CHAPTER FOUR

RESULTS OF SURVEYED REGIONS

Rietvlei Nature Reserve, South Africa

Initial fieldwork was carried out at the Rietvlei Nature Reserve, South Africa, from 18 February to 30 March 2004. Three brown hyaena dens were identified on the initial day with the aid of local ranger Karin Coetzee (Figure 6). An additional den was later located but was not included in the study as it was newly dug out with few faunal remains associated with it and the fact that it was discovered in late March when the permit for research was due to expire. The three dens examined were identified as Den R01, Den R02, and Den R03. All of the dens are modified aardvark (*Orycteropus afer*) burrows (A. Taylor, pers. comm.) located in both the open veld (R01 and R03) or in proximity to dense scrub (R02). Den R01 is located at coordinates S25º 53.370' EO 28º 18.207' in the open grasslands and yielded just 27 specimens. The den consists of three modified aardvark burrows connected by well-worn trails (Plate 1), and had gnawed faunal material and a latrine area in association. During daytime observations it appeared that this den was inactive as no new faunal remains were deposited at the dens and there was no evidence of disturbance to the dens themselves. Night observations of the den area were done on foot with handheld spotlights at which time three adult brown hyaenas were identified at the den. At the time of the fieldwork it was thought that this particular den was used as a resting site by the resident hyaenas and not a feeding or maternity den. Den R02 was the most active den during the three-month period of observations. This particular den is located in heavy scrub near a stand of trees at 25º 56.669' EO 28º 18.207' (Plates 2 &

3). When initially located den R02 was an older complex made up of a series of modified aardvark holes that had recently collapsed. During the period of observation a new series of holes were dug adjacent to the collapsed complex. Over a period of two weeks this den went from an older collapsed complex to a new complex with no less than four entrances and new 'trails' of fresh earth connecting the entrances as well as moving off into the adjoining stand of trees. New faunal remains were located daily and sounds of movement could be heard coming form the den on more than one occasion. Despite all of the activity, this site had only 12 specimens associated with it at the time of collection. Den R03 is another dug out aardvark burrow that had been dug extensively thus it had an opening a metre wide and two metres deep (Plates 4 & 5) with a tunnel extending deep into the earth beyond the means of the investigator to penetrate. Faunal evidence suggests that the den is currently being inhabited by porcupines, but had been used by brown hyaenas in the past. The fact that hyaenas had indeed been resident in this den in the past was confirmed by Riaan Marais, the reserve manager, but it yielded a mere seven specimens.

