


APPENDIX 9: Analysis of Selous Hunting Data

Analysis of hunting data of the SELOUS GAME RESERVE

Tanzanian
Tourist Hunting database



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2004

Disclaimer

The contents of this document are the result of the analysis of an enormous volume of computerised data. The quality of the data presented in this document is therefore only as good as the quality of the data that was computerised, which in turn is limited by the filing systems and diligence of retiring accurate data.

INTRODUCTION

This document presents the results of an analysis of the hunting data of the Selous Game Reserve (SGR) for the years 1988 to 2003. Data and some basic explanations only are presented as this document is essentially a technical support paper and is not intended as a detailed assessment of the hunting situation. Some background information of the SGR is provided where this helps to understand aspects of the data. This document is neither a history of the SGR or a presentation of opinions of hunting. Complex statistical tests have been avoided to ensure that the results presented here are easily understood.

Descriptions of the administration and regulations that pertain to hunting in Tanzania are presented in the primary paper, of which this document is an annex.

Computerisation and analysis of hunting permits

A Visual Basic / Access hunting database was developed for the SGR in 1999 by the author of this report with funding from the GTZ Selous Conservation Programme. This database was later simplified to operate solely on Microsoft Access 97 and with subsequent upgrades to operate on MS Access 2000, and to accommodate hunting data from other game reserves in Tanzania. The database stores data from hunting permits, which are separated into the following logical components:

Client details: Permit number; Client's name; Nationality; Hunting company; Professional hunter; Game scout accompanying client; Repeat permit (yes/no); Start & end dates of hunting safari; Number of observers.

Weapons brought by the client (up to 5)

Animals hunted: Type of animal; Hunting block; GPS coordinates (UTM: Northings & Eastings or other formats)

Hunting quota

Trophy measurement data is recorded according to 5 trophy types, i.e. antelope, boss-types, crocodiles, predators and tuskers.

The database includes some basic analysis and has extensive capability for summarisation of data. An 'Analysis Box' is available from which the number of hunting clients per year and total income generated from conservation fees, permit fees, trophy fees etc are presented. Lists of trophy data for the five basic trophy types are presented.

A DOS-based database (DataEase) was developed in the early 1990's by the PAWM project with funding from USAID and approximately 7,200 hunting permits were

entered for the whole of Tanzania for the period from 1988 to 1993. Unfortunately this initiative was not maintained after 1993. Data relevant to the SGR was extracted from the PAWM database and added to the Selous hunting database and all additional permits from the Selous that could be located have been entered. The database has been kept up to date by staff of the SGR. The database contains 5,845 hunting permits for the period 1988 to 2003. A total of 35,541 animals of 41 different species are recorded having been hunted on these permits. Hunting quota have been entered from 1996 to 2003.

Accuracy and applicability of this analysis

This analysis is not intended as a replacement of the Wildlife Division's accounting practices, nor as a check on their system. Instead it is intended as a means of gaining an overview of the hunting activities in the SGR and thereby offering an understanding of the industry. The trends presented here are more important than actual figures.

The hunting office in Tanzania frequently issues more than one permit to a single client, hence Table 12 shows a greater number of permits than clients. On some occasions a client wishes to extend the duration of his / her safari and an additional permit is issued, however in most instances the reasons for issuing additional permits is not clear. All permits are computerized and it is necessary to manually identify the duplicate permits. Control is difficult and there is the possibility that some permits are missed, others lost and the results of the database are therefore unlikely to provide an exact match of the financial figures of the Wildlife Division.

Description of the Selous Game Reserve

The SGR is the largest game reserve administered by the Wildlife Division. It is located in south-eastern Tanzania and covers an area of approximately 47,500 square kilometres. The reserve is separated into 8 administrative sectors, which are subdivided into 47 blocks as illustrated in Figure 1. Forty five blocks have for a long time been leased to hunting companies and 2 blocks (B1 and Z1) have been reserved for non-consumptive photographic tourism. Blocks KY1 and Y1 have recently been set aside for non-consumptive tourism.

To understand the hunting data and some of the implications thereof, it helps to understand the nature of some of the hunting blocks of the SGR as the areas differ markedly from one another. Drainage is mostly south to north by a number of large rivers, i.e. Njenje, Mbarang'andu and Luegu which flow into the Kilombero which joins with the Ruaha to form the Rufigi which takes the waters to the Indian Ocean.

