IUCN OTTER SPECIALIST GROUP BULLETIN
VOLUME 21 ISSUE 1 PAGES 36 - 39

Citation: Ogada, M.O. (2004) Scats and Glue – a Cheap and Accurate Method for Mapping African Clawless Otter Aonyx capensis (Schinz, 1821) Territories in Riverine Habitat. *IUCN Otter Spec. Group Bull*. **21**(1): 36 - 39

SCATS AND GLUE - A CHEAP AND ACCURATE METHOD FOR MAPPING AFRICAN CLAWLESS OTTER *AONYX CAPENSIS* (SCHINZ, 1821) TERRITORIES IN RIVERINE HABITATS

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(received 11th July 2004, accepted 16th August 2004)

ABSTRACT: Accurate mapping of otter territories has hitherto been done by means of telemetry. However, the widespread use of telemetry has curtailed the study of otter territorial behaviour in resource-poor countries, particularly in Africa. Researchers in Africa generally do not have the resources to invest in telemetry equipment and tracking vehicles and aircraft. The implanting of transmitters in otters is a highly invasive procedure that requires a high standard of veterinary/ animal handling skills and the risks are high. African clawless otters forage in family groups and these animals share a clan terrintory along a stretch of coastline or riverine habitat. This territory is regularly marked by deposition of spraints, mostly on rocks and other prominent features on the riverbanks. In the course of this experiment, the artificial transfer of scats from known *A.capensis* holts into neighbouring family territories was found to elicit a prompt response from the resident family group. When the process is repeated in both directions, i.e. scats from territory A into territory B and vice versa, it gave a highly accurate estimate of territorial boundaries and when repeated over time can give an indication of seasonal variation in territorial behaviour.

INTRODUCTION

Accurate mapping of otter territories has hitherto been undertaken to a high level of accuracy by means of telemetry. However, the development and widespread use of telemetry has curtailed the study of otter territorial behaviour in resource-poor countries, particularly in Africa. Researchers and students in Africa generally do not have the resources to invest in telemetry equipment and tracking vehicles and aircraft. Even where resources are available for equipment, the implanting of transmitters is a highly invasive procedure that requires a high standard of veterinary/animal handling skills and the animal's welfare can easily be compromised during and after the procedure.

African clawless otters are known to forage in family groups consisting of a mother and pups (KINGDON, 1997) occasionally joined by other related adults, and these animals share a clan territory along a stretch of coastline or riverine habitat. This territory is regularly marked by deposition of spraints, mostly on rocks and other prominent features on the riverbanks. In the course of this experiment, the artificial transfer of scats from known *A. capensis* holts into neighbouring family territories has been found to elicit a prompt response from the resident family group. When the process is repeated in both directions, i.e. scats from territory A into territory B and vice versa, it can give a highly accurate estimate of territorial boundaries and, when repeated over time, can give an indication of seasonal variation in territorial behaviour. This proposed non-invasive method could greatly reduce the cost of studying otter territorial behaviour while eliminating the need for animal handling.

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STUDY AREA

This study was carried out in the Ewaso Ng'iro River, Central Kenya, between 37' N0268749, UTM 0028824 and 37' N0262640, UTM0059070. The Ewaso Ng'iro river flows northwards through the Laikipia Plateau (alt. 1800m) with tributaries flowing from the foot of Mt. Kenya in the south and the Aberdare highlands in the south west. The river terminates in the Lorian swamp in north eastern Kenya.

MATERIALS AND METHODS

The following materials are required for this territorial survey technique:

a) Global Positioning System (GPS) set
b) Cyanoacrylate glue
c) Waterproof permanent marker
d) Measuring tape (50m or 100m)
e) Fresh otter scat (<48 hrs old) from a known source territory

African clawless otters are large animals (av. 20kg) and, in the Ewaso Ng'iro River, they forage on relatively small prey such as crabs (ave. wt. 11g) and crayfish (av. wt. 25g). Availability of food, therefore, is the most important factor in the location and size of territories in this area. Territories in the Lower Ewaso Ng'iro were all found to include small water reservoirs, which were constructed by livestock ranchers in the area. These reservoirs provided refuges for crayfish during the dry season when low water levels exposed the crayfish to increased predation by terrestrial predators.

Otter territories were established around these reservoirs and so spraints for the purposes of this experiment were taken from holts at the reservoirs.

We placed spraints on rocks along the river at 100-meter intervals and these were moved another 100 meters every 24 hours. At every point, the spraint was placed on a rock and secured with a small amount of glue. Cyanoacrylate ('super glue' brand) was used because it dried quickly and produced no discernible odour after 15 seconds. The glue was to prevent the experimental spraint from being blown off by the wind or washed off by rain. We also made a small blue mark on the spraint to facilitate positive identification of the spraint the following day. Within the initial territory, the experimental spraint does not elicit any response from the resident otters. However, when the spraint reaches another territory, the resident otters respond by removing it and replacing it with a fresh one. We then take the fresh spraint and repeat the process in the opposite direction until a similar response is elicited from the original group. We then took the GPS position of a point midway between the two response points and that is taken to be the end of the territory.