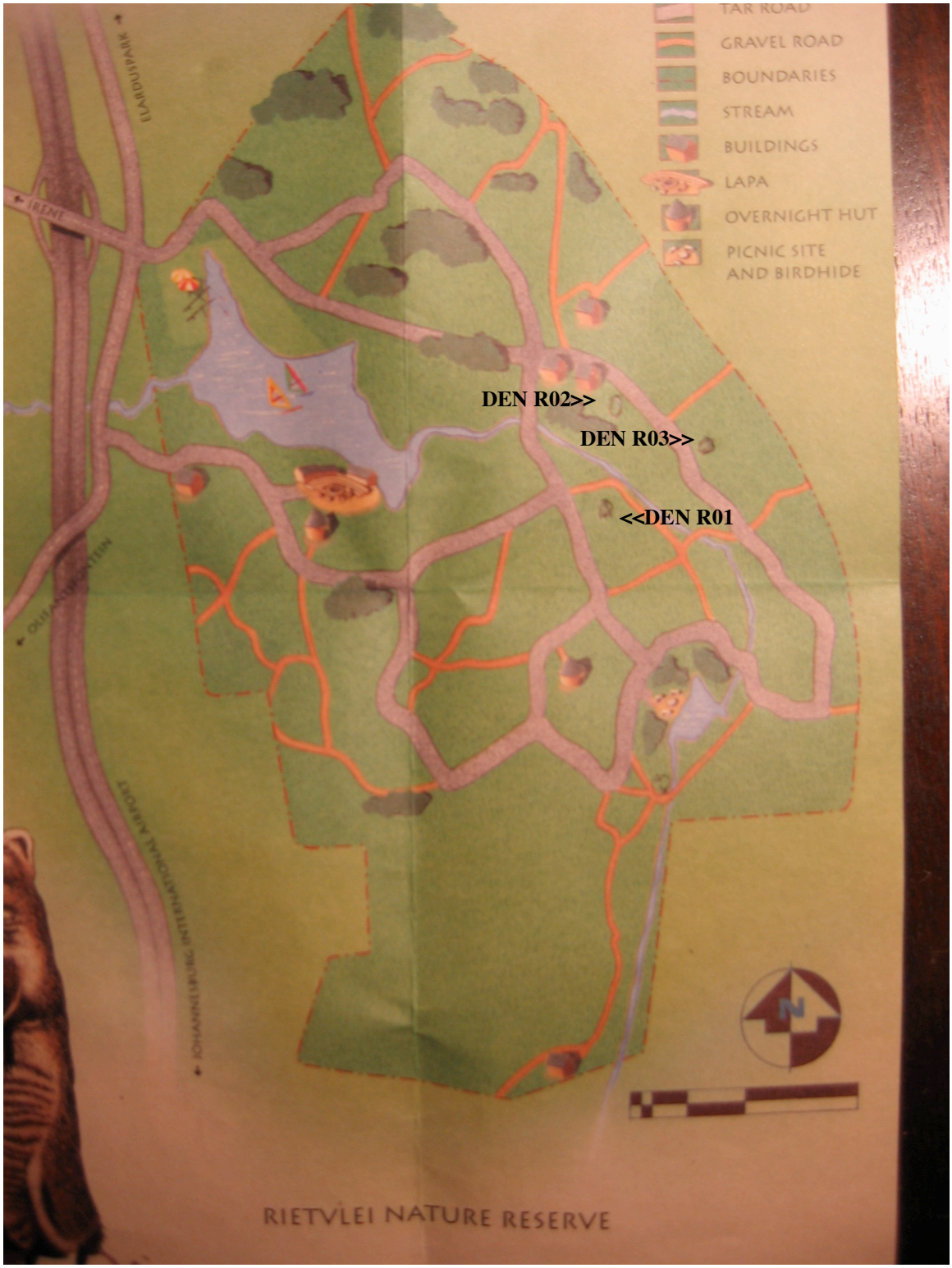

Figure 6: Rietvlei den locations

Mashatu Game Reserve, Botswana

After meetings with the staff of Mashatu Game Reserve, Botswana, in July of 2004, it was agreed that the researcher could set up camp at the boma camp, or kgothla, near the Motloutse Archaeological site and conduct research on the resident spotted hyaenas. During the two days in July the investigator was shown the region for the study, at which time a ranger identified three spotted hyaena dens, one of which was active and had cubs present. From 30 October to 23 December 2004 the researcher conducted surveys and observations of the previously established three dens as well as locating numerous other dens of both spotted hyaenas and leopards within the study area (Figure 7). Three additional active dens, and two inactive hyaena dens were located during the survey portion of the study. Included with the three dens located by the Mashatu Rangers, this gave a total of eight dens from which to work. Of these two were modified aardvark burrows (one active and one inactive) of which one appeared to be a resting place, while spotted hyaenas were found here on a regular basis there were no faunal remains present. The second series of dug out aardvark burrows had latrines associated with them but no current activity and no faunal remains. All of the remaining dens were in natural caves associated with the escarpment around the archaeological site. Two of these dens, one active and the other inactive, were located approximately 15 km from the archaeology site (where the vehicle was left) and 100-120 m above the valley floor. Due to the location of these dens and the nature of the den entrances on the cliff face, it was deemed to be unsafe for the researcher to collect material from them. Four dens were collected from; these included the three inactive dens (one of which had cubs present in July, but had no activity during the study period) located by the Mashatu staff and one

active den located during the survey portion of this study. These dens were given simple numerical identifications, Mashatu Den 1, Mashatu Den 2, Mashatu Den 3 (previously located by Mashatu rangers) and Mashatu Den 4. Mashatu Den 1 is a small cave at the base of the northern slope of the escarpment at S 22º 12.775' EO 28º 59.944' (Plates 6 & 7). The bone scatter associated with the den yielded 214 remains, ranging from one-centimetre fragments to an entire kudu bull skull. Mashatu Dens 2 and 3 are caves located along the base of the escarpment just south of the Motloutse Archaeology site on the south side of the dry river bed at S22º 12.962' EO 28º 59.816' and S22º 13.027' EO 29º 00.017' respectively (Plates 8 & 9). Combined these dens had 151 faunal remains, 58 from Den 2 and 93 from Den 3. Mashatu Den 4 is an active den about 8-10 km south of Dens 2 and 3 and is reached by hiking atop the escarpment and along the second westward 'finger' of said escarpment. This particular den is a large natural cave formation located just below the edge of the escarpment (Plates 10 & 11). Faunal remains associated with this den were found scattered down the slope below the den as well as the area above the den on top of the escarpment and consisted of 611 bones and bone fragments. Two adult animals and one juvenile were in residence during the entire period of the study, and continued to occupy the den after the collections were completed. All of the material was bagged in accordance with procedures previously laid out and transported back to laboratory facilities at the University of Witwatersrand, Johannesburg, South Africa for identification and analysis.