The block boundaries were originally created by Nicholson in the 1960s, but many boundary adjustments, particularly the outer boundary, have been made since. Nicholson never had an accurate overview map of the whole reserve and his development of the hunting blocks was based on a sketch map that for many years became the blue print for hunting in the SGR. The current chief warden, Mr B. Kibonde has recorded geographic coordinates for the outer boundaries and traced all

hunting block boundaries on standard topographic maps. It has since been possible to develop GIS data for the hunting blocks and calculate their size.

Nomenclature of hunting blocks by Nicholson follows the names of the major rivers with which the blocks are associated, i.e. the following river names:

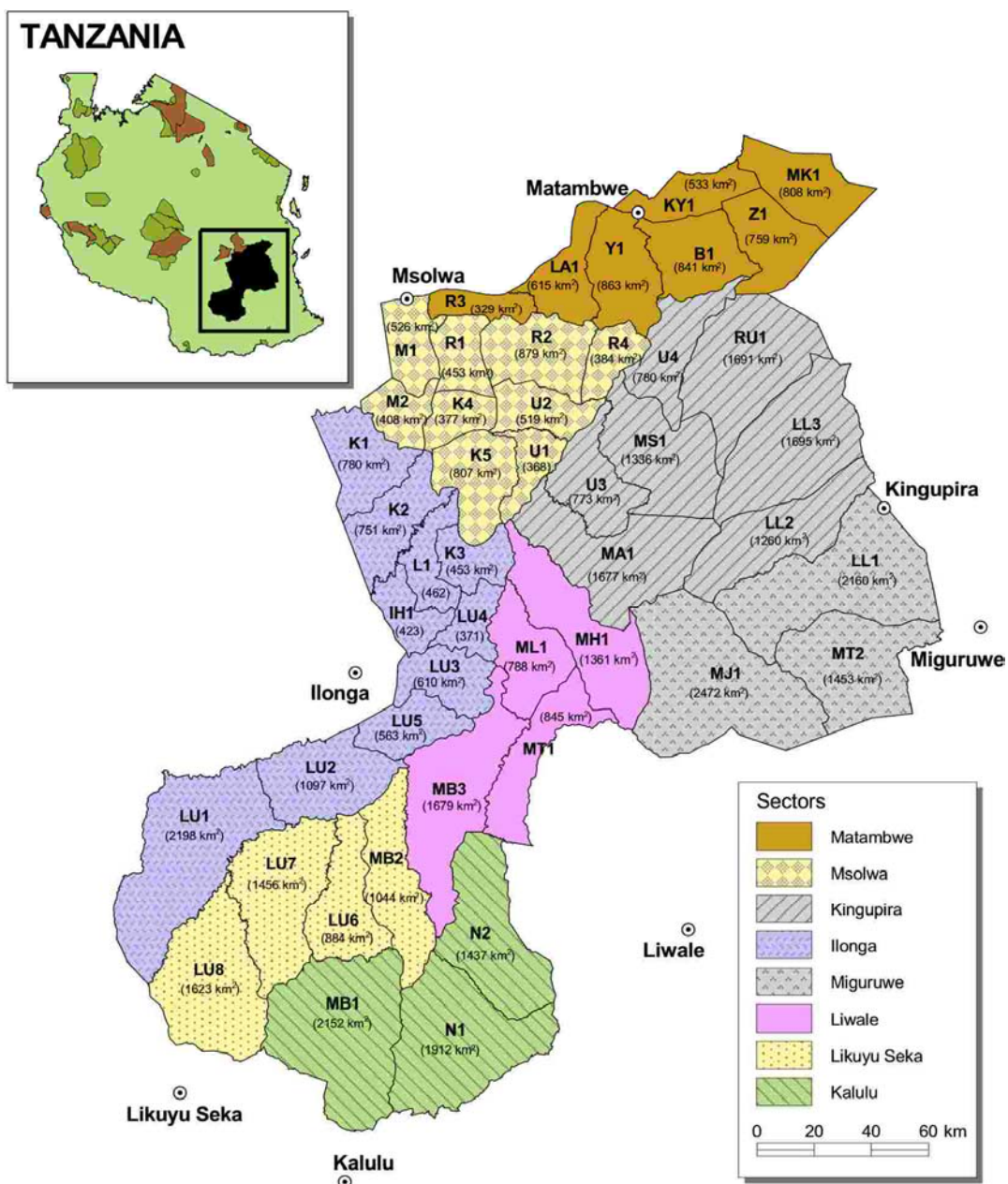
K – Kilombero: K1, K2, K3, K4, K5	MB – Mbarang’andu: MB1, MB2, MB3
L – Luhombero: L1	MT – Matandu: MT1, MT2
LL – Llong’onya: LL1, LL2, LL3	N – Njenje: N1, N2
LU – Luwegu: LU1, LU2, LU3, LU4, LU5, LU6, LU7, LU8	R – Ruaha: R1, R2, R3, R4
M – Msolwa: M1, M2	RU – Rufigi: RU1
MA – Madaba: MA1	U – Ulanga: U1, U2, U3, U4.

