

**REPORT OF HIGH CONSERVATION VALUES (HCVS) AND
CONSERVATION AREAS MONITORING IN OBARETIN, OLOGBO,
COWAN AND SAKPONBA ESTATES**

By

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TABLE OF CONTENTS

Title Page-----	1
TABLE OF CONTENTS -----	2
LIST OF FIGURES -----	3
LIST OF TABLES -----	4
1. INTRODUCTION -----	5
1.1 Background -----	5
1.2 Purpose of the Conservation Area and HCV Monitoring -----	5
1.3 The Specific Focus -----	6
2. THE CONSERVATION AND HCV MANAGEMENT AND AREAS-	7
2.1 Description of the Areas -----	7
3. METHODS AND TIMELINES -----	10
3.1 Methods -----	10
3.1.1 Document Review -----	10
3.1.2 Fauna and Flora Surveys -----	11
3.1.3 Monitoring of Community Values -----	14
3.1.4 Local Community Consultations -----	14
3.2 Timelines -----	15
4. FINDINGS -----	15
4.1 Implementation of the HCV and Conservation Areas Management Plan or Recommendations -----	16
4.2 Effectiveness of the Current Conservation and HCV Areas Management Options -----	45
4.3. Threat to the Conservation Areas and HCVs -----	49
5. MANAGEMENT RECOMMENDATIONS -----	57
6. SUGGESTED ACTIONS FOR THE CONSERVATION AREAS AND HCVS -----	59
7. REFERENCES -----	61
8. ANNEXES -----	62
Annex 1a: Flora Species Identified in Obaretin Conservation Areas-----	62
Annex 1b: Faunal Species Identified at Obaretin Conservation Areas-----	63
Annex 2a: Flora species identified in Ologbo conservation areas -----	66
Annex 2b: Faunal Species Identified in Ologbo Conservation Areas-----	67
Annex 3a: Floral Species Identified in Cowan Conservation Areas-----	72
Annex 3b: Faunal Species Identified in Cowan Conservation Areas-----	72
Annex 4a: Floral Species Identified in Sakponba Conservation Areas-----	74
Annex 4b: Faunal Species Identified in Sakponba Conservation Areas-----	76
Annex 5: Lists of local participants at the community consultations-----	78

LIST OF FIGURES

Figure 1: Map of Presco Estates showing the conservation and HCV areas -----	7
Figure 2: Map of Obaretin Estate showing the conservation areas -----	8
Figure 3: Map of Ologbo Estate showing the conservation areas -----	8
Figure 4: Map of Cowan estate showing the conservation areas -----	9
Figure 5: Map of Sakponba Estate showing the conservation and HCV areas--	10
Figure 6: Map of Obaretin CAs showing the transects used for biological surveys-----	11
Figure 7: Map of Ologbo CAs showing the transect used for biological surveys -----	12
Figure 8: Map of Cowan CAs showing locations for biological surveys-----	12
Figure 9: Map of Sakponba CAs showing locations for biological surveys---	13
Figure 10: Map of Obaretin Estate showing the conservation and HCV areas--	17
Figure 11: Map of the Ologbo Estate showing the conservation and HCV areas-	25
Figure 12: Map of Cowan Estate showing the conservation and HCV areas----	34
Figure 13: Map of Sakponba Estate showing the conservation and HCV areas--	39
Figure 14: Map of Cowan Estate showing threatened conservation areas-----	55
Figure 15: Map of Sakponba Estate showing the conservation areas affected by land preparation and road construction-----	58

LIST OF TABLES

Table 1: Monitoring timelines for HCVs and conservation areas -----	15
Table 2: Flora diversity and richness indices for conservation areas in the estates-----	15
Table 3: Summary of findings at Obaretin conservation areas-----	17
Table 4 Outcomes of the community consultation at Obaretin host communities-----	21
Table 5: Summary of findings at Ologbo Estate conservation areas-----	25
Table 6: Outcomes of the community consultation at Ologbo host communities-----	29
Table 7: Summary of findings at Cowan Conservation areas-----	32
Table 8: Outcome of consultations in Cowan host communities-----	36
Table 9: Summary of findings in Sakponba Estate-----	39
Table 10: Threats to the identified HCVs and conservation areas in Obaretin-----	49
Table 11: Threats to the identified HCVs and conservation areas in Ologbo----	51
Table 12: Threats to the identified HCVs and conservation areas in Cowan--	53
Table 13: Threats to the identified HCVs and conservation areas in Sakponba-----	55
Table 14: HCV and conservation areas management recommendations-----	57
Table 15: Suggested actions for the HCV and conservation areas -----	59

1. INTRODUCTION

1.1 Background

This report contains findings during the monitoring exercise of the existing conservation and HCV areas within the Presco's (Obaretin, Ologbo, Cowan and Sakponba) Estates, commissioned by Presco Plc., headquartered at Obaretin Estate in Ikpoba-Okha Local Government Area of Edo State, Nigeria. Having carried out series of HCV assessments within the estates, and subsequent designations of the areas for sound management by developing appropriate action plans, while also employing precautionary approaches in designating areas, hitherto not assessed, as conservation areas, it is important to periodically evaluate the level of successes and effectiveness of the implementations of the management plans. This can only be achieved by appraising, through field observations and community consultations to ascertain whether a particular strategy yields expected results, and/or whether there is need for modification(s) of a particular management style. This would be difficult, if not impossible, without a coordinated and sound conservation areas and HCV monitoring programmes as this.

Besides, understanding the reason(s) and driving forces for a decline in HCV status and conservation areas can help the organization to know which management activities may not be adequate, and what management changes are necessary to reverse the negative trend should there be any. Moreover, it is important to monitor the effectiveness of management strategies as well as current and potential threats to the identified HCVs and the conservation areas in the four estates.

Consequently, as a way of demonstrating total compliance with the RSPO requirements, and maintaining extant integrity, Presco Plc. has embraced the HCV concept as part of its standard operating procedures (SOPs), and incorporated it as environmental and social good practices. From the viewpoints of environmental responsibility, conservation of natural resources and biodiversity on one hand, and responsible development of new plantings, which include respecting local people's land-use rights as well as conserving natural vegetation on the other hand, the company has set aside areas within all estates in secondary forests, freshwater swamps, wetlands, ponds and lakes for biodiversity conservation while also enhancing improvement of identified HCVs and growth of new ones through environment-friendly, and international best practices in all dealings. To this effect, 5,303.3 ha of land have been designated, in secondary forests, freshwater swamp forests, wetlands pond and lakes, as conservation areas, and are being managed for enhancing biodiversity across the four operations areas.

1.2 Purpose of the Conservation Area and HCV Monitoring

This monitoring exercise aimed at assessing the current status of the conservation areas as a means of x-raying the effectiveness of the implementation of the adopted conservation strategies with a view to modifying or improving the existing management styles and action plans for a better result with protections of the conservation areas and biodiversity they contain as a management culture respected by all stakeholders.

In effect, this involved field assessment (verification) of the impacts of the management strategies by conducting biological surveys in the conservation and HCV management areas, where management actions are already being implemented through coordinated efforts using Eco-Guards (in Ologbo and Sakponba Estates), as well as the evaluation of the status of those areas not-yet covered (Obaretin and Cowan Estates) through constant patrols by Eco-Guards. The specific objectives were to:

- (i) assess implementation of the HCV and conservation areas management strategies and/or actions. This allowed for an appraisal of compliance with existing action plans and recommendations.
- (ii) evaluate the effectiveness of the current conservation areas management options in maintaining the ecosystems and/or enhancing the identified HCVs. This involved assessment of management objectives and whether the targets set out in the action plans are being met, or whether management prescriptions are sufficiently adequate to maintain the HCVs or enhancing their development as well as maintaining the ecological integrity of the conservation areas. This involved flora and fauna surveys and community consultations, where possible.
- (iii) investigate current and potential threats to the identified HCVs and conservation areas within the estates. This involved assessment of changes to the previously identified threats to the HCVs in the estates, monitor internal and external threats identified in the course of initial threat assessment process, and the possibility of new threats developing in the conservation areas.

1.3 The Specific Focus

- i. To follow up HCV action plans and recommendations (in audit form, to check what has or has not been implemented, and the existing gaps in implementations);
- ii. To survey flora and fauna RTE species and other indicator species as well as evaluation of the states of HCVs and the conservation areas;
- iii. Involvement in the implementations of certain activities and items of the action plans, based on the identified gaps in effectiveness of the existing management options and strategies;
- iv. Identifications of external, possible internal and potential threats to the identified HCVs and conservation areas, ascertaining their sources and causal factors.

2. THE CONSERVATION AND HCV MANAGEMENT AREAS

2.1 Description of the Areas

Generally, the conservation and HCV management areas are found across all the four Presco Estates, three of which are situated within Edo State in two local government areas (Ikpoba-Okha and Orhionmwon) and Ethiopie West Local Government Area in Delta State. The conservation and HCV areas fall within latitudes 5°45'0" and 6°11'0"N, longitudes 5°30'0" and 6°5'0" of Edo and Delta States in four concessions (Figure 1).

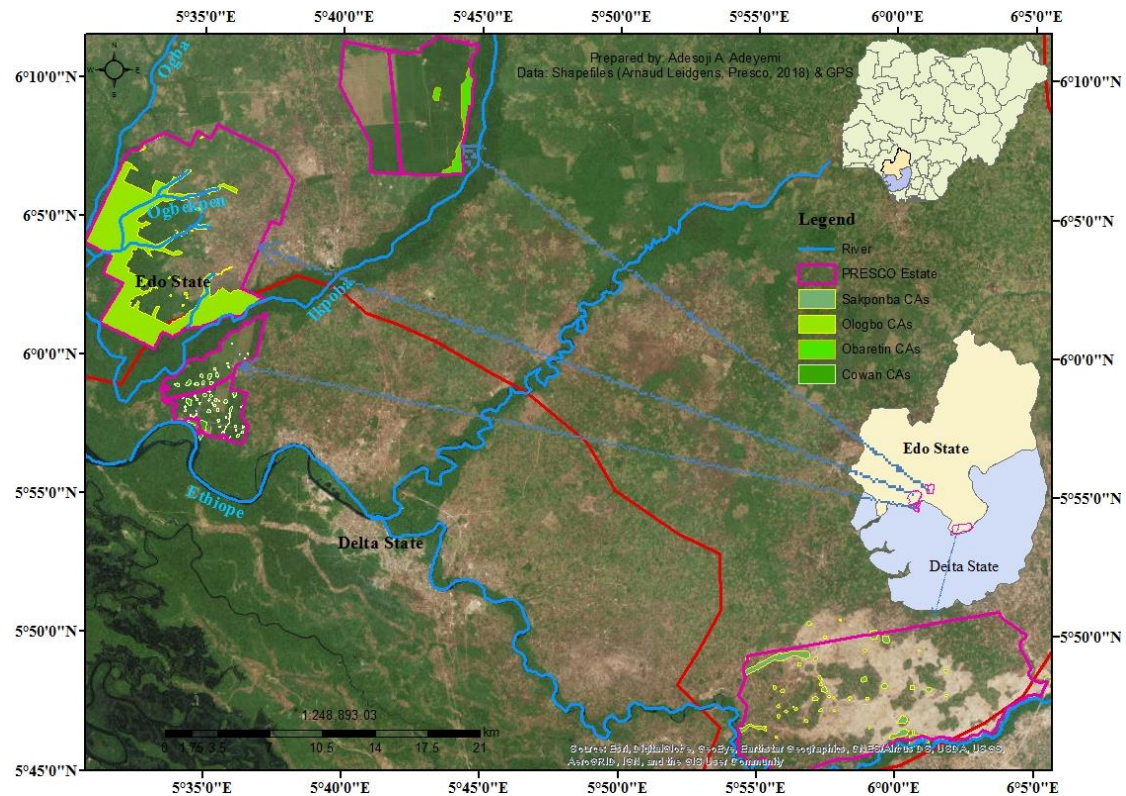


Figure 1: Map of Presco Estates showing the conservation and HCV areas

In specific terms, Obaretin Estate lies in the mid-eastern parts of the Ikpoba-Okha Local Government Areas (LGA), one of the 18 LGAs in Edo State (Figure 2).

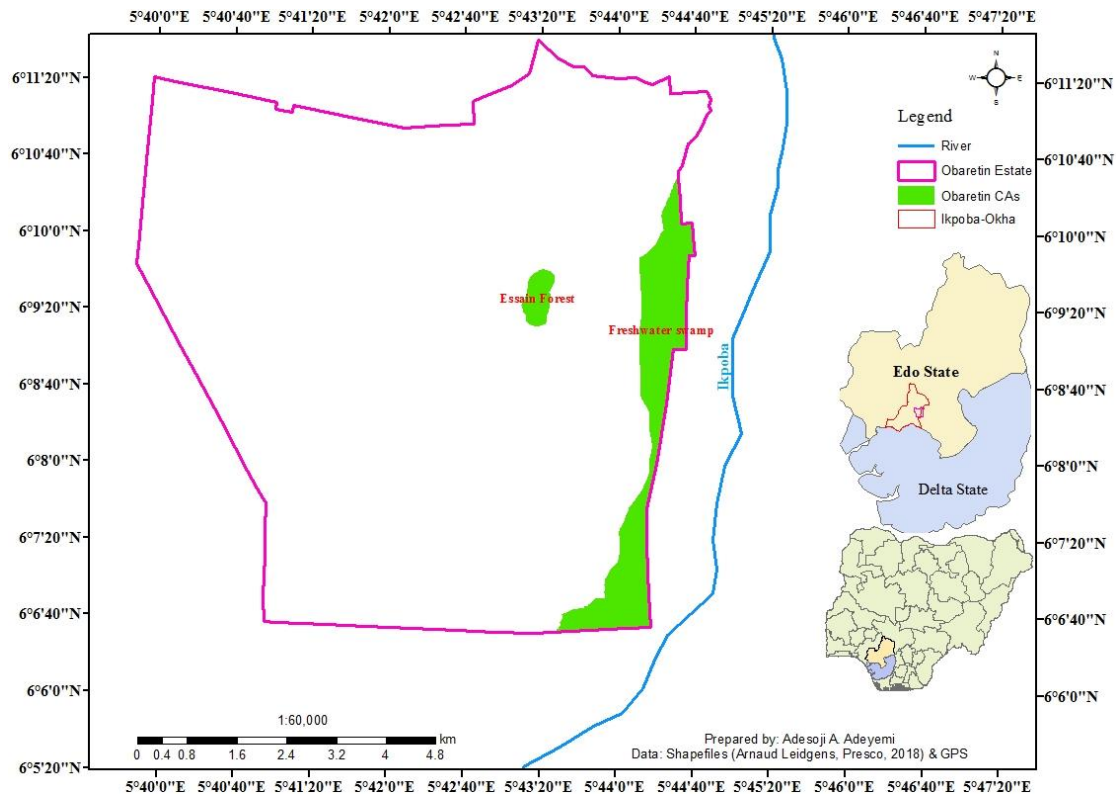


Figure 2: Map of Obaretin Estate showing the conservation areas

The Ologbo Estate is within latitudes 6°0'10" and 6°8'9"N, longitudes 05°30'0" and 05°37'40"E (Figure 3), and surrounded by a number of villages including Ikara, Ologbo, Ogbekpen, Iyanomor and Obayantor. The conservation areas within the estate are well over 25% of the entire concession.

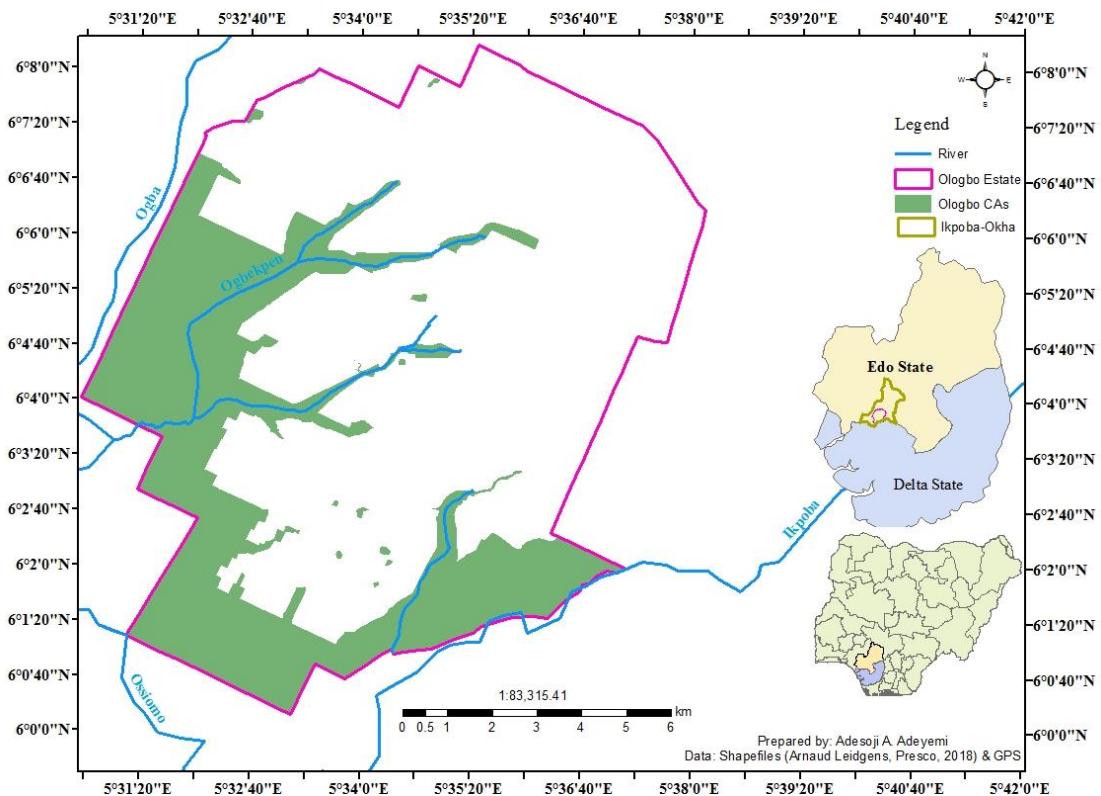


Figure 3: Map of Ologbo Estate showing the conservation areas

The Cowan Estate is located approximately 124 km south-west of Asaba (6°11.826'N, 6°43.674'E), the administrative capital of Delta State; and about 50 km to Warri (5°31'4.11"N, 5°44'49.89"E), the commercial capital of the state. Cowan Estate is about 2 km west of Oghara (5°56.961'N, 5°38.446'E), the headquarters of the Ethiope West Local Government Area. It lies between latitudes 5°57'50"N and 6°1'49"N; and longitudes 5°33'42"E and 5°37'15"E (Figure 4).

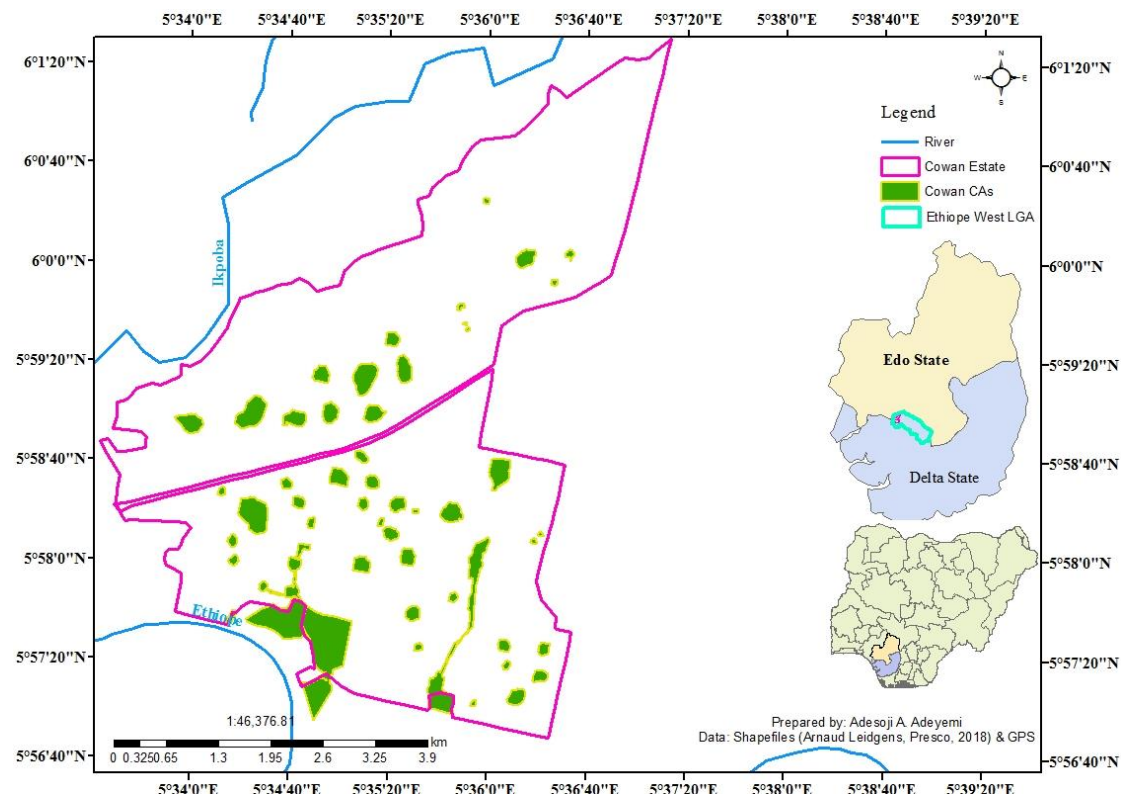


Figure 4: Map of Cowan estate showing the conservation areas

Sakponba Estate is located about 55 km southeast of Benin City, in Edo State of Nigeria within latitudes 5°44'40" and 5°50'40"N; longitudes 5°54'22" and 6°5'20"E (Figure 5). The estate is bordered to the north by the heavily degraded Urhonigbe Forest Reserve land (now the Sakponba Extension).

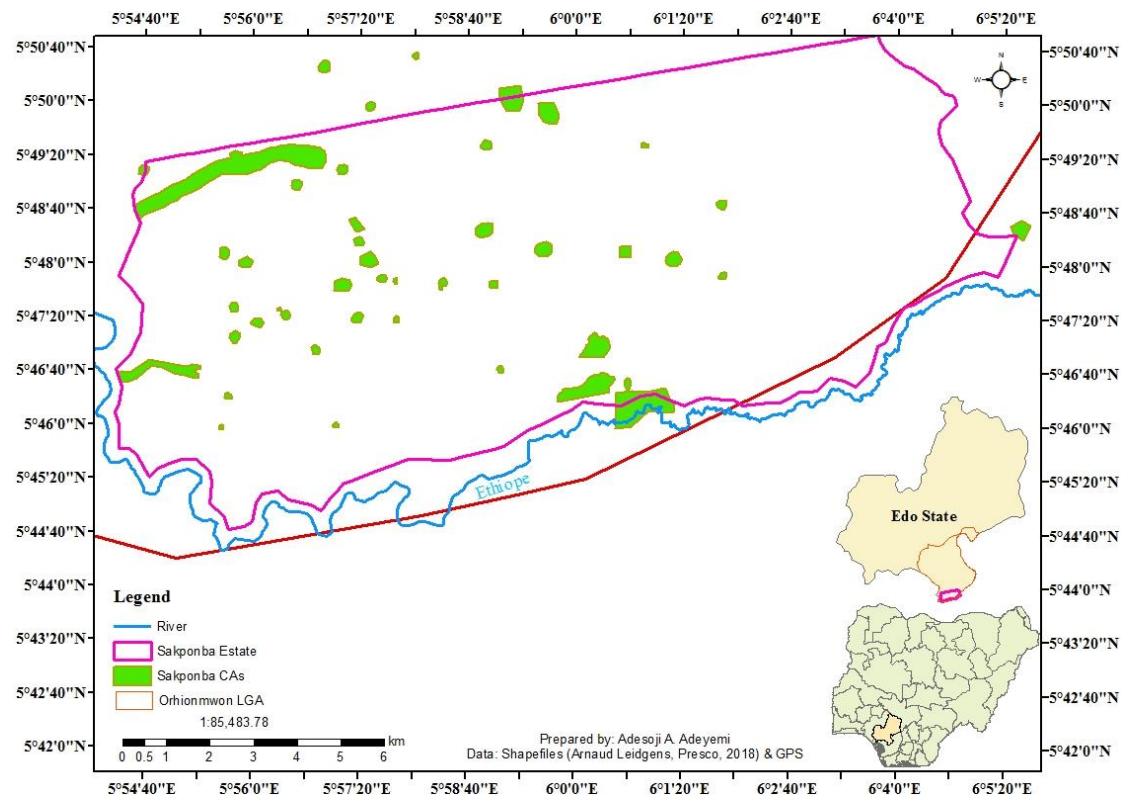


Figure 5: Map of Sakponba Estate showing the conservation and HCV areas

3. METHODS AND TIMELINES

3.1 Methods

Considering the dynamism of usual challenges in HCV management and conservation areas, which could make it difficult to make a sharp contrast between a decline in an HCV or HCV management and/or conservation areas occasioned by, or due to, weak implementation of management strategies, and that due to (well-implemented, but) ineffective management strategies, the following activities were carried out in the course of the monitoring exercise:

3.1.1 Document Review

Review of the existing HCV action plans, HCV reports and recommendations, past EIA and biodiversity reports were done to fully understand what the company set out to achieve in terms of managing the identified HCVs and the designated conservation areas as well as the identified threats to those areas and the values they harbour. To achieve this, all documents related to HCVs, including HCV reports, management action plans, and implementation plans were carefully studied. This helped to identify what parts of the recommendations have, or have not been implemented so far, and the current gaps in implementation procedures.