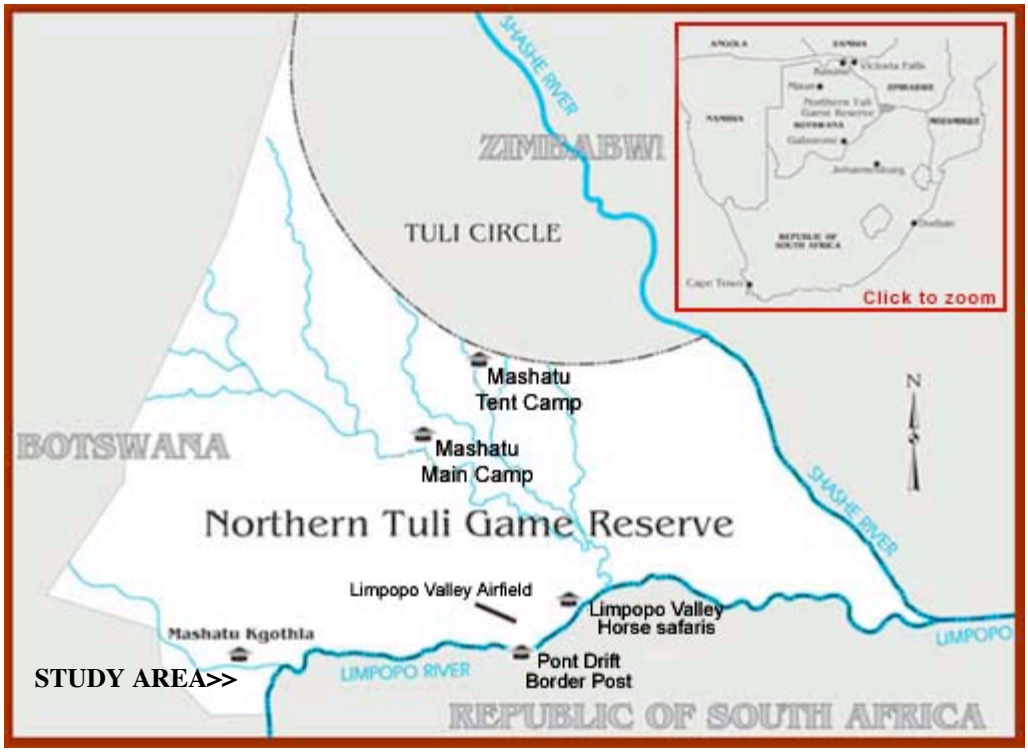

Figure 7: Map of Mashatu Game Reserve showing study area

Diamond Area No. 1 and Luderitz Peninsula, Namibia

Fieldwork completed in cooperation with the Brown Hyaena Project based in Luderitz, Namibia, took place from 22 August to 10 September 2005 and again from 13 October to 13 November 2005. All dens were located with the assistance of Ingrid Wiesel of the Brown Hyaena Project and all den designations used in this study are the same designations that she has given each den (Figures 8, 9 & 10). Three areas were covered in the region with the designations identifying the regions as well as the dens. All den designations with D-P followed by a number indicate dens located on the Luderitz Peninsula, designations D-SPG followed by a number indicate dens located in the Sperrgebiet area of Diamond Area 1, and designations with D-BB followed by a number indicate dens located near Bakers Bay, deep inside the Diamond Area. No observations were required for this portion of the study as the

Brown Hyaena Project has all the necessary recent tenant histories of the given den sites. All of the dens studied were not active during the time that faunal assemblages were examined and were natural caves formed by wind and erosion. Only a single den (one not collected from), den D-SPG 4, was an excavated den amongst heavy scrub approximately 10-12 m from the ocean surf. All other dens and resting sites located were natural caves and crevices.