Block LU1 in the southeast corner covers an area of rugged terrain of the Mbarika Mountains. Access to this area is difficult and the possibilities for hunting are therefore limited. Other blocks in the south of the reserve (LU8, N1, N2 and MB1) also cover areas of mountainous terrain where access is hampered, however the Luwegu, Njenje and Mbarang’andu Rivers support healthy wildlife populations and provide good hunting opportunities.

Msolwa Sector contains many small hunting blocks and is surrounded on three sides by large rivers and on the western side by numerous human settlements and various forms of agriculture. As a result there is thus little movement of wildlife in and out of this sector. Many small blocks are squeezed into this space and the pressure from hunting is most felt in this area.

Two blocks in the north, B1 and Z1 have for a long time been reserved for non-consumptive tourism. Blocks KY1 and Y1 have recently been added in 2001 and 2003 respectively. The other blocks in Matambwe Sector benefit from the non-consumptive use of the two blocks and also the proximity of productive wildlife areas outside, particularly Gonabis Open Area and Mikumi National Park.

Vegetation consists of miombo woodland (70%) in the west and southern parts and mixed Acacia woodlands in the north and east. Central areas on sand forests, which support good timber producing trees and offer good elephant hunting.



<i>Areas of blocks (km²)</i>													
B1	841	KY1	533	LU2	1,097	M1	526	MJ1	2,472	N2	1,437	U2	519
IH1	423	L1	462	LU3	610	M2	408	MK1	808	R1	453	U3	773
K1	780	LA1	615	LU4	371	MA1	1,677	ML1	788	R2	879	U4	780
K2	751	LL1	2,160	LU5	563	MB1	2,152	MS1	1,336	R3	329	Y1	863
K3	453	LL2	1,260	LU6	884	MB2	1,044	MT1	845	R4	384	Z1	759
K4	377	LL3	1,695	LU7	1,456	MB3	1,679	MT2	1,453	RU1	1,691		
K5	807	LU1	2,198	LU8	1,623	MH1	1,361	N1	1,912	U1	368		

Figure 1: Overview map of the Selous Game Reserve showing administrative sectors and hunting blocks.

Retention scheme

A retention scheme was negotiated for the SGR in 1992 and first implemented in 1994. This scheme enables approximately 50% of the income generated within the SGR to remain with the reserve. A complex breakdown of the income has been developed whereby the funds are shared between the SGR, the Tanzanian Wildlife Protection Fund and Treasury of the Central Government, then back to the Wildlife Division and to District Councils in which tourist hunting fees are generated. The breakdown is illustrated below in Figure 2 with a comparison to the disbursement of funds where retention schemes do not exist.

