5.1.6 **Archaeological sites**

5.1.6.1. ***Location and periodization of archaeological sites*** (see fig. 52, p. 75).

During the roads and forest tracks survey, quite a few archaeological sites were found while field walking. None were excavated. The sites excavated are south of the Iguéla lagoon (see 5.2.4).

The 25 archaeological sites discovered north of the Iguéla lagoon are listed in the following table (p. 76). Their detailed analyses are beyond the scope of this site survey report.

5.1.6.2. ***Discovery factors***

There are three primary factors that contributed to these sites being discovered.

1) Nearly all the sites were discovered by field walking areas that were undergoing erosion associated with roads or tracks such as embankments that had been created or disturbed by road work.
2) The OM-19 site is located at Mr.Michonnet's ranch. It was because of surface concentrations of lithic artifacts caused by the building of a wooden cow stockade. The main post holes of the stockade were dug down into the coastal sand to -50 cm where they encountered an archaeological layer.
3) The last primary discovery factor is like that found at site OM-20. There, natural erosion of a sand bank to the south of a small lagoon has allowed the artifacts to erode out of their archaeological layer buried at -50 cm.

Of course some sites show more than one system operating to expose artifacts. For example at site OM-10, slope erosion has developed after surface erosion and disturbances caused by road construction.

5.1.6.3. ***Artefact analysis***

The analyses of artifacts surface-collected or sampled from stratigraphic units - like road cuts - during the survey north of the Iguéla lagoon was carried out without getting into any kind of archaeological detail. The detailed analyses will be done for a paper that will be published later.

5.1.6.4. ***Chronology***

Stratigraphy, artifact analyses, and radiocarbon dates at sites in the Ogooué-Maritime province all help with determining the age of the sites discovered during the site survey. These sites also help to get an overall picture of man's settlements in the area for the last 10,000 years.

5.1.6.5. ***Archaeological impact assessment***

An archaeological impact assessment is the analysis of the relationship between what we know of the position of archaeological sites in the subsoil, the way man interacted with his environment during different periods of the past and the way development might disturb cultural heritage. This leads to formulating ways to alleviate the disturbance, i.e. recommendations (see 7.2 for this).

Site # [1]	Location # [2]	UTM Coordinates		Period
OM 1	1	9788500	535720	Stone Age
OM 2	3	9788800	536000	Stone Age
OM 3	4	9789100	536111	Stone Age and Iron Age (?)
OM 4	5	9789500	536330	Stone Age
OM 5	7	9791200	537310	Stone Age
OM 6	8	9791800	537540	Stone Age and Iron Age (?)
OM 7	9	9792100	537600	Stone Age
OM 8	14 and 15	9795100	542590	Stone Age and Iron Age
OM 9	31	9799100	540110	Iron Age
OM 10	33	9798400	539330	Stone Age
OM 11	35	9794700	537510	Stone Age
OM 12	38	9797500	535610	Stone Age
OM 13	39	9797700	535450	Stone Age
OM 14	40	9801700	533130	Stone Age
OM 15	45	9804400	530560	Stone Age
OM 16	49	9812700	532060	Stone Age
OM 17	-	9798900	548620	Stone Age
OM 18	-	9798700	550500	Stone Age
OM 19	-	9808125	528400	Stone Age
OM 20	-	9806000	529875	Stone Age
OM 23	-	near Omboué		Stone Age
OM 24	-	near Omboué		Stone Age
OM 27	43	9803340	532281	Stone Age
OM 28		9801398	552012	Stone Age and Iron Age

[1] This site number relates to the *Atlas Archéologique du Gabon* held at the *Département d'Archéologie et de Muséologie* of CICIBA. One or two letters refer to the province -in this case Ogooué Maritime province = OM- and a number is given to the site from 1 to n.
[2]The location number relates to the *Gabon Vert* report to *Amerada Hess Production Gabon*. These numbers correspond to the numbers shown on the maps submitted in this site survey report.

5.2. SOUTH OF THE IGUELA LAGOON.

5.2.1. **Soil and laterite**

South of the Iguéla lagoon soil samples were only collected on the southern shore of the lagoon in front of Iguéla village, at pedological profile location # 8, see fig. 31, p. 53.

5.2.1.1. ***Location and sampling***

The location of this pedological trench is at GPS position 535,492 and 9,788,107.