3.1.2 Fauna and Flora Surveys

This involved the use of systematic sampling technique using fixed transects and sample plots for flora species assessment within the HCV and conservation areas to record the relative or absolute abundance in the conservation areas and HCVs. To achieve this, grids of varied intervals and dimensions (between 500 m × 20 m and 1 km × 20 m) were superimposed on the maps of the four estates to ensure that representative samples of the conservation areas were captured (Figures 6 and 7), especially in Obaretin and Ologbo conservation areas. However, the sampling strategies were modified in Cowan and Sakponba conservation areas because of the peculiar natures of the conservation areas with most of them being wetlands and ponds (Figures 8 and 9). In addition, the existing transect laid by the eco-guards at Sakponba conservation areas were also used for the surveys, especially at Nyanchia. We could not lay additional transect(s) at Nyanchia to avoid disturbance of the ecosystem and its components, particularly faunal species.

In Cowan conservation areas GPS were used to mark the entrance of the transects and ensure a straight transects (where necessary, in the riparians and swamps) without cuttings to prevent disturbance and opening, which could encourage intrusions by illegal exploiters of forest resources. Similarly, laying of transects relied mostly on GPS coupled with the use of the already established (existing) patrol tracks. Also, new regenerations within the previously identified HCV management and designated conservation areas were assessed. Presence and abundance of plant species in connection with HCV 1 were recorded. Active searches were also employed for RTE flora species (e.g. *Cola nigerica* and *Gossweilerodendron balsamiferum* identified at Sakponba Estate) to capture the species that may fall outside transects or sample plots. The floral species were identified with professional skills, and by using appropriate field guides (Keay, 1989; Hawthorne and Gyakuri, 2006; Ndiribe and Illoh, 2007; Bown, 2013; Balogun, 2015; Ndiribe and Illoh, 2107).

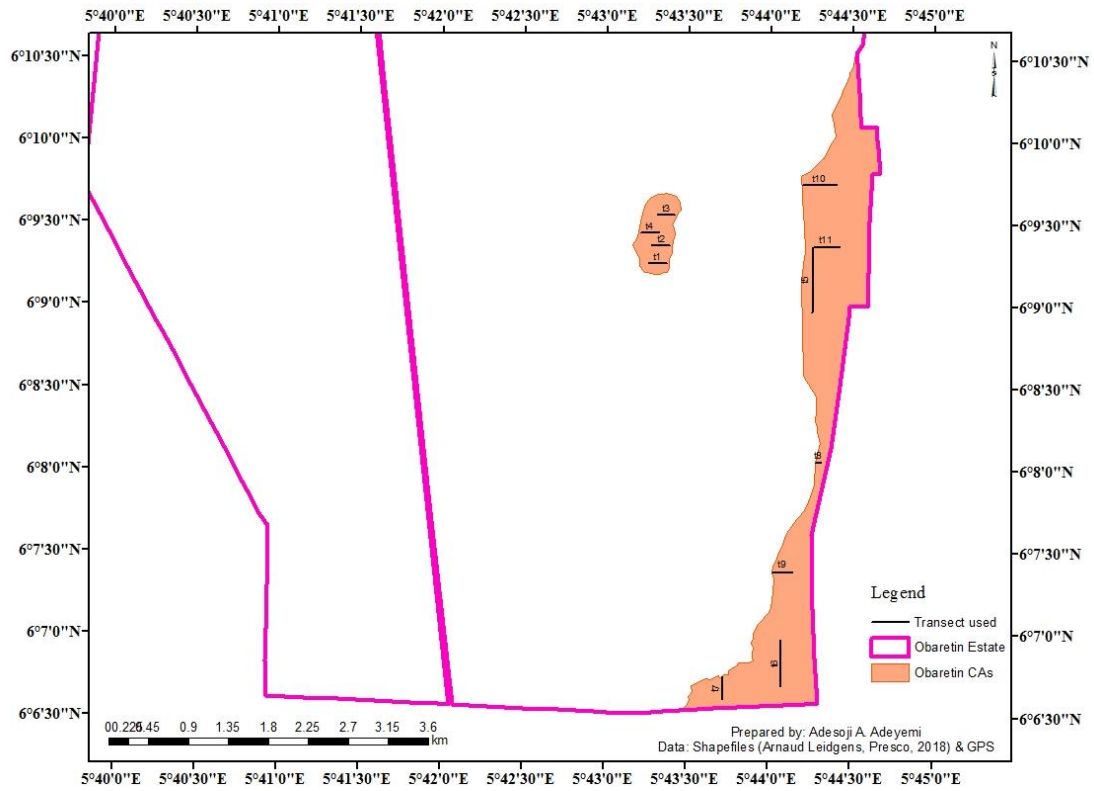


Figure 6: Map of Obaretin CAs showing the transects used for biological surveys

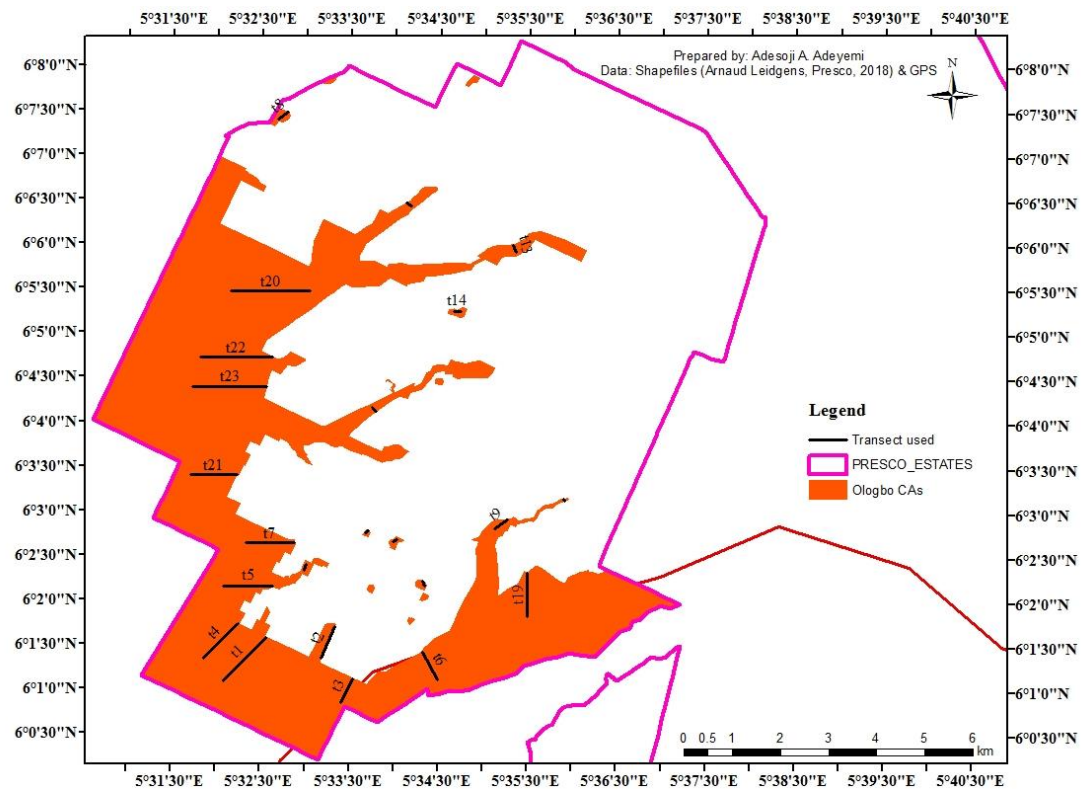


Figure 7: Map of Ologbo CAs showing the transects used for biological surveys

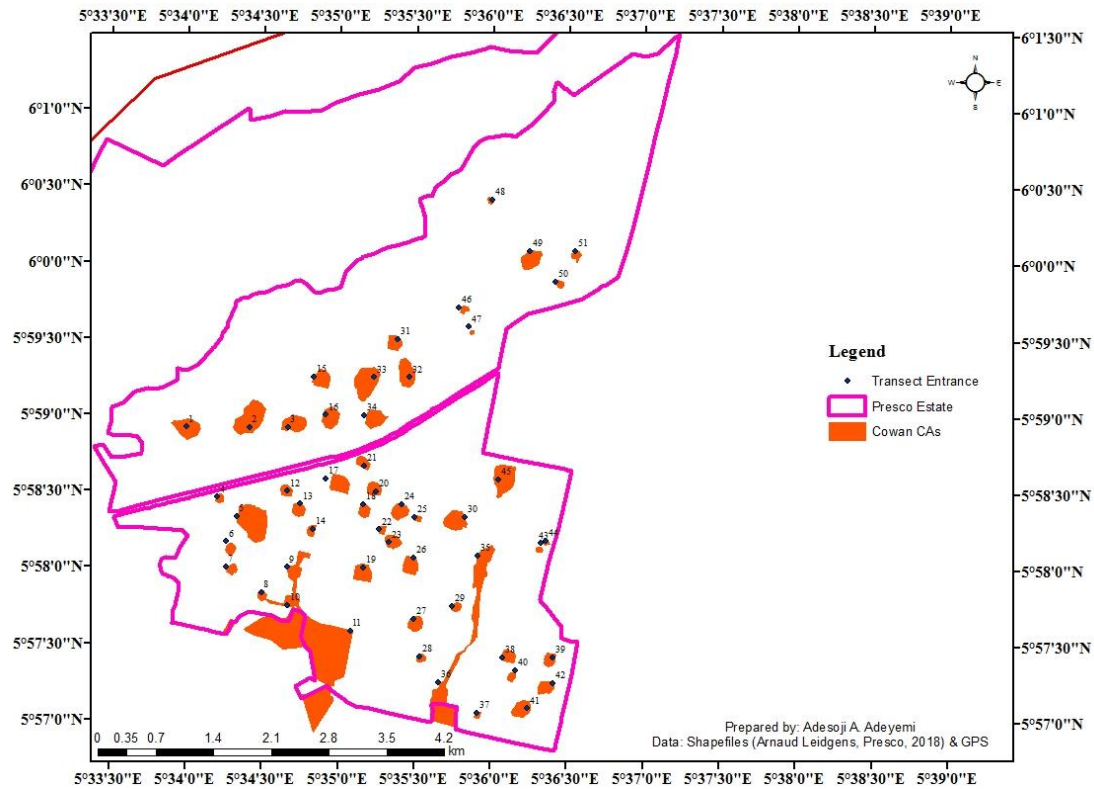


Figure 8: Map of Cowan CAs showing the locations for biological surveys

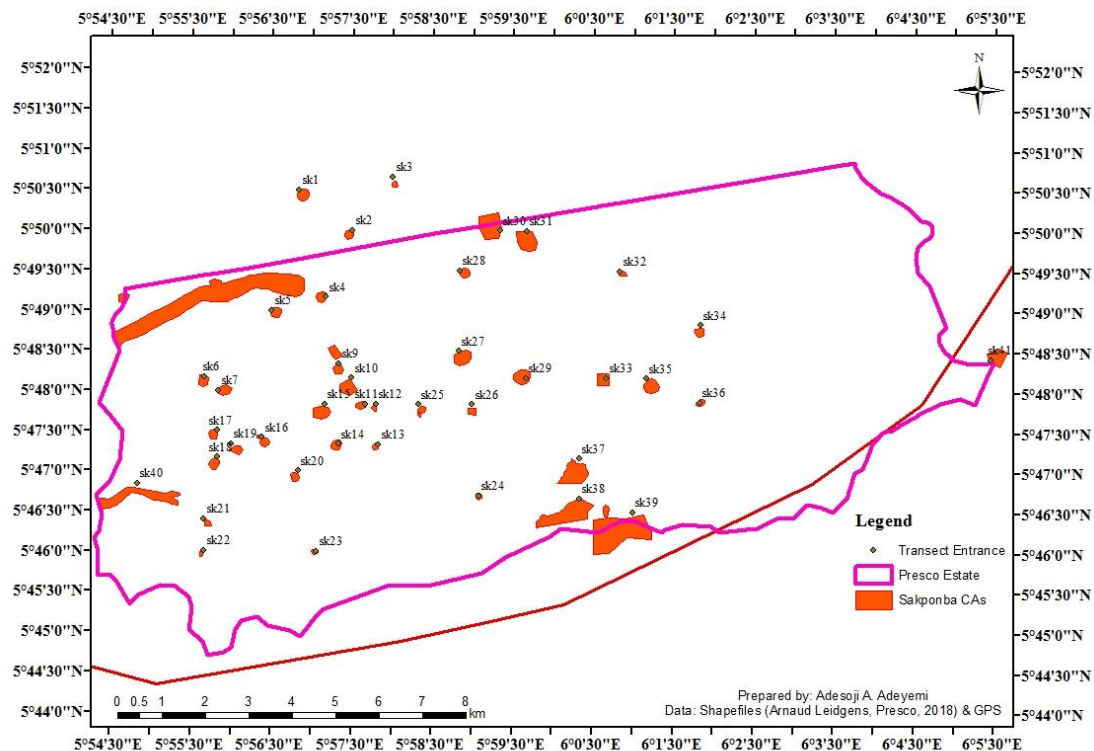


Figure 9: Map Sakponba CAs showing locations for biological surveys

In the case of fauna species, systematic transect walks were adopted to sample obvious animals, especially the RTE species as well as threats and disturbances to the HCVs, and in the conservation areas. The transect walks were done in slow and quiet manners (e.g. at a speed of 1 to 1.5 kmh⁻¹) along set routes (transects), and all

sightings, calls, or signs of animals, including species, behaviours and abundance were recorded. The point counts were used to sample the presence and density of birds. This involved standing at different locations, and recording sightings and calls of all observed birds. Transects were placed sufficiently far apart, as pre-determined by map grids to avoid repetition of same individuals being sighted multiple times. Active searches were also employed for locating particular HCV 1 individuals or nesting sites. With the help of field guides (Wilson and Reeder, 1993; Kingdon, 1997; Adeyanju *et al.*, 2012), additional information on presence of some wild mammalian and avian species was sought through the assistance of protection staff (eco-guards). Pictures in field guides were shown to the Eco-guards to aid in the identification of wildlife not encountered during survey.

Occupancy survey methods were also adopted for sampling rarer species, involving recording occurrence of species in different areas, based on signs such as footprints or dung, or feeding. In the case of HCV 2 and 3 monitoring, some areas or indicators which, if present, suggest that the ecosystem as a whole remains healthy were carefully selected, and assessed. This involved critical examination of structural composition and absence of threats to the HCVs and conservation areas. These approaches were replicated in the four estates.

3.1.3 Monitoring of Community Values

Monitoring of HCVs 5 and 6 were undertaken in a participatory manner involving local communities, to verify: whether the values are being maintained; if the value is being harvested, how sustainably done; the level of reliance on the value, conditions of value (e.g. Essain Shrine at Obaretin Estate; Ezenugbegbe, Arousa, Nyanchia and Egon-gougou Shrines in Sakponba Estate).

3.1.4 Local Community Consultations

Consultative meetings were held with cross sections of the populations of selected local communities (Plate 1). The objectives of this were for the team to understand the dependency on and / or activities of the host communities in the conservation areas and the HCVs, and to ascertain the social HCVs or specific conservation areas within the plantation that the local population depends on.



Plate 1: Cross sections of participant at the local community consultations expressing views on conservation areas

3.2 Timelines

Following the approval of the conservation areas and HCV monitoring proposal in June 2018, and subsequent discussions, the monitoring exercise was conducted early to mid-July, followed by reporting as presented in Table 1.

Table 1: Monitoring timelines for HCVs and conservation areas

Process steps	Main activities	Timeline (July 2018)			
		Wk1	Wk2	Wk3	Wk4-6
Document Review/field assessment	Review of HCV, EIA, SIA and other documents, Obaretin, Ologbo field surveys				
Field assessment continued, community consultations	Completion of Ologbo flora and fauna surveys. Local community consultations at Obaretin and Ologbo communities; Flora and fauna surveys at Cowan and community consultations; Commencement of Sakponba flora and fauna surveys				
Field assessment and community consultations	Completion of Sakponba flora and fauna surveys; Failed community consultations at Sakponba.				
Reporting	Drafting of report				
Finalization of report	Finalization and submission of report				

4.0 FINDINGS

Table 2 presents summary of the floras and diversity indices in the four estates. On the whole, more trees were encountered per hectare in Ologbo with least in Obaretin. Most of the species recorded in Obaretin were found in Essain Shrine with the freshwater swamp in the east of the estate denuded of valuable tree species, most of which must have been lost to illegal logging ravaging the area.

Table 2: Flora diversity and richness indices for conservation areas in the estates

Estate	Obaretin	Ologbo	Cowan	Sakponba
Parameter				
Species	29	93	29	75
Trees/ha	671	951	718	734
Dominance	0.085	0.032	0.077	0.034
Diversity Index	2.823	4.044	2.88	3.805
Evenness	0.58	0.613	0.614	0.599
Richness Index	4.302	11.51	3.941	11.22
Equitability	0.838	0.892	0.855	0.881

N.B: Dominance - degree to which a species is more numerous than its competitors in an ecological community; Evenness - how close in numbers each species in an environment is; Richness - number of different species represented in an ecological

community; *Equitability* - extent of the representation by equal numbers of individuals of the different species of a given community

4.1 Implementation of the HCV and Conservation Areas Management Plan or Recommendations

4.1.1 Obaretin Conservation Areas

Essain (Shrine) swamp forest, identified as HCVs 3 and 6 areas, is already mapped with clear boundaries as part of conservation measures, and sustainable management plan (Plate 2). The area of the forest is well-maintained as visibly seen. This forest is also a shrine being recognized by Obagie and Uroho communities as a sacred place, where no form of extractions or exploitations is allowed. This has greatly helped in preserving and maintaining the biodiversity of the area. The swamp is well-delineated, and the original extent of about 33.1 ha left for its sustainable management remains intact (Figure 10).



Plate 2: Conservation (warning) sign at Essain Swamp forest in Obaretin

Furthermore, there were no visible or disturbing signs of exploitation noticed within the swamp forest in the course of field survey. However, the situation in the freshwater swamp at the eastern border of the Obaretin revealed a heavily disturbed forest with profound signs of illegal loggings and unsustainable NTFP extractions. Although Presco has good intension, and has made good efforts to map out the area for conservation, activities of strangers, who were confirmed by people of Obagie and Uroho to be previous tenants before Presco's ownership of the land, are worrisome, and do not support conservation in any way. It appears the freshwater swamp at the eastern corner of the estate is not well-managed. In this regard, no conservation effort could be said to be yielding any positive result in the freshwater swamp contrary to

what obtained in the Essain Shrine swamp. Some of the rampant illegality in the forest include heavy logging, hunting, palm-wine tapping, NTFPs and fuel-wood extractions by strangers or previous tenants, particularly people from Delta State. Figure 10 shows HCVs 1, 3 and 6 areas.

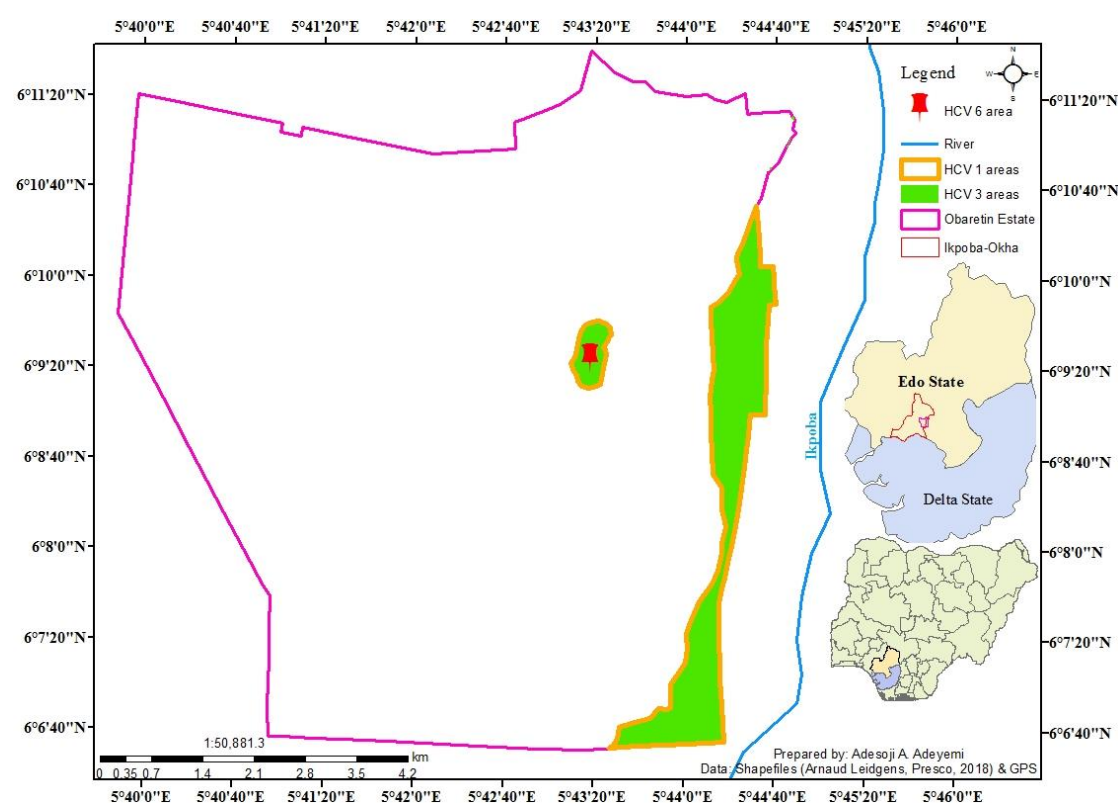


Figure 10: Map of Obaretin Estate showing the conservation and HCV areas

The previously identified HCVs 1, 3 and 6 in the area, especially the Essain Shrine swamp forest remained intact as summarized in Table 3.

Table 3: Summary of findings at Obaretin conservation areas

HCV	Definition	Present	Potentially present	Absent
1	Species diversity: Concentrations of biological diversity including endemic species, and rare, threatened or endangered (RTE) species that are significant at global, regional or national levels.			
2	Landscape-level ecosystems and mosaics: Large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national level and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.			
3	Ecosystems and habitats: Rare, threatened, or endangered ecosystems, habitats or refugia.			
4	Ecosystem services. Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.			

5	Community needs. Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples.		
6	Cultural values. Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or Indigenous peoples.		

