

REPORT

DISTRIBUTION PATTERN, THREATS AND USE OF SPOTTED-NECKED OTTERS (*Hydrictis maculicollis*) IN THE RIVERINE COMMUNITIES OF ONDO STATE, NIGERIA

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Abstract: The goal of the research is to assess the distribution pattern, threats, and use of Spotted-necked Otter, *Hydrictis maculicollis*, in the riverine areas of Ondo State, Nigeria. Field observations were conducted by walking transects along the banks of the rivers as well as the use of a speedboat/canoe on the water bodies. Focus group discussions (FGD) and key informant interviews (KII) were used to facilitate the research. A total of 51 groups of fishermen/farmers from 17 communities in Ilaje, Irele, Ese-Odo, and Okitipupa local government areas were interviewed. Key informant interviews were carried out where Focus group discussions could not be conducted. These were audio-recorded, after which they were transcribed and analysed qualitatively using thematic analysis. Spotted-necked showed wide distribution in the freshwater ecosystems along the riverbanks, marshy areas, swamps, and streams based on the presence of their indices in the area. During the survey, one dead otter was observed from a fisherman at Olopo, and about 12 skulls and over 500 nets damaged by otter were confirmed in the major river (River Oluwa) and its tributaries in the riverine communities. Direct hunting, with more than 65 set traps, was observed during the survey and accidental capture as well as noise pollution by speedboats was observed in 15 riverine communities as major threats to otter. Increasing demand for otter meat in local restaurants, trade in body parts, and use for traditional medicine in the region pose serious threats to otter populations if not addressed.

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INTRODUCTION

Otters belong to Order Carnivora and Family Mustelidae (Ketmaier and Bernardini, 2005). They are a distinct group of carnivores because of how well they have adapted to a semi-aquatic lifestyle (Kruuk, 2006). They also are an important species in wetlands and one of the main predators in aquatic habitats (Ottino and Giller, 2004). There are 13 living species of otters worldwide, three of which are only found

in Sub-Saharan Africa (Lelias et al., 2021). Spotted-necked otters can be found in lakes and bigger rivers over much of southern Africa, and they are thought to be extinct in Burundi, Ghana, Lesotho, and Togo (Reed-Smith et al., 2015). Nigeria is home to two species of otters; the African Clawless otter *Aonyx capensis* and the Spotted-necked otter *Hydrictis maculicollis*. *A. capensis* is found in north-western Nigeria, in the region of Kainji Lake and Borgu Game Reserve, where it shares habitat with the Spotted-necked otter. *A. capensis* have been observed in Calabar's rainforest and the Guinean savannah (Francesco et al., 2005). They are constrained to permanent bodies of freshwater with sufficient shoreline cover and a plentiful prey base (Skinner and Chimimba 2005). Signs of presence have always been recorded close to the water's edge (Procter, 1963).

The existence of the species is threatened by several issues. Hunting is prevalent in India, and the country is the greatest supplier of otter killed, mostly to meet the enormous demand in the Chinese market (Gomez et al., 2017). Skinner and Chimimba (2005) reported direct and indirect persecution and, perhaps, hunting have an impact on the range of Spotted-necked otters, while also aggravating the loss and deterioration of habitat. Most otters are subject to risk of illegal killing due to accidental capture in nets (Harrington et al., 2017). Climate change will seriously affect otters due to their dependence on rivers, lakes, streams, and riparian vegetation for shelter as well as the possible reduction in water levels and droughts as a result of global warming.

Otters are killed all over Africa for their meat, skins, and for medicinal purpose (Reed-Smith et al., 2015). In both rural and urban markets in African towns and cities selling plants and animals for medicine is prevalent (FAO, 2007). The penis of otters was reported to be crushed and mixed with coconut milk to enhance virility (Dong et al., 2010). Otter bile was once used in China to cure anaemia and irregular menstruation (Wang and Carey, 2014).