A 1 x 2 meter trench was studied on the top of a sandy hill overlooking the lagoon. It was opened there to study the difference between the white sands and the yellow sands visible around the lagoon.

Six (6) soil samples were taken

5.2.1.2. ***Local vegetation***

The local vegetation is a poor low grass type of savanna vegetation. Main species are *Ctenium*, *Pobeguinea* and *Chrysopogon*

5.2.1.3. ***Profile description***

2 layers were identified.

Layer # 1: A sand layer, brown in color, from the surface to -0.60 meter.

Layer # 2: A sand layer, yellow in color, from -0.60 meter to -3 meters.

The following table gives some information on the six samples gathered:

Sample #	Soil type	Munsell Code Color	Color	Depth (cm.)	pH value
1	Sand	7.5 YR 5/2	Brown	0 / -20	5.2
2	Sand	7.5 YR 5/4	Brown	-20 / -40	5.4
3	Sand	10 YR 5/3	Brown	-40 / -60	5.6
4	Sand	2.5 Y 6/6	Olive yellow	-60 / -80	5.6
5	Sand	2.5 Y 6/8	Olive yellow	-80 / -100	5.7
6	Sand	2.5 Y 6/8	Olive yellow	-100 / -120	5.7

It would be interesting to study the granulometric curve of the upper and the lower part of this sand mantle, so to understand how the sand was deposited. It must be stressed here most of the sand

deposits on the banks of the lagoon towards its opening to the ocean, e.g. in the area where pedological trench # 8 was dug, are white sands with Munsell Code color between 2.5 Y 9/0 to 5 Y 8/2. Usually these white sands are wind-deposited. But it has been shown near to Libreville (so-called "Sablières", north of the city) these white sands are in fact podzols, whose sand structure are no different from underlying "ochre" or "yellow" sand (Peyrot, Clist and Oslisly, 1990; Clist 1994).

5.2.2. **Vegetation**

The area immediately to the south of the Iguela lagoon is a mixed gallery forest / savanna pattern. This extends to near the forest block E to the southeast.

The vegetation from the upper part of the beach to a few hundred meters inland consist of a shrub and tree cover of a particular type whose general appearance has been shaped by the coastal winds. The strongest winds thus seem to come from the southwest (figs. 53 and 54).

Figure 53: Vegetation at Petit Loango, notice the elephants.

Figure 54: Vegetation at Petit Loango, notice the buffalo.

5.2.3. **Fauna**

The fauna seen, heard or registered in this area does not differ at all from the fauna known to exist inside the Iguela reserve: elephants, buffaloes, bush pigs, antelopes, crocodiles were all noted during the survey. The elephants and buffaloes are often seen wandering in the vegetation near to the beach, or on the beach itself, see figure 53 and 54. Some buffaloes were even seen splashing in the waves.

5.2.4. **Archaeological sites.**

Four archaeological sites were identified, then studied on the south shore of the Iguela lagoon. They are all grouped on the south shore in the savannas just south of Iguela village and to the south-west. The sites were numbered # 21, 22, 29, and 30 according to the Ogooué-Maritime Province census from the National Archaeological Atlas held at the Archaeology and Museology Department at CICIBA, Libreville.

5.2.4.1. *Archaeological site # 21*

The archaeological site was discovered by field walking the length of the savannas overlooking the lagoon.

The survey found thousands of artefacts knapped out of flint and quartz lying on the surface on the eroded side of the savanna, sloping to the lagoon (fig. 55). The position of the artefacts showed an archaeological layer to be present intact under the savanna.

A 1 x 2 meter trench was opened on site. This also was used as pedological profile # 8 (see 5.2.1). The trench was studied as squares A (1 square meter to the west) and B (1 square meter to the east).

Square A:

0/-50 cm. :	0	:	0 artefacts.
-50/-70 cm :	12 flint and 2 quartz	:	14 artefacts.
-70/-90 cm :	53 flints (1 burned), 1 knapping stone	:	54 artefacts.
-90/ and lower:	0	:	0 artefacts.

Square B:

0/-10 cm. :	57 flints and 9 pot sheds	:	66 artefacts.
-10/-50 cm :	0	:	0 artefacts.
-50/-60 cm. :	2 flints and 1 quartz	:	3 artefacts.
-60/-70 cm. :	3 flints	:	3 artefacts.
-70/-90 cm. :	45 flints	:	45 artefacts.
-90/-120 cm. :	2 flints, 1 quartz.	:	3 artefacts.
-120 cm. and lower :	0	:	0 artefacts.