4.1.1.1 State of the HCV 1: Species diversity

Flora, fauna and avifauna surveys were carried out in both the freshwater swamp and Essain Shrine forests to verify the presence or absence of species previously reported in the conservation areas.

Flora

Twenty-nine (29) tree species in 24 genera and 14 families were recorded with Dbh ≥ 10 cm (Annex 1a). Four (*Allanblackia gabonensis*, *Hallea stipulosa*, *Lophira alata* and *Nauclea diderrichii*) of which, (only seen) at the Essain Shrine forest (Figure 6), have been classified by IUCN as *vulnerable*, *Bridelia micrantha* (seen in the two conservation areas) is *least concern* (LC). The rest (24) of the flora species have not been assessed by the IUCN (IUCN, 2012). This serves as the baseline for subsequent evaluation since the previous assessment by Proforest (2017a) did not include detailed study of the flora species as at the time. Although Ogunjemite (2006 and 2007) carried out biodiversity surveys in Presco Estates, no specific references were made of the two conservation areas in Obaretin.

Fauna

Mammals

Four taxonomic groups including large mammals in four families (i.e. *Cercopithecidae*, *Suidae*, *Bovidae*, *Antelopinae*) were recorded. In total, there were eleven (11) mammalian species including the *vulnerable* (VU) and endemic white-throated monkey (*Cercopithecus erythrogaster*) in Plate 3, Mona monkey (*Cercopithecus mona*), common warhog (*Phacochoerus africanus*), Red river hog (*Potamochoerus porcus*), common duiker (*Sylvicapra grimmia*), Maxwell's duiker (*Cephalophus maxwelli*), bushbuck (*Tragelaphus scriptus*), striped ground squirrel (*Euxerus erythropus*), forest giant pouched rat (*Cricetomys emini*), Beecroft's anomalure (*Anomalurus beecrofti*) and fruit bat (*Epomophorus labiatus*) classified as *least concern* (LC) as (Annex 1b).

A taxon is *vulnerable* when the best available evidence indicates it is considered to be facing a high risk of extinction in the wild (IUCN, 2018). The endemic white-throated

and Mona monkeys belong to *Appendix I* animals as indicated by WCMC Status. According to the Convention on International Trade in Endangered Species (CITES) to which Nigeria is a signatory, *Appendix I* animals are species that are necessarily threatened with extinction, hence trade in specimens of such species is subject to strict regulation in order to avoid utilization that is incompatible with the survival of those species in the wild. The Endangered Species Decree No. 11 of 1985 categorized the two species in *Schedule 1*. By law, international trade in any of the two species is absolutely prohibited.



Plate 3: *Cercopithecus erythrogaster* sighted in Essain forest

In sum, eleven mammalian species as against the 13 species previously reported (Proforest 2017a) were encountered. Although the endemic white-throated monkey and common warthog (sighted in the freshwater swamp in the eastern part), hitherto unreported were encountered in the course of this survey. Nevertheless, Demidoff's Galago (*Galagoides demidovii*) was not recorded during the survey. Some of which may have been lost to hunting, particularly in the disturbed freshwater swamp.

Five species of ungulates were recorded during the survey, where the common warthog (*Phacochoerus africanus*) had the highest relative density (RD) of 7.14%. Other ungulates with their RD are the red river hog (2.23%), common duiker (4.02%), Maxwell's duiker (0.45%) and bushbuck (0.45%). Though all the ungulates encountered are of *least concern* going by the IUCN (2018), the common duiker, Maxwell's duiker and bushbuck belong to *Schedule 2* animals (international trade may be conducted under licence and strict regulations) in the Endangered Species Decree 11 of 1985.

All the rodents and bats are of *least concern* (LC) but belong to *Schedules 1* and *2* of WCMC and Decree 1, respectively. As such they do not qualify as threatened, near threatened, or (before 2001) conservation dependent.

Avifauna

Fifteen (15) families consisting of twenty-five (25) species of birds were recorded at Obaretin conservation areas (Annex 1b). The olive sunbird (*Cyanomitra olivacea*) and Vieillot's weaver (*Ploceus nigerrimus*) dominated the avifauna of the area with about 13% each of the species encountered. The yellow-casqued hornbill (*Ceratogymna*

elata), classified as *vulnerable* (VU) and African grey parrot (*Psittacus erithacus*) which is *endangered* (EN) were recorded in Essain forest and freshwater swamp, respectively (Annex 1b).

The 25 avifauna species encountered were fewer than the 40 species previously reported by Proforest (2017a). Nevertheless, the *vulnerable* yellow-casqued hornbill (*Ceratogymna elata*) and *endangered* African grey parrot (*Psittacus erithacus*) sighted during field surveys were not previously reported in Obaretin Estate. This may also be attributed to the disturbance in one of the conservation areas.

Herpetofauna

Three (3) reptilian (*Pythonidae*, *viperidae* and *veranidae*) families were encountered during the survey. In the IUCN Red List of Threatened Species, the rock python and Nile monitor lizard are *least concern* (LC) while the Gaboon viper and Ondo forest gecko are not-yet assessed (NA). In the WCMC Status, the royal python and monitor lizard appeared in *Appendix II* while in Decree No. 11 of 1985 (Happold, 1987), both are in *Schedule 1*. Presently, these reptiles, like other species, are affected by habitat loss occasioned by monocultures and excessive hunting. Also the two amphibians (African common toad and Nigerian banana frog) encountered during the study are of *least concern* (LC).

Invertebrates

A life form of the African giant land snail (*Archachatina marginata*) was encountered during the survey (Plate 4).



Plate 4: *Archachatina marginata* sighted the heavily degraded freshwater swamp

4.1.1.2 State of the HCVs 1 and 3: Rare threatened or endangered ecosystems

Although, none of the two forests could be classified as primary vegetation, the Essain swamp forest, about 33.1 ha has no clearly appreciable level of disturbance, since last assessment. It constitutes one of the rare ecosystems within the landscape. This forest is also recognized by Obagie and Uroho communities as a shrine, where

no form of exploitations is allowed. Thus, the Essain forest in the Obaretin Estate remained HCV 3 area, just as indicated in the previous HCV assessment. Between the periods of previous assessment and this monitoring exercise, there appears to be no unusual negative events or impacts on the forest as well as the HCV 1 in the Essain swamp forest.

The freshwater swamp, about 390.4 ha in the east of Obaretin Estate falls in this category. The area, however, currently witnesses heavy disturbance from various forms of exploitation including logging, hunting, palm-wine tapping, NTFPs and fuel-wood harvesting by strangers or previous tenants, particularly people from Delta State. It is worthy of note that the eastern freshwater swamp forest, which is now part of the conservatiuon areas in Obaretin was not covered in the first HCV assessment by Proforest (2017a).

4.1.1.3 State of the HCV 6: Cultural values

The Essain Shrine is confirmed to be a spiritual site by Obagie and Uroho communities, where elders and spiritual leaders meet occasionally, particularly during major festivals to offer prayers and sacrifices to deities. Obagie community performs annual rituals in December, which is usually supported by Presco Plc., as noted by the chiefs and elders. Therefore, HCV 6 still exists, as previously reported by Proforest (2017a). The integrity of the area is still being maintained by Presco, and the original extent remains largely intact. In addition, the Obagie people confirmed that they receive support from Presco for annual ritual at the site.

4.1.1.4 Outcome of Community Consultations in Obaretin Host Communities

Local consultations with communities, especially those at the periphery of the plantation, and whose activities could be within the operation influence of Presco Plc. in some way. To that effect, views and opinions of Obagie and Uroho people about the conservation areas were sought with a view to ensuring better management of the areas and the HCVs they contain. Table 4 presents the views of the local people in the course of the consultations.

Table 4: Outcomes of the community consultation at Obaretin host communities

Name of stakeholder	Date	Comments/concerns raised	Assessors response
The Odionwere (Pa Moses Omorogie Olchuro), other chiefs and representatives of the Obagie community	9 th July, 2018	1. The community acknowledged a good relationship with Presco, and that the presence of the company has benefitted them in many ways with electricity and water supply as good starting points. 2. The community indicated that they have a shrine called Essain, located within Obaretin plantation towards the east of the estate on 6°9'15" and 6°9'45"N, 5°43'10" and 5°43'24"E, where they perform annual ritual in	The assessor thanked the community for the time, and for providing useful information that will help managing the

		December of each year with financial support from Presco Plc. 3. The shrine is worshipped at a spot with a marked (<i>Alstonia boonei</i>) tree as the symbol of worship on 6°9'28"N and 5°43'12"E. 4. The community maintained that the company should do all possible to ensure that the shrine is not encroached in anyway, as they have no free access to the place, except during the annual ritual at the shrine. 5. They further stated that crying of a baby around the shrine is prohibited while hunting, fishing and any other form of extraction sacrilegious. By implication, any of the company staff (pregnant or nursing mother) should stay away from the shrine. 6. Meanwhile the community indicated that the logging, hunting and camping within the swamp forest at the far south-east of the estate are carried out by Deltans, especially Urhobos, who camped within the swamp to produce local gin and perpetrate other illegalities.	Essain Shrine (swamp forest).
Chiefs and representatives of Uroho community including HRH C.U. Ogieriakhi (the Enogie of Uroho), Elders and Youth representatives.	9 th July, 2017	1. The community maintained that they were the original landlord of the Obaretin Estate, and stated that they are at peace with Presco. 2. They however expressed displeasure over the ownership of the Essain Shrine, which is currently being served by Obagie community due to some period of neglect by their elders, who hitherto embraced Christianity. 3. The community wants recognition by Presco as the genuine custodian of the Essain Shrine, and offer them assistance to be able to make sacrifices and	The monitoring team thanked all the representatives in attendance, and informed them that all their concerns will be passed on to Presco management for considerations.

pacify their deities.

4. They noted that Uroho people were farming and collecting NTFPs in the area presently occupied by Presco before Presco took occupation of the land, especially *Thomatococcus danieli* leaves for roofing with permits from state government. They advised that Presco should do more for them to be less impacted by reduced land availability for farming.

5. The community indicated that they are not aware or participated in the illegal logging activities going on in the swamp forest, and that Urhobos from Delta State must be held responsible for the illegalities.

6. They however, confirmed that activities such as logging, hunting, fishing and tapping of raphia palm were taking place before Presco operations started, and that those responsible were paying royalties to Uroho community, but now that Presco has come, they took advantage of restricted access of Uroho community people, and continue with the activities without paying royalty to the community as previously respected.

4.1.2 Ologbo Conservation Areas

The HCV recommendations concerning Ologbo conservation areas have been implemented by the company. Specifically, all conservation areas have been mapped, and are under constant patrols by a team of eco-guards. Most of which are distinct as the boundaries are clearly marked with signs erected for recognitions (example in Plate 5), except along the Ogba and Ossiomo Rivers' boundaries, which is swampy (Figure 11) and almost inaccessible for constant patrols. However, these rivers serve as the natural boundaries in those axes.

To ensure continued protection of the conservation areas, the company's eco-guards are expected to implement daily patrols of the conservation areas to assess encroachment during which traps, snares and fishing nets are being removed and destroyed. It was also confirmed by the staff and local communities that Presco has been conducting series of awareness and capacity building trainings for staff and local

communities. No visible negative effects of agrochemicals were noticed in the conservation areas in the course of the fieldwork.



Plate 5: Conservation area (warning) sign at Ologbo Estate

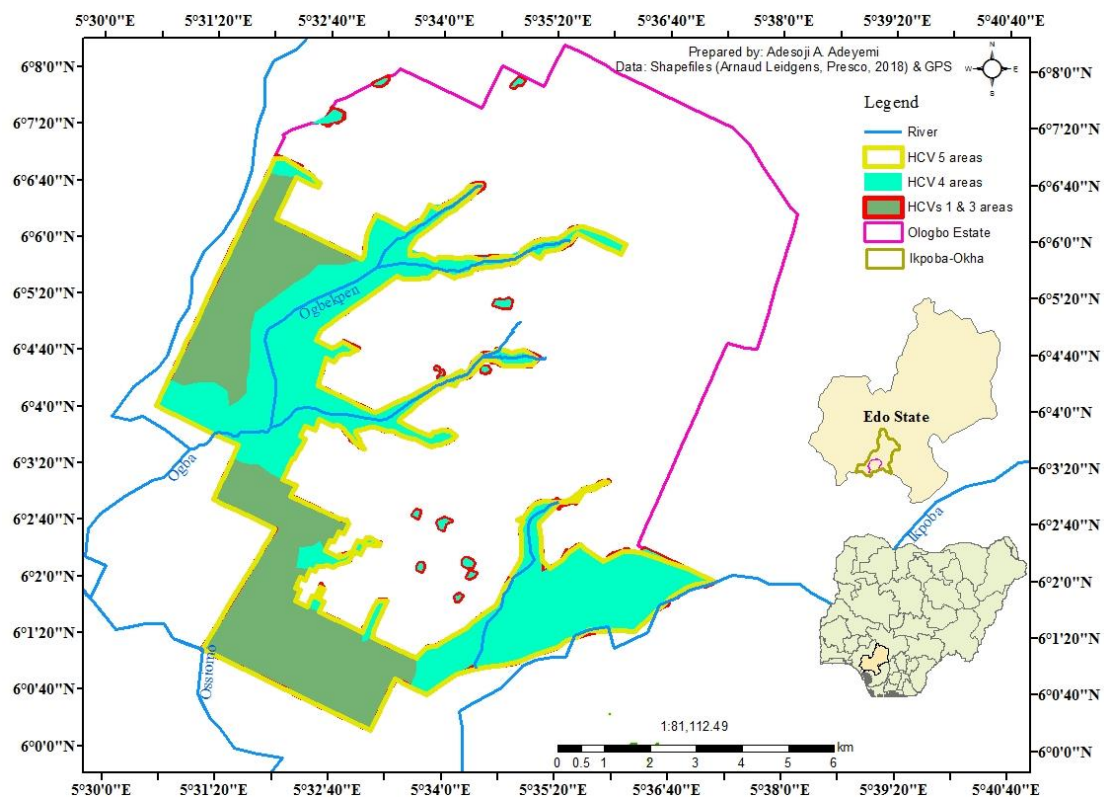


Figure 11: Map of the Ologbo Estate showing the conservation and HCV areas

People from host communities have been engaged by the company as either plantation staff, eco-guards or other units of the company operations as a way of providing alternative means of livelihoods. It is yet unclear whether Presco intends to provide other forms of alternative livelihood means for the host communities around the estate in form of skill acquisition, vocational training or other direct livelihood interventions, apart from direct employments.

During the community consultations, representatives of the communities confirmed that some of their people work with the company as plantation staff, however, none of them indicated that they have received any other alternative sources of livelihood from the company. Similarly, the local communities did not indicate that the company provided them with alternative options as substitutes to fuel-wood to ensure that exploitations noticed in the conservation areas are minimized. We assume this could be in pipeline, but not yet implemented as recommended. Consequently, people around the conservation areas still hunt, log and extract NTFPs of the conservation areas in an unsustainable manner. Nevertheless, all the communities visited noted that they are having continual engagements and negotiations with the company for better relationships.

The states of the Ologbo HCVs and conservation areas are presented in subsequent sections. Findings from the verification of previously identified HCVs are presented in Table 5. Although the lowland rain forest in the areas is partially disturbed in the swampy areas, the four previously reported HCVs remained present.

Table 5: Summary of findings at Ologbo conservation areas

HCV	Definition	Present	Potentially Present	Absent
1	Species diversity: Concentrations of biological diversity including endemic species, and rare, threatened or endangered (RTE) species that are significant at global, regional or national levels.			
2	Landscape-level ecosystems and mosaics: Large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national level and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.			
3	Ecosystems and habitats: Rare, threatened, or endangered ecosystems, habitats or refugia.			
4	Ecosystem services: Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.			
5	Community needs: Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for livelihoods,			

	health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples.		
6	Cultural values: Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or Indigenous peoples.		

4.1.2.1 State of the HCV 1: Species diversity

Flora

The Ologbo conservation areas are more of secondary forests, largely swampy with some riparian strips, and few pockets of wetlands within the landscape. These ecosystems contain an impressive concentration of ninety-three (93) flora species in 80 genera and 38 families. Twelve (12) of which (i.e. *Albizia ferruginea*, *Antrocaryon micraster*, *Entandrophragma angolense*, *Entandrophragma cylindricum*, *Khaya grandifoliola*, *Khaya ivorensis*, *Lophira alata*, *Mitragyna ledermannii*, *Mitragyna stipulosa*, *Nauclea diderrichii*, *Sterculia oblonga* and *Terminalia ivorensis*) have been classified as *vulnerable* (VU). Two (i.e. *Irvingia gabonensis* and *Milicia excelsa*) near *threatened* (NT) were also encountered in the areas. Although classified as *least concern* (LC), a good number of ten nationally-important tree species were also recorded. These include *Baphia nitida*, *Berlina grandiflora*, *Berlinia coriacea*, *Bridelia micrantha*, *Carapa procera*, *Celtis zenkeri*, *Cynometra hankei*, *Lovoa trichilioides*, *Parinari excelsa* and *Trema orientalis*. Other locally-important, but IUCN-yet-unclassified species recorded include those of the *Apocynaceae*, *Fabaceae*, *Meliaceae* and *Euphorbiaceae* families (Annex 2a). In sum, representatives of flora species previously reported (Proforest, 2015) were encountered with few other ones identified in the conservation areas, especially the lowland rain forest habitat.

Fauna

Mammals

Despite evidences of anthropogenic impacts occasioned by logging, poaching and other extraction activities that are not in consonance with conservation, the Ologbo conservation areas harbour a good number of mammals within the three habitat-types. The white-throated monkey (*Cercopithecus erythrogaster*), Mona monkey (*Cercopithecus mona*) and Senegal galago (*Galago senegalensis*) were the primates encountered during the field exercise, especially in the secondary lowland rain forest. White-throated monkey is a *vulnerable* (VU) species. White-throated and Mona monkeys belong to *Appendix I* animals as indicated by WCMC. The Endangered Species Decree No. 11 of 1985 categorized the two species as *Schedule 1*. According to the law, international trade is absolutely prohibited for these species of wildlife. Though of *least concern*, the Senegal galago (*Galago senegalensis*) belongs to *Schedule 2* animals of the Endangered Species Decree 11 of 1985. The relative

densities of the primates were 0.32%, 4.20% and 0.16% for *Cercopithecus erythrogaster*, *Cercopithecus mona* and *Galago senegalensis*, respectively.

Five species of ungulates including common warthog (*Phacochoerus africanus*), red river hog (*Potamochoerus porcus*), common duiker (*Sylvicapria grimmia*), Maxwell's duiker (*Cephalophus maxwelli*) and bushbuck (*Tragelaphus scriptus*) were encountered with RD of 3.7%, 10.6%, 1.13%, 0.16% and 1.46%, respectively. Although these five have been classified by the IUCN as *least concern* (LC), all the ungulates, except *Sylvicapria grimmia*, belong to *Schedule 2* animals of the Endangered Species Decree 11 of 1985.

All the rodents identified were of *least concern* (LC), going by the IUCN. The marsh cane rat (*Thryonomys swinderianus*) had the highest relative density of 14.55% and therefore more in abundance than other rodents that recorded 1.30%, 0.48%, 0.16%, 0.64%, 4.85% and 0.32% for striped ground squirrel, African giant squirrel, Gambian sun squirrel, Beecroft's anomalure, forest giant pouched-rat and brush-tailed porcupine, respectively. The presence of palatable and abundant grass, especially the periphery of the secondary forest and wetlands, favours cane rat existence in the conservation areas. According to Endangered Species Decree 11, all the rodents belong to *Schedule 2* animals, except the forest giant pouched-rat and marsh cane rat with no status. Brush-tailed porcupine (*Atherurus africanus*) belongs to *Schedule 1*.

Other mammals encountered at Ologbo conservation areas were Epauletted fruit bat (*Epomophorus labiatus*) and Nigeria white-toothed shrew (*Crocidura nigeriae*). The carnivores found in Ologbo conservation areas included African palm civet (*Nandinia binotata*), wild cat (*Felis sylvestris*), marsh mongoose (*Atilax palodinosus*), slender mongoose (*Herpestes sanguinea*) and common genet (*Genetta genetta*). All the carnivores are *least concern* (LC), going by their IUCN classifications.

Avifauna

A total of twenty-six (26) bird species in 23 genera and eighteen (18) families were encountered during the survey at Ologbo Estate. The family *Ploceidae* (weavers and sparrows) recorded more species than the others. The village weaver bird (*Ploceus cucullatus*) had the highest relative density of 9.69%, and this is followed by spectacled weaver (*Ploceus nigricollis*) and crested malimbe (*Malimbus malimbicus*) with RD of 7.27% and 6.47%, respectively. Twenty-four (24) of the bird species encountered are *least concern* (LC), except the yellow-casqued hornbill (*Ceratogymna elata*) and African grey parrot (*Psittacus erithacus*) that have been classified as *vulnerable* (VU) and *endangered* (EN), respectively.

Herpetofauna

The herpetofauna was represented by eight reptilian families and the Anuran order of the class *Amphibia*. The reptilian families of *Pythonidae*, *Viperidae*, *Elapidae*, *Veranidae*, *Gekkonidae*, *Agamidae*, *Scincidae* and *Testudinidae* are represented by rock python, Gaboon viper, black cobra, Nile monitor lizard, Ondo forest gecko, agama lizard, Guinean forest skink and Home's hinged-back tortoise, respectively. Some of these species like the rock python and monitor lizard are of conservation importance as they are protected as *Schedule 1* animals by the Endangered Species Decree 11 of 1985. The Home's hinged-back tortoise is *vulnerable* (VU) according to

the IUCN classification. The only anuran encountered is the Nigerian banana frog (*Afrixalus nigeriensis*), which is of *least concern* according to the IUCN categorization.

Invertebrates

Two (2) invertebrates encountered in this study are the African giant land snail (*Archachatina marginata*) and African freshwater crab (*Sudanonautes africanus*), both of which are of *least concern* (LC).

Considering the impressive presence of significant concentrations of rare, threatened, endemic and endangered flora and fauna species, which spread across the three habitat-types, especially in the swampy secondary forest, which constitutes the large chunk of the conservation areas, with others seen in wetlands and riparian forests, Ologbo conservation areas remained HCV 1.

4.1.2.2 State of the HCV 3: Rare threatened and endangered ecosystem

The three major habitat-types were previously characterized by CIRAD (2008) as potentially qualified to be HCV 3 since they were recognized as not-sufficiently rare enough to warrant classification as HCV 3 at the time. However, the areas have become very increasingly significant, going by the continued disappearance of most forest covers in most of the constituted forest reserves of southern Nigeria, especially in Edo State, and the inadequate protection of remaining forests occurring in Nigeria's protected areas, except in some inaccessible terrains. This provided grounds on which classification by Proforest (2015), wherein the lowland (secondary) rain forest and riparian swamps as well as the wetlands were based. These areas have been mapped, and remained unconverted. Based on our findings, it can be said that most of the HCV 1 previously reported in the conservation areas are still present. This is not to say that illegal hunting and logging have not impacted negatively on the flora and fauna population in the areas, but the efforts of eco-guard team in ensuring that such illegalities are minimized is commendable. This first monitoring serves as the basis for gauging subsequent successes in improving and enhancing HCV 1 species.

4.1.2.3 State of the HCV 4: Areas that provide basic services of nature in critical situations

Findings during field survey and community consultation revealed that the Ogbekpen and Ogba Rivers in the west and east of the lowland rain forest of the conservation areas are a source of drinking water, and fishing sites for some Ogbekpen and Ikara inhabitants. In addition, Proforest (2015) has cited Verwilghen and Chambon (2008) as saying that the smaller tributaries of Ogba and Ossiomo Rivers are used as water sources for some people of Ikara at the far south of the estate. Therefore, the rivers could be considered critical for maintaining water quality of these tributaries. These rivers as well as the tributaries are protected by the riparian forests along their courses.

Furthermore, large areas of freshwater swamp in the conservation area, particularly at the edges of the Ogbekpen and Ogba rivers are still very unique in maintaining ecosystem equilibrium, and as such play key roles in providing the necessary buffers

to the rivers and streams within the conservation areas while maintaining bank stability. Moreover, the wetlands in the conservation areas are important ecosystems, providing refuges for unique species of avifauna. These areas remained as previously reported, and have not been tampered with or affected by conversion or planting operations.