During the first phase of the study, from 22 August to 10 September, four dens and their prospective assemblages were examined in situ and all data recorded onto data sheets. Dens D-P 1 and D-P 2 (Plates 12 & 13) are within sight of one another and located at coordinates S 20º 41.696' EO 15º 09.329' and S 26º 41.801' EO 15º 09.423' respectively (Figure 8). D-P 1 has a recorded occupation from 1-7 August 1995 and D-P 2 has documented occupation from 20-28 August 1995 (Wiesel, 2006). These dens yielded 497 specimens, 241 from D-P 1 and 256 from D-P 2. These dens, as well as dens D-P 4 and D-P 16, are accessed via the Luderitz Peninsula, and are inside the diamond area and as such right of entry for the local population is restricted. Den D-P 4 is another natural cave site (Plate 14) situated high upon a hilltop above a very steep slope at S 26º 42.685 EO 15º 09.469 (Figure 8) and was occupied briefly in October of 2006 (Wiesel, 2006), after faunal examinations were completed. The slope was covered with 1,865 bones and bone fragments covering a distance of 20 m. The final den that was examined during the initial phase of cooperation with the Brown Hyaena Project was Den D-P 9, located at S 26º 40.404' EO 15º 07.605' (Figure 8) on the public area of the Luderitz Peninsula adjacent to Griffith Bay (Plate 15). Recorded occupation of this den was from 21 January to 16

February 2000, 8 April to 2 June 2000 and 23 July to 8 August 2000 (Wiesel, 2006). The bone scatter for this den yielded 5,955 specimens.