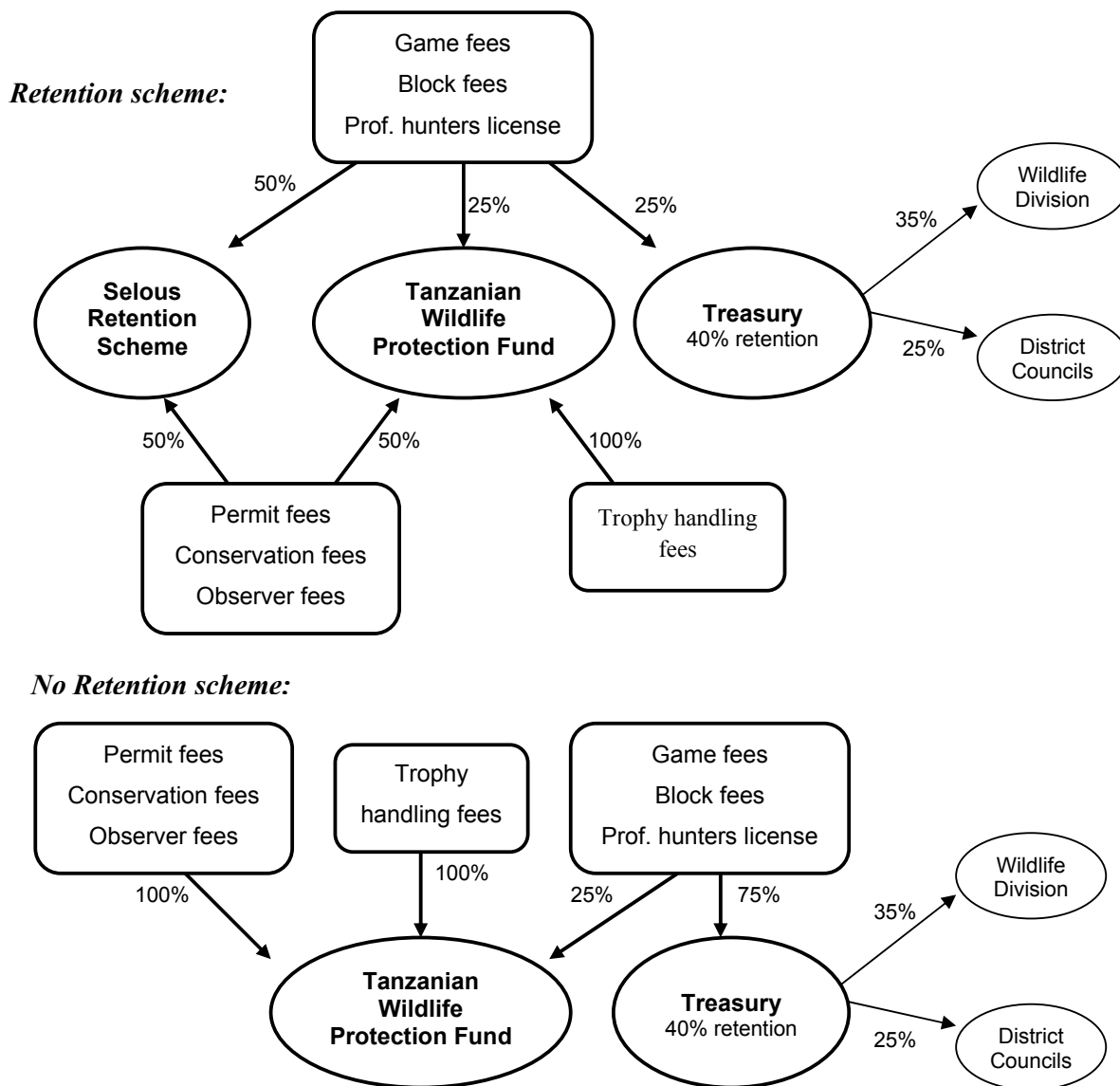


Figure 2: Disbursement of funds between the Selous Game Reserve, Tanzanian Wildlife Protection Fund and the Government Treasury where retention schemes exist, and a comparison for areas where retention schemes do not exist

VALIDITY OF DATA

When analysing data from the database it is crucial to initially determine whether the data set is complete and the extent to which it is representative of the hunting situation in the SGR. All old permits that could be located have been entered. There is a possibility that some may have been lost. To determine if gaps occur in the data, the annual distributions of hunts per block are mapped and the results presented overleaf in Figure 4. Blocks B1 and Z1 in the north are reserved for photographic tourism and no hunting is conducted there. Blocks KY1 and Y1 were added to the photographic area in 2001 and 2003 respectively. From 1996 to 2003 there does appear to be a reasonably consistent spread of hunts. For the purposes of this analysis, the data from 1996 to 2003 is considered representative of the hunting situation in the SGR.

Figure 3 below presents the Wildlife Division's hunting revenue per year recorded in the database. The data shows a marked increase in income in 1996 followed by a limited fluctuation per year from 1996 to 2003.

