of carrion. Although not especially surprising, this new information helps us better understand the movement ecology for this wide ranging species, and provides conservationists with critical information on the sizes and locations of the ecological neighborhoods of the populations involved. Still to be discovered is the extent to which tropical Turkey Vultures in northern South America migrate, as well as to extent to which subtropical populations northern coastal Chile, which hosts the densest population of Turkey Vultures anywhere, migrate seasonally.

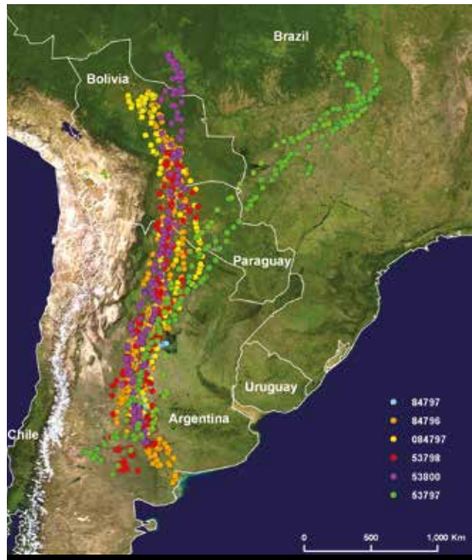
Overall our satellite tracking efforts with Turkey vultures demonstrate two things. First, the same general rules of avian migration apply to this species north and south of the equator. And second, satellite-tracking technology is an effective method for discovering the movements of this species both north and south of the Equator. With this in mind, our plan is to place additional tracking units on Turkey Vultures elsewhere in South America as soon as possible.

HAWK MOUNTAIN

Wing-tagged Turkey Vulture perched in a Kansas backyard.



Migration tracks of 24 Turkey Vultures in North America, 2003-2012.



Migration tracks of 6 Turkey Vultures in South America, 2009-2012.

Fitting a tracking unit on a vulture in Argentina.

Dr. Marc Bechard

Dr. Marc Bechard is Distinguished Professor of Biology at Boise State University, where he directs graduate students in the Raptor Biology Master Degree Program. Both he and Bildstein have studied the movement ecology of Turkey Vultures in nine countries including 16 states in the US.

Dr. Keith L. Bildstein

Dr. Keith L. Bildstein is Sarkis Acopian Director of Conservation Science at Hawk Mountain Sanctuary in Orwigsburg, PA, where he oversees an international training program for young raptors conservationists, directs graduate students, and is responsible for the Sanctuary's programs in Conservation Science.

David R. Barber

David R. Barber is a Research Biologist and GIS specialist at the Acopian Center for Conservation Learning at Hawk Mountain Sanctuary, where he co-coordinates research on Turkey vulture movements and manages the Sanctuary's databases including its accumulating satellite tracking data sets.

USER PROGRAM

TRACKING CARNABY'S COCKATOOS IN WESTERN AUSTRALIA

*'Pink Z' perched on Ozrea lilies in a Perth garden. © Christine Groom

By Christine Groom (University of Western Australia and Western Australian Department of Parks and Wildlife)

Carnaby's cockatoo

(***Calyptorhynchus latirostris***) is an endangered species found only in the south-west of Western Australia. It is a large black parrot that migrates from inland areas after the breeding season to more coastal areas in the non-breeding season. During the non-breeding season it is often seen in the inner suburbs of Western Australia's capital city, Perth (population about 1.8 million). It is quite unusual for an endangered species to be so readily observed.

How do they persist in such an urbanized environment? Where do they roost at night, how far do they travel to forage each day? Such spatial information on movements is fundamental to understanding the ecology of a species and for implementing conservation measures. A PhD project through the University of Western Australia began in 2012 to study the movements of Carnaby's cockatoos in the urban landscape of Perth.

Methods and tools used

Carnaby's cockatoo posed quite a challenge to design and attach a suitable tracking device. They have a powerful beak and are well known for their fondness for chewing. After much research into options, modified Telonics TAV 2617 units were selected and, with some trepidation with regard to the investment being set free, the first release of 11 study birds occurred in May 2012.

Thankfully most study birds have totally ignored their scientific burden. Of the first release, only one tracking device failed prematurely (unknown cause but probably chewed) and most exceeded their expected battery life of three to four months with one lasting more than nine months. The success has been attributed to the combination of fitting the 17g tracking device, under general anesthetic, to the underside of their two central tail feathers close to the body.

This initial release of study birds demonstrated their ability to move long distances in short periods of time making the ARGOS system ideal for monitoring their movements (see Fig.1).

As a pleasant surprise the accuracy of location fixes also exceeded expectations with over half the location fixes of location quality '2' or '3' (i.e. within about 500m). The cockatoos spend minimal time foraging on the ground and prefer to perch on top of the canopy of the tallest trees which assists good communications with the ARGOS satellites. It is also likely that within the study area there is minimal amount of interference compared to many other regions of the world such as Europe. The next closest city to Perth with a population over 100,000 is over 2000km away.

A recognized success

Following on from the successes in 2012, and armed with a better understanding of the strengths and weaknesses of the data obtained from ARGOS, the study has shifted to focus on understanding the roost site fidelity, daily movement patterns and foraging strategy of the cockatoos in the urban landscape.

Twelve study birds were fitted with tracking devices and released in 2013. Their tracking devices switch on for a period at night enabling their communal night roost locations to be identified. They also switch on for two mornings and two afternoons each week to enable their foraging habits to be studied. A vehicle fitted with roof-mount aerials and ARGOS Locator receivers provide voice readout of signal strength from study birds and this is used to locate and follow the flocks containing them. The study birds have their tail feathers coloured and marked with an identifying letter to make them distinguishable from their wild flock mates (see photos). Observations are made of flock sizes, feeding records and drinking locations to identify the resources they are utilizing and how they move through the urban landscape.

Now that the tracking methods have been tested, future studies are planned to better understand the migratory habits of this species and to study the closely related Baudin's cockatoo *(C. baudinii)* and Forest red-tail black cockatoo. (*C. banksii naso*).

© Christine Groom

The satellite tracking device attached to the underside of the two central tail feathers of study bird 'Pink B'

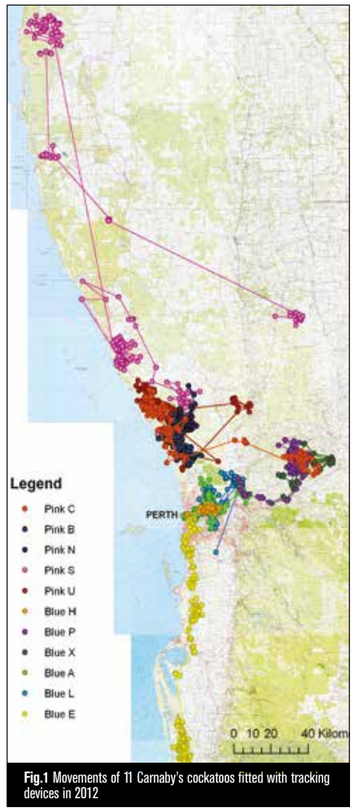


Fig.1 Movements of 11 Carnaby's cockatoos fitted with tracking devices in 2012

© Christine Groom

Carnaby's cockatoos opportunistically drink water from puddles on roads which put them in danger of being struck by vehicles. 'Green R' is perched on the bollard to the right.