4.1.2.4 State of the HCV 5: Areas fundamental to meeting basic needs

Findings from the community consultations confirmed that, though illegal, some of the villages still rely on the lowland rain forest and freshwater swamp and its resources to some extent (details in Table 6), with Ikara community appearing to be more reliant on natural resources available in the conservation areas than Ogbekpen and Ologbo communities. There were misconceptions by the representatives of Ikara community that the company was using armed eco-guards to harass them during exploitation of resources in the conservation areas, and an interaction with the eco-guards confirmed that some of the culprits arrested within the (conservation areas) were from Ikara Village. But it is clear that eco-guards did not, and (still) do not, carry out any arrest, only Presco's security personnel do so when receiving reports of illegal activities in the conservation areas from the eco-guards.

It seems that Ikara people have not completely relented in their quests for the forest resources of the conservation areas, especially the lowland rain and freshwater swamp forests. This development is contrary to the impression given to the previous report (Proforest, 2015) that the Ikara people still have access to other land for farming, and therefore, they posed no threat to the conservation areas.

4.1.2.5 Outcome of Community Consultations in Ologbo Estate

Representatives from the local communities were interviewed to share any comments and/or concerns they may have in respect of the Ologbo conservation areas, on management efforts in general, and specific matters relating to HCVs. Table 6 summarises outcomes of the local consultations.

Table 6: Outcomes of the community consultation at Ologbo host communities

Name of stakeholder	Date	Comments/concerns raised	Assessors response
Odionwere (Chief Godwin Omoregie) and representatives of Ogbekpen Community	10 th July, 2018	1. The community indicated that Presco should open up the road that leads to their farmlands and the Ogudugu Shrine at the other side of Presco Plantation in order to access the shrine, when necessary. 2. The representative of the community complained about non-availability of land for farming. They noted that all the benefit they were deriving from the former Ologbo Forest Reserve ceased since Presco	The team thanked the community for their time, and promise to relate all their concerns to the company.

		operations started.
Olaraja (Pa Samuel Egbiwe) and Representatives of Ikara community	10 th July, 2018	1. Representatives of Ikara confirmed that they have had a long-term relationship with Presco. 2. They however alleged that the company's Eco-guards may be responsible for aiding some of the illegality using the opportunity of restricted access to exploit the resources in the conservation areas, especially the fish, wildlife resources as well NTFPs (internal threats). 3. The people complained of denied access to the lakes in the conservation areas, from which they previously fished. 4. They want the Ikara-Igbokolo road to be opened up by Presco, or providing other alternative access route 5. Having accepted that there was possibility of some members of the community to have engaged in hunting, fishing and NTFPs extractions, they urged Presco to assist with alternative means of livelihood such as skill acquisitions in order to desist from illegal operations within Presco's conservation areas. 6. They also stated that Eco-guards are armed, therefore they felt the company is terrorising them with Eco-guards.
Elders and representatives of HRH, Prince Owen Akenzua of Ologbo Community	10 th July, 2018	1. Representatives of Ologbo Community confirmed that they were logging, fishing, hunting and collecting NTFPs from the conservation areas before Presco started operations, and from the body language, it is not impossible that these have not been stopped completely by the community. 2. They cited the monkey bridge as one of the hunting spots in the past.

3. They urged Presco to replicate what they are doing in the other host communities at Ologbo, in form of corporate social responsibilities so that the peace can continue to thrive between the two stakeholders.

4.1.3 Cowan Conservation Areas

All the conservation areas in Cowan Estate have been mapped with clear and well-maintained boundaries, having conservation signs erected for recognitions (Plate 6) in most of the conservation areas (only few ones are still without signs), which set out a clear intension for conservation and sustainable management. However, some of the ponds are still devoid of sufficient vegetation covers that are necessary to preserve the biodiversity and water quality.



Plate 6: Conservation area (warning) sign at a pond in Cowan Estate

The recommendation to rehabilitate the areas within 20 m radius of the less-vegetated pond boundaries is **not yet** implemented. However, the company may have intention of doing this just as it is being done in Ologbo Estate, where new plantings of indigenous tree species were noticed as a form of rehabilitation. This, if replicated in Cowan, especially around the ponds, would better protect the ponds from hot weather. Nevertheless, all streams within the conservation areas are well-protected with riparian buffers.

The company recognizes the Uton Ajaka shrine, the only HCV 6 within the estate, and now situated within the HCV 5 area, as presented in the next section. The Ajagbodudu Community also confirmed that the HCV 6 area is well-managed, and that they are satisfied with the level of recognition by the company. The present states of all the previously reported HCVs are presented in the subsequent sections.

Table 7: Summary of findings at Cowan Conservation areas

HCV	Definition	Present	Potentially present	Absent
1	Species diversity: Concentrations of biological diversity including endemic species, and rare, threatened or endangered (RTE) species that are significant at global, regional or national levels.			
2	Landscape-level ecosystems and mosaics: Large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national level and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.			
3	Ecosystems and habitats: Rare, threatened, or endangered ecosystems, habitats or refugia.			
4	Ecosystem services: Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.			
5	Community needs: Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples.			
6	Cultural values: Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or Indigenous peoples.			

4.1.3.1 State of the HCV 1: Species diversity

Flora

A total of 29 tree species in 27 genera belonging to 18 families with Dbh ≥ 10 cm were identified in the patches of disturbed riparian forests and wetlands (Annex 3a), including four 4 *vulnerable* (VU) species (i.e. *Albizia ferruginea*, *Allanblackia gabonensis*, *Hallea stipulosa* and *Nauclea diderrichii*). Most of the tree species were identified in the riparian forests. The *Nauclea diderrichii* stems were found to be predominant in one of the freshwater swamps (Figure 12), which appeared to be

disturbed by hunting and NTFPs collection. Besides, the riparian wetlands have been considered to be areas of high conservation value due to the potentially-sensitive biota associated with them (Proforest, 2017b).

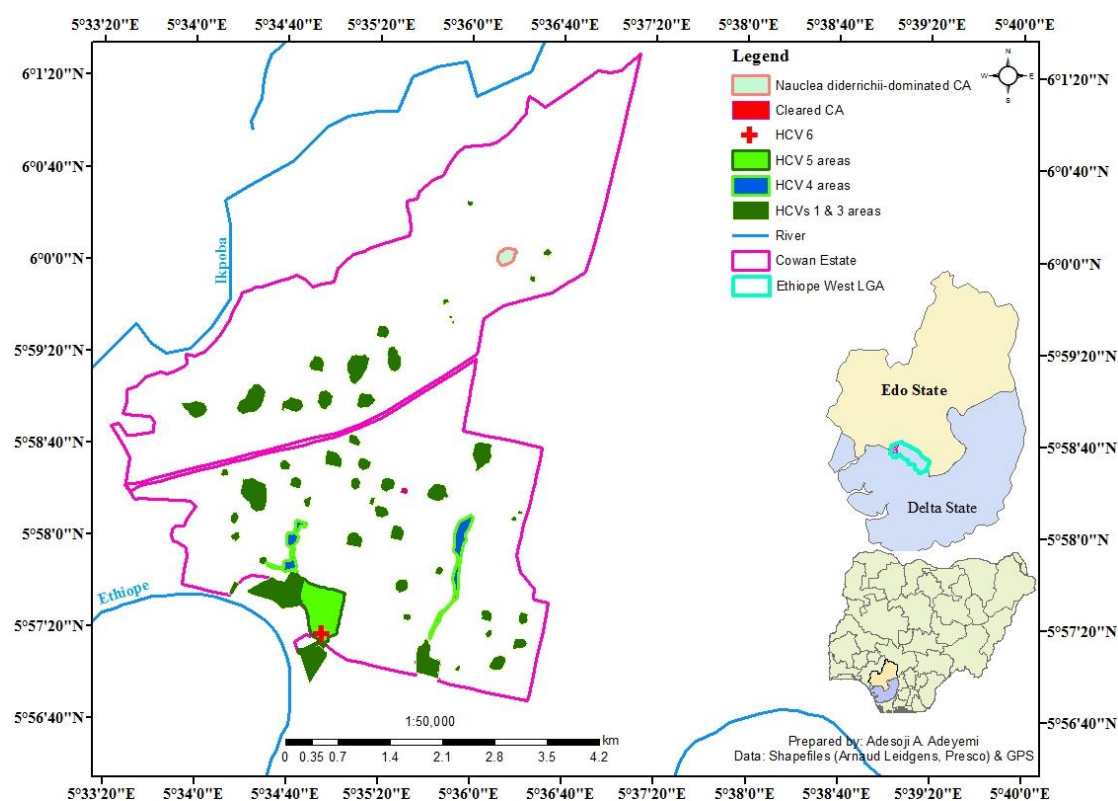


Figure 12: Map of Cowan Estate showing the conservation and HCV areas

Fauna

Mammals

The mammals of Cowan conservation areas are conspicuously represented by rodents, ungulates and carnivores. Six (6) species of rodents common to the area are striped ground squirrel (*Euxerus erythropus*), African giant squirrel (*Protoxerus stangeri*), Gambian sun squirrel (*Heliosciurus gambianus*), forest giant pouched rat (*Cricetomys emini*), marsh cane rat (*Thryonomys swinderianus*) and the shaggy swamp rat (*Dasyms incomptus*) as shown in Annex 3b.

Two species of ungulates including the common duiker (*Sylvicapria grimmia*) and bushbuck (*Tragelaphus scriptus*) were recorded at Cowan conservation blocks. At the national level, both species belong to animals in *Schedule 2* of the Endangered Species Decree 11 of 1985. They also belong to WCMC *Status I*. For the carnivores, wild cat (*Felis sylvestris*). The African palm civet (*Nandinia binotata*), marsh mongoose (*Atilax paludinosus*) and common cusimanase (*Crossarchus obscurus*) were encountered in the areas, and they all belong to *Schedule 2*.

All the mammals encountered are *least concern* according to the IUCN Red List of Threatened species. The riparian forest appeared very disturbed, and as such no mammalian species was recorded. Most of the mammals were found in the vegetation around the ponds and swamps within the oil palm plantation. This may be because of

food availability in the plantation, and the fact that the animals are less-threatened in those habitats, compared to the riparian vegetation, where hunting appeared to be intense. Signs of hunting using serial snares (traps) were seen in the riparian forest, just as hunting was confirmed to be happening by the youth of Ajagbodudu community.

Avifauna

Fifteen (15) avian species represented in seven (7) families were encountered in the Cowan conservation areas. Among the common families were the *Ploceidae* (weavers and sparrows), *Ardeidae* (Egrets and herons) and *Anatidae* (ducks). The black-headed weaver (*Ploceus melanocephalus*) predominated with a relative density of 58.46% in Cowan. This was followed by Hartlaub's duck (*Pteronetta hartlaubii*) and great white egret (*Ardea alba*) with relative densities of 15.95% and 10.14%, respectively (photo in Plate 7). Although all the identified bird species are *least concern* (LC), Grey-headed sparrow (*Passer griseus*), Black kite (*Milvus migrans*) and African harrier hawk (*Polyboroides typus*) are *Schedule 1* animals. Similarly, the Great white egret (*Ardea alba*) and Black-headed heron (*Ardea melanocephala*) are *Schedule 2* animals.



Plate 7: *Ardea alba* and *Pteronetta hartlaubii* sighted in ponds of Cowan Estate

Herpetofauna

The rock python (*Python sebae*), black cobra (*Naja nigricolis*) and Nile monitor lizard (*Varanus niloticus*) were the three species encountered during the faunal survey. Two habitat-types that support herpetofauna exist in Cowan Estate. The swamp forest protects the monitor lizard while the ponds support the royal python. Pythons and monitor lizards are only recognized nationally as *Schedule 2* animals of the Endangered Species Decree 11 of 1985.

4.1.3.2 State of the HCV 3: Rare, threatened and endangered ecosystems

All swamps, wetlands (**except the one** in red in Figure 12) and ponds in the Cowan conservation areas, which constitute HCV 3 areas are still intact. However, HCV 1 species within the conservation areas appeared threatened by the activities of the local

people, who collect NTFPs and hunt (illegally) through trapping in the riparian vegetation.

4.1.3.3 State of the HCV 4: Areas that provide basic services of nature in critical situations

Protection of watersheds and regulation of regulate stream flow

Riparian vegetation in the conservation areas still protect the two streams and preserve water quality by trapping sediments and pollutants associated with run-off, helping recharge underground aquifers, dissipating stream energy during floods, and providing detritus for aquatic organisms. No logging was noticed in any of the riparian forests, except the exploitation of the NTFPs, which was confirmed to be happening within the riparians by the two local communities.

4.1.3.4 State of the HCV 5: Areas fundamental to meeting basic needs

Basic needs and collection of NTFPs

There is still a relatively large area cultivated by the Ajagbodudu community in the south of the estate. The area was argued to serve as a critical source of basic needs for the community, which is said to be crucial to the livelihoods of the people in the community. Besides, the people of Oghareki and Ajagbodudu communities indicated that they do collect a range of NTFPs such as leaves (vegetables) and herbs from the landscape, especially the riparian forests. They also indicated that they harvest fish and other aquatic resources from the ponds within the estate (all of which are now designated as conservation areas), especially during festivities in December of every year.

The Ajagbodudu community noted that the ponds were inherited from their ancestors and they are known to produce natural sources of protein from time immemorial, and that no alternatives could be said to be suitable in replacing the resources obtainable from the ponds. In addition, Ajagbodudu community indicated that they still hunt in the riparian forests as well as wetlands. Signs of fishing were also noticed in the streams within the riparian vegetation. Thus, the riparian vegetation along the water bodies and the ponds are still being used by the two host communities.

The findings suggest that parts of the conservation areas are fundamental to meeting the basic livelihood needs of the local communities, e.g. subsistence. HCV 5 is therefore verified to be present. However, the current findings extend the areas of values to the local communities to include all the fishing-viable or active ponds within the conservation areas.

4.1.3.5 State of the HCV 6: Cultural values

Sites of local cultural/traditional or religious importance

Ajagbodudu community indicated having a sacred site (Uton Ajaka Creek), which is located partly in the estate and partly outside (HCV 6). The recognized central site of

the shrine is located within Field 14 (HCV 5 area) on 5°57.281'N, 5°34.938'E in the creek, not far from the community. The area, according to the community is recognized and preserved by the company.

4.1.3.6 Outcome of the Community Consultations

Representatives from local communities were interviewed to share any comments and/or concerns they may have in respect of the Cowan conservation areas, on their views, management efforts in general, and specific matters relating to HCVs. Table 8 summarises outcomes from local consultations.

Table 8: Outcome of consultations in Cowan host communities

Name of stakeholder	Date	Comments/concerns raised	Assessors response
The Unugbrogodo of Oghareki (Chief Destiny Okare), Elders and representatives of Oghareki	13 th July, 2018	1. People of Oghareki affirmed that there exists a long-term relationship between the community and the company, and that there has been very good interactions between the two parties. 2. They, however, complained that Presco has taken their ponds, where they used to fish during festivities, especially December Period, and turned it to conservation areas. They noted that the fishing is only for subsistence, and that there cannot be any substitute for that. 3. They stated that they are ready to partner with Presco to ensure that their women fish in the ponds without tapering with the company produce or resources. 4. They noted that there were NTFPs collections in the (now) conservation areas before Presco came, but these are not happening anymore. 5. The representatives stated that it would be good if Presco can plant some of the NTFPs they extracted from the conservation areas, particularly the <i>Iroghoje</i> (a native spice) outside the conservations areas for community to harvest. This would reduce intrusion into the conservation areas.	The team thanked the representatives of the community for sharing their views concerns about the conservation areas.

		6. Elders of Oghareki noted that hunting signs (snares) noticed at the boundary between the conservation area and plantation could be internal, perhaps by the field workers or security staff of the company.	
Elders and representatives of Ajagbodudu Community led by Mr. Mebelahaji Samson	13 th July, 2018	1. The community confirmed that despite the installation of the conservation area sign posts, fishing is still on-going by the people of the community. 2. They noted that the ponds are their ancestral heritage, and fishing in festive periods is a part of their custom. Hence, Presco should consider their stand on fishing in the ponds and leave the ponds to them for fishing to avoid unnecessary frictions between the two parties.	The team thanked the chiefs, elders and representatives of the community for sharing their opinions about the conservation areas.

4.1.4 Sakponba Conservation Areas

The results from the flora and fauna surveys are detailed in the subsequent sections, which include those encountered in Nyanchia riparian and Awa riparian buffers, ponds and wetlands. The Nyanchia forest (HCV 1), within which an HCV 6 (Nyanchia Shrine) is situated, is under constant patrols by a committed team of eco-guards. This goes for all the conservation areas in Sakponba Estate including ponds, secondary forest, swamps and wetlands. Although there are no disturbing signs of hunting and NTFP extractions in the conservation areas, it was not possible to verify from the local communities around the estate whether there were good collaborations between the company and the host communities to ensure sustainable management of the designated conservation areas.

All the conservation and HCV areas are already mapped, and there is adequate action plan already in place for their management. However, three swamps have been affected (partly destroyed) by land preparations and road construction (Figure 13).

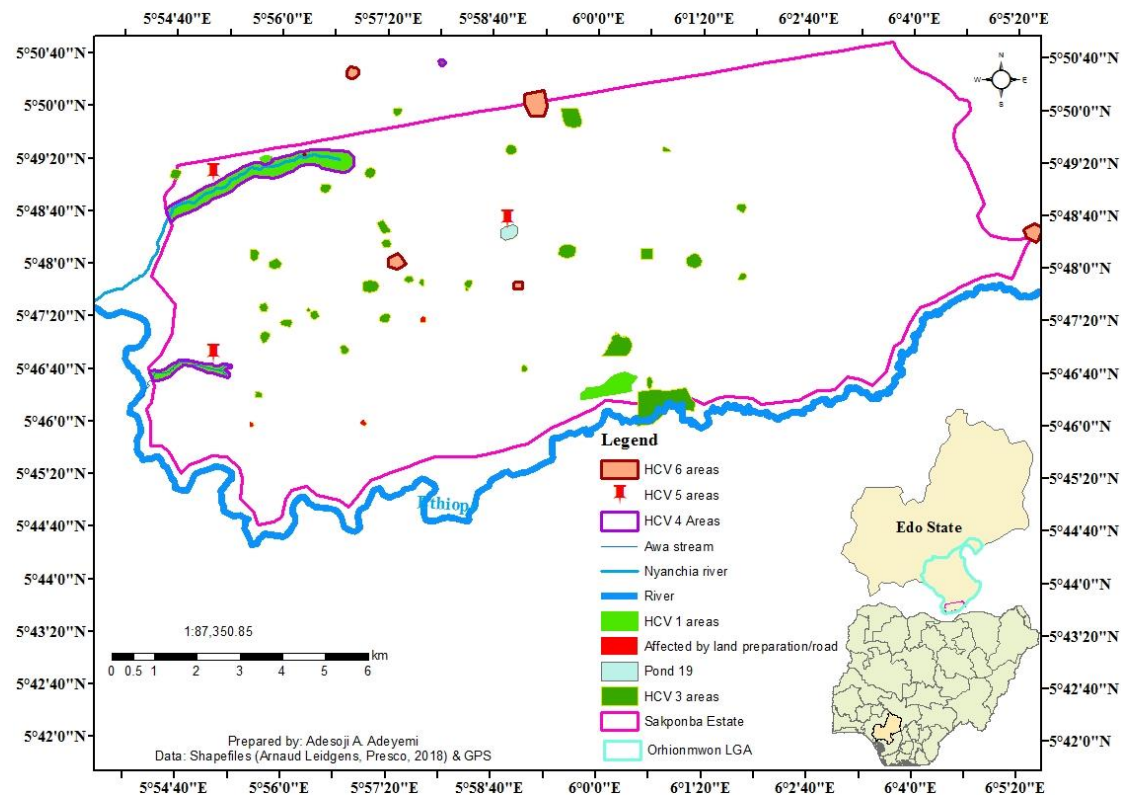


Figure 13: Map of Sakponba Estate showing the conservation and HCV areas

All recommendations concerning buffers around rivers and streams are already implemented at Sakponba Estate. Nevertheless, the new artificial regeneration or tree planting, which was recommended to provide further buffer for Awa stream, referred to as “**small unnamed stream**” in the previous Sakponba HCV report by Proforest (2017c), is not yet in place. Although the set-aside areas are recognized and managed by the company including the riparians and ponds, three of the conservation areas were affected in the course of land clearing and road construction. However, no negative signs of pollution or effects of agrochemicals were noticed in the ponds and other conservation areas.

All HCV 6 areas within the estate are well-managed and there are no clearing within the vicinities of the HCV sites. However, warning signs (such as ‘do not shout or make noise’, ‘do not urinate here’) to specifically notify strangers of the sacred areas **are not yet** mounted in all HCV 6 areas. The summary of verifications of the HCVs at Sakponba Estate is shown in Table 9, and the states of the conservation areas and HCVs are presented in the subsequent sections.

Table 9: Summary of findings in Sakponba Estate

HCV	Definition	Present	Potentially present	Absent
1	Species diversity: Concentrations of biological diversity including endemic species, and rare, threatened or endangered (RTE) species that are significant at global, regional or national levels.			
2	Landscape-level ecosystems and mosaics: Large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national level and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.			
3	Ecosystems and habitats: Rare, threatened, or endangered ecosystems, habitats or refugia.			
4	Ecosystem services: Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.			
5	Community needs: Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples.			
6	Cultural values: Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or Indigenous peoples.			

4.1.4.1 State of the HCV 1: Species diversity**Flora**

The conservation areas within the estate are largely ponds and wetland with some pockets of riparian strips (forests). There are sufficient signs of frequent management interventions (e.g. regular patrols by eco-guards, well-delineated conservation area boundaries, seats constructed by eco-guards for consistent patrols, patrol lines or transect, etc).

At Sakponba conservation areas and biodiversity plots, a total of 75 tree species belonging to 64 genera in 26 families were encountered. These include the stems of *critically endangered Cola nigerica* (CE) and *endangered Gossweilerodendron balsamiferum* (EN), most of which were found in Nyanchia riparian forest, and few others in the Awa stream riparian buffer and Akure 1 secondary forest (Figure 23). Two near-threatened (NT) species (i.e. *Irvingia gabonensis* and *Milicia excelsa*) were

identified. There were also stems of *Albizia ferruginea*, *Allanblackia gabonensis*, *Entandrophragma utile* and *Nauclea diderrichii*, which have been classified as *vulnerable* (VU) by the IUCN (Annex 4a).

Fauna

Mammals

Thirteen (13) mammalian species were identified in Sakponba conservation areas, and these include one primate, two ungulates, seven rodents and three carnivores. White-throated monkey (*Cercopithecus erythrogaster*) was the only primate found in the riparian forest within the conservation areas. The white-throated monkey is a *vulnerable* (VU) species (IUCN, 2018) nearing extinction due to its decreasing population as a result of over-hunting for its fur and meat. Today, all of its territories are protected and regarded as a holy land, where hunting and logging is restricted, in some places. In Nigeria, the species is protected by the Endangered Species Decree 11 of 1985. The presence of the white-throated monkey with a low relative density of 0.43% in Sakponba conservation blocks may be an indication of low population as a result of anthropogenic activities occasioned by poaching and habitat loss.

The red river hog (*Potamochoerus porcus*) and bushbuck (*Tragelaphus scriptus*) with relative densities of 1.07% and 1.06%, respectively were the only ungulates encountered. Though the two species are of *least concern* (IUCN, 2018), in Nigeria they are protected, as *Potamochoerus porcus* appear on *Schedule 1* and *Tragelaphus scriptus* on *Schedule 2* of the Endangered Species Decree 11 of 1985.