The Spotted-necked otter is listed on CITES Appendix II (www.cites.org) and classified as Near-threatened with a declining population on the IUCN Red List (Reed-Smith et al., 2015). The range of otters in Nigeria is largely unknown, and information about them comes from museum specimens from a time when this region's overall ecological characteristics were very different from those of today (Francesco, 2005). In Nigeria, both the African clawless otter and the Spotted-necked otter are very rare, and possibly declining. Little work has been done on the ecology and conservation of the Spotted-necked otter in the South West area of Nigeria. Therefore, this research aims to assess the distribution pattern of Spotted-necked otters as well as threats and uses in the riverine area of Ondo State, which will help in further inventory and conservation of the species.

MATERIAL AND METHODS

Study Area

The research was conducted in the coastal areas of Ondo State, which is in Nigeria's Southwest region between Latitude 5° 50' N - 6° 09' N and Longitude 4° 45' E - 5° 05' E. Ondo State's coastline is around 180 km long. The watershed encompasses an area larger than 2000 km². It consists of four local government areas. Okitipupa local government is the most populous in this research region, with a population of 234,138 and a land area of 803 km². They are Ikales-speaking people. Ilaje local government has a land area of 1,318 km² and is the largest local government in Ondo State in terms of population (129,795). They are part of the Ilaje ethnic group. Ese-Odo local government has an area of 762 km² and a population of 158,256 people from the Ijaw and Apoi ethnic groups. The Irele local government has the fewest people (144,136)

and the smallest area (963 km²). They communicate in Ikales (National Bureau of Statistics, 2010) (Fig. 1). Commercial activities in these areas are carried out in speedboats and canoes used for transportation of goods and people, petroleum exploration, and the boat building industry (NIPOST, 2017) while fishing and agriculture are the primary occupations of the locals (Kabir et al., 2020).

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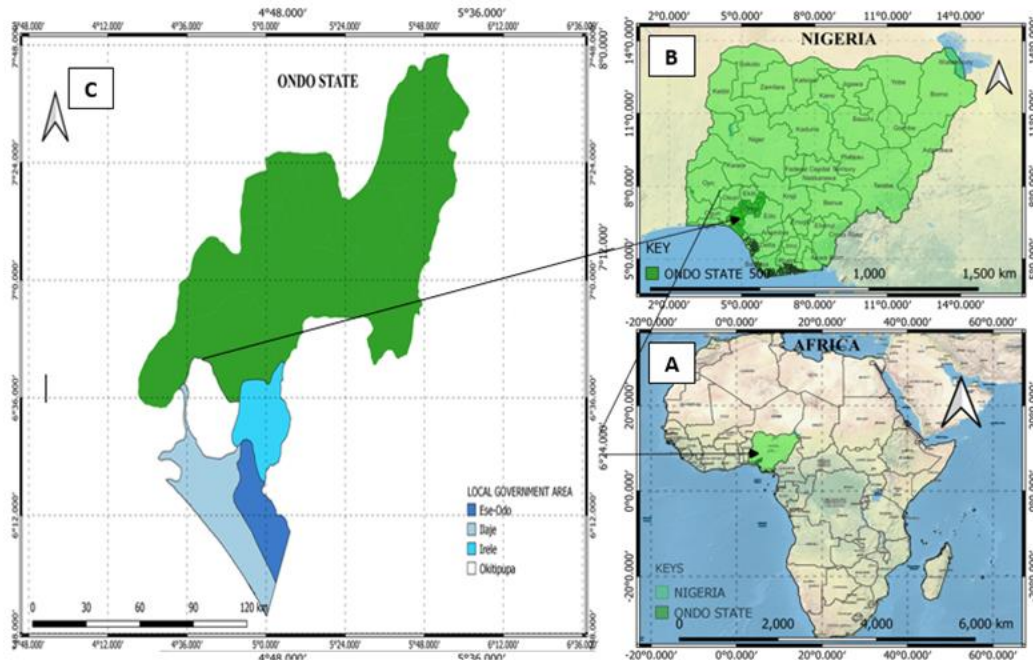


Figure 1. A: The location of Nigeria in Africa, B: The location of Ondo State in Nigeria, C: Map of the study area, showing the local government areas in the riverine area of Ondo State, Nigeria (Salami et al., 2022).