© Christine Groom

Christine GROOM

Christine Groom is a PhD candidate at the University of Western Australia in the School of Animal Biology. She also works as a Research Officer in the Species and Communities Branch of the Western Australian Department of Parks and Wildlife.
See Christine's blog : http://carnabyscockatoo.blogspot.com.au

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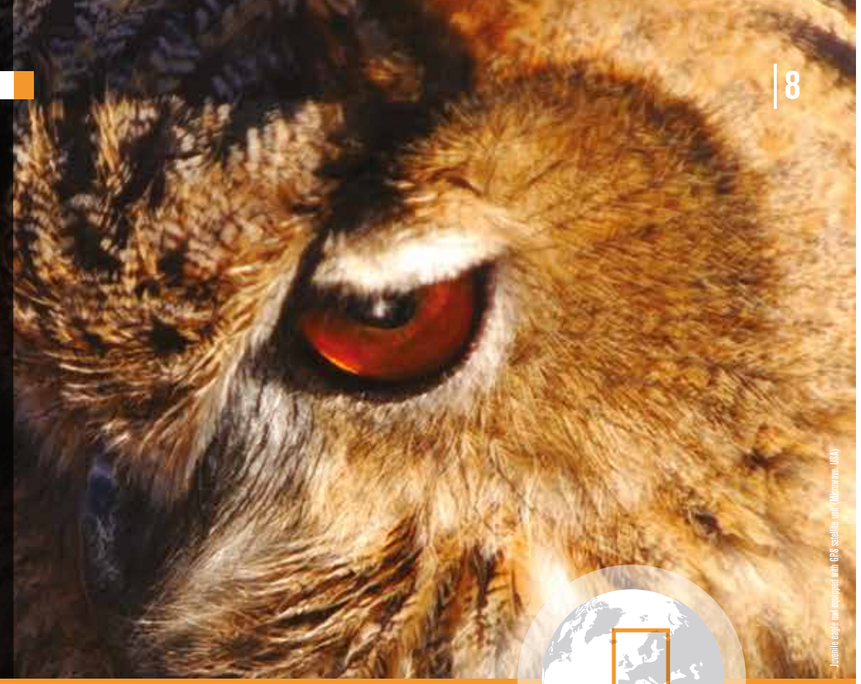
Manda Page (Department of Parks and Wildlife)

NATAL DISPERSAL OF EAGLE OWLS

A EUROPEAN SCALE PROJECT



Juvenile eagle owl equipped with GPS satellite unit (Microwave, USA)

By Vincenzo Penteriani, María del Mar Delgado, Jari Valkama and Pertti Saurola / CSIC - FNHM

Since 2010,

a 4-year international research project on eagle owl Bubo bubo natal dispersal has started in south-western Finland. The eagle owl is the largest European owl, ranging from boreal forests to coastal habitats of southern Europe. The main aim of the study is to disentangle the different drivers and factors affecting the process of natal dispersal by studying the movements of juveniles, which are radiotagged in the surrounding of their nests when they are ca. 8 weeks old.

Comparing studies to improve our knowledge on the specie

Dispersal routes and behavioural strategies of boreal eagle owls will be compared with the telemetry data already available from two previous European studies on this species: the one conducted by Vincenzo Penteriani and María del Mar Delgado in the Mediterranean hills of southern Spain (Sierra Norte of Seville) and the research carried out in the alpine habitats of western Switzerland (Bern Alps; study conducted by Raphäel Arlettaz and Adrian Aebischer, Institute of Ecology and Evolution, Bern University).

This European scale study is expected to improve our knowledge on how different ecological constraints may act on the dispersal patterns of the same species.

The project is granted by the Autonomous Government of Andalusia (Excellence Projects, SPAIN) and the research team currently working in Finland is composed by Vincenzo Penteriani (principal investigator, Estación Biológica de Doñana, C.S.I.C., Spain), María del Mar Delgado (Metapopulation Research Group, University of Helsinki, Finland), Jari Valkama and Pertti Saurola (Finnish Natural History Museum, University of Helsinki, Finland).

Method used

During the Finnish project a total number of ca. 40 juveniles will be radiotagged with GPS satellite units (Microwave, USA), which are expected to last 1.5 – 2.5 years each. Over this period, every ten days and during the whole night, the hourly locations of each radiomarked owl are recorded via the ARGOS system.

Results

Unexpectedly, the results of this project are going well beyond original expectancies. Actually, we are not only recording several interesting patterns of animal movements, which are extremely valuable from a scientific perspective, but the repeated checking of the eagle owl nests from the egg-laying to the starting of dispersal showed us that several eagle owl nests are still persecuted by humans in Finland. Indeed, because eagle owls are tagged with 70 grams satellite units operated by the ARGOS system, it is not possible to put transmitters on fledglings before they are ca. 2 months old. Thus, by locate them after they leave the nest (when they have approximately one month), very small VHF leg tags are used: the continuous following of the fledglings before they leave the nest, allowed us discovering that several of these young owls are killed by humans. As an end consequence, this telemetry study also allowed planning new conservation measures for the species in this country.

During our researches in Finland, we are receiving the continuous and indispensable help of several ornithologists and ringers, in particular Jere Toivola and Eino Salo.

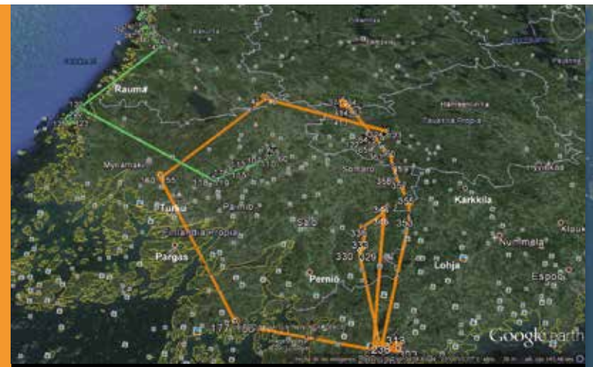
ABOUT NATAL DISPERSAL

Natal dispersal (i.e., the movement of wandering individuals from their birthplaces to their first breeding locations) can be considered one of the most intriguing ecological processes determining the spatial spreading of individuals. Dispersal is a field that embraces a multitude of disciplines, from population ecology and genetics to conservation biology. The study of dispersal has very important conservation implications, mainly because dispersers are the future breeders of animal populations, but their behaviours and the areas they are using during dispersal have been poorly studied and are generally unknown.