Figure 55 Archaelogical site # 21.

In both squares, charcoal was present in the archaeological layer present between -50 and -90 centimeters. The charcoal enabled one radiocarbon date to be processed: **Beta-74285, 6300 +/- 60 bp**. As calibrated following Stuiver and Reimer tables of 1993 the true calendar date at 1 sigma is 5,280-5,149 BC.

The artefacts from square B in the first 10 centimeters of soil are to be considered as *in situ*. They have been colored dark grey due to being lying for a long time in the humic sand, no sign of any disturbance was visible, and they seem to have been knapped differently from the c.6,300 years bp layer ones.

The pottery are too few to say anything about them. One sherd displays a criss-cross incised motif and a suspension hole.

The 5,280-5,149 BC layer has the greatest concentration between -70 and -90 centimeters. This must be the archaeological layer. It can thus be seen, biotic agents and erosion are responsible for the slight vertical displacement of artefacts.

Putting together surface finds and artefacts collected during the excavations the following picture can be suggested :

- before c.5,200 BC no important settlement is known on this hill top.
- around 5,200 BC a Late Stone Age camp is put up. A flint knapping area (or areas) are buried here. This is evidenced by the thousands of artefacts jutting out of the hill slope, and by the c.50 artefacts/square meter found in the trenches.

- later, either during the Neolithic or Iron age times a village is constructed on the same spot. This is shown by pot sherds surface collected. These are ancient. All the pot sherds are coming from one area where recent erosion has destroyed the first 10 centimeters of deposit. One sherd with walking comb impressions connects the sherds to the Neolithic. But before linking the assemblage to this period, a good knowledge of local pottery production must be developed.

5.2.4.2. *Archaeological site # 22*

The site was identified while field walking in a savanna to the west of site # 21. There, a white sand hill has a steep slope going down to the water (figs. 56 and 57). Empty white oyster shells, european artefacts, and some flints were noted lying on the surface. Later, oyster shells refuse heaps were identified. It was decided to excavate trial pits to check the presence of an historical layer in which bones could be preserved due to the presence of the shells.

Five square meters were excavated. Four were opened in a row next to an oyster shell refuse heap where european artefacts were sticking out and to try to get a good idea of the local stratigraphy. A fifth one was excavated 20 meters to the northwest right on top of another shell refuse heap. The results are given below, following the way site # 21 was presented :

Trench # 1:

0/-40 cm. :	0	:	0 artefacts.
-40/-60 cm. :	3 flints	:	3 artefacts.
-60/-80 cm. :	0	:	0 artefacts.

Trench # 2:

0/-40 cm. :	0	:	0 artefacts.
-40/-60 cm. :	4 flints, 1 pot sherd	:	5 artefacts.
-60/-85 cm.	0	:	0 artefacts.

Trench # 3:

0/-40 cm. :	0	:	0 artefacts.
-40/-60 cm. :	1 quartz, 5 flints	:	6 artefacts.
-60/-80 cm. :	0	:	0 artefacts.

Trench # 4:

0/-40 cm. :	4 flints (three of them burned), 1 quartz, 20 pot sherds:		25 artefacts.
-40/-50 cm. :	40 flints (1 of them burned):		40 artefacts.
-50/-60 cm. :	311 flints, 2 quartz	:	313 artefacts.
-60/-80 cm. :	0	:	0 artefacts.

Trench # 5:

0/-20 cm. :	European pottery, tobacco pipes, copper vessel, glass beads, glass goblet, fish and mammal bones, palm nuts.
-20/-50 cm. :	0 artefacts.
-50/-60 cm. :	charcoal.
-60/-80 cm. :	0 artefacts.

Figure 56 Archaelogical site # 22.

Figure 57 Archaelogical site # 22.

A charcoal sample taken from trench # 4 at -50/-60 cm. was sent to be radiocarbon-dated. The result is **Beta-74286, 3680 +/- 60 years bp.** The true calendar date at one sigma is 2,138-1,952 BC (calibrated dates following Stuiver and Reimer tables of 1993).