Climate and Biodiversity of the Coastal Areas of Ondo State

The riverine regions have a tropical climate with rainy (April to October) and dry seasons. The typical temperature is 28°C during rainy season, and the average rainfall index is around 3000mm. With a mean temperature of 32 °C and an average rainfall index of 800mm for the dry season (Adesina and Ogunseiju, 2017). The region is drained by several perennial streams and rivers, which pass through several coastal communities before emptying the ocean via an estuary with a water exchange between the coast and the shoreline (Agunbiade et al., 2010). The predominant kind of vegetation in this region is mangrove swamp, particularly the red mangrove *Rhizophora racemose* and the white mangrove *Avicenniaspp* typical of swamps. Two to ten months of the year, the area is exposed to tide change and salt water incursion. There are three subzones that border the coastal marshes and creeks; freshwater, brackish water and saltwater (Bolarinwa et al., 2016). The coastal areas are estimated to be about 60,000 hectares in size, rich in biodiversity and home to a variety of fish, shellfish, finfish species, amphibians, reptiles, mammals and other aquatic animals (Solarin et al., 2010).

Data Collection

To estimate the presence of Spotted-necked otters in the area, a reconnaissance survey (February 2020) was conducted among fishermen and farmers as well as individuals in the communities that routinely utilize the coastline and have potential encounters with otters (Fig. 2A,B). This method is appropriate for assessing the relative

abundance of some rare species and has been used to measure the abundance of other wild mammals in the hunting terrestrial system (van der Hoeven et al., 2004).



Figure 2A: (right) Focus group discussion at Ode-Iyansan. Source: Field survey, 2021

Figure 2B: (left) Key Informant Interview at Akotogbo. Source: Field survey, 2021

Field Observations

Field observations were conducted by walking transects along the banks of the rivers as well as by speedboat or canoe on the water bodies from 6.00am to 11.00am, 3:00pm to 6:00pm and 8:00pm to 10:00pm for 30 days. This involved walking along the river banks to observe otter activities as well as possible threats to its survival. The surveys were carried out both during the day (to look for otters and signs of their presence) and at night using torchlight (to look for active individuals). The GPS coordinates of the distribution pattern of otters in the study area were taken to generate a distribution map for the species (Fig. 3).

Focus Group Discussions and Key Informant Interviews

Focus group discussions (FGD) and key informant interviews (KII) were used to facilitate the research in 2021. Respondents who had fished for more than 10 years as well as those who work in the aquatic milieu were selected. Subjects included whether respondents had ever seen otters in the area, in what kind of habitat, main activities observed, threats to the otters and use of otter. For ease of identification, otter pictures were displayed to responders, and a native interpreter was used to translate the questions into Ijaw language during the discussions among the Ijaw communities. A total of 51 groups of fishermen/farmers from 17 communities in the four local government areas were interviewed. Key informant interviews were carried out where Focus group discussion could not be conducted. The following communities were selected for the survey; Aboto, Akata, Ipare, Laradha, Olopo and Lekki meta were selected from Ilaje. Agadagba, Arogbo, Enikorogha, Igbekebo and Igbotu were selected from Ese-odo; Akotogbo, Ode Iju-osun and Ode Iyansan were selected from Irele while Erinje, Araromi Ayeka and Oloto communities were selected from Okitipupa Local Government Area (Figure 2A,B, Table 1).

Data Analysis

Data on the Focus Group Discussions and Key Informant Interviews were audio-recorded, after which it was transcribed and analysed qualitatively using thematic analysis.