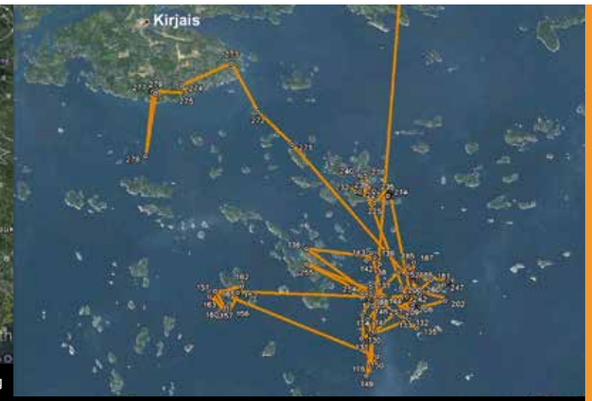
CSIC
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

A juvenile is equipped with the transmitters in a boreal forest of southern Finland

An eagle owl juvenile improving its flying skills



Map 1 Male and female eagle owls seem to follow two different dispersing strategies, males (orange path) being more philopatric than females (green path): after wandering for several months, males have a tendency to come back to the vicinity of the natal area (more information on our web page http://www.luomus.fi/english/zoology/satellite_eagle_owls/).



Map 2 Surprisingly, several inland eagle owls spent the winter on the frozen sea, moving among the small islands and rocks of the archipelago south to Turku (Baltic Sea).

Vincenzo Penteriani (EBD-CSIC)

Vincenzo is a researcher at the Estación Biológica de Doñana (Spanish Council for Scientific Research, C.S.I.C.). His scientific interests are mainly focused on the ecology of natal dispersal and floater strategies, animal movement, vocal communication and visual signalling, as well as effects of moon phases on animal behaviour. Main preferred biological models are long-lived predators (www.vincenzopenteriani.org).

Pertti Saurola (Université d'Helsinki)

Pertti is an emeritus researcher at the Finnish Museum of Natural History. Before retirement in2001 he worked 28 years as the Head of the Finnish Bird Ringing Scheme. Saurola's main interest in ornithology has been research and conservation of birds of prey, including satellite tracking Ospreys and White-tailed Eagles.

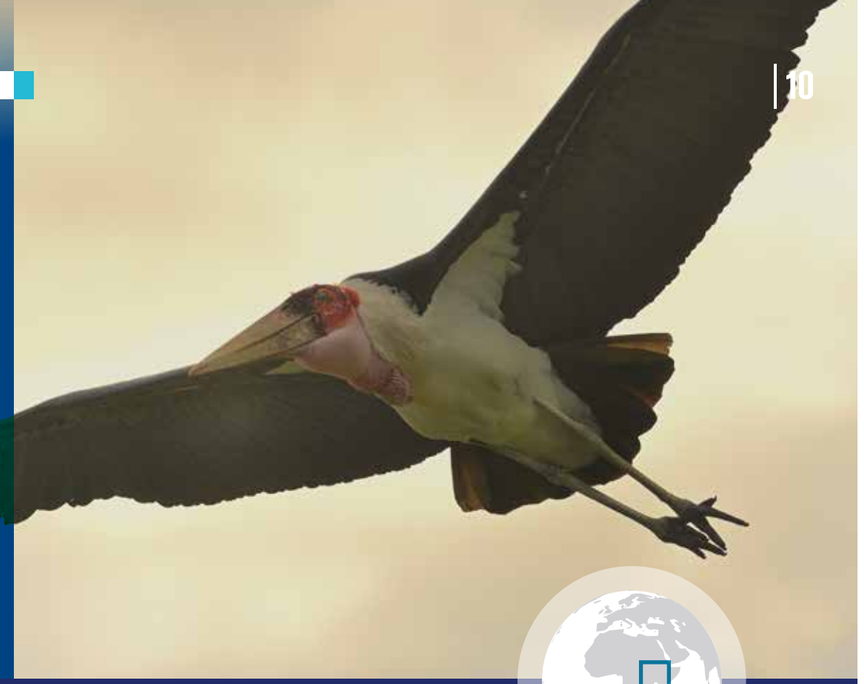
Jari Valkama (FNHM)

Jari works as a Senior Curator at the Finnish Museum of Natural History (FNHM). He is responsible for monitoring of birds of prey populations in Finland and is also the head of the Finnish bird ringing scheme. He is working with population ecology of birds of prey, in particular the Eurasian Eagle Owl and Northern Goshawk.

María del Mar Delgado (CSIC)

María del Mar did a PhD in ecology at the Doñana Biological Station (CSIC, Spain); then she moved to the University of Helsinki (Finland), where she is actually working as a post-doctoral researcher. She is interested on a wide array of issues within behavioural and evolutionary ecology and conservation biology.

STUDYING MARABOU STORKS
AROUND THE LAKE VICTORIA BASIN



By Neil & Liz Baker / TAWIRI (Tanzania Wildlife Research Institute)

In the autumn

of 2005 the Food and Agriculture Organization of the United Nations (FAO) issued a warning to Africa that avian influenza would arrive by Christmas and would devastate poultry populations and pose a potentially significant threat to humans. The FAO was stating that the disease was being spread by infected water birds and ornithologists quickly to start studies on the subject.

In order to respond to this concern the expertise of Neil Baker on waterbirds of Tanzania has been asked to study samples of aquatic birds and migrant residents at locations along three migration routes used by migratory birds of Palearctic the Nile, Rift Valley and the East Coast. These locations were also chosen because of their use by humans, livestock and poultry.

All the early samples proved negative but, at the FAO / OIE (World Organisation for Animal health) conference in Rome in May 2006 there were still sufficient concerns that some field workers were asked to concentrate on specific species that met certain criteria.

In Tanzania, Neil Baker chose 3 different bird species for study.

- The Little Stint Calidris minuta,

- The Indian House Crow Corvus splendens,

- The stork Marabout

For our third species, the Marabou Stork Leptoptilos crumeniferus seems to be very interesting according to its strong presence in Tanzania. We have learned from veterinarians of the Ministry of Agriculture and Livestock Development in Dar es Salaam that H5N1 had been detected in commercial poultry units in Khartoum (Sudan) and subsequently in village chickens in Juba (South Sudan) more than 1,200km further south along the Nile Valley.

Marabou Storks feed on long dead animal matter whatever the cause of death and are present in all villages along the Nil. A published research (Pomeroy 1972) explains that these Nile Valley Marabous moved south along the river into the Lake Victoria Basin only 500km further south.

The question is, do Marabous really move between the Sudan and Lake Victoria and could Marabou's live long enough to carry the H5N1 virus from the Sudan to Lake Victoria? Just how far these birds move, we know there is some seasonality but the majority of birds appear to be almost sedentary. Indeed, a very high concentration of Marabou Stork is observed around rubbish dumps and abattoirs. (The general public sees Marabou Stork as a large ugly bird, more vulture than stork, standing around waiting for something to die).

Our sample size for surveillance of avian influenza was 100 Marabou Storks.

USAID had contracted the animal disease unit within the Wildlife Conservation Society (WCS) to oversee further surveillance and to offer satellite tracking where it was deemed relevant. Having fitted PTTs to Greater Flamingos in 2000 (Baker et al 2005) the opportunity to fit them to Marabou Storks in the Lake Victoria basin was taken with enthusiasm.

The research program was run close to Mwanza, the second largest city in Tanzania, on the southern shore of Lake Victoria where large flocks of Marabou are concentrated at rubbish dumps, around fish landing sites and at a specific site where fish scraps from processing factories were dumped and processed for local markets.