The five trenches dug leads one to the following conclusion about this site :

- at between -40 to -60 centimeters in the white sands a Late Stone Age site dating back to 2,138-1,952 BC (calibrated dates following Stuiver and Reimer tables of 1993) is well preserved along several dozen square meters. A knapping position was sampled via trench # 4 (>300 objects / square meter!).
- between c.2,000 BC and the XVIII th. or the XIX th. centuries, i.e. during the next 4,000 years, no permanent settlement was positioned here.
- during either the XVIII th. century or the XIX th. century a large settlement (important extension of surface finds) developed there. Its economy relied on fishing, hunting (bones of fishes and mammals conserved in the shell midden), collecting oysters along the Atlantic ocean a few kilometers away. Palm trees were growing near to the village. The material culture consisted of imported european artefacts (plates, dishes, tobacco pipes, glass bottles and goblets, copper vessels - called "Neptunes" - glass beads, etc.) and Gabonese traditional pottery. It can be either a Gabonese village, or a european settlement.
- since the time of this historical village, no other settlement is evident there. The hill top was used this century as a burial ground.

5.2.4.3. *Archaeological site # 29*

Site # 29 was surveyed and artefacts were only surface-collected. The site is situated in a southerly extension of the savanna covering site # 22. It is 800 meters away from site # 22. The find spot overlooks a small river connecting with the lagoon. Due to frequent grazing of groups of buffaloes, the survey was not extended any further into the savannas.

Flint and quartz artefacts are found on the surface of the white sands. It is hard to be sure from which depth they are coming, as their presence is due to bulldozer work. This work was done for an old debarkation point with a small track going uphill to the savanna.

The site can be linked with the Late Stone Age (i.e. 10,000 to 2,000 bp).

5.2.4.4. *Archaeological site # 30*

Site # 30 is 500 meters to the north-west of site # 22. Its environment is similar to site 22: in a savanna, on the edge of the hill slope going down to the lagoon. The artefacts are lying about on the white sands.

The site can be linked to the Iron Age due to the physical characteristics of the pot sherds collected. Some flints were also found near to the edge of the slope. This points to a buried Late Stone Age layer buried under the Iron Age layer.

5.2.5. **Road survey**

The road survey to be carried out on the track going from the south bank of the lagoon (the opposite site of the Iguéla camp) to Petit Loango.

The track does not exceed the width of a four-wheel drive vehicle i.e. c.2.5 to 3 meters. The state of the surface is poor, holes are plenty all along the track.

Wet areas are few, as usually the track was opened in savannas and along ridges.

This means - if the track is to be used for heavy transportation, it will have to be widened and re-surfaced along the whole length, roughly 30 kilometers.

Beyond Tassi the track loses itself in the forest and is no longer usable (see also 6.5.3). At the present the only way to continue till Petit Loango (about 25 kilometers) is over the beach. This is possible from about three hours before till three hours after low tide.

5.2.6. **Description of works / cost evaluation**

<u>The Road from Iguéla shore till Tassi</u>

30 kilometers of road in savannas :

road surfacing : 30 km x 5,220 $ =	156,600 $

Culverts :

5 x 1,099 $ =	5,495 $
TOTAL	**162,095 $**

<u>The road between Tassi and Petit Loango</u>

No works required.

6.5. ARCHAEOLOGICAL SITES

Few archaeological sites were found in the forest block. Only two sites were identified, one on the coast at Petit Loango, the second one at pedological trench n°4.

6.5.1. **Archaeological site 25**

At the Petit Loango location on the coast an historical site was found. Behind the base camp, in the local savanna grown on a white coastal sand formation, several heaps of oyster shells were located. Amongst them several pot sheds of European origin can be found. This type of evidence is in the first 10 centimetres of soil.

As far as 3 kilometres south of Petit Loango, several locations were found with oyster shell refuse and European made pots.

6.5.2. **Archaeological site 26**

At pedological trench # 4 two archaeological layers were found while studying the cuts of the trench (see figure 76). It is in a thick primary forest with large trees on a north facing hill slope, though near the hill top. A river flows some hundred meters to the north. The approximate location of the trench is at 567,750 and 9,752,925.

The first archaeological layer consists of small stone flakes of microlithic size at -0.40 meters in soil layer # 2. This soil layer extends from - 0.05 to - 1.10 meters and is made up of a brown clay. The layer can be for the time being be linked to a Late Stone Age camp site of c.10,000 to 4,000 bp date.

