

SAHARA CONSERVATION FUND PAN-SAHARAN WILDLIFE SURVEY OVERVIEW OF PILOT PHASE RESULTS 2010-2011 IN NIGER AND CHAD

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Key words: Pan-Saharan Wildlife Survey, Sahara Conservation Fund, Chad Niger, dorcas, dama, Nubian bustard, Scimitar-horned oryx

The Pan Saharan Wildlife Survey has been set up by the Sahara Conservation Fund working in collaboration with the Zoological Society of London and supported by His Highness Sheikh Mohammed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi (United Arab Emirates). Since start of field work in December 2009 seven large scale field surveys have been undertaken in three different countries.

The presentation provides a rapid overview of the PSWS coverage to date, and more detailed reports on the objectives, methodologies and outcomes of four selected surveys undertaken in sahelian habitats of Niger and Chad in 2010- 2011.. Particular attention will be paid to results on livestock-wildlife use patterns and conservation implications of the PSWS data for target species such as dorcas, bustards, dama gazelle and Scimitar-horned oryx. Recommendations for conservation actions arising will be reviewed.

THE LAST VIABLE ADDAX POPULATION IN THE WILD FACING OIL ACTIVITIES IN NIGER

By Thomas Rabeil (Sahara Conservation Fund)

Key words: addax, conservation, distribution, oil, impact.

The last viable addax population in the wild has found a refuge in the desert of Tin Toumma located in the eastern zone of Niger. This population has been studied since 2006 by the team of the sahelo-saharan antelope project. A specific methodology based on transects within the current distribution area has been implemented to monitor the nucleus of the addax population. The team has carried out aerial and road surveys to estimate the population and to analyze the distribution according to ecological and human factors. Oil prospection and exploitation have started in 2008 but have reached the core area of the distribution in 2010. The pressure of the permanent and unorganized truck movements of oil companies and militaries in charge of their security has increased last year and has become unacceptable for the addax population. In 2010, the impact of oil activities in the Tin Toumma was so important that a part of the addax population has been obliged to migrate further north looking for a compromise between human pressure and good pastures. Since the oil activities have started in the area, several attempts have been undertaken to warn the Nigerien partners about the threat for the wildlife and the addax in particular. If nothing is done to set up a conservation plan in close collaboration with oil companies settled in Tin Toumma desert, the last viable population of addax may collapse in the next years considering there are very few remaining suitable habitats around the current distribution area.

THE DEMOGRAPHIC DECLINE OF THE 'LAST SURVIVING' MOROCCAN DORCAS GAZELLE (*GAZELLA DORCAS MASSAESYLA*) FROM M'SABIH TALAA RESERVE, MOROCCO

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Abstract

A five-season density estimate of the Moroccan dorcas gazelle (*Gazella dorcas massaesyla*) population was conducted in a 1987ha fenced area (M'Sabih Talaa reserve, MT), west central Morocco, using line transect method between April 2008 and August 2009. The observer walked 20 times a 14 transect segments of a total length of 42.3 km. Compared to previous studies that reported an average density of 0.098 individuals per ha (in 1996), our data from the present study indicated a population decline of nearly 50% in less than 15 years with an average population density of 0.051 individuals per ha. The population structure is in agreement with the ecology and social organization of the species (territorialism and polygyny) but a lower apparent fertility rate (less than 0.5 fawns per female). The important recent collapse of the dorcas gazelle population in the MT reserve may be attributed to the combined effects of poaching and depredation by feral dogs.

Keywords: Antelope; distance sampling; line transects; population estimate; *Gazella dorcas massaesyla*

SCIMITAR-HORNED ORYX POPULATION MANAGEMENT (PN Sidi Toui) AND ADDAX MONITORING (PN Djebil and Senghar)

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Key words: Oryx, Addax, Tunisia, Sidi Toui, Djebil, Senghar, Bou Hedma, territoriality

The first part of CMS/FFEM D-P2010-01 undertook activities in four Tunisian National Parks in 2010.

At PN Sidi Toui two female oryx were translocated from PN Bou Hedma in line with recommendations to address the imbalance in adult sex ratio at Sidi Toui. . A genetic analysis of the translocated females was recommended before mixing with Sidi Toui oryx. Survey of the current composition and social dynamics of the Sidi Toui oryx revealed continuing male biased adult sex ratio, but improved female recruitment since 2008. Space use by oryx throughout the park was mapped.. Consistent long term territoriality (3-4 yrs) by the same individual males ,and breeding age females moving between different males is demonstrated.