Method and equipments used

Marabous were fitted with 51.5gm solar powered PTTs from North Star Science and Technology harness sat snugly between the shoulder blades but Marabous have long scapular feathers that would interfere with light access to the panel when the birds were at rest and we did not know if the storks would stay aloft long enough to continually power the PTTs. On large birds the usual arrangement is a back pack but Marabous have a large soft airsac at the base of the neck so a pelvic harness was used, adopted from a design developed by ornithologists in Zimbabwe. The results obtained have been SPECTACULAR and Marabou n°207 continues to provide intermittent fixes, more than 4 years after fitting.

A bird day

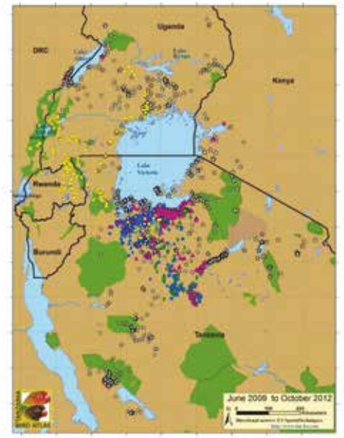
Marabous are entirely diurnal; they do not fly at night but roost in trees or manmade structures such as electrical sub-stations. All fixes during the hours of darkness could then be attributed to roosting birds or those sitting on nests.

Results found

Migratory wild bird were blamed for spreading avian influenza but it seems that the viruses spread are more likely to be caused by other vectors such as the import of poultry or poultry products. Indeed, Marabous digestive system has clearly evolved to withstand constant contact with bacteria and viruses.

It is still important to continue the avian influenza surveillance program on Marabou Storks and on other migrant waterbird sprecies.

ARGOS tracking of 5 marabous equipped



DISTANCES COVERED, JUNE 2009 TO OCTOBER 2013

- Marabout 206 : 65,536 km*
- Marabout 207 : 47,761 km*
- Marabout 209 : 63,505 km*
- Marabout 213 : 5,180 km
- Marabout 215 : 14,624 km

*Still transmitting

Fig.1 Marabou after being fitted with a energy transmitter PTT. During flying hours, the panels will be fully exposed to the sun.

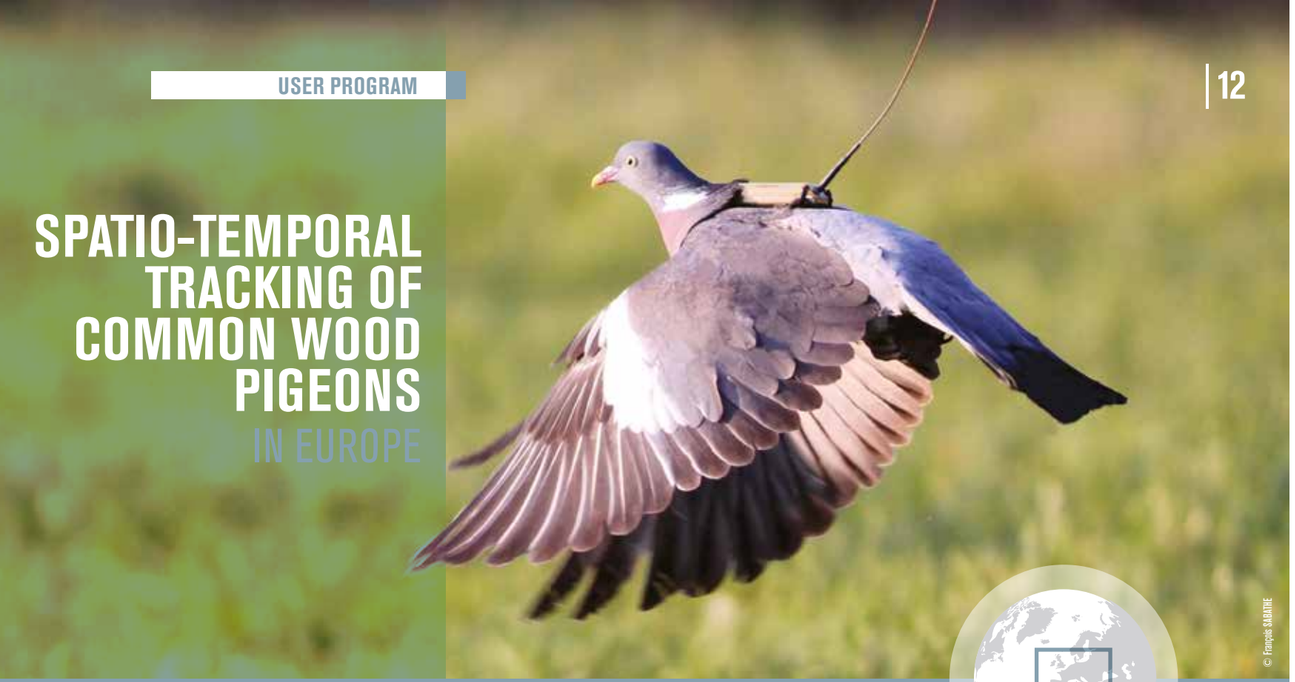
Fig. 2 An adult Marabou well perched above a fish market a few days after being equipped with a PTT. The red air bag at the base of the neck shows the skin here is incredibly thin and would be easily torn by a conventional harness.

Neil BAKER arrived in Dar es Salaam, Tanzania in February 1980 and began a long process of observation and data collection for the Bird Atlas. Working closely with his wife, **LIZ BAKER**, he established a database of more than 800.000 observations of birds.

During the 1980s, there was great interest in forest bird is then diverted to the benefit of waterfowl such as flamingos and African marabous.

ZOOM on marabou 207 from 2009 to 2012

2009 | 2010 | 2011 | 2012



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SPATIO-TEMPORAL TRACKING OF COMMON WOOD PIGEONS IN EUROPE

By Valérie Cohou / GIFS France (Groupe d'Investigations sur la Faune Sauvage)

Knowledge of bird migration patterns is essential if we are to understand their ecology and behavior. However, little is known about the migration strategies of many species, despite their importance in the preservation of migratory avifauna.

Common Wood Pigeons (*Columba palumbus*) are one of the most widespread and abundant bird species in Europe. In France, they are classified as game and hunted extensively. Many birds cross France during the autumn, some of them spending the winter in south-western Europe, from France to the Iberian peninsula. Despite the species' importance as a game bird, its staging habits, habitats and (over)wintering zones are still poorly known.

In 2001, the French GIFS wildlife study group undertook a program to track these birds using ARGOS transmitters. The results led to new hypotheses about the species' migration patterns, bringing into question older, now obsolete, theories.

The research project was achieved through the involvement of the 13 hunting federations in the Aquitaine and Midi Pyrenees regions and with financial backing from many partners (Conseil Régional Aquitaine, Conseil Régional de Midi-Pyrénées and the Fédération Nationale des Chasseurs). It also benefits from an international partnership with scientists in Portugal and Spain. The project's principal objective is to clarify the migrations of Common Wood Pigeons in south-western Europe using ARGOS transmitters (microwave telemetry) to ensure the species' sustainable management.

Overall results

Between 2001 and 2003, eight Common Wood Pigeons were fitted with ARGOS transmitters weighing 20 grams with a nominal lifetime of no more than one year. The pigeons were captured in February at Bourdalat, in the Landes region of France. Between 2009 and 2013, the French GIFS captured 39 birds in France and Portugal, fitting them with new solar-powered ARGOS transmitters weighing between 12 and 18 grams, with a potential lifetime of several years.