The second layer consists of pot sheds, stones and burned earth (remnants of hut walls ?) and is buried at -0.25 meters in soil layer # 2 (see above).

Due to the very small sample of archaeological material, it can only be linked in a general sense to the local Iron Age though the depth of the layer and the primary forest there shows it can not be of recent age. The Iron Age in the Iguéla general area must have started around 2,000 years ago.

Nevertheless the evidence is strongly suggestive of a small village having been established on the hill several centuries ago.

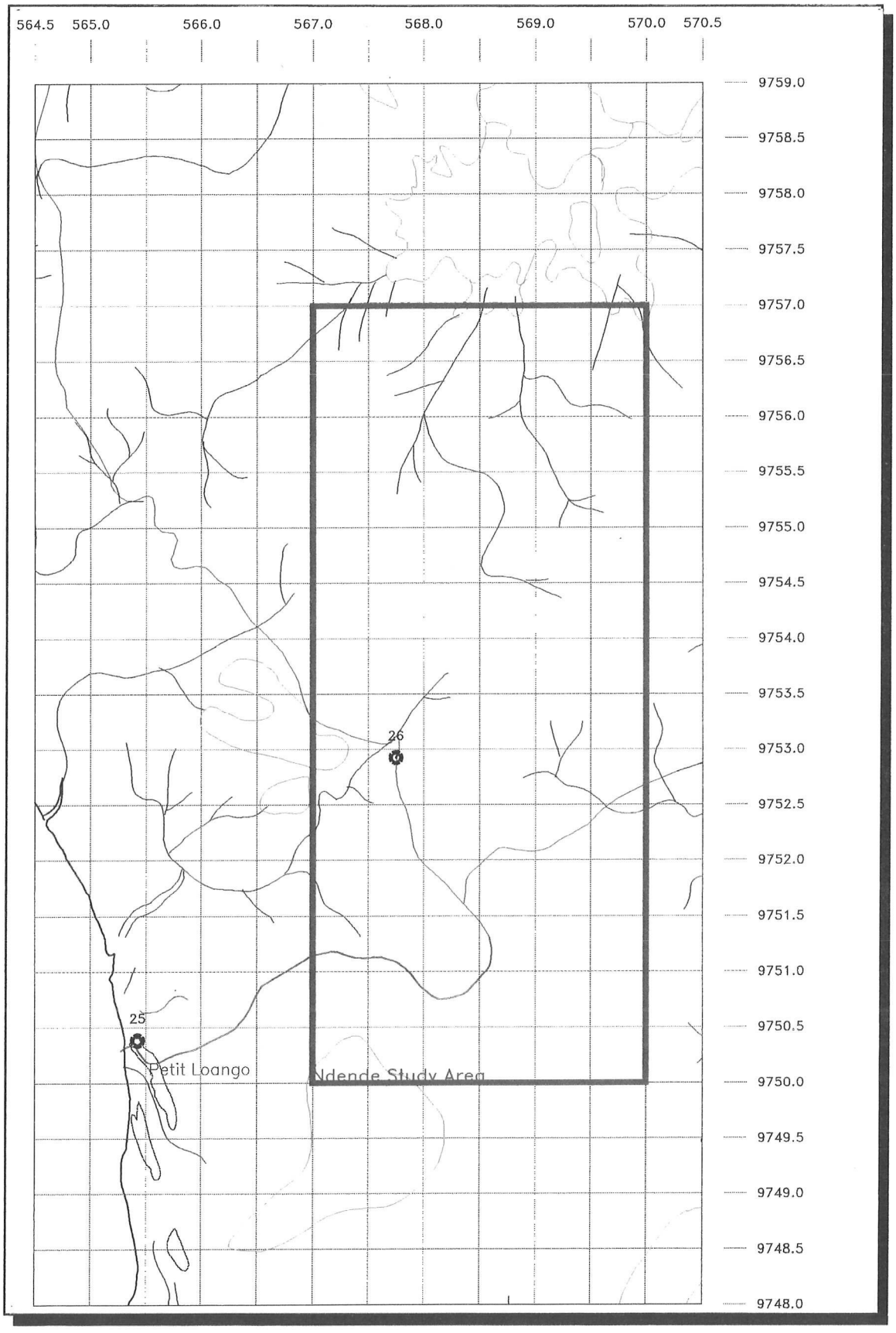

Figure 76: Archaeological sites found in the southern study area.