At PN Djebil an exercise to identify map and record all addax encountered over three days was used to train park staff and a research student in field recording techniques and addax identification. Park staff reported two addax deaths among the 28 transported to Djebil from PN Bou Hedma in February 2007 and from SSP-EEP zoos in December 2007; 25 of the remaining 26 were observed during the mission, the one animal missed is believed present by staff. Detailed individual identification records for all surviving founder addax, and individual female breeding performance since arrival are summarised.

At PN Senghar a brief visit to Oued Zebbes was used to create an accurate map of the fence line, confirming a 2660 ha enclosure. The 20 addax present at Oued Zebbes (3.7 adults with 7.3 immature making 10.10 overall) were being fed daily at the acclimatisation pen and showed excellent body condition. Dune fields are causing problems with the perimeter fence.

DISTRIBUTION DES GAZELLES LEPTOCERES (GAZELLA LEPTOCEROS) DANS L'ERG OCCIDENTAL.

A Fellous (Chercheur INA, Alger)

Un travail de recherche doctorale en cours de finalisation, tente de remédier à la faiblesse des données concernant le statut et la distribution de la gazelle leptocère (*Gazella leptoceros*) dans la partie Nord de l'Erg Occidental.

Parmi les objectifs de cette étude : l'identification des différents types d'habitats naturels fréquentés par cette espèce ainsi que les principales menaces permettant d'actualiser son statut de conservation dans la région.

THE USE OF GIS AND ECOLOGICAL NICHE-BASED MODELS FOR STUDYING THE DISTRIBUTION, EVOLUTION AND CONSERVATION OF BIODIVERSITY IN THE SAHARA DESERT

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Abstract (250 words):

The combination of Geographical Information Systems (GIS) with ecological niche-based models (ENM) has prompted biodiversity research with robust analytical methods. These tools are useful to analyse geographic-related processes in distributions, such as the identification of suitable habitat areas for rare species or over large and remote study areas, in evolution, such as the identification of biogeographical patterns in genetic variability distribution, and conservation planning, such as the prediction of climate change effects on biodiversity distribution. ENMs relate species presence data with climatic and habitat factors and identify relationships between presence probability and environmental gradients, and probability of occurrence models.

This work presents four biodiversity case-studies focused on distribution, evolution and conservation in the Sahara Desert: 1) Canids (*Canis* and *Vulpes*) are used in predictions of probability of occurrence across large and remote areas; 2) Nile crocodiles (*Crocodylus*

niloticus) are used in applications of Remote Sensing techniques to derive fine-scale predictions of population occurrence and dispersal in isolated mountains; 3) Agamid lizards (*Agama*) are used in assessments of geographical coherence in the distribution of molecular haplogroups, identification of potential contact zones, and quantification of niche divergence; 4) 25 vertebrates from three altitudinal groups and with distinct dispersal abilities are used in predictions of the impacts of climate change on biodiversity distribution on range margins. All case-studies emphasise the biological value of the isolated Saharan mountains. Most suitable habitats were predicted to be fragmented and generally restricted to mountains, where hotspots of genetic diversity were also identified.

Keywords (3 to 5): Geographical Information Systems, Ecological niche-based models, Distribution
Evolution, Conservation

FIRST USE OF GPS SATELLITE COLLARS TO MONITOR DORCAS GAZELLE: PRELIMINARY RESULTS IN KATANE ENCLOSURE (NORTH FERLO FAUNA RESERVE, SENEGAL)

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After the first transfer of 23 dorcas gazelles from Guembeul Reserve to Katane enclosure (in North Ferlo Fauna Reserve) in March 2009, and as part of the reintroduction project of this species in Senegal, three additional males were transferred and released in November 2010. No previous experiences using GPS satellite collars (GSC) in this species are described. Taking advantage of the transfer of these three males, we tested the feasibility of this monitoring procedure in dorcas gazelles. To ensure that not injures or changes in gazelle behavior as well as to ensure their welfare, GSC and several fixations systems were tested previously with captive dorcas gazelles in the Finca Experimental “la Hoya” (Almería, Spain).

In November 2010 these three males were transferred, collared and released in the extension of the Katane enclosure, not used previously by reintroduced ungulates. Besides terrestrial GPS positions, the collars provide information on activity. As GSC allows to be programmed in different ways to record and to send GPS positions and activities data, three different programs were used, one for each collar, in order to optimize data and batteries life. Only partial information is regularly sent through ARGOS systems but complete data are kept in the collar.