The common rodents in Sakponba conservation sites were the striped-ground squirrel (*Euxerus erythropus*), African giant squirrel (*Protoxerus stangeri*), Gambian sun squirrel (*Heliosciurus gambianus*), Beecroft's anomalure (*Anomalurus beecrofti*), forest giant pouched rat (*Cricetomys emini*), marsh cane rat (*Thryonomys swinderianus*) and brush-tailed porcupine (*Atherurus africanus*). All of which are *least concern*. In Nigeria, the three species of squirrels and brush-tailed porcupine appear on *Schedules 2* and *1* of the Endangered Species Decree 11 of 1985, respectively. The marsh cane rat with a relative density of 15.20% is the most abundant species among the rodents and other wildlife species encountered in the conservation areas. The cane rat inhabits majorly the wetlands where most of its feeding requirement is met. The wetlands contain most of the nutritional and succulent grasses the cane rat feed on, and as such, prefers to inhabit most of this habitat, especially the periphery of the ponds.

The brush-tailed porcupine (*Atherurus africanus*), with a relative density of 0.64%, is another important rodent of the study sites. The species has a *least concern* (LC) status in the IUCN Red List of Threatened Species. However, porcupine is a *Schedule 1* animal. The swamp and secondary forests are the major habitats of the porcupine in the estate. Three (3) carnivores were encountered including African palm civet (*Nandinia binotata*) found in the secondary forest, riparian strips and wetlands. The wild cat (*Felis sylvestris*) inhabits the swamp forest while the marsh mongoose (*Atilax paludinosus*) was found in the riparian forest and wetlands. The palm civet and mongoose belong to *Schedule 2* while the wild cat belongs to *Schedule 1* of the Endangered Species Decree 11 of 1985. The three carnivores are *least concern*.

Although all mammals encountered, except the white-throated monkey, were of least conservation concern. Most of them are very important and considered endangered at national level.

Avifauna

Twelve (12) families represented by fifteen (15) species of birds were encountered in Sakponba conservation areas with 22.48% of the identified fauna species (Annex 4b). The black-headed weaver (*Ploceus melanocephalus*) of the family *Ploceidae* is more in abundance than other bird species in the areas. This is closely followed by the Hartlaub's duck (*Pteronetta hartlaubii*) of the family *Anatidae* with a relative density of 14.78%. The least-sighted species was the red-collard widowbird (*Euplectes ardens*) with a relative density of 0.21%, Gaboon woodpecker (*Dendropicos gabonensis*), African grey parrot (*Psittacus erithacus*), Black-and-white casqued hornbill (*Bycanistes subcylindricus*) and the blue-headed wood-dove (*Turtur brehmeri*).

All the species encountered are categorically *least concern* (LC) species except the African grey parrot, which is *endangered* (EN), and also falls in *Schedule 1* of the Nigeria's Endangered Species Decree 11 of 1985. The wetland harbours more (11) bird species than pond/lake (7), swamp forest (4), secondary forest (2) and riparian forest (1).

Herpetofauna

The herpetofauna encountered in the conservation areas include four reptiles. These are the African rock python (*Python sebae*), gaboon viper (*Bitis gabonica*), Nile monitor lizard (*Varanus niloticus*) and West African mud turtle (*Pelusios castaneus*) and their relative densities are 0.21%, 0.21%, 0.63% and 15.85%, respectively. All the reptiles encountered have *least concern* status except *Bitis gabonica* that is not yet assessed by the IUCN. The rock python and Nile monitor lizard are protected by Endangered Species Decree 11 of 1985. No reptile was sighted in the secondary and riparian forest during the survey while the ponds and wetland harbour the mud turtle more than other habitat types. Mud turtles are fast disappearing as a result of habitat alterations by humans, thus their conservation can be enhanced by protecting ponds and wetlands of Sakponba conservation areas.

The presence of one each of *critically endangered* (CE) and *endangered* (EN) flora and fauna, two *near threatened*, four *vulnerable* flora species, along with the species of national conservation importance in the areas, especially the three sites qualifies the three habitats as HCV1 areas. The existence of the African grey parrot, in particular, is note-worthy, and it requires such protection as offered by the riparian and secondary forests. Therefore, HCV 1 is confirmed to be present.

4.1.4.2 State of the HCV 3: Rare, threatened and endangered ecosystems

There are about four types of vegetation within the Sakponba conservation areas: riparian forests (along the buffering Nyanchia River and Awa Stream) and wetland/ponds surrounded by grasses and some other hydrophilic species and small pockets of secondary forests (*Akures*) and young regenerations (*Egbon-Guigo Shrine*).

About 50% of the conservation areas are ponds and swamps. Although the ponds are not so big, ranging from 0.4ha to about 3 ha in sizes, they could be larger during the peak of rainy season. They are mainly located in the savannah-like grassland with the major ones such as Ezenugbegbe being sacred sites or shrines for the fringe communities. The swamps provide a refuge to a variety of wildlife species (mostly birds), though no HCV 1 bird species was encountered at the swamps or ponds. All the small pockets of swamps and ponds (conservation areas and biodiversity plots) considered to be HCV 3 areas are still intact to a large extent. The vegetation of the conservation areas at Sakponba appeared relatively stable, and these provide a good ground for improving and/ or enhancing HCV 1 species, if the management efforts are sustained, through the commendable activities of the eco-guard team.

4.1.4.3 State of HCV 4: Areas that provide basic services of nature in critical situations

Provision of clean water and protection of riparian vegetation

The streams and rivers in the conservation areas as well as riparian vegetation still play important role in supporting and regulating ecosystem services including flood regulation/buffering and water purification. Besides, Proforest (2017c) noted that Nyanchia is a viable source of drinking water for the people of Obanakhoro while on their farms. They also explained that Nyanchia River is a major source of protein during the dry season, according to them; the stream produces large quantities of fish during the dry season, which the people of the community collect. In addition, the riparian forest that buffers the Awa stream is critical to maintaining the quality and quantity of water in the stream as well as the aquatic lives therein. The earlier recommendation of Proforest (2017c) to protect all the swamp areas has been implemented by setting aside those areas for conservation priority, and excluded them from all conversion at the initial time.

Based on the above, HCV 4 is still being maintained. Given the presence of the very few perennial swamps, several seasonal ponds, and the two riparian forests that serve to protect the water bodies on which local communities depend for household consumption. Further rehabilitations, especially around Awa Stream would score the conservation areas very high.

4.1.4.4 State of the HCV 5: Areas fundamental to meeting basic needs

There were no disturbing signs of NTFP exploitation and hunting in the conservation areas noticed during the fieldwork. Although Proforest (2017) earlier reported limited hunting, especially in the riparian vegetation along Nyanchia and Ethiope Rivers, this might still be happening on subsistence scale in the dry season during the fishing period, especially at Nyanchia, but almost impossible due to the constant presence of the protection personnel (eco-guards) at the locations (Plate 8).



Plate 8: Seat constructed at Nyanchia forest patrolling at Sakponba Estate

We could not establish the dependence of the local communities on the resources of conservation areas in the course of the evaluation, as efforts to engage any of the host communities were unsuccessful. Nevertheless, the identified sites reported to be HCV 5 areas are shown in Figure 13.

4.4.5 State of the HCV 6: Cultural values

Sites of local cultural/traditional or religious importance

The surrounding communities, except Obanakhoro, have earlier indicated that they have shrines or sacred sites located within the estate; these have already been designated as conservation areas and HCVs, and are (now) being managed within the estate. Four sacred sites including Ezenugbegbe, Arousa (Plate 9), Nyanchia (Plate 10) and Egbon-guigo are within the estate as parts of the conservation areas; Izabumwen (Plate 11) is in the extension while Ezenubie is located just outside of the concession. These HCVs are in good condition, no threat of conversion was noticed, and Sakponba HCV management plan is already in place for their proper management.



Plate 9: Aruosa Shrine at Sakponda Estate



Plate 10: Nyanchia Shrine within Nyanchia riparian forest



Plate 11: Izabumwen Shrine within Sakponba Estate

The HCV 6 areas within the Sakponba Estate are still intact well-maintained and undisturbed as shown in Figure 13.

4.2 Effectiveness of the Current Conservation and HCV Areas Management Options

4.2.1 Obaretin Conservation Areas

No doubt, the company complied and implemented most of the recommendations of the HCV reports, but the implementation of those actions appears more successful and effective (only) in areas where local communities also have interests (to visit their shrines). For instance, in the Essain (Shrine) Swamp forest, no noticeable signs of disturbance were seen, while there are continued exploitations in the freshwater swamp at the eastern corner, perhaps because the area is not being sufficiently patrolled as being done in Ologbo and Sakponba conservation areas. Also the area shares boundary with community land, which harbours lots of strangers, especially palmwine tappers and NTFP collectors (Plate 12). Hunting is still on-going (Plate 13) and the area is extensively logged (Plate 14). The boundary of this forest is not yet demarcated, and as such it appears the people, who were original tenants, saw no difference in the current ownership of the area, believing that they still have some use-right to operate in the swamp.



Plate 12: Tapper's camp within the freshwater swamp at Obaretin Estate



Plate 13: Serial snares in the freshwater swamp near a tapper's camp in Obaretin Estate



Plate 14: logging in the freshwater swamp of Obaretin Estate

Meanwhile, Obagie and Uroho people confirmed that those people operating in the freshwater swamp are Urobo from Delta State, who used to pay royalty to the

communities, but now using the opportunity of Presco's ownership to illegally operate in the area without the knowledge of indigens.

4.2.2 Ologbo Conservation Areas

In Ologbo conservation areas, despite the presence of eco-guards, whose duties are to patrol the conservation areas to ensure that these areas are not encroached, signs of hunting and over-exploitation were noticed. Local people especially from Ikara community indicated that they have continued to hunt and extract NTFPs in the lowland rainforest (now conservation area) since they have no alternatives to replace the resources exploited in the conservation areas. Eco-guards confirmed that some of the people (offenders) arrested in the conservation areas were from Ikara community.

Although people from Ologbo community did not categorically take responsibility for illegal exploitations (logging) in the area, their body language during the consultation suggested that they may be culpable. When asked the sources of logs being converted in the area, they could not give any straight response to explain the real sources. Instead, they opined that unless other alternative sources of livelihood are available, most of the youth might not have choice than to return to the conservation areas, especially for timber exploitation, even though it is illegal. It was observed that local communities have not been properly integrated into conservation areas plan by a way of collaboration, and it was clear that sustainable management of those areas are not yet of concern to the local people. The current management actions are not yet sufficiently adequate to address the illegalities especially hunting and logging in the lowland rain forest within the estate.

4.2.3 Cowan Conservation Areas

Although all the conservation areas, riparian vegetation, ponds and wetlands are demarcated with definite boundaries, these have not addressed the pressure from hunting, or prevented local people, especially Ajagbodudu from excessive exploitation of NTFPs in the riparian areas. Hunting traps (snare) were seen in the riparian forests (Plate 15). It was also confirmed by the people of Ajagbodudu that their youth still hunt and collect NTFPs in the conservation areas on continual basis. While Oghareki indicated that they are fishing in the ponds, and collecting NTFPs in the two riparian forests.



Plate 15: Snares seen in riparian forest at Cowan Estate

The ponds also appeared disturbed as a result of constant human presence during fishing (Plate 16), and this has affected the behaviours of the avian species encountered at the ponds during the survey (Plate 17).



Plate 16: Fishing signs seen at a pond in Cowan Estate



Plate 17: *Ardea alba* and *Pteronetta hartlaubii* fleeing upon noticing the team presence from far off at Cowan Estate

Findings during community consultation showed that none of the two local communities agreed with Presco on conservation of the ponds. They still see the ponds as belonging to them, and exploitation of NTFP and hunting are still ongoing in the riparian forests and vegetation around the ponds. It appears some of the field workers have not respected the rule of “no fishing and hunting in the conservation areas” aware of all the conservation areas, especially the ponds and swamps, as serial snares were noticed at the boundary of the plantation. The fishing net was suspected to have been set up by some of the field workers (**this should be investigated**).

4.2.4 Sakponba Conservation Areas

All measures put in place in managing the conservation areas in Sakponba appeared to be yielding desired results, and as such are very effective as there were no visible signs of disturbance or over-exploitations in the conservation areas. Moreover, the eco-guard personnel are positively-spirited and personally motivated to enforce all the rules of management plan implementations. Signs of constant patrols by the eco-guards were noticed in all the conservation areas visited, except pond in 19 (Figure 13), where the local people inhabiting Averenavre Camp near Iwevbo resisted and denied any entry by Presco’s staff, and other non-natives. Thus, the pond has not been constantly patrolled by the eco-guards to avoid problems with the inhabitants.

4.3. Threat to the Conservation Areas and HCVs

Threats to the identified HCVs and conservation areas were assessed through field observations and consultations with local (host) communities with due considerations to the extent of the area, the severity and duration of the impacts on the HCVs and conservation areas in estimating the importance of the threats. For external threats, attempts were made to identify direct and indirect causes, where feasible. Details of the threats or potential threats identified in each of the four estates are presented in Tables 10, 11, 12 and 13 for Obaretin, Ologbo, Cowan and Sakponba, respectively.

4.3.1 Threats to Obaretin HCVs and Conservation Areas

Table 10: Threats to the identified HCVs and conservation areas in Obaretin

HCV	Brief description of value present in conservation areas	Main threats/Potential Threats
1	Species diversity: Presence of 4 <i>vulnerable</i> floral species, 1 <i>vulnerable</i> faunal species, 1 <i>vulnerable</i> and 1 <i>endangered</i> avifauna, as listed in IUCN Red list, mostly seen in Essain Shrine Forest.	<u>Hunting</u> Field verifications and confirmation from community consultations revealed indicators of some threats in form of (possibly) internal (Plate 18), and external (especially from those camping within the freshwater swamp forest). Wildlife hunting through trapping (serial snares), especially at the boundary between plantation and the freshwater swamp in the east of the estate was noticed, as exemplified in Plate 19.
3	Ecosystems and habitats:	There is extensive logging in the degraded freshwater

	Freshwater swamp forest in the east of the estate with populations of nationally-important and IUCN Red-listed species.	swamp with some level of confidence on the part of the perpetrators. This has really damaged the integrity of the ecosystem (Plate 20). Sounds of chainsaw were also heard during the field survey, and, logs were being floated through waterways to conversion points, as verified by the team during field work (Plate 21). These loggers and other users of the swamps were alleged to be intruders and illegal occupants from Delta States, as noted by Obagie and Uroho communities.
6	Areas critical to local communities' traditional cultural identity: Essain Shrine worshipped by Obagie community, also recognized by Uroho people.	At present, there appears to be no threat to the shrine. However, possibility of hunting from within may not be ruled out, as some loaders and transporters saw nothing bad in hunting, even within the plantation, not far from the mill. As of the time of monitoring exercise, no threats of conversion to the identified Essain shrine was noticed, and it seems impossible for this to happen in future during replanting since the areas is already designated by Presco HCV management.



Plate 18: Hunting signs as potential threats to HCV 1 in Obaretin Estate



Plate 19: Hunting threats at the degraded freshwater swamp forest using serial snares for trapping at the boundary of the plantation



Plate 20: Logging and fuel-wood exploitation within the freshwater swamp forest of Obaretin Estate



Plate 21: Conversion terminus for some of the logs transported through waterway

4.3.2 Threats to Ologbo HCVs and Conservation Areas

Table 11: Threats to the identified HCVs and conservation areas in Ologbo

HCV	Brief description of value present in conservation area s	Main threats/Potential Threats
1	Species diversity: Presence of 14 <i>vulnerable</i> , <i>near threatened</i> and nationally important flora, RTE and endemic fauna including the endemic population of <i>vulnerable</i> white-throated monkey and 2 avifaunal species listed on IUCN Red List as <i>vulnerable</i> and <i>endangered</i> species.	<u>Logging</u> Illegal logging of important, <i>vulnerable</i> and <i>near threatened</i> floral species, especially <i>Milicia excelsa</i>, <i>Terminalia ivorensis</i>, <i>Nauclea diderrichii</i>, could stimulate local species extinction. <u>Hunting</u> Field verifications and confirmation during local community consultations revealed indicators of threats in form of hunting, with spent cartridges seen in the lowland rain forest in the swampy area (Plate 22). Confirmation during community consultation, especially at Ikara

		community, showed that some unrepentant youth never relented and stopped hunting. There were also allegations by Ikara community that threats might also be internal, as may be carried out by field workers.
3	Ecosystems and habitats: The conservation areas are majorly lowland rain forest and freshwater swamps, and are under great anthropogenic threats and are becoming at national level, and due to the alarming deforestation rates in Edo State in particular.	Imminent illegal forest clearance in the conservation and HCV areas for subsistence farming by villagers still appears a great threat, especially around Ikara community axis of the estate, where people claimed that farmland are becoming very scarce, and that the only option might be to encroach the Presco's conservation areas. Some people of Ikara Village threatened continued exploitation in the lowland rain forest and swamps during community consultation.
4	Areas that provide basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes: Riparian forest and swamps regulate stream flows to maintain water quality and quantity for Ikara, Ologbo and Ogbekpen communities	Continued excessive illegal logging in riparian buffers could degrade the conservation areas and HCVs, consequently affect water quality and quantity.
5	Areas containing resources that are fundamental to meeting the basic livelihood needs of the local communities: Continued reliance of the surrounding communities on the lowland rain and swamp forests for NTFPs and wildlife resources	Declining population of wildlife and important floral species due to overharvesting are a great threat to the conservation areas.



Plate 22: Spent cartridge seen in Ologbo conservation area

4.3.3 Threats to Cowan HCVs and Conservation Areas

Table 12: Threats to the identified HCVs and conservation areas in Cowan

HCV	Brief description of value present in conservation areas	Main threats/Potential Threats
1	Species diversity: Presence of 4 <i>vulnerable</i> floral species including <i>Albizia ferruginea</i> , <i>Allanblackia gabonensis</i> , <i>Hallea stipulosa</i> and <i>Nauclea diderrichii</i> , most of which were found in the riparian forest and swamps. RTE and nationally rare and endangered faunal species.	<u>Hunting</u> Field verifications and confirmation during community consultations, especially Oghareki revealed that some members of the community still hunt within the conservation areas, especially the riparian forest using serial snares (traps). Threat to the avian populations by the fishermen, one of whom confirmed that birds were also hunted in the process of fishing (Plate 23). <u>NTFP collection</u> Over-harvesting of important NTFPs in riparian forests.
3	Rare, threatened or endangered ecosystems: The ponds, swamps and wetlands	Medium to large-scale fishing could deplete the value of the ponds and wetlands, and also a threat to the population of avifauna that inhabit the pond, wetland and swamp ecosystems. Anthropogenic activities in the conservation areas, as exemplified through intentional removal of conservation area sign in the <i>Nauclea diderrichii</i> dominated swamp (Plate 24). Accidental destructions of the HCV areas (Figure 14) during clearing operations (Plate 25) thereby exposed the faunal species inhabiting the destroyed ecosystem to the risk of being killed.
4	Areas that provide basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes: The riparian, freshwater swamp forests maintain the functionalities of water bodies in the conservation areas.	No threat of clearance was noticed, except that the swamp areas could (potentially) be at risk of pollution by the use of agro-chemicals.
5	Areas that contain resources that are fundamental to meeting the basic livelihood	Declining population of wildlife species due to over-hunting.

	needs of the local communities: Continued reliance of the surrounding communities on the freshwater swamps and ponds	Over-extraction of NTFPs in the swamp forests.
6	Areas critical to local communities' traditional cultural identity: The Uton Ajaka Shrine, which is located close to the company's staff quarters, and within the Field 14 in the creek, close to Ajagbodudu community.	No threat identified, as Field 14 containing the shrine has already been left for Ajagbodudu community (custodian of the shrine) as HCV 5 for farming, as cassava farms, and other use-signs were noticed in the course of fieldwork. However, threats may result from over-use of the area for farming.

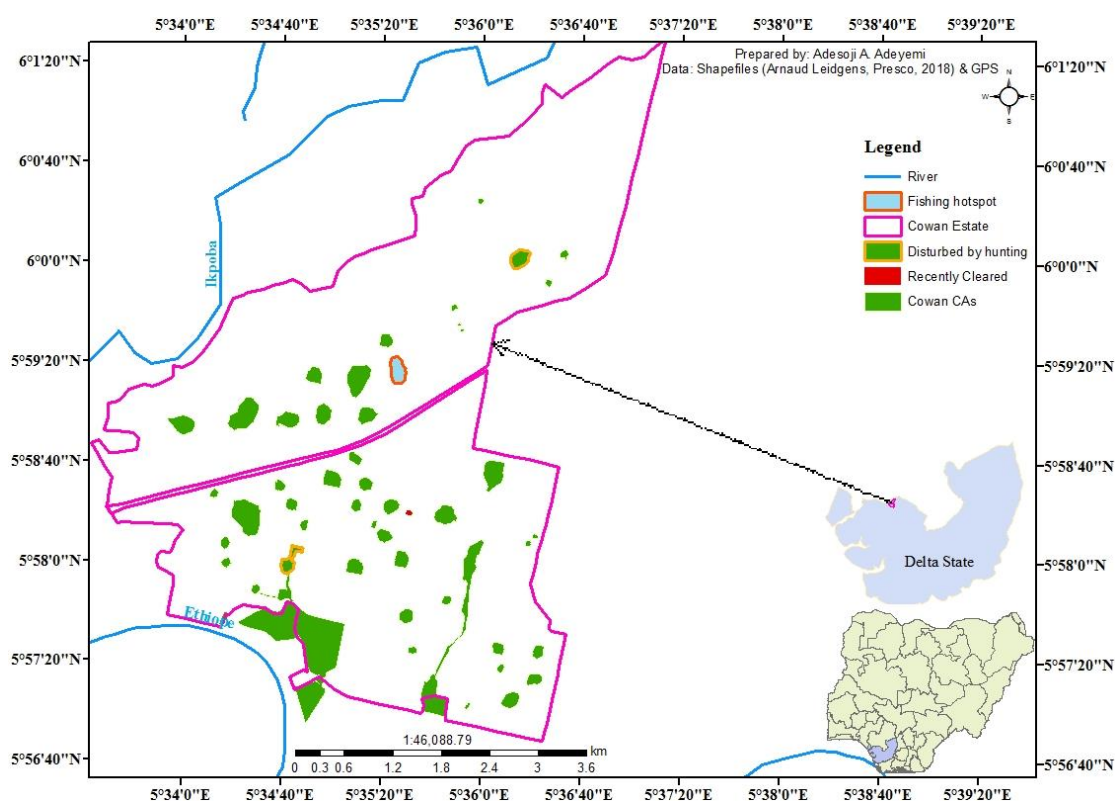


Figure 14: Map of Cowan Estate showing threatened conservation areas



Plate 23: Fisherman, who confirmed to be hunting bird species in conservation areas

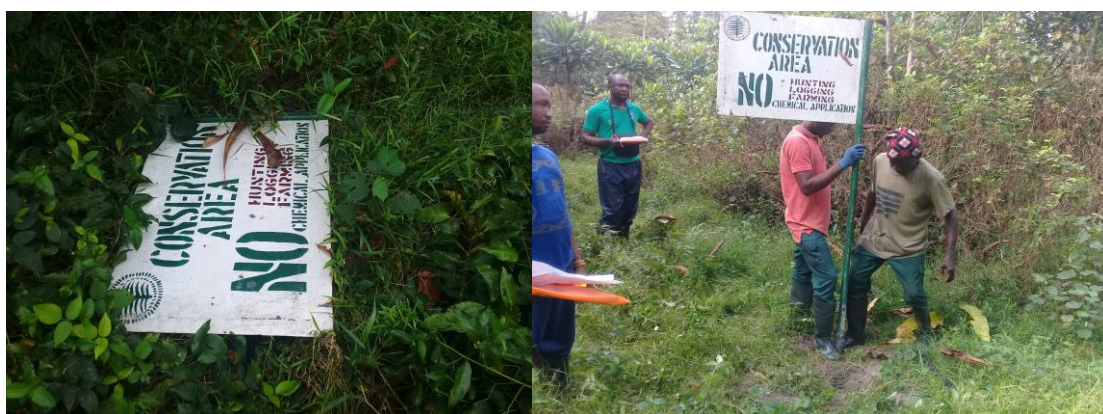


Plate 24: Team members re-installing the removed sign (06°0'5"N, 005°36'15"E)



Plate 25: Dying mongoose (*Atilax paludinosus*) found in a cleared conservation area

4.3.4 Threats to Sakponba HCVs and Conservation Areas

Table 13: Threats to the identified HCVs and conservation areas in Sakponba

HCV	Brief description of value present in conservation areas	Main threats/Potential Threats
1	Species diversity: Presence of <i>endangered</i> <i>Gossweilerodendron balsamiferum</i> and <i>Cola nigerica</i> , which is <i>critically endangered</i> as listed by IUCN. Impressive population of species listed as nationally rare, threatened and endangered fauna, including Bushbuck and Red River Hog	Potential over-harvesting of NTFPs and subsistence hunting in riparian forests that buffer Nyanchia River and Awa Stream. No hunting signs were evidently noticed in the course of fieldwork. Nevertheless, host communities earlier indicated their dependence on the riparian strips for animal protein.
3	Rare, threatened or endangered ecosystems: The ponds, riparian forests and wetlands	Accidental clearance and potential destructions of wetlands and swamps during land preparation and road constructions, three of which were already affected by these operations (as indicated in Figure 15).