DISCUSSION

This method is still new and it is recommended that it only be used for the study of *A. capensis* populations in riverine habitats at the present time. More experimentation has to be undertaken in order to gauge its applicability to the study of other otter species. Even within the species there may be differences in the territorial behaviour of non-riverine populations, e.g. those living in lakes and marine habitats. Territories in riverine habitats are easily defined due to their linear nature, but they may not be as definite where we have open water such as lakes and oceans. The decline in numbers of otters around the world has been a cause of considerable concern (DAVIS, 1971, MACDONALD et al., 1978) more so because few estimates of otter densities and standardised estimation methods are available. This is a

potentially useful method for estimating the density of *A. capensis*, which is unknown throughout much of its range. It is a particularly important technique because lack of resources is one of the two serious impediments to research on African otters. The other is the difficulty in locating and trapping them. Another important measure that could be obtained from this method is the productivity of otter habitats. *A. capensis* territories vary in size from 3 - 20 km (KINGDON, 1997). This may be determined by the availability of food, the results of the current study showing that some territories are as small as 0.6 km.

Telemetry would still be required, particularly to cover for seasonal variation in territorial behaviour. The two methods (telemetry and scats and glue) could be complementary as the 'scats and glue' technique could be a useful guide as to where the limited resources available could be best spent on telemetry.

Acknowledgements - I would like to acknowledge the support of my project sponsors; Columbus Zoo, Lincoln Park Zoo, Mpala Wildlife Foundation, and the Whitley Laing Foundation. For scientific advice on experimental design, my supervisors Dr. Penninah Aloo-Obudho and Prof. Romanus Okelo of Kenyatta University. Finally my field assistants Hussein Mohamed and Sadat Abdi for their tireless work in the field.

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RÉSUMÉ

EPREINTES ET COLLE – UN MOYEN PRECIS ET BON MARCHE POUR DELIMITER LES TERRITOIRES DE LOUTRES A JOUES BLANCHES DU CAP *AONYX CAPENSIS* (SCHINZ, 1821) EN HABITAT RIVULAIRE

Jusqu'à présent, la localisation précise d'un territoire de loutre a été possible grâce à la télémétrie. Cependant la standardisation de cette méthode a été un frein à l'étude du comportement territorial de la loutre dans les pays en voie de développement, particulièrement en Afrique. En Afrique, les chercheurs n'ont généralement pas la possibilité d'investir dans l'équipement, les véhicules et les moyens aériens nécessaires pour le suivi des animaux par radio-pistage. L'implantation d'émetteur est une procédure lourde et risquée, qui requiert un personnel hautement qualifié pour la manipulation des animaux et le suivi vétérinaire. Les loutres à joues blanches recherchent leur nourriture en groupes familiaux. Les membres d'un même clan se partagent un territoire qui se situe le long d'une portion de côte ou de rivière. Ce territoire est régulièrement marqué par le dépôt d'épreintes sur des pierres ou d'autres points marquants situés sur les rives. Au cours de cette expérience, des crottes d'*A. capensis* de sites connus ont été placés sur les territoires des familles voisines, ce qui a provoqué une prompte réponse du groupe familial résident. Lorsque la procédure est répétée dans les deux directions, c'est à dire lorsque des épreintes sont déposées du territoire A vers le territoire B et vice versa, cela permet d'obtenir une estimation très précise des limites du territoire de chaque groupe. Cette expérience répétée dans le temps, donne des indications sur les variations saisonnières de l'occupation du territoire.

RESUMEN

Actualmente, la delimitación exacta de los territorios de las nutrias se ha hecho por medio de radio-telemetría. Sin embargo, la aplicación de esta tecnología en países en vías de desarrollo ha sido muy limitada, particularmente en el continente africano. Los investigadores en África generalmente no cuentan con los recursos necesarios para invertir en equipo de radio-telemetría y medios de transporte aéreo y terrestre. Por otra parte, la implantación quirúrgica de transmisores en nutrias es un procedimiento altamente invasivo que requiere de un alto nivel de entrenamiento en técnicas veterinarias, mientras que el riesgo para los individuos es alto. La nutria desgarrada forrajea en grupos familiares, y éstos comparten territorios entre sí, los cuales se extienden a lo largo de las riveras de los ríos y las costas marítimas. Estos territorios son delimitados por medio de la deposición de heces en rocas y otros sustratos prominentes encontrados sobre los márgenes de los ríos. Durante la realización del presente experimento, se transfirieron artificialmente heces de los territorios conocidos de *A. capensis* a territorios vecinos para documentar la respuesta de los grupos residentes. Cuando el proceso se repitió en ambos sentidos, es decir, cuando las heces del territorio A se colocaron en el territorio B y viceversa, se obtuvo una estimación de los límites territoriales. La repetición periódica puede proporcionar información acerca de las variaciones estacionales y el comportamiento territorial de la especie.