One male was found death two months after release and the collar containing the data was recovered. Preliminary results show that two of the males remain together while the third one has moved to the opposite site of the extension. Although they occasionally visit the main enclosure, they have established their territories in the extension and two of them close to the release site. Activity data show diurnal activity pattern for the males; during the night, they are almost resting although with shorter times of activity.

Key words: *Gazella dorcas*, reintroduction, Senegal, North Ferlo Fauna Reserve, GPS collars

ETUDE DES PETITS ET MOYENS CARNIVORES À PARTIR DES PIÈGES PHOTOGRAPHIQUES DANS LE MASSIF DE TERMIT ET LE DÉSERT DE TIN TOUMMA AU NIGER

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Mots clés : pièges photographiques, Termit-Tin Toumma, carnivores, phases de la lune.

Résumé

Cette recherche a consisté à l'étude des mammifères en général de la zone de Termit et de Tin Toumma à l'aide des pièges photographiques et des petits carnivores (chacal doré, fennec, renard pâle, renard famélique) en particulier. Elle a pour objectifs de déterminer le temps total passé par les pièges photographiques sur le terrain (effort de piégeage) ; mettre en évidence ou confirmer la présence de certaines espèces de la zone d'étude; connaître les périodes d'activités (heure, phase de la lune) des petits carnivores ; calculer le temps passé par chaque espèce lorsque le piège est opérationnel et enfin avoir une idée générale sur la distribution des carnivores. Les pièges photographiques utilisés ont une durée moyenne de 5339,99 heures soit 222,5 jours sur le terrain. L'étude a permis de mettre en évidence la présence des espèces suivantes : la hyène rayée, le caracal, le porc-épic et le ratel. Les petits carnivores ont été les plus photographiés à l'aide des pièges photographiques itinérants avec la sardine comme appât. Le chacal doré est le plus actif alors que le renard pâle est le plus craintif. Le fennec est le plus plastique car il se retrouve dans tous les types d'habitats. Le fennec, le renard pâle et le renard famélique sont indifférents à la phase de la lune. Le chacal doré présente des pics d'activités pendant le premier croissant et le premier quartier.

TITLE: FROM GUESSWORK TO MANAGEMENT: ESTABLISHING A GENETIC BASELINE FOR HOOFSTOCK CONSERVATION AT AL AIN WILDLIFE PARK AND RESORT

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Abstract: Al Ain Wildlife Park and Resort holds populations of many ungulates within its collection that belong to species of high conservation importance. The provenance of many animals is not certain and until recently these populations have been maintained with little or no stud book management. In order to develop long term conservation management strategies for the collection, including the future translocation or reintroduction of individuals, it is necessary to accurately assess the identity, relatedness and diversity within the Al Ain populations and to compare these measures with other *ex situ* populations. To this end, AWP and the RZSS WildGenes laboratory are collaborating on a year-long project to perform DNA analysis on animals from five species: Arabian oryx, scimitar-horned oryx, addax, dama gazelle and giraffe. For each species, the research is split into two phases: 1) a survey of the mitochondrial (mt)DNA diversity present in the population, and 2) a survey of the nuclear DNA diversity within and among individuals. Here we report on the

results of Phase 1, which involved sequencing the mtDNA cytochrome b gene and/or the mtDNA control region. Results are presented for each species together with an interpretation of the findings in the context of *ex situ* conservation management.

DOES HABITAT STRUCTURE EXPLAIN MHORR GAZELLE AND SCIMITAR ORYX DISTRIBUTION AT RF GUEUMBEUL (SENEGAL)? A PRELIMINARY APPROACH

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It is well documented that habitat structure has a strong influence in species distribution and it has been demonstrated as well that animal densities show pattern of spatial and temporal variation as a result of changes in habitat structure. Within the framework of the project “Reinforcement of the *Nanger dama mhor* population in Senegal” funded by UNESCO and OPAN, we analyzed the possibility that habitat characteristics explain the distribution of two reintroduced Sahelo-Saharan ungulates at the Reserve de Guembeul (Senegal). Fourteen plots were selected. Every plot was a 25 m-side square separated from the closet plot by at least 500 m. Habitat was characterized within the plots by studying eight vegetation variables. Tree and shrub species were also identified within the plots. We found tree and shrub cover and configuration of plant species to define two differentiated habitat structure half at Guembeul. The west part of the Reserve is characterized by high density of trees and *Opuntia* cover is also very high. In the Eastern part of Guembeul, the percentage of grass is higher than the tree and shrub cover, *Opuntia* being almost absent. Although accurate censuses of mhor gazelle and scimitar oryx at Geumbeul are not available yet, it seems feasible to suggest that their distribution in this Reserve is coupled to habitat structure. Considering habitat changes occurred at the studied area in the last 10-15 years it could be suggested this to be one of the causes of the decline of the mhror gazelle reintroduced population at Guembeul.