Most of the individuals tracked followed a south-west/ north-east flyway during the spring migration, ending their journey in Germany, the Czech Republic, Poland or Finland. Two of them stopped near Toulouse, France, one originating in Portugal and the other in south-west France.

Lessons learned

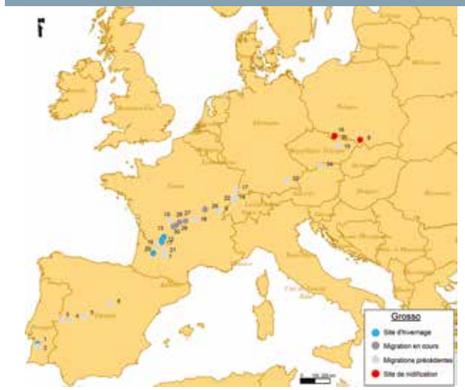
Generally speaking, the birds are relatively attached to their breeding zone. This hypothesis is currently being confirmed by further research. On the other hand, they appear to be less attached to their overwintering zones. Several birds spent the cold season in different places from one year to the next (the Iberian peninsula or the south-west of France). However, these sites are always along the South West/ North East migration flyway, which has been known for a long time. Common Wood Pigeons appear to choose their overwintering area according to opportunities, particularly available food. They may also stay for more than a year on their breeding site.

gifs

Common wood pigeon

tagged and equipped with a 20 grams transmitter (Microwave Telemetry)

Three birds, three trajectories



Aniza, was fitted with a transmitter in Portugal on 11 February 2009. It migrated from 12 March to 14 May 2009, arriving in Switzerland. After 28 and a half months, it migrated again from 4 to 29 October to overwinter in the Landes region of France. It then took only seven days to fly back to Switzerland in the spring of 2011, where it remained until the summer of 2012.

Grosso, was also fitted with a transmitter in Portugal on 11 February 2009. It nested in Poland then overwintered in the Dordogne département of France. In March 2010, it returned to Poland before migrating back to the Lot-et-Garonne département of France to overwinter. It returned to Poland in the following season.

Bourdalat, was fitted with a transmitter in the south-west of France on 16 February 2012 and headed to Finland.

Valérie COHOU

Valerie has a Master II degree in population dynamics and is responsible for missions within GIFS France since 2001.
She actively participates in the organization of the structure and its development. She gives great importance to the study of wood pigeons.

CROSS OR GO AROUND? STUDYING THE MIGRATION STRATEGY OF ORIENTAL HONEY BUZZARDS IN EAST ASIA

By Noriyuki Yamaguchi / Nagasaki University, Japan

The Oriental Honey Buzzard

or(***Pernis ptilorhyncus)*** is a raptor species distributed throughout East Asia. The northern population, which breeds in southern Siberia, northern Mongolia, northeastern China, Korea and Japan, migrates and is assumed to winter in south and southeastern Asia. Among them, birds breeding in Japan have to surmount large stretches of water to reach their wintering grounds, because Japan is an island nation surrounded by sea. Using the ARGOS system, we tracked the spring and autumn migrations of more than 40 individual buzzards from Japan, to determine where and how the birds traveled between their breeding and wintering grounds and the ingenious strategies they devised for their migrations.

The large-scale migration detour and its seasonal difference

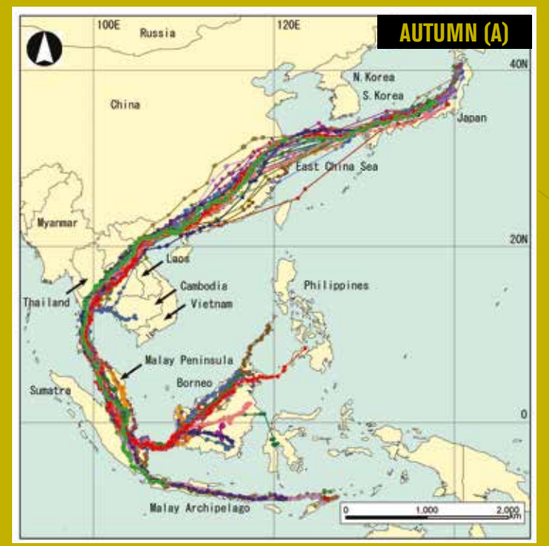
In autumn, after departing from the western end of Japan, the tracked birds migrated westward 680km across the East China Sea, then crossed inland China, Vietnam, Laos and Thailand until they reached the Malay Peninsula. All the birds continued on from the Malay Peninsula but their directions and terminal points differed. Some birds reached the Philippines through Borneo, while others ended their migration on Borneo Island or moved along the Malay Archipelago. In spring, the birds mainly followed the same routes used during the autumn migration, but the routes over inland China were located north of those used during the autumn migration, and they reached the end of the Korean Peninsula. Unlike the autumn migration, the birds detoured around the East China Sea by travelling the length of the Korean Peninsula and crossing the Korean/Tsushima Strait to reach Japan. The birds thus made a detour around the South China Sea both in spring and autumn, but for the East China Sea, they made a detour to get there in spring but crossed it directly in the autumn (Fig. 1).

Buzzards can cross the sea directly owing to autumn weather conditions over the East China Sea

Why do the Oriental Honey Buzzards choose to cross the East China Sea only in autumn? Why can the birds only cross the sea directly in autumn? To answer those questions, we examined weather conditions, precipitation, thermal energy, and wind direction and strength over the sea, and then, by overlaying the flight paths, correlated the real-time locations of the tracked birds with the various weather conditio ns. We hypothesized that weather conditions, in particular thermals and wind greatly affects the migration strategy of the species, because they usually fly by soaring and gliding. To analyze the weather conditions, we used spatio-temporal data obtained from a numerical weather-prediction product provided by the Japanese Meteorological Agency.

Our weather analysis confirmed that there were relatively strong and stable winds blowing in a southwesterly direction (which are tailwinds for the buzzards) over the East China Sea during the autumn. In contrast, the wind directions were not stable in spring. Furthermore, it appeared that relatively strong thermals frequently occurred over broad areas of the sea during the autumn. While crossing the sea in autumn, each tracked bird travelled by catching strong thermals and taking advantage of tail winds, thus avoiding bad weather conditions, such as headwinds and rainfall (animations can be found at goo.gl/IeRFIR and goo.gl/w5GvNc for wind conditions; goo.gl/aUZJzj and goo.gl/Q5rT8N for thermal energy).

Migratory raptors rely on soaring and gliding and thus usually detour around sea barriers, probably because thermals are very scarce over the ocean and the birds must then flap their wings, thus consuming a large amount of their energy reserves. The Japanese population of Oriental Honey Buzzards made a detour around the East China Sea in spring, supporting the common belief that land birds should avoid crossing broad water barriers. In contrast, they may chose to cross the Sea directly in autumn, probably because of the unique weather conditions there at that time. The birds' itineraries strongly depend on wind direction, which means they can conserve energy on this long non-stop flight thanks to soaring and gliding thus making fewer demands on basal metabolism. We will investigate the three-dimensional patterns of Honey Buzzards crossing the East China Sea directly by increasing our tracking effort using ARGOS/GPS PTTs in the near future.