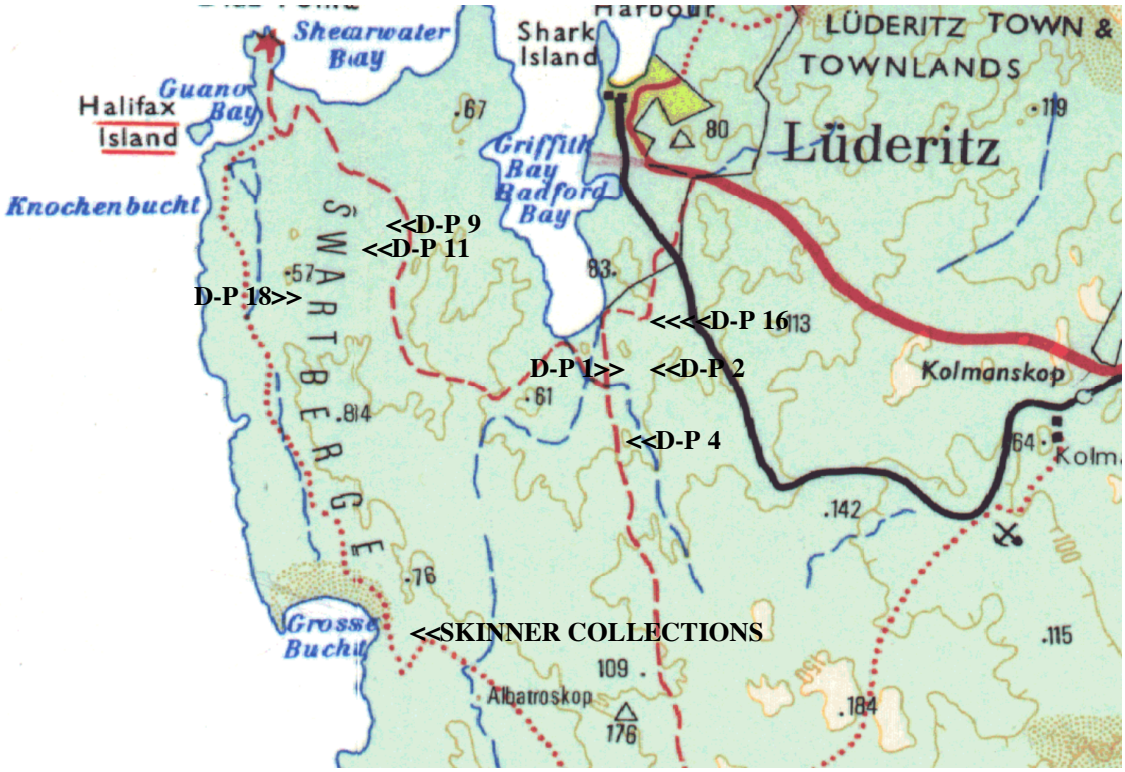

Figure 8: Peninsula and Skinner Dens

Five dens were examined during the second phase of fieldwork in association with the Brown Hyaena Project from 13 October to 13 November. Two of these dens, D-P 11 and D-P 18 are located on public land on the Luderitz Peninsula. One, D-P 16, is located in the diamond area adjacent to the public region of the Luderitz Peninsula (Figure 8). Upon returning to the Luderitz Peninsula Den D-P 18 was the first den to be examined. D-P 18 is situated at S 26º 40.179' EO 15º 07.331'(Figure 8) near the top of the rocky hills adjacent to Griffith Bay (Plate 16). Documented times of occupation were from 10 September to 9 December 1997, 8 January to 13 January 2000, 13 July to 15 July 2000, 10 October to 15 October 2001 and 17 October 2001 to 31 March 2002 (Wiesel, 2006). In addition to 1,811-recorded specimens there were 14 desiccated carcasses of Cape fur seal pups (*Arctocephalus pusillus*) that had their

skullcaps bitten through (Plate 17). Den D-P 11 is located at S26º 40.505' EO 15º 07.499' (Figure 8) and only a few hundred metres up the wash from D-P 9. Like most of the other dens in the region, it is in a small cave at the base of a rocky outcrop (Plate 18). There has not been any documented occupation of this den since its discovery by the Brown Hyaena Project (Wiesel, 2006). This particular den yielded the least amount of material from this particular region, with only 117 specimens recovered from the den. The last den accessed via the peninsula (but on restricted diamond company land) was Den D-P 16. D-P 16 (Plate 19) is positioned on a ridgeline at S 26º 40.834' EO 15º 09.706' (Figure 8) just off of the main road leading to the public areas on the peninsula. A week old jackal (*Canis mesomelas*) carcass was at this den when it was examined, but considering a many horned adder (*Bitis cornuta*) was in residence at the opening of the den for two of the three days it took to log the 1,287 bones, it is doubtful that the hyaenas were present at the time. Recorded occupations of this den were from 10 October to at least 14 October 1995 (researcher left region after the 14th) and from 22 July to 15 September 2001 (Wiesel, 2006). D-SPG 1 (Plate 20) is located in the Sperrgebiet region of Diamond Area 1 near Atlas Bay at coordinates S 26º 50.036' EO 15º 08.551' (Figure 9). Located less than 150 m from the bay, this den, like D-P 18 is characterised by the presence of numerous desiccated seal pup carcasses with atypical damage to the skull as seen in Plate 17. There is no documented occupation of this den since its discovery (Wiesel, 2006). After a week's work 3,252 bones and bone fragments were logged from this site. The last den examined, D-BB 1, is located 120 km south of Luderitz (S 27º 41.222' EO 15º 32.347') in Diamond Area No. 1 at Bakers Bay (Figure 10). The den is situated high up on the east side of the ridge that runs parallel with Bakers Bay (Plate 21) and is protected from the strong winds frequently experienced in the area. The den opens

up onto a step slope that has a bone scatter running all the way to the base of the ridge. There is no documented occupation of this den since its discovery (Wiesel, 2006). The top one-third of the scatter, from the den to approximately 75 m down the slope was examined and produced 1,351 specimens. The den also has easy access to the top of the ridge, and from the ridge access to the extensive seal colony at Bakers Bay. Brown hyaenas were seen foraging at the seal colony every day for the week spent in the area at all times of the day. At one time a total of eight individuals were seen foraging amongst the seal colony, along with over 30 jackals. One kill by a brown hyaena of a seal pup was observed, and a second kill of a seal pup, this time by a jackal, was videoed.