		The wetland areas could be at risk of pollution from agro-chemicals since they are within the plantation's area of influence.
4	Areas that provide basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes: Critical water catchment areas required to maintain continuous flow of Nyanchia River and Awa Stream in the conservation areas.	Potential water pollution due to fertilizer and other agrochemical usage. Potential reduction in fish and other aquatic populations due to pollution, and (possibly) excessive fishing as associated impacts at Nyanchia River could deplete the quality of the water body.
5	Areas that contain resources that are fundamental to meeting the basic livelihood needs of the local communities: NTFP gathering from the forest along the Nyanchia River, Awa stream and Ekusu (Shrine) shrub areas	Potential over-exploitation of NTFPs in the riparian forests and Ekusu shrub land (young regeneration).
6	Areas critical to local communities' traditional cultural identity: These include the shrines Ezenugbegbe, Nyanchia, Arousa, Izabumwen, Ikusu and Egbon-guigo, which are in within the estate and the extension	No signs of threat to HCV 6 areas were noticed during field survey.

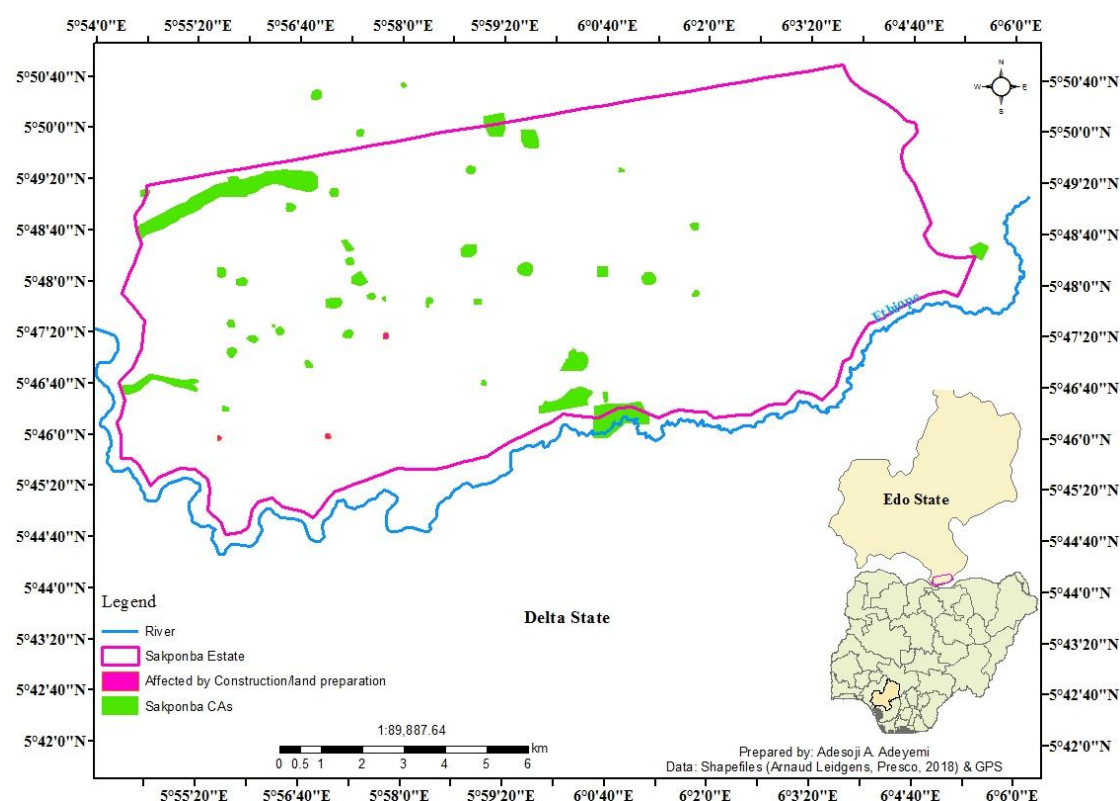


Figure 15: Map of Sakponba Estate showing the conservation areas affected by land preparation and road construction

5. MANAGEMENT RECOMMENDATIONS

Table 14 outlines recommendations for managing the HCVs and conservation areas in the four estates.

Table 14: HCV and conservation areas management recommendations

HCV	Threats	Affected estate	Recommendations
1	- Over-hunting of RTE fauna species - Continued illegal logging activities and excessive NTFPs extractions	- Obaretin freshwater swamp, Cowan riparian forests and swamps, Ologbo lowland rain forest and swamps. - Obaretin freshwater swamp and Ologbo lowland	- Community (conservation) education and engagement, (result-oriented) regular patrols (by committed patrol teams) of conservation and HCV areas, especially the lowland rain forest at Ologbo, freshwater swamp in Obaretin and riparian and swamps in Cowan Estates. - Education and sensitization of field workers including (but not limited to) loaders in Obaretin and Cowan plantations on the importance of conservation. - Regular patrols to cover Obaretin Estate, and an increased number of effective personnel (eco-guards) at Ologbo conservation areas, considering the large size of the lowland rain forest

	rain forest.	and the largely swampy terrain. The company should explore the possibilities of partnering with the host communities (especially Ologbo and Ikara in Ologbo Estate) for effective conservation of the affected areas and HCVs. Periodic review of the ability, commitment and effectiveness of the eco-guards towards service delivery, especially at the Ologbo axis. The attitudes of the eco-guard personnel at Ologbo sharply contrasted with the kind of motivation demonstrated by their Sakponba counterparts. Although some of the areas under their watch are swampy, thus inaccessible in the peak of raining season, most of the drier parts of the lowland rain forest showed little signs of constant patrols. From our interactions with the eco-guard team, there were not as much motivation and the enthusiasm expected of protection personnel in the circumstance. No doubt, a number of them are hard-working, it would be better to efficiently team-work to achieve meaningful results. To this end, Ologbo team of eco-guards need re-orientation to ensure change of attitudes towards implementing conservation actions. It is also good if their number could be increased so that much ground would be covered during weekly patrols. Proper guidance should be ensured during clearing operations and road constructions to avoid further loss of swamps and wetlands, especially in Sakponba.
3	- Destruction of wildlife habitat and dislodgement of fauna species in the course of land preparation and road constructions	- There should be caution, especially in Cowan during conservation boundary tracing and maintenance, with clear specifications as to what need to be done, being handed to the operators or contractors. Presco should consider rehabilitating

		all the affected conservation areas (the one cleared in Cowan and three other partially affected in Sakponba).
4	- (Potential) water pollution due to agro-chemical usage	- Avoid applications of agro-chemicals in the buffer zones of riparian forests around streams, rivers, swamps, wetlands and ponds.
5	- Over-dependence of the host communities on conservation areas for wood, NTFPs and bushmeat (protein)	- Provision of alternative means for host communities, who depend on conservation areas, especially Ikara community at Ologbo Estate, Oghareki and Ajagbodudu at Cowan Estate.
6	- Clearing of shrines (Essain forest in Obaretin; Uton Ajaka in Cowan; Ezenugbegbe, Nyanchia, Arousa, Izabumwen, Ikusu and Egbon-guigo in Sakponba Estate)	- Continued collaborations with the local communities to ensure proper management of the HCV 6 areas at Obaretin, Cowan and Sakponba Estates. Regular appraisal of local communities' satisfactions of HCV 6 management areas.
Other CAs	- Illegal logging, poaching and non-sustainable extractions of NTFPs - Accidental clearance and destruction of conservation areas	- Sensitization and educations of the host communities. Exploring local participation or joint management options for the conservation areas, especially at Ologbo and Cowan. Specialized trainings for patrol teams (eco-guards), especially on floral and faunal species identifications using appropriate guides and taxonomic keys. Rehabilitation of all conservation areas affected in Cowan and Sakponba Estates.

6. SUGGESTED ACTIONS FOR THE CONSERVATION AREAS AND HCVS

Table 15 presents some actions, which could help in the management of conservation areas and the identified HCVs.

Table 15: Suggested actions for the HCV and conservation areas

Objective	Estate	Action required	Timeline
1. Protecting the integrity of the lowland rain forest, freshwater	Obaretin, Ologbo, Cowan and Sakponba	Educate local communities on the importance of conservation	Periodically (at least twice a year)

swamps, riparian, wetlands and ponds		Sensitize all staff and contractors about the company's stand and position on conservation, and the locations of all conservation areas as designated, as well as the important RTE species they contain	Periodically (at least twice a year)
		Complete the erections of conservation signs in all the conservation and HCV areas	By June 2019
		Rehabilitation of vegetation around ponds with insufficient vegetal covers, Awa stream riparian, and the conservation areas affected or erroneously cleared in Cowan and Sakponba Estates.	By June 2020
2. Stop illegal logging in conservation areas	Obaretin and Ologbo	Community engagement to identify the real culprits and find solutions. Clear demarcation and constructing barriers around the lowland rain forest of Ologbo and Freshwater swamp in Obaretin, or devising other possible means to secure the areas, while exploring options like community involvement in conservation area management.	Continuous with necessary modifications or adjustments, based on prevailing socio-economic realities
3. Stop over-exploitation of wildlife and NTFPs	Obaretin, Ologbo and Cowan	Provision of alternative sources of livelihoods as part of corporate social responsibilities	Subject to financial abilities of the company and other considerations
4. Protection of all wetlands and swamps from clearance and destruction	Ologbo, Cowan and Sakponba	Specific instructions indicating the exact areas to be cleared given to the operators and contractors	During land preparation and boundary demarcations and maintenance
5. Maintaining good water quality	Ologbo, Cowan and Sakponba	Monitoring of water quality through laboratory analysis	Monthly (in raining season) and twice in the dry season, if possible, or quarterly as it were.
		Regular meetings and	Continuous

		engagements with the host communities on control and prevention of water pollution	(periodically)
6. Protection of all shrines (HCV 6 areas)	Obaretin, Cowan and Sakponba	Engage the local people in joint monitoring	As deemed necessary by the management (occasionally)
7. More protection staff and further training for eco-guards	All estates	Capacity building of the Eco-guards, especially on practical ecology and fieldwork techniques	Periodically (based on the availability of resources and financial realities)

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8. ANNEXES

Annex 1a: Flora Species Identified in Obaretin Conservation Areas

Tree species encountered in Obaretin conservation areas

Species	Family	IUCN	Authority	Trees/ha
<i>Alchornea cordifolia</i>	Euphorbiaceae	NA	(Schumach. & Thonn.) Müll. Arg.	7
<i>Allanblackia gabonensis</i>	Clusiaceae	VU	(Pellegr.) Bamps	5
<i>Alstonia boonie</i>	Apocynaceae	NA	De Wild.	6
<i>Anthocleista djalensis</i>	Lamiaceae	NA	A. Chev.	41
<i>Anthocleista vogelii</i>	Loganiaceae	NA	Planch.	23
<i>Anthostema aubryanum</i>	Euphorbiaceae	NA	Baill.	34
<i>Antiaris toxicaria</i>	Moraceae	NA	Lesch.	10
<i>Bombax buonopozense</i>	Malvaceae	NA	P. Beauv.- FTWA, ed.2, 1:334.	30
<i>Bridelia micrantha</i>	Phyllanthaceae	LC	(Hochst.) Baill.	20
<i>Ceiba pentandra</i>	Malvaceae	NA	C.F. Gaertn.	2
<i>Cleistopholis patens</i>	Annonaceae	NA	(Benth.) Engl.&Diels -FTWA, ed.2, 1:38.	56
<i>Cola gigantea</i>	Sterculiaceae	NA	A. Chev.	7
<i>Cola millenii</i>	Sterculiaceae	NA	K. Schum.	11
<i>Dialium guineense</i>	Fabaceae	NA	Willd.	50
<i>Ficus exasperata</i>	Moraceae	NA	Vahl	7
<i>Ficus Mucoso</i>	Moraceae	NA	Ficalho	8
<i>Funtumia elastica</i>	Apocynaceae	NA	(Preuss) Stapf	15
<i>Hallea ciliata</i>	Rubiaceae	NA	(Aubrév. & Pellegr.) J.-F.Leroy	6
<i>Hallea stipulosa</i>	Rubiaceae	VU	(DC.) J.-F.Leroy	4
<i>Hylodendron gabunense</i>	Fabaceae	NA	Taub.	2
<i>Lophira alata</i>	Ochnaceae	VU	Banks ex Gaertn.	8
<i>Musanga cecropioides</i>	Urticaceae	NA	R. Br. ex Tedlie	81
<i>Nauclea diderrichii</i>	Rubiaceae	VU	(De Wild.) Merr.	5
<i>Pterocarpus mildbraedii</i>	Fabaceae	NA	Harms	4
<i>Raphia vinifera</i>	Arecaceae	NA	P.Beauv.	127
<i>Ricnodendron heudelotii</i>	Euphorbiaceae	NA	(Baill.) Heckel	11
<i>Sterculia setigera</i>	Malvaceae	NA	Del.	19
<i>Tabernaemontana pachysiphon</i>	Apocynaceae	NA	Stapf.	11
<i>Uapaca staudtii</i>	Phyllanthaceae	NA	Pax	61
Total				671

Annex 1b: Faunal Species Identified at Oberetin Conservation Areas

Habitat type and relative density (RD in %) of primates in Obaretin conservation areas

Common name	Scientific name	Habitat		RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	SwF				
PRIMATES	PRIMATA						
Cheek-pouched monkeys	<i>Cercopithecidae</i>						
White-throated monkey	<i>Cercopithecus erythrogaster pococki</i>	7	1	3.13	VU	I	1
Mona monkey	<i>Cercopithecus mona</i>	10	4	4.46	LC	I	1
Signs		17	5				
Number of species		2	2				

SF: secondary forest (Essain Shrine forest); SwF: Swamp forest

Habitat type and relative density (RD in %) of ungulates in Obaretin conservation areas

Common name	Scientific name	Habitat		RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	SwF				
UNGULATES	UNGULATA						
Pigs	Suidae						
Common warthog	<i>Phacochoerus africanus</i>	8	8	7.14	LC	R	2
Red river hog	<i>Potamochoerus porcus</i>	5	0	2.23	LC	R	2
Antelopes	Antelopinae						
Common duiker	<i>Sylvicapra grimmia</i>	2	7	4.02	LC	1	-
Maxwell's duiker	<i>Cephalophus maxwelli</i>	0	1	0.45	LC	1	2
Bovids	Bovidae						
Bushbuck	<i>Tragelaphus scriptus</i>	1	0	0.45	LC	1	2
Signs		16	16				
Number of species		4	3				

SF: secondary forest (Essain Shrine forest); SwF: Swamp forest

Habitat type and relative density (RD in %) of rodents in Obaretin conservation areas

Common name	Scientific name	Habitat		RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	SwF				
RODENT	RODENTIA						
Squirrels	Sciuridae						
Striped ground squirrel	<i>Euxerus erythropus</i>	3	2	2.23	LC	-	2
Anomalures	Anomaluridae						
Beecroft's anomalure	<i>Anomalurus beecrofti</i>	0	1	0.45	LC	-	2
Pouched rats	Cricetomyinae						
Forest giant pouched rat	<i>Cricetomys emini</i>	8	0	3.57	LC	-	-
Signs		11	3				
Number of species		2	2				

SF: secondary forest (Essain Shrine forest); SwF: Swamp forest

Habitat type and relative density (RD in %) of bats in Obaretin conservation areas

Common name	Scientific name	Habitat		RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	SwF				
BATS	CHIROPTERA						
Fruit bats	Pteropodidae						
	<i>Epomophorus labiatus</i>	0	3	1.35	LC	-	-
Signs		0	3				
Number of species		0	2				

SF: secondary forest (Essain Shrine forest); SwF: Swamp forest

Habitat type and relative density (RD in %) of birds in Obaretin conservation areas

Common name	Scientific name	Habitat		RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	SwF				
Cuckoos / Coucals	Cuculidae						
Red-chested cuckoo	<i>Cuculus solitaries</i>	1	0	0.45	LC	-	-
Senegal coucal	<i>Centropus senegalensis</i>	3	1	1.79	LC	-	-
African emerald cuckoo	<i>Chrysococcyx cupreus</i>	4	0	1.79	LC	-	-
Hornbills	Bucerotidae						
Yellow-casqued hornbill	<i>Ceratogymna elata</i>	3	1	1.79	VU	-	-
African grey hornbill	<i>Lophoceros nasutus</i>	13	4	7.59	LC	-	-
White-crested hornbill	<i>Tockus albocristatus</i>	4	4	3.56	LC	-	-
Sunbirds	Nectarinidae						
Olive sunbird	<i>Cyanomitra olivacea</i>	30	0	13.39	LC	-	-
Weavers	Ploceidae						
Southern red bishop	<i>Euplectes orix</i>	1	1	0.90	LC	-	-
Vieillot black weaver	<i>Ploceus nigerrimus</i>	30	0	13.39	LC	-	-
Blue-billed malimbe	<i>Malimbus nitens</i>	2	0	0.89	LC	-	-
Southern grey-headed sparrow	<i>Passer diffusa</i>	0	1	0.45	LC	-	-
Vultures / kites	Accipitridae						
Palm nut vulture	<i>Gypohierax angolensis</i>	1	0	0.45	LC	-	-
Black kite	<i>Milvus migrans</i>	6	0	2.68	LC	-	1
African harrier hawk	<i>Polyboroides typus</i>	0	5	2.23	LC	-	1
Finches	Fringillidae						
Bare-breasted firefinch	<i>Lagonosticta rufopicta</i>	2	0	0.89	LC	-	-
Pale-fronted Negro-finch	<i>Nigrita luteifrons</i>	4	0	1.79	LC	-	-
Guinea fowls	Numididae						
Helmeted guinea fowl	<i>Numida meleagris</i>	6	0	2.68	LC	-	-
Whydahs	Viduidae						

Pin-tailed whydah	<i>Vidua macroura</i>	1	0	0.45	LC	-	-
Woodpeckers	Picidae						
Gabon woodpecker	<i>Dendropicos gabonensis</i>	0	1	0.45	LC	-	-
Rollers	Coraciidae						
Blue throated rollers	<i>Eurystomus gularis</i>	0	2	0.89	LC	-	-
Kingfishers	Alcedinidae						
Grey-headed kingfisher	<i>Halcyon leucocephala</i>	0	1	0.45	LC	-	-
Parrots	Psittacidae						
African grey parrot	<i>Psittacus erithacus</i>	0	1	0.45	EN	-	1
Ducks	Anatidae						
Hartlaub's duck	<i>Pteronetta hartlaubii</i>	0	2	0.89	LC	-	-
Doves	Columbidae						
Laughing dove	<i>Streptopelia senegalensis</i>	0	1	0.45	LC	-	-
Owls	Strigidae						
African wood-owl	<i>Strix woodfordii</i>	0	1	0.45	LC	-	-
Signs		111	26				
Number of species		16	15				

SF: secondary forest (Essain Shrine forest); SwF: Swamp forest

Habitat type and relative density (RD in %) of herpetofauna in Obaretin conservation areas

Common name	Scientific name	Habitat		RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	SwF				
REPTILES	REPTILIA						
Snakes	Serpentes						
Python	Pythonidae						
Rock python	<i>Python sebae</i>	1	0	0.45	LC	1	1
Viper	Viperidae						
Gaboon viper	<i>Bitis gabonica</i>	3	0	1.34	NA	1	-
Monitors	Veranidae						
Nile monitor lizard	<i>Varanus niloticus</i>	1	1	0.90	LC	-	1
Geckos	Gekkonidae						
Ondo forest gecko	<i>Cnemaspis petrodroma</i>	1	0	0.45	NA	-	-
AMPHIBIANS	AMPHIBIA						
Toads	Bufonidae						
African common toad	<i>Sclerophrys regularis</i>	2	0	0.89	LC	1	-
Frogs	Annurans						
Nigerian banana frog	<i>Afraxalus nigeriensis</i>	0	2	0.89	LC	1	-
Signs		8	3				
Number of species		5	2				

SF: secondary forest (Essain Shrine forest); SwF: Swamp forest

Habitat type and relative density (RD in %) of invertebrates in Obaretin conservation areas

Common name	Scientific name	Habitat		RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	SwF				
MOLLUSC	MOLLUSCA						
Giant snails	Achatinidae						
African giant land snail	<i>Archachatina marginata</i>	0	1	0.45	LC	-	-
Signs		0	1				
Number of species		0	1				

SF: secondary forest (Essain Shrine forest); SwF: Swamp forest

Annex 2a: Flora species identified in Ologbo conservation areas

Species	Family	IUCN	Authority	N/ha
<i>Albizia ferruginea</i>	<i>Fabaceae</i>	VU	(Guill. & Perr.) Benth.	13
<i>Albizia zygia</i>	<i>Fabaceae</i>	NA	J.F. Macbr.	5
<i>Alstonia boonei</i>	<i>Apocynaceae</i>	NA	De Wild.	25
<i>Alstonia congensis</i>	<i>Apocynaceae</i>	NA	Engl.	5
<i>Anthocleista djalolensis</i>	<i>Loganiaceae</i>	NA	A. Chev.	16
<i>Anthocleista nobilis</i>	<i>Loganiaceae</i>	NA	G. Don.	4
<i>Anthonotha macrophylla</i>	<i>Fabaceae</i>	NA	P Beauv.	2
<i>Antiaris toxicaria</i>	<i>Moraceae</i>	NA	Lesch.	6
<i>Antrocaryon micraster</i>	<i>Anacardiaceae</i>	VU	A. Chev.	2
<i>Baphia nitida</i>	<i>Fabaceae</i>	LC	Lodd	9
<i>Barteria fistulosa</i>	<i>Passifloraceae</i>	NA	Mast.	5
<i>Berlina grandiflora</i>	<i>Fabaceae</i>	LC	(Vahl) Hutch.&Dillz.-FTWA,ed2,1:170	9
<i>Berlinia coriacea</i>	<i>Fabaceae</i>	LC	Keay.	5
<i>Brachystegia eurycoma</i>	<i>Fabaceae</i>	NA	Harms	8
<i>Bridelia micrantha</i>	<i>Phyllanthaceae</i>	LC	(Hochst.) Baill.	18
<i>Caloncoba glauca</i>	<i>Flacourtiaceae</i>	NA	(P. Beauv.) Gilg	4
<i>Canarium schweinfurthii</i>	<i>Burseraceae</i>	NA	Engl.	10
<i>Canthium subcordatum</i>	<i>Rubiaceae</i>	NA	DC.	6
<i>Carapa procera</i>	<i>Meliaceae</i>	LC	DC.	7
<i>Ceiba pentandra</i>	<i>Malvaceae</i>	NA	C.F. Gaertn.	6
<i>Celtis zenkeri</i>	<i>Ulmaceae</i>	LC	Engl.	9
<i>Cleistopholis patens</i>	<i>Annonaceae</i>	NA	(Benth.) Engl.&Diels -FTWA, ed.2, 1:38.	27
<i>Cola laurifolia</i>	<i>Sterculiaceae</i>	NA	Mast.	3
<i>Cylicodiscus gabunensis</i>	<i>Mimosaceae</i>	NA	Harms	6
<i>Cynometra hankei</i>	<i>Fabaceae</i>	LC	Harms	7
<i>Daniela ogea</i>	<i>Fabaceae</i>	NA	(Harms) Rolfe ex Holland	4
<i>Desplatsia subericarpa</i>	<i>Tiliaceae</i>	NA	Bocq.	7
<i>Dialium guineense</i>	<i>Fabaceae</i>	NA	Willd.	20
<i>Diospyros dendo</i>	<i>Ebenaceae</i>	NA	Welw. ex Hiern	11
<i>Diospyros zenkeri</i>	<i>Ebenaceae</i>	NA	(Gürke) F White	59
<i>Discoglyprena caloneura</i>	<i>Euphorbiaceae</i>	NA	(Pax) Prain	7
<i>Drypetes floribunda</i>	<i>Euphorbiaceae</i>	NA	(Müll.-Arg.) Hutch.	8
<i>Drypetes gilgiana</i>	<i>Euphorbiaceae</i>	NA	(Pax) Pax & K Hoffm.	6
<i>Elaeis guineensis</i>	<i>Arecaceae</i>	NA	Jacq.	30
<i>Entandrophragma angolense</i>	<i>Meliaceae</i>	VU	(Welw.) C DC.	7
<i>Entandrophragma cylindricum</i>	<i>Meliaceae</i>	VU	(Sprague) Sprague	10
<i>Ficus Mucoso</i>	<i>Moraceae</i>	NA	Ficalho	30
<i>Funtumia africana</i>	<i>Apocynaceae</i>	NA	(Benth.) Stapf	20
<i>Funtumia elastica</i>	<i>Apocynaceae</i>	NA	(Preuss) Stapf	10
<i>Gilbertiodendron dewevrei</i>	<i>Fabaceae</i>	NA	(De Wild.) J.Léonard	5
<i>Harungana madagascariensis</i>	<i>Hypericaceae</i>	NA	Lam. ex Poir.	26
<i>Hunteria umbellata</i>	<i>Apocynaceae</i>	NA	(K.Schum) Hallier f.	6
<i>Irvingia gabonensis</i>	<i>Irvingiaceae</i>	NT	(Aubry-Lecomte ex O'Rorke) Baill.	3
<i>Khaya grandifoliola</i>	<i>Meliaceae</i>	VU	C.DC.	5
<i>Khaya ivorensis</i>	<i>Meliaceae</i>	VU	A. Chev.	4