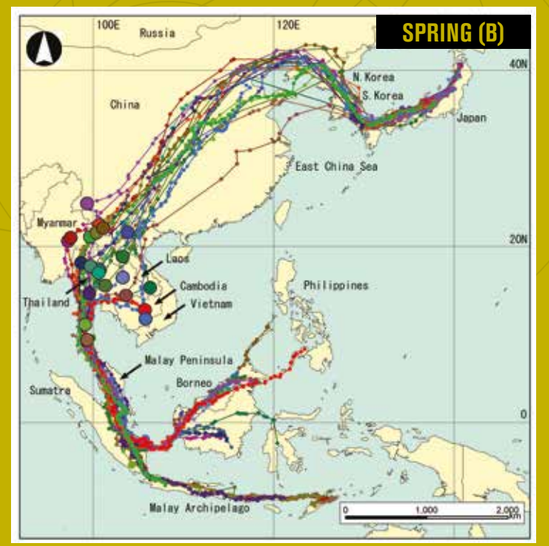


Fig. 1 Autumn (A) and spring (**B**) migration routes of Oriental Honey-Buzzards tracked from 2003 to 2009. From Higuchi (2010) Journal of Ornithology 153: 3-14.

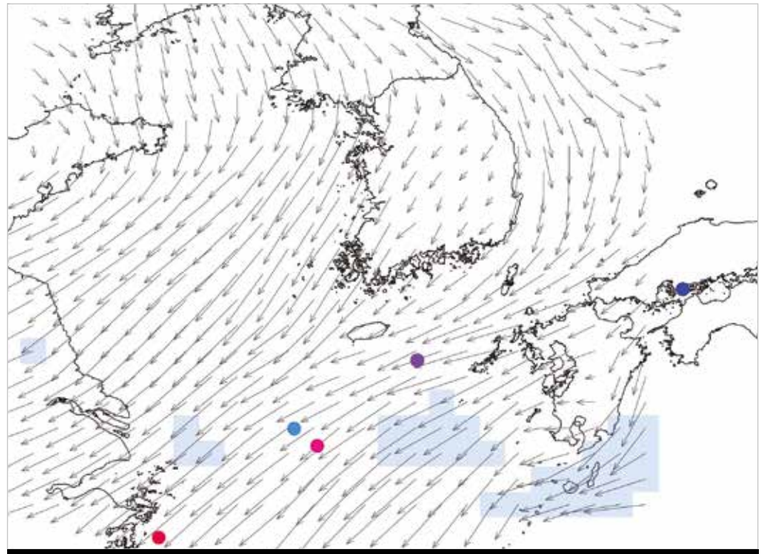
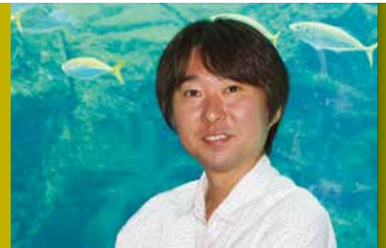


Fig. 2 A snapshot showing movements of tracked Oriental Honey-Buzzards (colored circles) and the temporal change in the weather conditions in the East China Sea in autumn. From Yamaguchi et al. (2012) Journal of Ethology 30: 1-10.

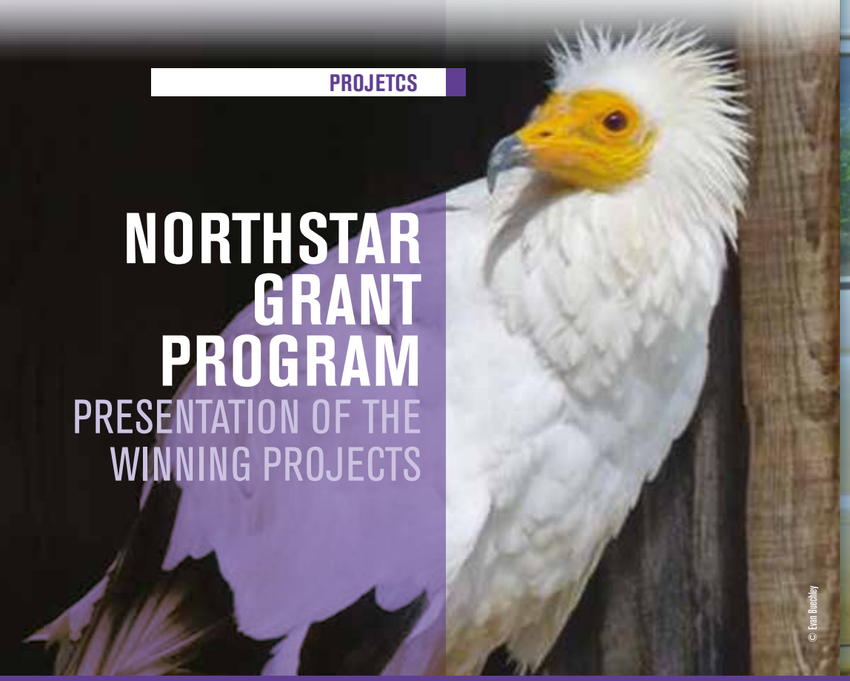


Noriyuki Yamaguchi

Noriyuki Yamaguchi is an associate professor at Nagasaki University, Japan. He has been studying the migration behavior of birds under the supervision of Pr. Hiroyoshi Higuchi. He particularly focuses on how weather conditions affect migration routes and patterns of birds, by applying meteorological and statistical methodology.

NORTHSTAR GRANT PROGRAM

PRESENTATION OF THE WINNING PROJECTS



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TRACKING EGYPTIAN VULTURES IN THE MIDDLE EAST

A GLOBALLY THREATENED SPECIES

Project 1 Egyptian vulture

Project 2 Hooded Vultures in Africa

By Evan Buechley, Cagan Sekercioplu - The University of Utah and Emrah Coban - KuzeyDoga

North Star

helps understanding and preserving Old World vultures with its Grant Program

Initiated in 2003 and managed by the American Bird Conservancy, North Star's bi-annual Grant Program provides 8 PTTs (any model) to winning projects.

The jury in charge of selecting programs took into account several points:

- The expertise of researchers

- The feasibility of the projects

- The scientific and conservation merit

- The plans for disseminating results to managers and the public.

This year, the expert review panel convened by the American Bird Conservancy selected 2 projects out of 32 proposals received, each of which will receive 4 GPS PTTs.

Interestingly, both winning projects this year are studying old world vultures. «Old World vultures are facing a crisis as most of their populations are witnessing alarming declines. Indeed, both Asia and Africa have recently observed a wide-spread unprecedented decline of many species of vultures.» Vultures are an ecologically vital group of birds that face a range of threats around the world.

Vultures serve a critical function helping to clean the environment of waste and to reduce the threat of disease outbreaks. Vultures feed on the remains of dead animals, removing carcasses rapidly and helping other scavengers locate carcasses.

This year's winning proposals are as follows:

Project 1 : «Ecology and Migration of an Important Breeding Population of the Globally Endangered Egyptian Vulture (Neophron percnopterus)»

By Evan Buechley and Cagan Sekercioglu / University of Utah.