Table 1. Selection process, variables and rationale for the Focus group discussion and Key Informant Interviews in the riverine areas of Ondo State

Table Methods	Participants	Selection Criteria and Rationale	Theme	Description of Themes
Key Informant Interview/ Focus Group Discussion	<ul style="list-style-type: none"> • Fishermen • Farmers • Boat/canoe transporters • Market women • Chiefs • Associations/ Groups 	10 years and above experience in fishing/farming or work in the aquatic milieu.	<ul style="list-style-type: none"> • Distribution patterns • Threats • Uses 	<p>Types of habitats, season and frequency of occurrence</p> <p>What are the threat factors, causes of death and trends in otter numbers</p> <p>Economic, traditional and medicinal values of otters</p>

RESULTS

Otter Distribution pattern

The presence of Spotted-necked otter was observed in all the coastal communities sampled (Fig. 3). All the interviewees confirmed to have seen Spotted-necked otter directly in and around the rivers, swamps, streams, and marshy areas as well as indirectly through observation of destroyed nets, partially eaten fish in nets, spraint in forested areas, on logs, and near river banks. Most interviewees confirm to have seen otters primarily in the morning and evening especially during the raining season (Table 2). Otters were generally called “Lombo” among the Ilajes regardless of species and “Okosi” in Ijaw dialect.

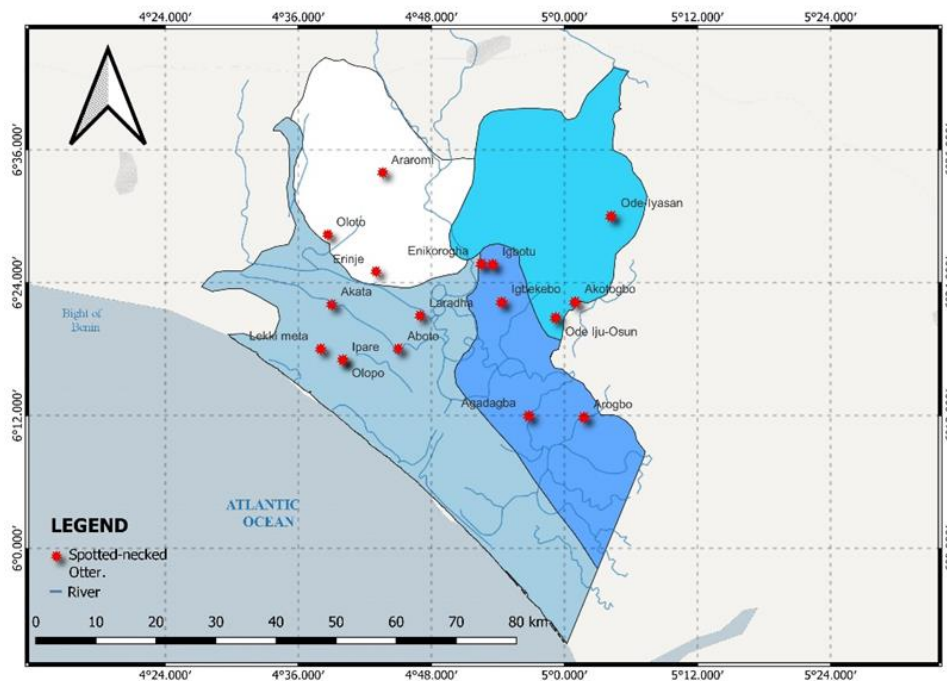


Figure 3. Spatial distribution of spotted-necked otter in the study area (Salami et al., 2022).

Table 2. Signs of Spotted-necked Otter in the Study Areas

Sign	Means of Identification	Subjective Response	Objective Response
• Dead Otter	Field Observation and Focus group discussion/Key Informant Interview	95% of the interviewees confirmed to have seen dead otter before.	A dead spotted-necked otter was observed from a fisherman at Olopo during survey (Fig. 4). More than 12 otter skulls were seen during the survey (Fig. 5).
• Otter parts	Field Observation and Focus group discussion/Key Informant Interview	82% of the interviewees confirmed to have seen otter parts especially the skulls from hunters/fishermen and market women.	Not encountered during survey
• Spraints	Field Observation and Focus group discussion/ Key Informant Interview	94% of the interviewees agreed to have seen Otter spraints in the area while 6% of the interviewees said they have not seen Otter spraints before.	Not encountered during survey.
• Torn Nets	Field Observation and Focus group discussion/ Key Informant Interview	100% of the interviewees agreed to have observed Otter torn fishing nets.	Over 500 damaged nets was observed through walking transect along the river banks in all the communities surveyed
• Footprints/Tracks		18% of the interviewees agreed to have seen the footprint of Otter 82% of the interviewees disagreed.	