<i>Klainedoxa gabonensis</i>	Irvingiaceae	NA	Pierre	5
<i>Lecaniodiscus cupanioides</i>	Sapindaceae	NA	Planch. ex Benth.	21
<i>Lophira alata</i>	Ochnaceae	VU	Banks ex Gaertn.	11
<i>Lovoa trichilioides</i>	Meliaceae	LC	Harms	13
<i>Macaranga barteri</i>	Euphorbiaceae	NA	Müll. Arg.	9
<i>Macaranga staudtii</i>	Euphorbiaceae	NA	Pax	6
<i>Maranthes robusta</i>	Chrysobalanaceae	NA	(Oliv.) Prance ex F.White	5
<i>Milicia excelsa</i>	Moraceae	NT	(Welw.) C.C. Berg	3
<i>Millettia thonningii</i>	Fabaceae	NA	(Schumach.) Baker	7
<i>Mitragyna ledermannii</i>	Rubiaceae	VU	(K.Krause) Ridsdale	4
<i>Mitragyna stipulosa</i>	Rubiaceae	VU	(DC.) Kuntze.	10
<i>Monodora myristica</i>	Annonaceae	NA	(Gaertn.) Dunal	2
<i>Morus mesozygia</i>	Moraceae	NA	Stapf	5
<i>Musanga cecropioides</i>	Urticaceae	NA	R. Br. ex Tedlie	54
<i>Myrianthus arboreus</i>	Urticaceae	NA	P.Beauv.	7
<i>Napoleonaea vogelii</i>	Lecythidaceae	NA	Hook. & Planch.	6
<i>Nauclea diderrichii</i>	Rubiaceae	VU	(De Wild.) Merr.	9
<i>Ola subscorpioidea</i>	Olacaceae	NA	Oliv.	12
<i>Parinari excelsa</i>	Chrysobalanaceae	LC	Sabine	5
<i>Parinari robusta</i>	Chrysobalanaceae	NA	(Oliv.) Prance	8
<i>Pausinystalia johimbe</i>	Rubiaceae	NA	(K.Schum.) Pierre ex Beille	3
<i>Pentaclethra macrophylla</i>	Fabaceae	NA	Benth.	14
<i>Petersianthus macrocarpus</i>	Lecythidaceae	NA	(P Beauv.) Liben	7
<i>Picralima nitida</i>	Apocynaceae	NA	(Stapf) T.Durand & H.Durand	5
<i>Piptadeniastrum africanum</i>	Fabaceae	NA	(Hook. f.) Brenan	11
<i>Psychotria alba</i>	Rubiaceae	NA	Ruíz & Pavón.	3
<i>Pterocarpus mildbraedii</i>	Fabaceae	NA	Harms	9
<i>Pterocarpus osun</i>	Papilionaceae	NA	Craib	10
<i>Pycnanthus angolensis</i>	Myristicaceae	NA	(Welw.) Warb.	14
<i>Raphia vinifera</i>	Arecaceae	NA	P.Beauv.	29
<i>Rauvolfia vomitoria</i>	Apocynaceae	NA	Afzel.	12
<i>Ricinodendron heudelotii</i>	Euphorbiaceae	NA	(Baill.) Heckel	25
<i>Rothmannia hispida</i>	Rubiaceae	NA	(K Schum.) Fagerlind	8
<i>Spondianthus preussii</i>	Euphorbiaceae	NA	Engl.	7
<i>Sterculia oblonga</i>	Malvaceae	VU	Mast.	9
<i>Strombosia grandifolia</i>	Olacaceae	NA	Hook.f.	15
<i>Symphonia globulifera</i>	Clusiaceae	NA	L.f.	9
<i>Terminalia ivorensis</i>	Combretaceae	VU	A. Chev.	13
<i>Terminalia superba</i>	Combretaceae	NA	Engl. & Diels	8
<i>Tetrapleura tetraptera</i>	Fabaceae	NA	(Schum. & Thonn.) Taub.	7
<i>Trema orientalis</i>	Cannabaceae	LC	(L.) Blume	6
<i>Trichilia monadelphpha</i>	Sterculaceae	NA	(Thonn.) JJ de Wilde	5
<i>Uapaca heudelotii</i>	Rubiaceae	NA	Baill.	6
<i>Uapaca staudtii</i>	Phyllanthaceae	NA	Pax	11
<i>Xylopia quintasii</i>	Annonaceae	NA	Engl. & Diels	4
<i>Zanthoxylum leprieurii</i>	Rutaceae	NA	Guill. & Perr.	5
<i>Zanthoxylum zanthoxyloides</i>	Rutaceae	NA	(Lam.) Zepern. & Timler	6
Total				951

Annex 2b: Faunal Species Identified in Oberetin Conservation Areas

Habitat type and relative density (RD in %) of primates in Ologbo conservation areas

Common name	Scientific name	Habitat			RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	RF	WL				
PRIMATES	PRIMATA							
Cheek-pouched monkeys	Cercopithecidae							

White-throated monkey	<i>Cercopithecus erythrogaster pococki</i>	0	2	0	0.32	VU	I	1
Mona monkey	<i>Cercopithecus mona</i>	14	12	0	4.20	LC	I	1
Galagos or bush babies	Galagonidae							
Senegal galago	<i>Galago senegalensis</i>	0	1	0	0.16	LC	-	-
Signs		14	14	0				
Number of species		1	3	0				

SF: secondary forest; RF: riparian forest; WL: wetland

Habitat type and relative density (RD in %) of ungulates in Ologbo conservation areas

Common name	Scientific name	Habitat			RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	RF	WL				
UNGULATES	UNGULATA							
Pigs	Suidae							
Common warthog	<i>Phacochoerus africanus</i>	15	8	0	3.71	LC	R	1
Red river hog	<i>Potamochoerus porcus</i>	14	52	0	10.66	LC	R	1
Antelopes	Antelopinae							
Common duiker	<i>Sylvicapra grimmia</i>	3	4	0	1.13	LC	1	2
Maxwell's duiker	<i>Cephalophus maxwelli</i>	0	1	0	0.16	LC	1	2
Bovids	Bovidae							
Bushbuck	<i>Tragelaphus scriptus</i>	4	5	0	1.46	LC	1	2
Signs		36	70	0				
Number of species		4	5	0				

SF: secondary forest; RF: riparian forest; WL: wetland

Habitat use type and relative density (RD in %) of rodents in Ologbo conservation areas

Common name	Scientific name	Habitat			RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	RF	WL				
RODENT	RODENTIA							
Squirrels	Sciuridae							
Striped ground squirrel	<i>Euxerus erythropus</i>	4	4	0	1.30	LC	-	2
African giant squirrel	<i>Protoxerus stangeri</i>	2	1	0	0.48	LC	-	-
Gambian sun squirrel	<i>Heliosciurus gambianus</i>	0	1	0	0.16	LC	-	-
Anomalures	Anomaluridae							
Beecroft's anomalure	<i>Anomalurus beecrofti</i>	1	3	0	0.64	LC	-	2
Pouched rats	Cricetomyinae							
Forest giant pouched rat	<i>Cricetomys emini</i>	30	0	0	4.85	LC	-	-
Cane rat	Thryonomidae							
Marsh cane rat	<i>Thryonomys swinderianus</i>	55	0	35	14.55	LC	-	-
Porcupines	Hystriidae							
Brush-tailed porcupine	<i>Atherurus africanus</i>	2	0	0	0.32	LC	-	1
Signs		94	9	35				
Number of species		6	4	1				

SF: secondary forest; RF: riparian forest; WL: wetland

Habitat use type and relative density (RD in %) of bats (*Chiroptera*) in Ologbo conservation areas

Common name	Scientific name	Habitat			RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	RF	WL				
Fruit bats	<i>Pteropodidae</i>							
Epauletted fruit bats	<i>Epomophorus labiatus</i>	3	1	0	0.64	LC	-	-
Signs		3	1	0				
Number of species		1	1	0				

SF: secondary forest; RF: riparian forest; WL: wetland

Habitat use type and relative density (RD in %) of insectivores in Ologbo conservation areas

Common name	Scientific name	Habitat			RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	RF	WL				
INSECTIVORES	<i>INSECTIVORA</i>							
Shrews	<i>Soricidae</i>							
Nigeria white-toothed shrew	<i>Crocidura nigeriae</i>	1	4	0	0.81	LC	-	-
Signs		1	4	0				
Number of species		1	1	0				

SF: secondary forest; RF: riparian forest; WL: wetland

Habitat type and relative density (%) of carnivores (*Carnivora*) in Ologbo conservation areas

Common name	Scientific name	Habitat			RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	RF	WL				
Palm civets	<i>Nandininae</i>							
African palm civet	<i>Nandinia binotata</i>	12	5	0	2.75	LC	I	2
Cats	<i>Felidae</i>							
Wild cat	<i>Felis sylvestris</i>	0	1	0	0.16	LC	-	1
Mongoose	<i>Herpestidae</i>							
Marsh mongoose	<i>Atilax paludinosus</i>	3	1	0	0.64	LC	I	2
Slender mongoose	<i>Herpestes sanguine</i>	1	1	0	0.32	LC	1	2
Genets	<i>Genetta</i>							
Common genet	<i>Genetta genetta</i>	1	2	0	0.48	LC	-	2
Signs		17	10	0				
Number of species		4	5	0				

SF: secondary forest; RF: riparian forest; WL: wetland

Habitat type and relative density (RD in %) of herpertofauna in Ologbo conservation areas

Common name	Scientific name	Habitat			RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	RF	WL				
REPTILES	<i>REPTILIA</i>							
Snakes	<i>Serpentes</i>							
Python	<i>Pythonidae</i>							
Rock python	<i>Python sebae</i>	1	2	0	0.48	LC	1	1
Viper	<i>Viperidae</i>							
Gaboon viper	<i>Bitis gabonica</i>	1	1	0	0.32	NA	1	-
Cobra	<i>Elapidae</i>							
Black cobra	<i>Naja nigricollis</i>	0	1	0	0.16	-	-	-

Monitors	Veranidae							
Nile monitor lizard	<i>Varanus niloticus</i>	1	3	0	0.64	LC	-	1
Geckos	Gekkonidae							
Ondo Forest gecko	<i>Cnemaspis petrodroma</i>	0	2	0	0.32	NA	-	-
Agamids	Agamidae							
Agama lizard	<i>Agama agama</i>	1	0	0	0.16	LC	-	-
Skink	Scincidae							
Guinean forest skink	<i>Mochlus guineensis</i>	0	2	0	0.32	LC	-	-
Tortoises	Testudinidae							
Home's hinged-back tortoise	<i>Kinixys homeana</i>	0	2	0	0.32	VU	-	-
AMPHIBIAN	AMPHIBIA							
Frogs	Anurans							
Nigerian banana frog	<i>Afraxalus nigeriensis</i>	1	2	0	0.48	LC	-	-
Signs		5	15	0				
Number of species		5	9	0				

SF: secondary forest; RF: riparian forest; WL: wetland

Habitat type and relative density (RD in %) of birds in Ologbo conservation areas

Common name	Scientific name	Habitat			RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	RF	WL				
WEAVERS AND SPARROWS	PLOCEIDAE							
Village weaver	<i>Ploceus cucullatus</i>	0	0	60	9.69	LC	-	-
Vieillot's black weaver	<i>Ploceus nigerrimus</i>	3	0	8	1.77	LC	-	-
Spectacled weaver	<i>Ploceus nigricolis</i>	30	0	15	7.27	LC	-	-
Crested malimbe	<i>Malimbus malimbicus</i>	10	0	30	6.47	LC	-	-
Grey-headed sparrow	<i>Passer griseus</i>	0	1	0	0.16	LC	-	-
Pin-tailed whydah	<i>Vidua microura</i>	0	0	1	0.16	LC	-	-
SWALLOWS	HIRUNDINIDAE							
Ethopian swallow	<i>Hirundo aethiopica</i>	3	0	0	0.48	LC	-	-
Common sand martin	<i>Riparia riparia</i>	0	2	0	0.32	LC	-	-
BEE-EATERS	MEROPIDAE							
White-throated bee-eater	<i>Merops albicollis</i>	0	1	0	0.16	LC	-	-
GUINEA FOWLS	NUMIDIDAE							
Helmeted guinea fowl	<i>Numida meleagris</i>	17	0	0	2.74	LC	-	-
FRANCOLINS	PHASIANIDAE							
Double-spurred francolin	<i>Francolinus bicalcaratus</i>	12	7	0	3.06	LC	-	-
CUCKOOS AND COUCALS	CUCULIDAE							
Senegal coucal	<i>Centropus senegalensis</i>	5	0	0	0.81	LC	-	-
African emerald cuckoo	<i>Chrysococcyx cupreus</i>	0	1	0	0.16	LC	-	-
SUNBIRDS	NECTARINIDAE							
Olive sunbird	<i>Nectarinia olivacea</i>	8	0	0	1.29	LC	-	-

KITES	ACCIPITRIDAE							
Black kite	<i>Milvus migrans</i>	4	7	0	1.77	LC	-	1
OWLS	STRIGIDAE							
African wood-owl	<i>Strix woodfordii</i>	1	1	0	0.32	LC	-	-
HORNBILLS	BUCEROTIDAE							
Yellow-casqued hornbill	<i>Ceratogymna elata</i>	0	2	0	0.32	VU	-	-
CUCKOO-SHRIKES	CAMPEPHAGIDAE							
Blue-cuckoo shrike	<i>Coracina azurea</i>	1	0	0	0.16	LC	-	-
SHRIKES	LANIDAE							
Gambian puff-back shrike	<i>Dryoscopus gabensis</i>	0	1	0	0.16	LC	-	-
Red-billed shrike	<i>Prionops caniceps</i>	1	1	0	0.32	LC	-	-
KINGFISHERS	ALCEDINIDAE							
Blue-breasted kingfisher	<i>Halcyon malimbica</i>	0	1	0	0.16	LC	-	-
PARROTS	PSITTACIDAE							
African grey parrot	<i>Psittacus erithacus</i>	0	1	0	0.16	EN	-	1
DUCKS	ANATIDAE							
Hartlaub's duck	<i>Pteronetta hartlaubii</i>	0	4	14	2.91	LC	-	-
CROWS	CORVIDAE							
Pied crows	<i>Corvus albus</i>	3	0	0	0.48	LC	-	-
DOVES	COLUMBIDAE							
Blue-headed dove	<i>Turtur brehmeri</i>	1	0	0	0.16	LC	-	-
SWIFTS	APODIDAE							
African palm swift	<i>Cypsiurus parvus</i>	0	0	9	1.45	LC	-	-
Signs		100	30	77				
Number of species		15	13	6				

Habitat type and relative density (RD in %) of some invertebrates in Ologbo conservation areas

Common name	Scientific name	Habitat			RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	RF	WL				
MOLLUSC	MOLLUSCA							
Land snail	Achatinidae							
African giant land snail	<i>Archachatina marginata</i>	1	14	0	2.43	LC	-	-
ARTHROPOD	ARTHROPODA							
Crab	Potamonautidae							
African freshwater crab	<i>Sudanonautes africanus</i>	3	3	0	0.96	LC	-	-
Number of signs		4	17	0				
Number of species		2	2	0				

SF: secondary forest; RF: riparian forest; WL: wetland

Annex 3a: Floral Species Identified in Cowan Conservation Areas

Species	Family	IUCN	Authority	Na/ha
<i>Albizia ferruginea</i>	Fabaceae	VU	(Guill. & Perr.) Benth.	2
<i>Alchornea cordifolia</i>	Euphorbiaceae	NA	(Schumach. & Thonn.) Müll. Arg.	88
<i>Allanblackia gabonensis</i>	Clusiaceae	VU	(Pellegr.) Bamps	14
<i>Alstonia boonie</i>	Apocynaceae	NA	De Wild.	9
<i>Anthocleista djalensis</i>	Lamiaceae	NA	A. Chev.	66
<i>Bambusa vulgaris</i>	Poaceae	NA	Schrad. ex J.C.Wendl.	47
<i>Calamus deerratus</i>	Arecaceae	LC	G.Mann & H.Wendl.	120
<i>Ceiba pentandra</i>	Malvaceae	NA	C.F. Gaertn.	16
<i>Cleistopholis patens</i>	Annonaceae	NA	(Benth.) Engl.&Diels -FTWA, ed.2, 1:38.	5
<i>Cola laurifolia</i>	Sterculiaceae	NA	Mast.	27
<i>Dialium guineense</i>	Fabaceae	NA	Willd.	7
<i>Elaeis guineensis</i>	Arecaceae	NA	Jacq.	34
<i>Ficus exasperata</i>	Moraceae	NA	Vahl	63
<i>Ficus Mucosa</i>	Moraceae	NA	Ficalho	16
<i>Hallea ciliata</i>	Rubiaceae	NA	(Aubrév. & Pellegr.) J.-F.Leroy	7
<i>Hallea stipulosa</i>	Rubiaceae	VU	(DC.) J.-F.Leroy	8
<i>Harungana madagascariensis</i>	Clusiaceae	NA	Lam. ex Poir.	6
<i>Hevea brasiliensis</i>	Euphorbiaceae	NA	(A. Juss.) Muell. Arg.	22
<i>Macaranga staudtii</i>	Euphorbiaceae	NA	Pax	2
<i>Margaritaria discoidea</i>	Euphorbiaceae	NA	(Baill.) G.L. Webster	4
<i>Musanga cecropioides</i>	Moraceae	NA	R. Br. ex Tedlie	4
<i>Nauclea diderrichii</i>	Rubiaceae	VU	(De Wild.) Merr.	29
<i>Newbouldia laevis</i>	Bignoniaceae	NA	(P. Beauv.) Seem.	49
<i>Pentaclethra macrophylla</i>	Fabaceae	NA	Benth.	4
<i>Psidium guajava</i>	Myrtaceae	NA	L.	9
<i>Pycnanthus angolensis</i>	Myristicaceae	NA	(Welw.) Warb.	19
<i>Raphia vinifera</i>	Arecaceae	NA	P.Beauv.	11
<i>Spondias mombin</i>	Anacardiaceae	NA	Linn.	32
<i>Treculia africana</i>	Moraceae	NA	Decne.	11
Total				718

Annex 3b: Faunal Species Identified in Cowan Conservation Areas

Habitat type and relative density (RD in %) of rodents in Cowan conservation areas

Common name	Scientific name	Habitat				RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	SL	SwF	WL				
RODENT	RODENTIA								
Squirrels	Sciuridae								
Striped ground squirrel	<i>Euxerus erythropus</i>	0	0	0	2	0.06	LC	-	2
African giant squirrel	<i>Protoxerus stangeri</i>	0	0	2	0	0.06	LC	-	-
Gambian sun squirrel	<i>Heliosciurus gambianus</i>	2	0	2	2	0.12	LC	-	-
Pouched rats	Cricetomyinae								
Forest giant pouched rat	<i>Cricetomys emini</i>	0	4	1	0	0.15	LC	-	-
Cane rats	Thryonomidae								
Marsh cane rat	<i>Thryonomys swinderianus</i>	0	5	3	19	0.81	LC	-	-
Murid rats	Muridae								

Shaggy swamp rat	<i>Dasymys incomptus</i>	0	0	0	1	0.03	LC	-	-
Signs		0	9	8	23				
Number of species		0	2	4	4				

SF: secondary forest; SL: shrubland; SwF: swamp forest; WL: wetland

Habitat type and relative density (RD in %) of ungulates in Cowan conservation areas

Common name	Scientific name	Habitat				RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	SL	SwF	WL				
UNGULATES	UNGULATA								
Antelopes	Antelopinae								
Duikers	<i>Cephalophini</i>								
Common duiker	<i>Sylvicapra grimmia</i>	1	0	5	3	0.27	LC	1	2
Bovids	Bovidae								
Bushbuck	<i>Tragelaphus scriptus</i>	0	0	1	0	0.03	LC	1	2
Signs		1	0	6	3				
Number of species		1	0	2	1				

SF: secondary forest; SL: shrubland; SwF: swamp forest; WL: wetland

Habitat type and relative density (RD in %) of carnivores in Cowan Conservation sites, Presco PLC

Common name	Scientific name	Habitat type				RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	SL	SwF	WL				
CARNIVORES	CARNIVORA								
Palm civets	Nandininae								
African palm civet	<i>Nandinia binotata</i>	3	0	0	0	0.09	LC	I	2
Cats	Felidae								
Wild cat	<i>Felis sylvestris</i>	0	0	0	1	0.03	LC	-	1
Mongoose	Herpestidae								
Marsh mongoose	<i>Atilax paludinosus</i>	0	0	2	6	0.24	LC	I	2
Common cusimanase	<i>Crossarchus obscurus</i>	0	0	0	2	0.06	LC	1	2
Signs		3	0	2	9				
Number of species		1	0	1	3				

SF: secondary forest; SL: shrubland; SwF: swamp forest; WL: wetland

Habitat type and relative density (RD in %) of herpertofauna in Cowan conservation areas

Common name	Scientific name	Habitat				RD (%)	IUCN Status	WCMC Status	Decree 11
		SF	SL	SwF	WL				
REPTILES	REPTILIA								
Snakes	Serpentes								
Python	Pythonidae						LC	-	1
Rock python	<i>Python sebae</i>	0	0	0	1	0.03			
Cobra	Elapidae						NA	-	-
Black cobra	<i>Naja nigricolis</i>	0	0	0	2	0.06			
Monitors	Varanidae						LC	-	1
Nile monitor lizard	<i>Varanus niloticus</i>	0	0	2	0	0.06			
Signs		0	0	2	3				
Number of species		0	0	1	2				