This project will use North Star GPS PTTs to study the ecology and migration of an important breeding population of the globally endangered Egyptian Vulture in the Kars and Igdar Provinces of eastern Turkey.

This study will be the largest and most comprehensive tracking study of Egyptian Vultures anywhere in the world and will provide crucial information about the behavior, habitat use, and migratory routes of this species in a region of the world where they have been very little studied. The Egyptian Vulture is relatively abundant in Kars and Igdir Provinces, but it is globally endangered and declining throughout its range. It has shown one of the fastest global declines of any species, and went from «Least Concern» to «Endangered» in just one year, 2007.

The project will use the resulting tracking data to:

1) Determine summer and winter home ranges, migration routes, breeding territories, and foraging grounds;

2) Evaluate habitat preferences and usage;

3) Study juvenile dispersal;

4) Identify causes of mortality and geographic bottlenecks; and

5) Target conservation actions

Evan Buechley and other researcher have already worked on program studies — *more details page 17 article opposite.*

Project 2 : « Movement Ecology and Conservation of Hooded Vultures in Africa»

By Dr. Keith Bildstein and Dr. Jean-Francois Therrien / Hawk Mountain Sanctuary in Pennsylvania.

The project selected in the Grant program will use North Star GPS PTTs and aims to assess the movement ecology of Hooded Vultures in East, West, and South Africa.

Specifically, the project seeks to identify the sizes of home ranges and the extent of seasonal movements in individuals. Moreover, it is hoped to be able to assess the vultures' reliance on human activities for food, and to pinpoint potential feeding hotspots and areas of urgent conservation concern. It is also hoped that factors can be identified that are responsible for population declines in the species and to assess current survival rates of individuals in the wild.

The North Star Grant Program will occur again in 2014-2015.
The program will be announced in the fall of 2014 and have proposals due in the late winter of 2015.
To date, since the inception of program, North Star has provided over 60 PTTs to ground-breaking projects all over the world.

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This project is a collaboration between the University of Utah and the Turkish non-profit organization Kuzey Doga.
Together, Evan Buechley, PhD student at the University of Utah, Dr. Cagan Sekercioglu, professor at the University of Utah and founder of Kuzey Doga, and Emrah Coban, KuzeyDoga biologist, have conducted extensive surveys of vulture populations in eastern Turkey, established Turkey's first ever vulture restaurant which provides a safe and reliable source of carrion, and has initiated the first ever satellite-tracking study of an Egyptian vulture population breeding outside of Europe.

In the summer of 2012 we trapped and fitted three Egyptian vultures (*Neophron Percnopterus*) with satellite tracking devices in Igdir Province of eastern Turkey. The 3 birds, named *Aras*, *Igdir*, and *Arpacay*, were fitted with satellite transmitters that were provided by the Turkish government with a one-time investment in this project.
These three birds revealed a previously undocumented migratory route for the species, traveling over the Arabian Peninsula and crossing at the Straight of Bab el Mandeb into Africa.
On their migrations, they passed through a long list of countries; Turkey, Azerbaijan, Iran, Iraq, Syria, Jordan, Saudi Arabia, Yemen, Djibouti, Ethiopia, and Somalia.

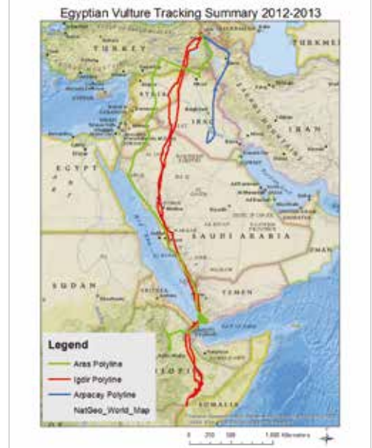
Unfortunately, *Aras* stopped sending transmissions in central Ethiopia, and we are working to track down any information in this regard. *Arpacay* went missing during migration in southern Iraq. We contacted BirdLife Iraq, who within a couple of days of our reaching out, managed to track down the last location and recover the bird, collect information on the area, and obtain the transmitter for our future use. We cannot thank BirdLife Iraq enough for their professional and timely help in this regard. While unfortunate, documenting such mortalities is an important component of this project. Of the three birds, *Igdir* is the only that made the return migration to Turkey along a strikingly overlapping migration path. In the summer of 2013 we were very pleased to see *Igdir* back in Turkey and confirm that she was attending a nest in the Aras River Bird Sanctuary!

While this initial year of tracking data was fascinating, we plan to fit more Egyptian vultures with satellite tracking devices in coming years to augment our sample size and expand upon our knowledge of this important breeding population of the species. We are very honored to have received the North Star transmitter grant in 2013. In the upcoming months, we will be working hard to fit these tracking devices on Egyptian vultures and to continue analysis of the habitat usage and migration strategies of this charismatic species.

Evan Buechley
(from left to right Kayahan Agirkaya and Evan Buechley)

Evan is a PhD student in Biology at the University of Utah. His research interests pertain to the conservation and ecology of birds, specifically endangered species management, climate change, renewable energy infrastructure, and ecosystem services. He has worked as a professional field biologist for 7 years on projects in five countries and four continents. Work experiences includes managing populations of critically endangered California condors in the southwestern US, conducting a population status assessment of the Augur buzzard in Kenya, censusing the avian communities on the islands of Micronesia, assisting with reintroductions of Bearded vultures in Spain, and assessing the impacts of wind farms on birds in the western US. Please see our lab website for more information on our first year tracking Egyptian vultures breeding in Turkey at:
http://bioweb.biology.utah.edu/sekercioglu/Vulture%20Research/vulture_index.html

Evan Buechley and KuzeyDoga Biologist Yakup Sasmaz prepare to release an Egyptian vulture fitted with a satellite telemetry unit in eastern Turkey



ARGOS tracking of 3 Egyptian vultures between 2012 and 2013

ARGOS-3 HD
JPEG IMAGES TRASMISSION IN ADDITION TO METEOROLOGICAL DATA

Site 1 TAVAN BOGD

Since summer 2012, Dr. Hironori Yabuki and his team at Jamstec (Japan Agency for Marine-Earth Science and Technology), in cooperation with IMHE (Institute of Hydrology, Meteorology, and Environment), have set up ARGOS-III two-way data transmission for near real-time observation at their four Automatic Climate Observation System (ACOS) sites in Mongolia. The first site, in Tavan Bogd in western Mongolia, is the area of highest altitude in the country. The second site, at Bulgan in eastern Mongolia, is the area of lowest altitude. The third and fourth sites, at Nalaikh and Terelj, respectively, are both in the central area.

Hourly transmitted observations include weather data such as temperature, atmospheric pressure, humidity, wind speed and direction, precipitation, solar radiation, snow depth as well as soil moisture. On top of these observation sensors, Dr. Yoshihiro Iijima JAMSTEC and Hidefumi Yatomi CLS Tokyo office have implemented JPEG cameras to watch vegetation and accumulated snow at the sites in Bulgan and Terelj. The JPEG images are transmitted with ARGOS-III HDR (High Data Rate).