Source: Field Survey, 2021.



Figure 4. Dead Spotted-necked otter at Ipare (Salami et al., 2022).



Figure 5. Skulls of Spotted-necked otter at Enikorogha. Source: Field survey, 2021.

Threat factors associated with spotted-necked otters in the riverine area of Ondo State

The data indicate that “Direct hunting” is a major threat to Spotted-necked otter in the coastal regions of Ondo State (Table 3).

Table 3. Threat Factors associated with Spotted-necked Otter in the Study Area

Threats Faced	Means of Identification	Subjective Response	Objective Response
Direct hunting	Field Observation and Focus group discussion	100% of the interviewees agreed that direct hunting is a major threat to Otter.	More than 65 different types of traps set around the riverine areas were observed through walking transect along the river banks
Accidental catch	Field Observation and Focus group discussion	24% of the interviewees agreed while 76% were undecided.	Not encountered during survey.
Noise pollution	Field Observation and Focus group discussion	24% of the interviewees agreed while 88% of the interviewees were undecided.	Noise pollution from speedboats were observed in 15 communities during survey.

Source: Field Survey, 2021

Ilaje Local Government Area

In Okoha Igbokoda, all the interviewees considered spotted-necked otter, called “Igun” in Ilaje dialect, as a natural enemy because of the degree and severity of damage to their fishing nets as well as reduction in income due to depredation on fishes within the nets. An interviewee at Olopo confirmed the killing of a Spotted-necked otter in February, 2021 with his dog. In Ipare, spotted-necked otter is often hunted, particularly by the fishermen and farmers in the area, using traps, nets and guns.

Ese Odo Local Government Area

In Igbekedo, Spotted-necked otter was a major delicacy among the Apoi which led to great demand for its meat, and there are several canteens where otter meat was served. Many of the interviewees reported catching otters accidentally in fishing nets and with spears. In the same vein, another interviewee reported that noise pollution was a threat to otter survival in the area. In Igbotu, all the people interviewed reported that excessive hunting and accidental capture are threat to otters in the area.

Irele Local Government Area

Most of the interviewees confirmed that spotted-necked otters had been killed in the Akotogbo River with special traps, nets, hook and guns. In Ode-Iju Osun, the interviewees confirmed that spotted-necked otter had been killed frequently with wire traps. An interviewee confirmed that he killed 3 otters in the last four months in 2021. They also reported that noise pollution and habitat degradation pose serious threat to its conservation.

Okitipupa Local Government Area

In Araromi Ayeka, otters were reported to have been killed in Igbinsin-Oloto and in Erinje, Spotted-necked otters have also been killed by farmers and fishermen with guns and wire traps (Fig. 6).



Figure 6. A wire trap observed at Igbotu. Source: Field survey, 2021.

Use of Spotted-Necked Otter in Local Communities

The results revealed that all the interviewees affirmed that Spotted-necked otter serves as food (Fig. 7) and a source of income (Fig. 8). The interviewees stated that various parts of the spotted-necked otter are used for traditional medicine in the selected communities across the four local government regions (Tables 4 and 5).

Table 4. Various uses of Otter in the Riverine Areas of Ondo State.

Body Parts	Application	Sociocultural Belief
Head	Head mixed with other ingredients.	For detecting crime and for predicting future occurrence. Antidote against bad luck
Meat	Source of animal protein and income	Increased strength
Skulls and lower jaw bones	Rheumatism, aches	Pain relief Increased strength
Male sex organ	Impotence	Increased virility in men
Bones	Bone, various concoctions	Increased strength in new born babies
Intestines	Pains, Weakness	Increased strength
Claws	Claw decoction with other ingredients	Increased strength and stamina especially when fighting.
Internal organs (liver, bile etc)	Aches, itching, diseases, discomfort, Anaemia	Pain relief and treatment of several diseases
Oil		For production of chemicals

Source: Field survey, 2021

Table 5. Uses of Otter in the Local Government Areas of Ondo State.