SF: secondary forest; SL: shrubland; SwF: swamp forest; WL: wetland

Habitat type and relative density (RD in %) of birds in Cowan conservation areas

Common name	Scientific name	Habitat				RD (%)	IUCN	WCMC	Decree
		SF	SL	SwF	WL				

							Status	Status	11
WEAVERS AND SPARROWS		PLOCEIDAE							
Black-headed weaver	<i>Ploceus melanocephalus</i>	0	12	100	980	58.46	LC	-	-
African masked weaver	<i>Ploceus velatus</i>	0	0	0	200	6.02	LC	-	-
Red-collared widowbird	<i>Euplectes ardens</i>	0	0	0	1	0.03	LC	-	-
Yellow-mantled widowbird	<i>Euplectes macrourus</i>	0	0	0	200	6.02	LC	-	-
Senegal indigo-finch	<i>Vidua chalybeata</i>	0	0	0	2	0.06	LC	-	-
Grey-headed sparrow	<i>Passer griseus</i>	0	0	0	1	0.03	LC	-	1
CUCKOOS		CUCULIDAE							
African emerald cuckoo	<i>Chrysococcyx cupreus</i>	0	0	1	0	0.03	LC	-	-
HORNBILLS		BUCEROTIDAE							
White-crested hornbill	<i>Tockus albocristatus</i>	0	0	1	0	0.03	LC	-	-
KINGFISHERS		ALCEDINIDAE							
Shining-blue kingfisher	<i>Alcedo quadribrachys</i>	0	0	0	19	0.57	LC	-	-
Grey-headed kingfisher	<i>Halcyon leucocephala</i>	0	0	0	2	0.06	LC	-	-
EGRETS AND HERONS		ARDEIDAE							
Great white egret	<i>Ardea alba</i>	0	0	0	337	10.14	LC	-	2
Black-headed heron	<i>Ardea melanocephala</i>	0	0	0	10	0.30	LC	-	2
KITES AND HAWKS		ACCIPITRIDAE							
Black kite	<i>Milvus migrans</i>	0	0	0	2	0.06	LC	-	1
African harrier hawk	<i>Polyboroides typus</i>	0	0	0	4	0.12	LC	-	1
DUCKS		ANATIDAE							
Hartlaub's duck	<i>Pteronetta hartlaubii</i>	0	0	0	530	15.95	LC	-	-
Signs		0	12	100	228				
				2	8				
Number of species		0	1	3	13				

SF: secondary forest; SL: shrubland; SwF: swamp forest; WL: wetland

Annex 4a: Floral Species Identified in Sakponba Conservation Areas

Species name	Family	IUCN	Authority	N/ha
<i>Albizia ferruginea</i>	<i>Fabaceae</i>	VU	(Guill. & Perr.) Benth.	8
<i>Albizia lebbeck</i>	<i>Fabaceae</i>	NA	(L.) Benth.	12
<i>Albizia zygia</i>	<i>Fabaceae</i>	NA	J.F. Macbr.	7
<i>Alchornea cordifolia</i>	<i>Euphorbiaceae</i>	NA	(Schumach. & Thonn.) Müll. Arg.	36
<i>Allanblackia gabonensis</i>	<i>Clusiaceae</i>	VU	(Pellegr.) Bamps	14
<i>Alstonia boonie</i>	<i>Apocynaceae</i>	NA	De Wild.	27
<i>Anthocleista djalensis</i>	<i>Loganiaceae</i>	NA	A. Chev.	61
<i>Baphia nitida</i>	<i>Fabaceae</i>	LC	Lodd	12
<i>Baphia pubescens</i>	<i>Fabaceae</i>	NA	Hook. f.	8
<i>Berlinia craibiana</i>	<i>Fabaceae</i>	NA	(Bak.f.) -FWTA, ed.2, 1:470.	4
<i>Berlinia grandiflora</i>	<i>Fabaceae</i>	NA	(Vahl) Hutch.&Dillz.-FTWA,ed2,1:170	19

<i>Blighia sapida</i>	<i>Sapindaceae</i>	NA	K.D. Koenig	5
<i>Blighia unijigata</i>	<i>Sapindaceae</i>	NA	Bak.-FTWA, ed.2, 1:723.	4
<i>Bombax buonopozense</i>	<i>Malvaceae</i>	NA	P. Beauv.- FTWA, ed.2, 1:334.	7
<i>Brenania brieyi</i>	<i>Rubiaceae</i>	NA	(De Wild.) Petit.-FTWA,ed.2, 2:116.	2
<i>Bridelia atroviridis</i>	<i>Euphorbiaceae</i>	NA	Muell. Arg.FTWA, ed.2, 1:370	8
<i>Canarium schwienfurthii</i>	<i>Burseraceae</i>	NA	Engl.	5
<i>Ceiba pentandra</i>	<i>Malvaceae</i>	NA	C.F. Gaertn.	11
<i>Celtis zenkeri</i>	<i>Ulmaceae</i>	NA	Engl.	14
<i>Chrysophyllum albidum</i>	<i>Sapotaceae</i>	NA	G. Don - FTWA, ed.2, 2:27. (Benth.) Engl. & Diels -FTWA, ed.2, 1:38.	2 23
<i>Cleistopholis patens</i>	<i>Annonaceae</i>	NA		
<i>Cola nigerica</i>	<i>Sterculiaceae</i>	CE	Brenan & Keay -FTWA, ed.2, 1:329.	1
<i>Cola nitida</i>	<i>Sterculiaceae</i>	NA	(vent.) Schott & Endl -FTWA, ed.2, 1:329	2
<i>Combretodendron macrocarpum</i>	<i>Lecythidaceae</i>	NA	(P.Beauv.) Keay -FTWA, ed.2, 1:761.	3
<i>Dacryodes edulis</i>	<i>Burseraceae</i>	NA	(G.Don) H.J. Lam	8
<i>Dialium dinklagie</i>	<i>Fabaceae</i>	NA	Harms- FWTa, ed2, 1:449	3
<i>Dialium guineense</i>	<i>Fabaceae</i>	NA	Willd.	12
<i>Entandrophragma utile</i>	<i>Meliaceae</i>	VU	(Dawe & Sprague) Sprague	4
<i>Erythrina vogelii</i>	<i>Fabaceae</i>	NA	Hook. f.	1
<i>Ficus asperifolia</i>	<i>Moraceae</i>	NA	Miq.	2
<i>Ficus exasperata</i>	<i>Moraceae</i>	NA	Vahl	4
<i>Ficus sur</i>	<i>Moraceae</i>	NA	Forssk	2
<i>Funtumia elastica</i>	<i>Apocynaceae</i>	NA	(Preuss) Stapf	23
<i>Gossweilerodendron balsamiferum</i>	<i>Fabaceae</i>	EN	(Verm.) Harms	2
<i>Harungana madagascariensis</i>	<i>Hypericaceae</i>	NA	Lam. ex Poir.	12
<i>Hevea brasiliensis</i>	<i>Euphorbiaceae</i>	NA	(A. Juss.) Muell. Arg.	73
<i>Homalium africana</i>	<i>Samydaceae</i>	NA	(Hook.f.) Benth.	2
<i>Irvingia gabonensis</i>	<i>Irvingiaceae</i>	NT	(Aubry-Lecomte ex O'Rorke) Baill.	3
<i>Klainedoxa gabonensis</i>	<i>Irvingiaceae</i>	NA	Engl.	13
<i>Lecanioidiscus cupanioides</i>	<i>Sapindaceae</i>	NA	Planch. ex Benth.	8
<i>Macaranga barteri</i>	<i>Euphorbiaceae</i>	NA	Müll. Arg.	5
<i>Macaranga spinosa</i>	<i>Euphorbiaceae</i>	NA	Müll. Arg.	3
<i>Mangifera indica</i>	<i>Anacardiaceae</i>	NA	Linn.	4
<i>Margaritaria discoidea</i>	<i>Euphorbiaceae</i>	NA	(Baill.) G.L. Webster	19
<i>Milicia excelsa</i>	<i>Moraceae</i>	NT	(Welw.) C.C. Berg	1
<i>Morinda lucida</i>	<i>Rubiaceae</i>	NA	Benth.	2
<i>Musanga cecropioides</i>	<i>Moraceae</i>	NA	R. Br. ex Tedlie	25
<i>Nauclea diderrichii</i>	<i>Rubiaceae</i>	VU	(De Wild.) Merr.	3
<i>Newbouldia laevis</i>	<i>Bignoniaceae</i>	NA	(P. Beauv.) Seem.	12
<i>Ongokea gore</i>	<i>Olacaceae</i>	NA	(Hua) Pierre.	3
<i>Pausinystalia macroceras</i>	<i>Rubiaceae</i>	NA	(K. Schum.) Pierre ex Bielle	2
<i>Pentaclethra macrophylla</i>	<i>Fabaceae</i>	NA	Benth.	13
<i>Piptadeniastrum africana</i>	<i>Fabaceae</i>	NA	(Hook. f.) Brenan	7
<i>Pseudospondias microcarpa</i>	<i>Anacardiaceae</i>	NA	(A.Rich.)Engl.	2
<i>Psidium guajava</i>	<i>Myrtaceae</i>	NA	L.	16

<i>Pterocarpus osun</i>	<i>Fabaceae</i>	NA	Craib	4
<i>Pterocarpus soyauxii</i>	<i>Fabaceae</i>	NA	Taub. -FTWA, ed.2, 1:517.	5
<i>Pycnanthus angolensis</i>	<i>Myristicaceae</i>	NA	(Welw.) Warb.	13
<i>Rauvolfia vomitoria</i>	<i>Apocynaceae</i>	NA	Afzel.	24
<i>Ricinodendron heudelotii</i>	<i>Euphorbiaceae</i>	NA	(Baill.) Heckel	9
<i>Santiria trimera</i>	<i>Burseraceae</i>	NA	(oliv.) Aubrev.	4
<i>Spathodea campanulata</i>	<i>Bignoniaceae</i>	NA	P. Beauv.	6
<i>Spondias mombin</i>	<i>Anacardiaceae</i>	NA	Linn.	34
<i>Staudtia stipitata</i>	<i>Myristicaceae</i>	NA	Warb.	4
<i>Sterculia rhinopetala</i>	<i>Malvaceae</i>	NA	K. Schum.	4
<i>Strombosia pustulata</i>	<i>Olacaceae</i>	NA	Oliv.	5
<i>Symphonia globulifera</i>	<i>Guttiferae</i>	NA	Linn.f.	2
<i>Tabernaemontana pachysiphon</i>	<i>Apocynaceae</i>	NA	Stapf.	11
<i>Tetrapluera tetraptera</i>	<i>Leguminosae</i>	NA	(Schum. & Thonn.) Taub.	2
<i>Treculia africana</i>	<i>Moraceae</i>	NA	Decne.	2
<i>Trema guineensis</i>	<i>Cannabaceae</i>	NA	(Schum. & Thonn.) Ficalho	3
<i>Uvariastrum elliotianum</i>	<i>Annonaceae</i>	LC	(Engl. & Diels) Sprague & Hutch	5
<i>Uvariopsis bakeriana</i>	<i>Annonaceae</i>	NA	(Hutch. & Dalz) Robyns & Ghesq	2
<i>Vitex ferruginea</i>	<i>Avicenniaceae</i>	NA	Schum. & Thonn.	4
<i>Voacanga africana</i>	<i>Apocynaceae</i>	NA	Stapf.	6
Total				734

Annex 4b: Faunal Species Identified in Sakponba Conservation Areas

THabitat type and relative density (RD in %) of primates in Sakponba conservation areas

Common name	Scientific name	Habitat					RD (%)	IUCN Status	WCMC Status	Decree 11
		SwF	SF	P	RF	WL				
PRIMATES	PRIMATA									
Cheek-pouched monkeys	Cercopithecidae									
White-throated monkey	<i>Cercopithecus erythrogaster</i>	0	0	0	2	0	0.43	VU	1	1
Signs		0	0	0	2	0				
Number of species		0	0	0	1	0				

SF: secondary forest; SwF: swamp forest; P: pond; RF: riparian forest; WL: wetland

Habitat type and relative density (RD in %) of ungulates in Sakponba conservation areas

Common name	Scientific name	Habitat					RD (%)	IUCN Status	WCMC Status	Decree 11
		SwF	SF	PPL	RF	WL				
UNGULATES	UNGULATA									
Pigs	Suidae									
Red river hog	<i>Potamochoerus porcus</i>	0	0	0	5	0	1.07	LC	R	1
Bovids	Bovidae									
Bushbuck	<i>Tragelaphus scriptus</i>	0	1	1	0	3	1.06	LC	1	2
Signs		0	1	1	5	3				
Number of species		0	1	1	1	1				

SF: secondary forest; SwF: swamp forest; P: pond; RF: riparian forest; WL: wetland

Habitat use type and relative density (%) of rodents in Sakponba conservation areas

Common name	Scientific name	Habitat					RD (%)	IUCN Status	WCMC Status	Decree 11
		SwF	SF	PPL	RF	WL				
RODENT	RODENTIA									
Squirrels	Sciuridae									
Striped ground squirrel	<i>Euxerus erythropus</i>	0	2	0	0	0	0.43	LC	1	2
African giant squirrel	<i>Protoxerus stangeri</i>	2	1	0	0	0	0.64	LC	-	-
Gambian sun squirrel	<i>Heliosciurus gambianus</i>	1	1	0	1	0	0.63	LC	-	-
Anomalures	Anomaluridae									
Beecroft's anomalure	<i>Anomalurus beecrofti</i>	0	2	0	0	0	0.42	LC	-	2
Pouched rats	Cricetomyinae									
Forest giant pouched rat	<i>Cricetomys emini</i>	0	1	0	0	0	0.21	LC	-	-
Cane rat	Thryonomidae									
Marsh cane rat	<i>Thryonomys swinderianus</i>	0	6	11	0	54	15.20	LC	-	-
Porcupines	Hystricidae									
Brush-tailed porcupine	<i>Atherurus africanus</i>	1	2	0	0	0	0.64	LC	-	1
Signs		4	15	11	1	54				
Number of species		3	7	1	1	1				

SF: secondary forest; SwF: swamp forest; P: pond; RF: riparian forest; WL: wetland

Habitat type and relative density (%) of carnivores in Sakponba conservation areas

Common name	Scientific name	Habitat					RD (%)	IUCN Status	WCMC Status	Decree 11
		SwF	SF	PPL	RF	WL				
CARNIVORES	CARNIVORA									
Palm civets	Nandininae									
African palm civet	<i>Nandinia binotata</i>	0	1	0	5	4	2.14	LC	I	2
Cats	Felidae									
Wild cat	<i>Felis sylvestris</i>	1	0	0	0	0	0.21	LC	-	1
Mongoose	Herpestidae									
Marsh mongoose	<i>Atilax paludinosus</i>	0	0	0	3	1	0.85	LC	I	2
Signs										
Number of species										

SF: secondary forest; SwF: swamp forest; P: pond; RF: riparian forest; WL: wetland

Habitat type and relative density (RD in %) of herpertofauna in Sakponba conservation areas

Common name	Scientific name	Habitat					RD (%)	IUCN Status	WCMC Status	Decree 11
		SwF	SF	PPL	RF	WL				
REPTILES	REPTILIA									
Snakes	Serpentes									
Python	Pythonidae									
African Rock python	<i>Python sebae</i>	0	0	1	0	0	0.21	LC	1	1
Viper	Viperidae									
Gaboon viper	<i>Bitis gabonica</i>	0	0	0	0	1	0.21	NA	1	-
Monitors	Veranidae									
Nile monitor lizard	<i>Varanus niloticus</i>	1	0	2	0	0	0.63	LC	1	1
Turtles	Testudinidae									
Mud turtles	<i>Pelomeducidae</i>									
West African mud turtle	<i>Pelusios castaneus</i>	0	0	62	0	12	15.85	LC	-	-
Signs		1	0	65	0	13				
Number of species		1	0	3	0	2				

SF: secondary forest; SwF: swamp forest; P: pond; RF: riparian forest; WL: wetland

Habitat type and relative density (RD in %) of birds in Sakponba conservation areas

Habitat										
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Common name	Scientific name	SwF	SF	PPL	RF	WL	RD (%)	IUCN Status	WCMC Status	Decree 11
WEAVERS AND SPARROWS	PLOCEIDAE									
Black-headed weaver	<i>Ploceus melanocephalus</i>	20	0	15	0	70	22.48	LC	-	-
Red-collared widowbird	<i>Euplectes ardens</i>	0	0	0	0	1	0.21	LC	-	-
KINGFISHERS	ALCEDINIDAE									
Shining-blue kingfisher	<i>Alcedo quadribachys</i>	1	0	3	0	4	1.71	LC	-	-
Grey-headed kingfisher	<i>Halcyon leucocephala</i>	0	0	1	0	1	0.42	LC	-	-
WOODPECKERS	PICIDAE									
Gaboon woodpecker	<i>Dendropicos gabonensis</i>	0	1	0	0	0	0.21	LC	-	-
PARROTS	PSITTACIDAE									
African grey parrot	<i>Psittacus erithacus</i>	0	1	0	0	0	0.21	EN	-	1
EGRETS	ARDEIDAE									
Great white egret	<i>Ardea alba</i>	0	0	14	0	6	4.28	LC	-	2
HORNBILLS	BUCEROTIDAE									
African grey hornbill	<i>Lophoceros nasutus</i>	2	0	22	0	8	6.85	LC	-	-
Black-and-white casqued-hornbill	<i>Bycanistes subcylindricus</i>	0	0	0	0	1	0.21	LC	-	-
DUCKS	ANATIDAE									
Hartlaub's duck	<i>Pteronetta hartlaubii</i>	20	0	30	0	19	14.78	LC	-	-
SWIFTS	APODIDAE									
African palm swift	<i>Cypsiurus parvus</i>	0	0	8	0	0	1.71	LC	-	-
FRANCOLINS	PHASIANIDAE									
Double-spurred francolin	<i>Fringilla bicalcaratus</i>	0	0	0	0	6	1.28	LC	-	-
GUINEAFOWLS	NUMIDIDAE									
Helmeted-guineafowl	<i>Numida meleagris</i>	0	0	0	0	15	3.21	LC	-	-
DOVES	CULUMBIDAE									
Blue-headed wood-dove	<i>Turtur brehmeri</i>	0	0	0	1	0	0.21	LC	-	-
FLYCATCHERS	MONARCHIDAE									
Blue-headed flycatcher	<i>Terpsiphone nitens</i>	0	0	0	0	6	1.28	LC	-	-
Signs		43	2	93	1	137				
Number of species		4	2	7	1	11				

SF: secondary forest; SwF: swamp forest; P: pond; RF: riparian forest; WL: wetland

Annex 5: Lists of local participants during the community consultations

List of participants at Obagie community

SN	Name	Phone	Position
1	Pa Moses Omoroge Ochuro	08103710514	Odiowere
2	Mr. Sunday Nomaye	-	Member
3	Capt. Agbechion H.	-	3 rd position
4	Mr. S. A. Agbaraho	-	4 th position
5	Mr. Anthony Uwogbusan	-	Member
6	Mr. Unity Erharuyi	08032825142	Member
7	Mr. Monday Onhiaro	-	Member
8	Benson Aigbowbuosa	-	Member
9	Mr. William Eyekegboro	-	Member
10	Mr. Solomon Aiguehiren	08032596138	Member
11	Napoleon Aiyekhor	-	Member
12	Felix Iserhierhein	08038823066	Member

13	Sunday Okhiaro	-	Member
14	Friday Ehusiennen	08036872230	Member
15	Peter Uyinwmen	-	Member
16	Believe Obauwe	-	Member
17	Fred Iserhamehun	-	Member
18	Christopher Ogbemudue	-	Member
19	Monday Enomayo	-	Member
20	Stephen Owuoregie	-	Member
21	Iyare Ineh	-	Member
22	Friday Uyuangho	-	Member
23	Monday Edebiri	-	Member
24	Osagiator Akorobo	-	Member

List of participants at Uroho community

SN	Name	Phone	Position
1	Matthew Agbonlahor	08139628397	Elder
2	Sunday Erharuyi	08116505247	Elder
3	Gabriel Erharuyi	08086429345	Elder
4	Obamonyi Agbonlahor	08085373915	Elder
5	Sunday Omorotiomani	07033515192	Elder
6	Jimoh Osunde	08051808234	Elder
7	Ogieva Joseph	08059556579	Elder
8	Ebohon Osaheniye	07036729847	Elder
9	Influence Ogieriakhi	08074751611	Elder
10	Christopher Idemudia	08038754209	Elder
11	Osagie Osunde	08178245184	Elder
12	Sunny Edokpolor	08114545900	Elder
13	Earnest Onaiwu	08059982092	Elder
14	Victor Agbonaubare	08026713678	Elder
15	Egharevba Austin	08056733841	Elder
16	Friday Erharuyi	08056730370	Youth
17	Osabuohien Idemudia	07033790732	Youth
18	Julius Erharuyi	08182531985	Elder

List of participants at Ogbekpen community

SN	Name	Phone	Position
1	Godwin Omoregie	08161191394	Odionwere
2	Samson Amalawa	07052331300	General secretary
3	Fred Amalawa	07050445560	Elder
4	Pullen Okoro	07053498822	Elder
5	Ikponmwosa Enoruwa	-	Elder
6	Alex Odigie	08078264434	Elder
7	Robinson Odigie	08152044335	Elder
8	Godfrey Bello	-	
9	Igbinoba Odigie	07059441290	Elder

List of participants at Ikara community

SN	Name	Phone	Position
1	Mr. Friday Udoh	08126145959	Elder
2	Boyowa Eyejamuro	07030240038	Trust secretary

3	Authur Egbewi	08050205078	Member
4	Pa Omonedo	08063880056	Assistant secretary
5	Pastor Victor Sibra	08160939478	Member
6	Emma Oghara	-	Member
7	Mr. Moses Nene	-	Member
8	Mr. Godwin John	-	Member

List of participants at Ologbo community

SN	Name	Phone	Position
1	Ighodaro Omorodion	08075779447	Auditor
2	Fred Ulieyin	07066562477	General secretary
3	Vincent Egbeire	08091723622	President
4	F. Osazuwa	08067357683	Member
5	HRH. Prince Owon Akenzua		

List of participants at Ogharekhi community

SN	Name	Phone	Position
1	Chief Destiny Okwe	08032270235	Uwugbiogodo
2	Chief Edwin Imonkhe	08141860376	Uruevivoro
3	Chief Felix Orouwgho	080337715786	Irokhua
4	Chief A. D. Tietie	08038473447	Member
5	Chief Matthew Ajamunfol	08038473447	Member
6	Chief Isaac Udju	07066265375	Member
7	Chief Francis Makinde		Member
8	Chief Jonathan Eruteyan	08153849143	Member
9	Chief Maclean Agbon	08033926243	Member
10	Chief K. O. Tanma	08033920884	Member
11	Chief Rapheal Iyah	08158648314	Member
12	Chief Agent Iware	08151156943	Member
13	Chief Felix Ekreghiro	08067794610	Member
14	Chief Emma Ofolokim	08111618254	Member
15	Chief Jolumbuw Aluka	08030699211	Member

List of participants at Ajagbodudu community

SN	Name	Phone	Position
1	Mr. Mebulahiaje Samson	-	Community leader
2	Mr. Felix Koko	-	Community leader
3	Mr. Frank Mebulahiaje	-	Community leader
4	Mr. Alfred Etere	-	Member
5	Mr. Anthony Aboro	-	Member
6	Eyetemi Ogborefo	07053047982	Vice chairman
7	Christopher Johnny	08122087491	Member
8	Obakare Believe	08057917420	Chairman
9	Samuel Edma	08078703712	P. R. O
10	Okotie Samuel	08125419018	Member
11	Felix Ayo	-	Member
12	Itsekure Shola	08063481380	Member
13	Mebularije Julius	07083641733	Member
14	Atakere Tuoyo	08071486563	Member
15	Okayin Mogha	08026092320	Member

16	Mrs. Yellow Kuri	-	Member
17	Mrs. Itsekure Rosemary	-	Member
18	Agawmess Omakere	-	Member
19	Mrs. Korson	-	Member
20	Patricia	-	Member
21	Atakere Evelyn	-	Member
22	Anuma Mabel	-	Member
23	Akra Mary	-	Member