The ARGOS-III HDR is capable of transmitting 50 kilo bytes data per day, at about 50° latitude. In Bulgan, a VGA resolution (640 x 480) JPEG image, size of which is 30 to 40 kbytes, is transmitted every day. The image file is divided into 60 to 70 HDR messages, and transmitted to METOP-A and SARAL satellites. The image data transmission is completed with 3 or 4 satellite passes within half a day.

The JPEG images will be useful for a number of applications, including watching the ice conditions for polar researchers, monitoring nesting places for biologists, or any other site monitoring. ARGOS-III HDR makes it possible to develop new and scientifically pertinent uses of the ARGOS system.

The JAMSTEC's JPEG transmission is implemented with Campbell CR1000 data logger and a serial JPEG camera. The CR basic software and camera are available via CLS as well as a package of JPEG transmission tool. The received JPEG images are made available to a user on a dedicated WEB site.

Site 2 BULGAN

Camera installed on site 2

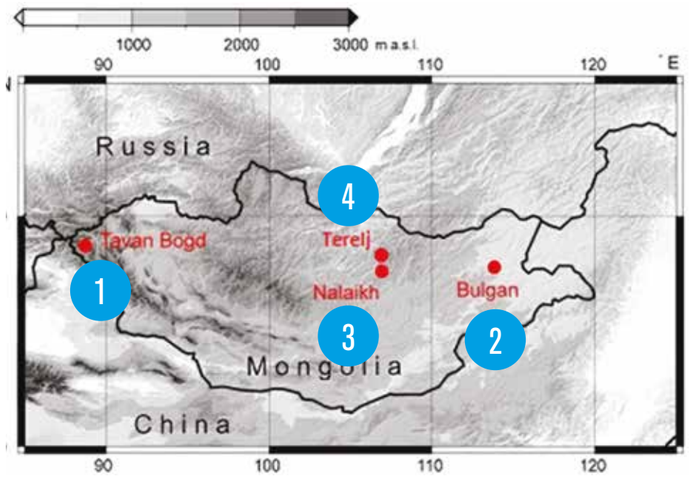
JPEG image taken in August 22, 2013

JPEG image taken in October 14, 2013

Site 3 NALAIKH

Site 4 TERELJ

Location of 4 sites in Mongolia



NEW GONIOMETER
RXG-134

To help you find your platform equipped with an ARGOS transmitter

The new RXG-134 goniometer is an indispensable portable tool for retrieving an ARGOS transmitter in the field. With its very high sensitivity, it indicates the direction and strength of a signal from an ARGOS transmitter in order to facilitate a search.

The RXG-134 can receive an ARGOS signal at a distance of more than 100 km, depending on the elevation at which the goniometer antenna is placed, the strength of the signal sent by the ARGOS transmitter to be found, and the environmental conditions.

The bearing of the signal received from the ARGOS transmitter and its estimated distance are displayed instantaneously on the goniometer's screen each time a signal is received. The goniometer directly collects the ARGOS messages received and these can then be downloaded to a PC with a USB link.

If the ARGOS transmitter to be found is equipped with a GPS, the RXG-134 goniometer can instantly decode the coordinates transmitted in the ARGOS messages and display them on its screen to facilitate retrieval.

The RXG-134 is fully compatible with all generations of ARGOS transmitters: from ARGOS-1 to ARGOS-3. A built-in GPS and internal compass provide the goniometer's local position. This new portable tool is waterproof (IP66) and has an operating autonomy of 50 hours.

Please contact us for further details at **info@cls.fr**

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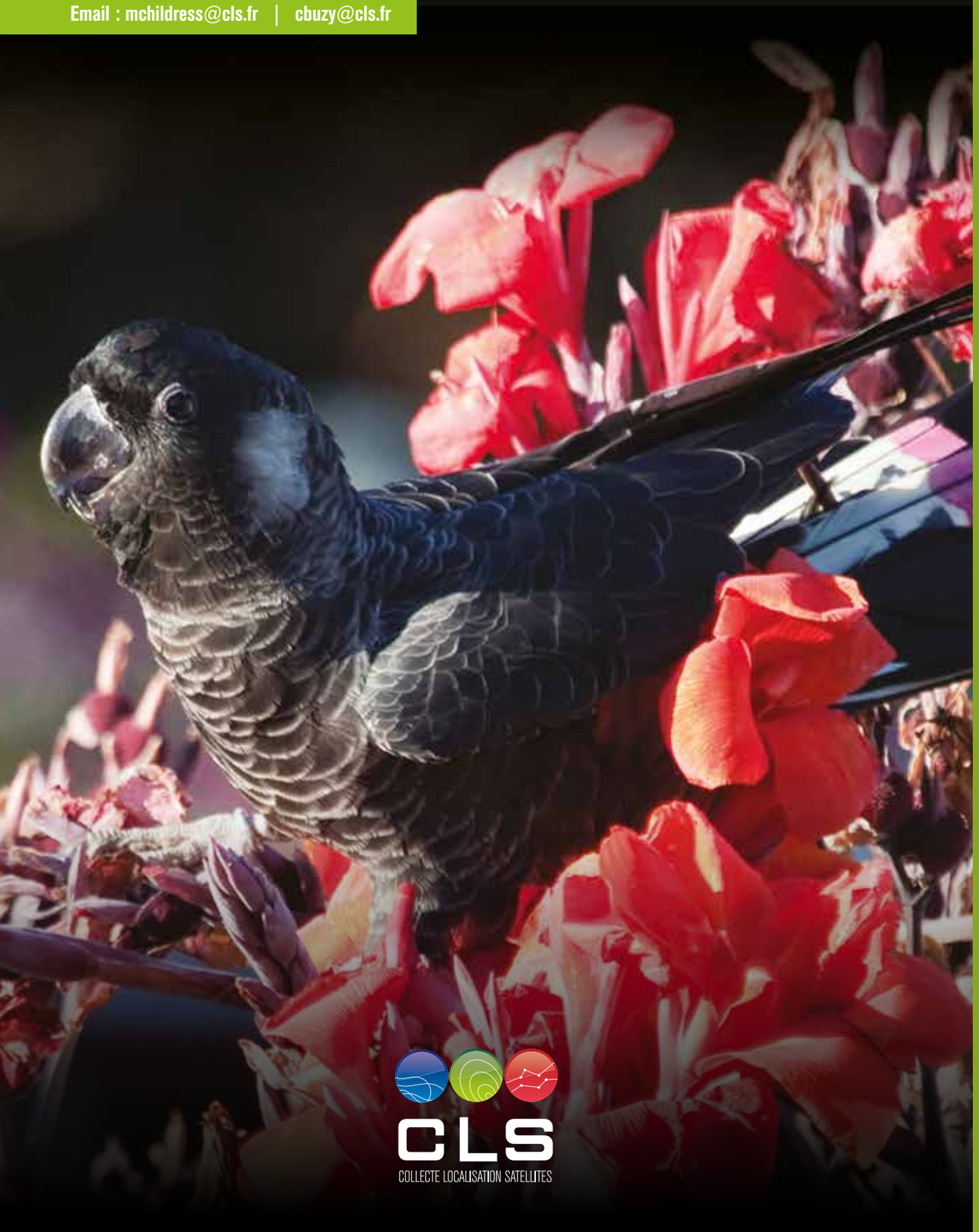

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