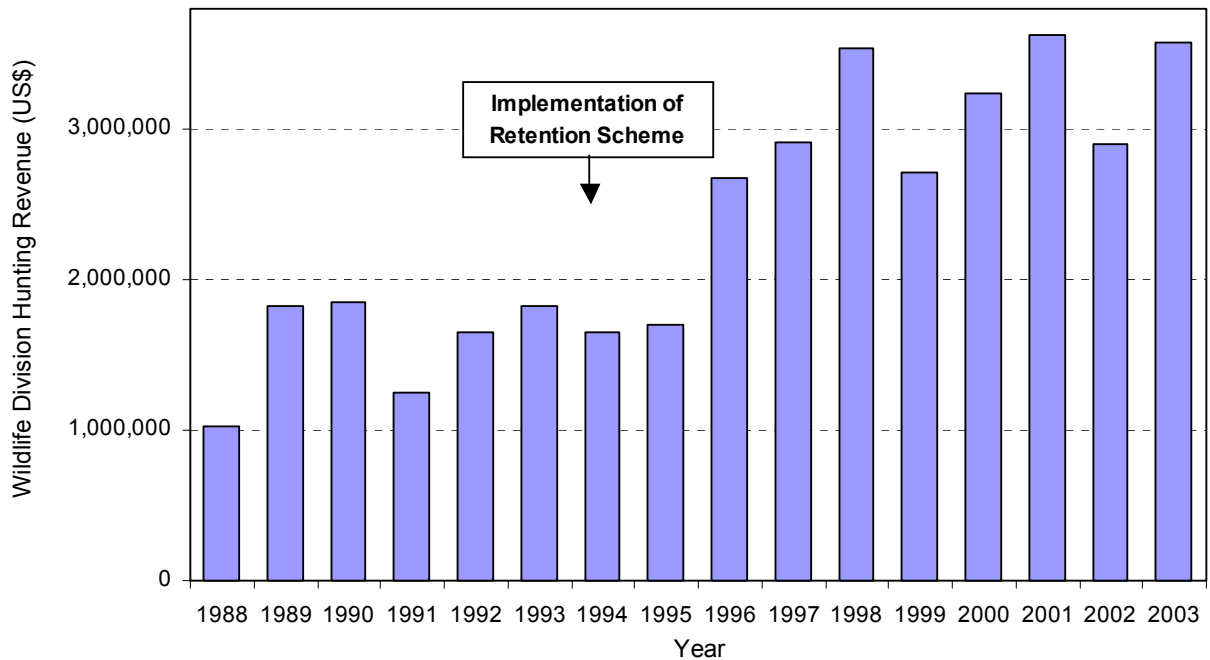


Figure 3: Wildlife Division hunting revenues from the Selous Game Reserve as calculated from the database for the years 1988 to 2003.

A retention scheme was initiated for SGR in 1992 becoming effective in 1994, which resulted in a large increase in the availability of funds to manage the game reserve. Figure 3 shows a delay before the benefits of the retention scheme and the improved management realised a real improvement in the income generation and financial viability of the game reserve.