L.G.A	Uses					
	Meat	Income generation	Aphrodisiac	Bone/Claw/Skull (Medicinal)	Oil (Medicinal)	Liver/Bile (Medicinal)
Ilaje	100%	95%	80%	92%	60%	95%
Ese-Odo	100%	80%	100%	98%	74%	80%
Irele	85%	55%	60	40%	54%	60%
Okitipupa	92%	64%	20	58%	45%	62%

Source: Field survey, 2021



Figure 7. Roasted head of otter for sale at Igbekebo. Source: Field Survey, 2021.



Figure 8. Head of otter preserved to be sold to traders from Benin Republic. Source: Field Survey, 2021.

DISCUSSION

Otter Distribution Pattern

The findings reveal that spotted-necked otters are well distributed in all the riverine communities of the four local government areas, and are seen mostly in the morning and evening, especially during the rainy season. This is thought to be due to the abundant of fish species present. They inhabit marshy areas, swamps, and streams of the freshwater ecosystems. This agrees with Kruuk, 2006, who states that spotted-necked otters inhabit only fresh water environments. Perrin and Carranza (2000) reported that Spotted-necked otters use riverine vegetation and rocky riverbanks during the winter dry season, and generally occur where human disturbance is least.

Threats to Otters

It is evident from this study that direct hunting, accidental capture, and noise pollution are the major threats facing Spotted-necked otters in the study area. This is consistent with Acharya (2017): in Nepal, otter populations have declined largely because of degradation of natural habitats and hunting. Ponsonby (2018) reported that expansion of human settlements poses a threat and disturbance to otters, while Trivedi and Joshi (2018) stated that otters are not habituated to human presence.

Uses of Otters

Spotted-necked otters are primarily taken for consumptive purposes in all the communities visited. Spotted-necked otters serve therapeutic purposes which include the treatment of erectile dysfunction in men. This is consistent with findings of Dong et al., (2010), who reported that in Cambodia, an otter's baculum (penis bone), crushed and mixed with coconut milk, is prescribed as an aphrodisiac. De Luca and Mpunga (2013) also reported on several traditional uses of otters and found that they were eaten in southern Tanzania. In addition, the heads of otters are mixed with other plant parts for making an antidote against bad luck among the Ijaws in the Ese Odo local government area. This agrees with Lev (2003), that animals and products derived from different organs of their bodies have constituted part of medicinal substances used in various cultures since ancient times. Rowe-Rowe (1990) also reported that human hunters kill otters for bushmeat food and for their skins, in part as retribution for their eating fish desired by fishermen. Hadipour et al.(2011) reported that the otter is also hunted for its fur and taxidermy proposes in recent years. Still (2003) reported that the demand created by traditional medicine is one of the causes of the over exploitation of population of numerous animal species.

CONCLUSION

The study revealed that otters inhabit freshwater ecosystems and they are well distributed in different habitats ranging from marshy areas, streams and swamps in the riverine communities of Ondo State. However, excessive hunting, accidental capture as well as noise pollution threaten the survival of this keystone species in its home range. Increasing demand for otter's meat for food and body parts for economic and traditional uses may further reduce the already declining populations of otter in the riverine communities. The research also confirmed the presence of African clawless otter (*Aonyx capensis*) in the area, but the scope of work was limited to spotted-necked otter. Therefore, there is need for more conservation education and provision of alternative livelihoods such as mini-livestock production, crafts making and ecotourism initiatives among the locals. Further research should be conducted to extensively study these species in all the coastal communities of Southwestern Nigeria.