Figure 9: Atlas Bay Den, D-SPG 1

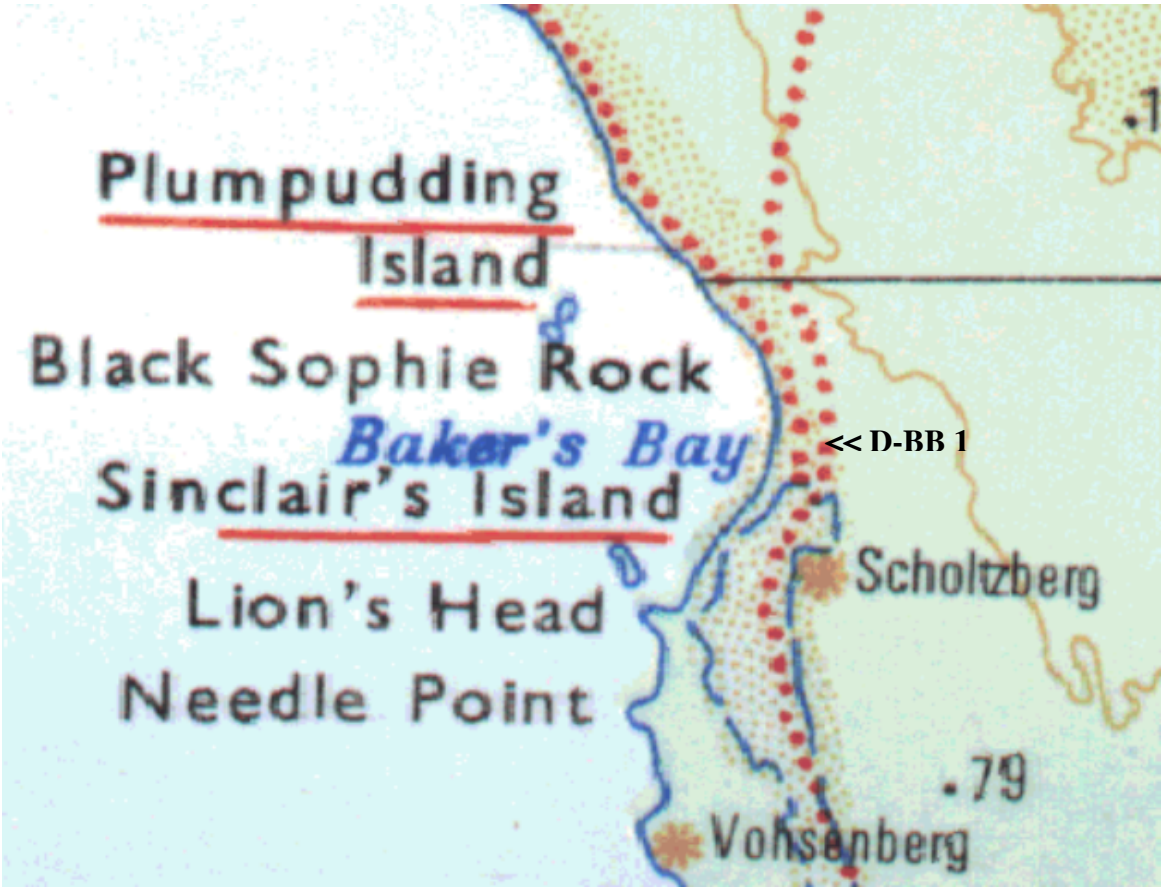

Figure 10: Bakers Bay Den, D-BB 1

Gobabeb, Namib-Naukluft Park, Namibia

From 11 September to 12 October 2005 fieldwork was conducted in the Namib-Naukluft Park near Gobabeb, Namibia in conjunction with the Gobabeb Training and Research Centre to try and locate the dens of spotted hyaenas. Long transects were conducted along the rocky ridges and washes above the Kuiseb River bed, as well as the ridges bordering Zebra Pans and the old copper mining areas. In all only two dens were located and examined, one of which was a known den, the location of which was shown to the researcher by the staff at Gobabeb. The two dens were given the

designations NN-1 and NN-2 (Plates 22 & 23) and were on the eastern edge of the Kuiseb river just south of Gobabeb (refer to Figure 5). Den NN-1 is situated in a wash at S 23º 37.055' EO 15º 06.955'. This den was previously collected from in the 70's by Henschel *et. al.* (1979) when it had 296 collected remains; the current accumulation yielded 685 specimens, the bulk of which were unidentified bone fragments. The second den located is in the upper regions of the same wash as den NN-1 at S 23º 37.012' EO 15º 07.009' and contained a single gemsbok humerus in its interior and no faunal remains outside. The number of spotted hyaenas in the region has been drastically reduced since the early 80's due to the large herds of gemsbok moving out of the area as a result of drought conditions (J. Henschel, pers. comm.).