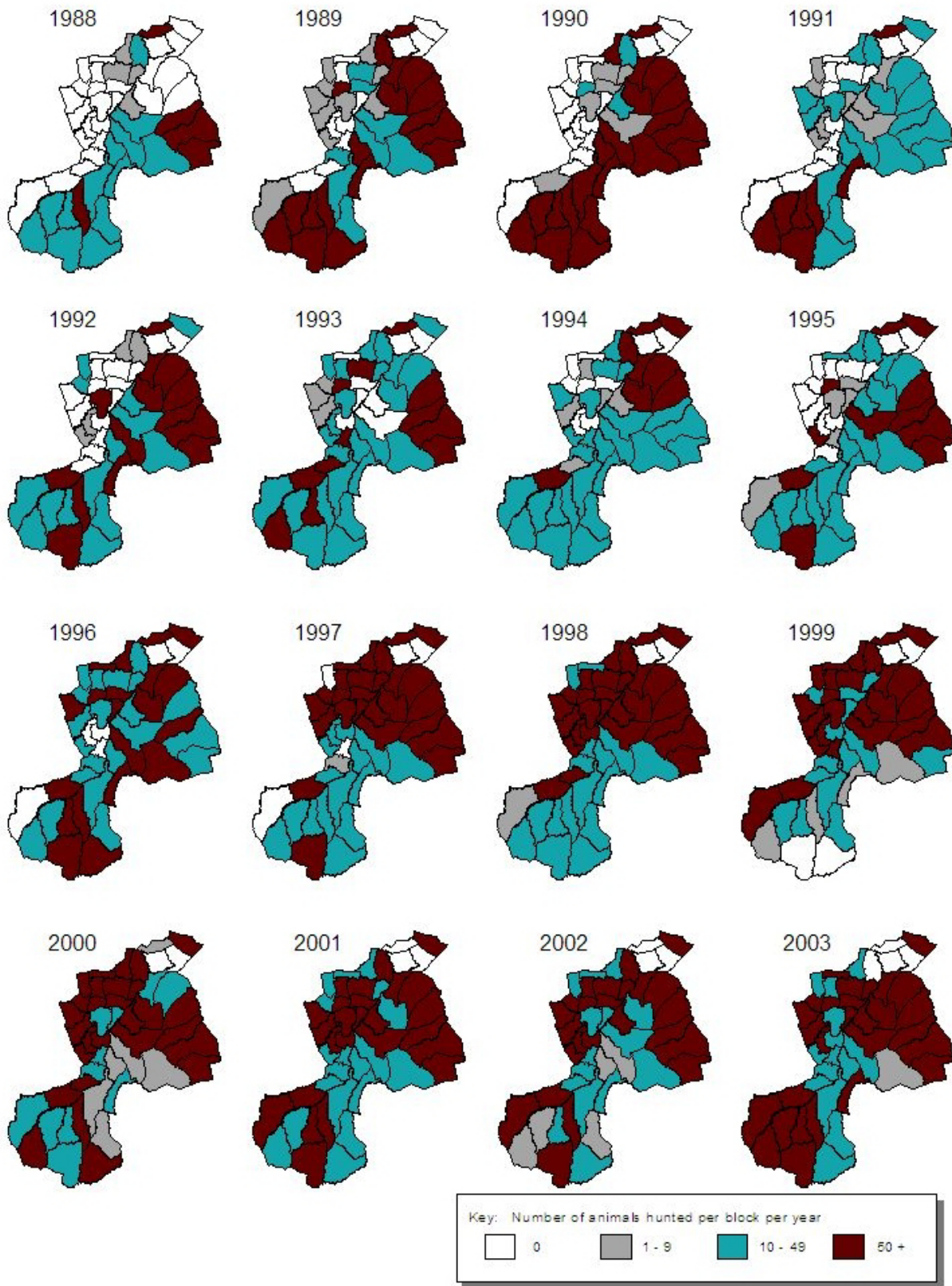


Figure 4: Annual distribution of hunts as per hunting blocks

FINANCIAL PROFILE OF THE SELOUS GAME RESERVE

Table 1: Approximate income (US\$) generated by the Wildlife Division from various hunting fees in and around the Selous Game Reserve

Year	Clients	Permit fees	Conservation fees	Observer fees	Trophy fees	Trophy handling fees	Block fees	Total fees
1988	99	56,700	177,900	?	600,900	27,900	165,000	1,028,400
1989	185	110,100	370,700	?	1,023,365	54,900	262,500	1,821,565
1990	177	104,550	348,300	?	1,119,830	52,000	225,000	1,849,680
1991	115	66,600	212,400	450	684,655	32,900	247,500	1,244,505
1992	163	96,750	330,500	800	939,025	48,200	240,000	1,655,275
1993	198	112,800	340,900	3,350	1,026,170	55,400	292,500	1,831,120
1994	174	100,050	321,000	2,150	898,140	49,300	285,000	1,655,640
1995	168	97,350	313,900	4,050	980,005	48,100	262,500	1,705,905
1996	325	184,950	534,000	2,700	1,553,575	90,800	307,500	2,673,525
1997	346	195,450	568,800	4,400	1,729,535	95,700	315,000	2,908,885
1998	436	244,350	704,900	11,700	2,123,200	119,300	337,500	3,540,950
1999	343	192,300	542,000	10,650	1,563,945	93,900	315,000	2,717,795
2000	431	243,900	663,900	11,950	1,872,455	119,500	330,000	3,241,705
2001	483	269,100	759,900	13,950	2,118,935	131,100	330,000	3,622,985
2002	417	230,700	547,500	9,750	1,672,190	112,100	322,500	2,894,740
2003	479	265,050	728,700	8,450	2,122,540	128,800	322,500	3,576,040