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RESUME

RÉPARTITION, MENACES ET UTILISATION DE LA LOUTRE À COU TACHETÉ (*Hydricis maculicollis*) DANS LES COMMUNAUTÉS LACUSTRES DE L'ÉTAT D'ONDO, AU NIGERIA

Le but de la recherche est d'évaluer le modèle de répartition, les menaces et l'utilisation de la loutre à cou tacheté *Hydricis maculicollis* dans les zones fluviales de l'État d'Ondo, au Nigeria. Les observations sur le terrain ont été réalisées en parcourant des transects le long des berges des rivières ainsi qu'en utilisant un hors-bord/canoë sur les plans d'eau. Des Discussions de Groupe (DG) et des Entretiens avec des Informateurs Clés (EIC) ont été utilisés pour faciliter la recherche. Au total, 51 groupes de pêcheurs/agriculteurs de 17 communautés des territoires de gouvernement local d'Ilaje, Irele, Ese-Odo et Okitipupa ont été interrogés. Des entretiens avec des

informateurs clés ont été menés là où les discussions de groupe ne pouvaient pas avoir lieu. Ceux-ci ont été enregistrés en audio, après quoi ils ont été retranscrits et analysés qualitativement par analyse thématique. L'espèce présente une large répartition dans les écosystèmes d'eau douce le long des berges des rivières, des zones marécageuses, des marécages et des cours d'eau, en fonction de la présence de leurs indices dans la région. Au cours de l'enquête, une loutre morte a été trouvée chez un pêcheur à Olopo, environ 12 crânes et plus de 500 filets endommagés par la loutre ont pu être confirmés sur le cours principal de la rivière Oluwa et ses affluents dans les communautés riveraines. Comme menaces majeures sur la loutre, nous avons observé durant l'enquête la chasse directe avec plus de 65 pièges posés, une capture accidentelle ainsi que la pollution sonore par des vedettes rapides de 15 communautés lacustres. La demande croissante de viande de loutre dans les restaurants locaux, le commerce de certaines parties du corps et leur utilisation en médecine traditionnelle dans la région constituent de graves menaces pour les populations de loutres si elles ne sont pas prises en compte.

RESUMEN

PATRÓN DE DISTRIBUCIÓN, AMENAZAS Y USO DE LAS NUTRIAS DE CUELLO MANCHADO (*Hydrictis maculicollis*) EN LAS COMUNIDADES RIBEREÑAS DEL ESTADO DE ONDO, NIGERIA

El objetivo de la investigación es evaluar el patrón de distribución, las amenazas, y el uso de la Nutria de Cuello Manchado *Hydrictis maculicollis* en áreas ribereñas del Estado de Ondo, Nigeria. Las observaciones de campo fueron realizadas caminando transectas a lo largo de las barrancas de los ríos, así como mediante el uso de lancha rápida/canoa en los cuerpos de agua. Se utilizaron discusiones en Focus Groups (FGD) y entrevistas con informantes clave (KII) para facilitar la investigación. Fueron entrevistados un total de 51 grupos de pescadores/agricultores, de 17 comunidades en las áreas de gobiernos locales de Ilaje, Irele, Ese-Odo y Okitipupa. Las entrevistas con informantes clave fueron llevadas a cabo cuando no podían realizarse reuniones con Focus-groups. Fueron grabadas, luego de lo cual fueron transcritas y analizadas cualitativamente utilizando análisis temático. La nutria de cuello manchado mostró una amplia distribución en los ecosistemas de agua dulce a lo largo de las barrancas de ríos, áreas pantanosas, pantanos, y arroyos, en base a la presencia de sus índices en el área. Durante el relevamiento, se observó 1 nutria muerta (de un pescador) en Olopo, alrededor de 12 cráneos y más de 500 redes dañadas por nutrias fueron confirmadas en el río principal (Río Oluwa) y sus tributarios. Se observó caza directa con más de 65 trampas puestas en el terreno, y captura accidental así como contaminación sonora por lanchas rápidas, en 15 comunidades ribereñas, como las principales amenazas a la nutria. La creciente demanda por carne de nutria en los restaurantes locales, el comercio en partes corporales, y el uso para la medicina tradicional en la región son serias amenazas a las poblaciones de nutria si no son encaradas.