Key words: habitat structure, species distribution, mhor gazelle, scimitar oryx.

Dans le cadre de la conservation des antilopes sahélo-sahariennes, le Sénégal a entrepris avec des pays partenaires comme l'Espagne et Israël un important programme de réintroduction. Cette coopération qui remonte à environ trois décennies porte sur trois espèces d'antilopes sahélo-sahariennes : la gazelle dama mhor, l'oryx algazelle et la gazelle dorcas. L'objectif général de la présente communication est de retracer les axes majeurs de mise en œuvre du programme. A ce titre, sont concernées :

- la Réserve Spéciale de Faune de Gueumbeul, (créée en 1983 avec une superficie de 720 ha) qui constitue le centre d'élevage et d'acclimatation ;
- et la Réserve de Faune du Ferlo Nord (rattachée à la Direction des Parcs Nationaux en 1996 avec une superficie de 487 000 ha) au niveau de laquelle la translocation est effectuée à partir du stock de la Réserve de Guembeul, pour un lâcher en semi-captivité et ultérieurement en liberté.

Bien qu'une évolution positive soit notée pour les populations d'oryx et de gazelles dorcas, les menaces notées portent sur la vétusté des grillages périmétraux des enclos (facilitant l'accès de prédateurs comme les chacals et les chiens, et d'autres petits ruminants), l'insuffisance des points d'eau et le faible taux de reproduction des gazelles damah mhor. Dans une perspective de meilleure gestion des effectifs, des axes de recherche et un processus de création d'une station écologique sont en cours de réalisation.

Mots clé : Réintroduction, antilopes sahélo-sahariennes, suivi des populations, Sénégal.

FOUR YEARS OF SURVEY AND MONITORING OF LAPPED-FACED VULTURE (*TORGOS TRACHELIOTUS*) IN TERMIT, NIGER.

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Key words: Lapped-faced Vulture, threats, conservation, Termit

Summary

The survey and monitoring of Lapped-faced vulture *Torgos tracheliotus* started 4 years ago in the future reserve of Termit – Tin Toumma. Surveys show that, we have less than 30 pairs remaining in the wild in Termit. The main objective is to improve knowledge of the raptor in this particular area for sound conservation measures. Priority specific objectives are: to estimate the population of this specie in Termit, to identify threats to lapped-faced vulture and to elaborate a conservation plan.

Both road survey and count units methods are combined to reach the expecting results. Continuous surveys from vehicle based on stopping and making observations from fixed vantage points along the survey route have been suitable. Two visits are made early in the breeding season to establish occupancy, and two subsequent visits to establish success or confirm that a nest is not occupied or breeding has not taken place.

A total of 107 birds have been recorded in 2008 and 83 individuals in 2009 against 74 in 2010.

Threats to lapped-faced vulture from human interference are the cause of nesting failure. Drought is also recognised as one of the most important threats to birds (2 chicks died on the nests and an adult in a well in 2010). The use of chemicals as strychnine to eliminate Jackal is another threat to be proved. Conservation measures include awareness campaign, providing water around wells during reproduction period, satellite tracking to know where birds are going after reproduction and the elaboration of conservation strategy based on fly way approach.

COMBINING ECOLOGICAL NICHE-BASED MODELLING AND LANDSCAPE GENETICS FOR CONSERVATION PLANNING OF ENDANGERED NORTH AFRICAN GAZELLES (POSTER)

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Abstract (max: 250 words)

North African gazelles represent excellent models to understand factors determining genetic structure in wide-range vertebrates that have undergone strong population declines. However, there is lack of quantitative knowledge on distribution of suitable habitats, range regression, genetic structure, and barriers in the landscape for gene flow. Moreover, suitable areas for potential reintroductions are poorly known and it is unknown how captive populations may contribute for maintaining genetic variability of wild populations. This study addresses conservation planning for *in-situ* and *ex-situ* populations of *Gazella dorcas* and *G. cuvieri*, and aims to answer the following questions: which environmental and human-related factors are linked to the ecological niche of species? Which is the level of niche breadth? Where are located suitable areas for species occurrence? How have the size and configuration of suitable ranges fluctuated along time? How genetic variability is spatially distributed in wild populations? What is the level of genetic variability in semi-wild and captive populations?

Where are located barriers in the landscape for gene flow? Does genetic structure reflect temporal changes in the size and distribution of suitable areas? Can evolutionarily significant units (ESUs) be identified? Where are spatially located suitable areas for potential reintroductions? Can captive populations contribute for the maintenance of genetic variability of wild populations? Non-invasive genetic methods, ecological niche-based models and landscape genetics will allow gaining insights into the genetic structure of populations. The integrative research strategy is expected to provide stakeholders and conservation managers with framework data for conservation planning of wild, semi-wild and captive populations.

SOCIAL IMPACT AND SENSIBILISATION AROUND REINTRODUCTION PROJECTS

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Reintroduction projects of desert ungulates usually carry a preadaptation phase in semi-wild conditions, what means building an enclosure large enough for the animals to obtain food

in a natural way and to develop their social behaviour. This fact reduces the available space for the local livestock. Being livestock the main resource for arid land human populations, at first instance, reintroductions enter in a direct conflict with local population's interests. Positive aspects for local populations are providing some access to resources as electricity, water and communications.

Overgrazing is a quite common problem in sahelian ecosystems. Some time after an area is fenced and avoids the entrance of livestock, the natural vegetation starts recovering very quickly. This means that a seeds bank is created inside the fence that also benefits the non protected areas

Diffusion of all the benefits trough activities and sensibilisation of the local communities are important components in reintroduction projects. Nevertheless, traditional sensibilisation methods did not cause the desired impact but others, based in their cultural way of live resulted in a better knowledge and comprehension of the project. As results, adult and young people have become now much interested and try to enter and help us in the enclosure and cases of animals out of the fence have been immediately reported to the guards.

Key words: reintroduction, impact, sensibilisation

PROJECTIONS FOR THE REINTRODUCED SSA POPULATIONS IN SENEGAL AND REFLECTIONS ON ITS EVOLUTION

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Reintroduction projects of locally extinct SSA in Senegal are being conducted with SHOryx, Mohor and Dorcas gazelle. For all of them the Guembeul Special Fauna Reserve (specially created for this purpose) has been the first step (reception enclosures and first adaptation phase) being the second step North Ferlo Fauna Reserve, where an acclimatation enclosure in Katane provides the animals semi-wild conditions.

The founder animals in Senegal comes from *ex situ* breeding programs and are derived from 7 Mohor (2.5) in June 1984, from 10 SHO: 8 (5.3) in February 1999 plus 2 (0.2) in February 2002 and from 26 Dorcas: 20 (6.14) in April 2007 plus 6 (3.3) in March 2009. The evolution and present situation of each species' populations has shown differences caused by a combination of factors as adaptation to semi-wild after strict captive conditions, management incidences or stochastic processes, negative events that could, eventually, compromise the future of the populations.

Theoretical projections of populations' growth in semi-wild are presented for each species in order to program future needs, avoid overgrazing and lack of fenced space and prepare future actions for the right development of these projects.

Key words: Senegal, reintroductions, population projection

Current situation of the red-fronted gazelle (*Gazella rufifrons*) population at the Ferlo North Faune Reserve and the Birds National Park of Djoudj: actions aimed at the preservation of these and other threatened sahelosaharian populations

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The Ferlo North Faune Reserve and the Birds National Park of Djoudj have the last populations of red fronted gazelles of Senegal. In addition, Ferlo boasts a small representation of the fauna of the Sahel which populated Northern Senegal until recently. Several initiatives are underway to evaluate the status of the populations of red fronted gazelles both in Djoudj and Ferlo, as part of the “National strategy for the conservation of the Sahelo-saharian species of Senegal”, co-developed by the Spanish National Parks Autonomous Organism (OAPN, Ministry of the Environment) and the Senegal National Park Directorate. The relevance and current situation of these populations was unknown at present given the absence of any recent studies. Only in Djoudj, a program focused in the study of the dorcas gazelle population was carried out in 2007.

On the other hand, a considerable effort has been undertaken at Ferlo to evaluate the status of other critically threatened species like the red-necked ostrich. So far, significant evidence of the critical situation of these species has been obtained, their main current threats, and most importantly, a program with urgent protection actions has been elaborated. These actions, consensuated with the Senegal National Park Directorate, are to be implemented shortly, in the context of the Senegal National Strategy mentioned above.

Key words: red-fronted gazelle, red-necked ostrich, population status, urgent protection measures.