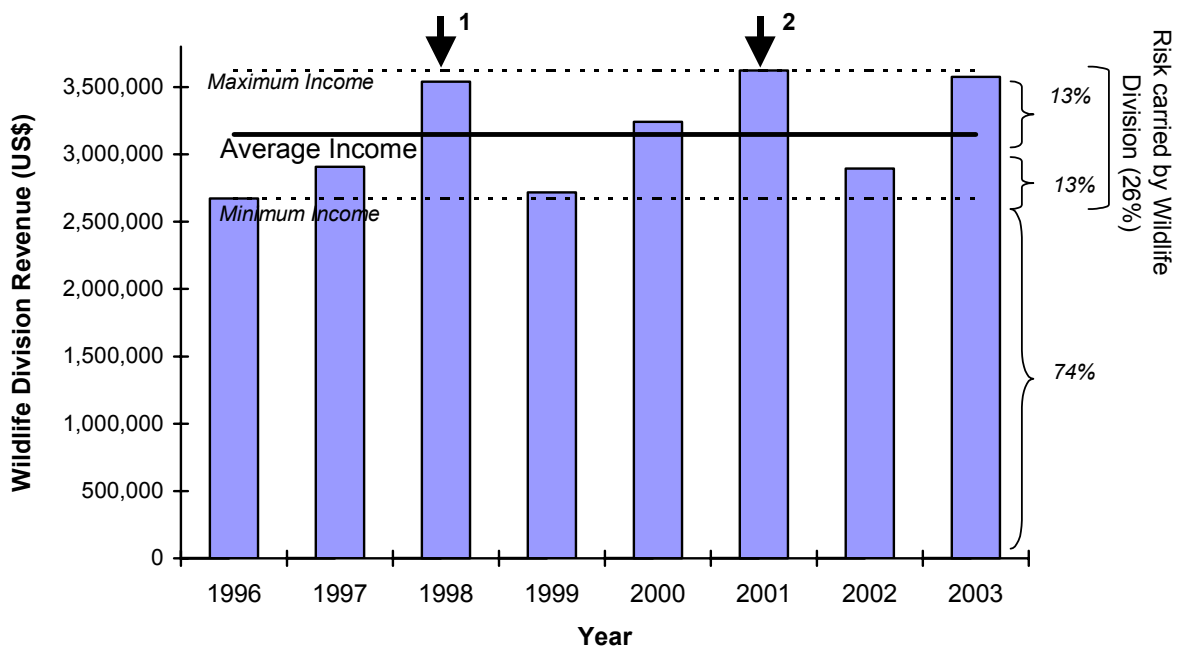
A breakdown of the annual income generated by the Wildlife Division from tourist hunting in the SGR is presented above in Table 1. Hunting blocks are leased to companies with an annual quota of animals that may be hunted of which at least 40% must be utilised annually. As shown later in this document, many companies frequently fail to meet the 40% minimum and the topping-up amounts paid are therefore an important component of the income generated. The data in Table 1 does therefore not represent the full income received and has to be re-worked based on the utilisation of the available quota for the years 1996 to 2003 and the revised data are presented in Table 2.

Table 2: Income generated by the Selous Game Reserve from hunting with applying the 40% minimum quota utilisation rule, and income from photographic tourism.

Year	Permit fees	Conservation fees	Observer fees	Trophy fees	Trophy hand fees	Block fees	Total fees
1996	184,950	534,000	2,700	1,844,235	90,800	307,500	2,964,185
1997	195,450	568,800	4,400	2,025,135	95,700	315,000	3,204,485
1998	244,350	704,900	11,700	2,420,675	119,300	337,500	3,838,425
1999	192,300	542,000	10,650	2,368,965	93,900	315,000	3,522,815
2000	243,900	663,900	11,950	2,610,620	119,500	330,000	3,979,870
2001	269,100	759,900	13,950	2,421,340	131,100	330,000	3,925,390
2002	230,700	547,500	9,750	2,363,630	112,100	322,500	3,586,180
2003	265,050	728,700	8,450	2,424,435	128,800	322,500	3,877,935

Applying the 40% minimum quota utilisation rule results in a 26% increase in the income generated from trophy fees, but an overall increase of 13% to the total fees generated from the Wildlife Division from hunting over the period from 1996 to 2003.

Figure 3 shows fluctuations in the in annual income from hunting. Tourism is affected by external events. Figure 5 demonstrates how two separate terrorist attacks have each caused approximately 25% drop in income in the following year. Hunting quota are set by the Wildlife Division in advance of the season. Figure 6 shows that drops in tourist numbers in 1999 and 2002 were not anticipated by the Wildlife Division.



Key: 1 – Bombing of the United States Embassies, Dar es Salaam & Nairobi
 2 – Attack on the New York World Trade Centre

Figure 5: Income generated by the Wildlife Division from tourist hunting in the Selous Game Reserve, showing fluctuations relating to terrorist attacks and the percentage risk carried by the Wildlife Division.

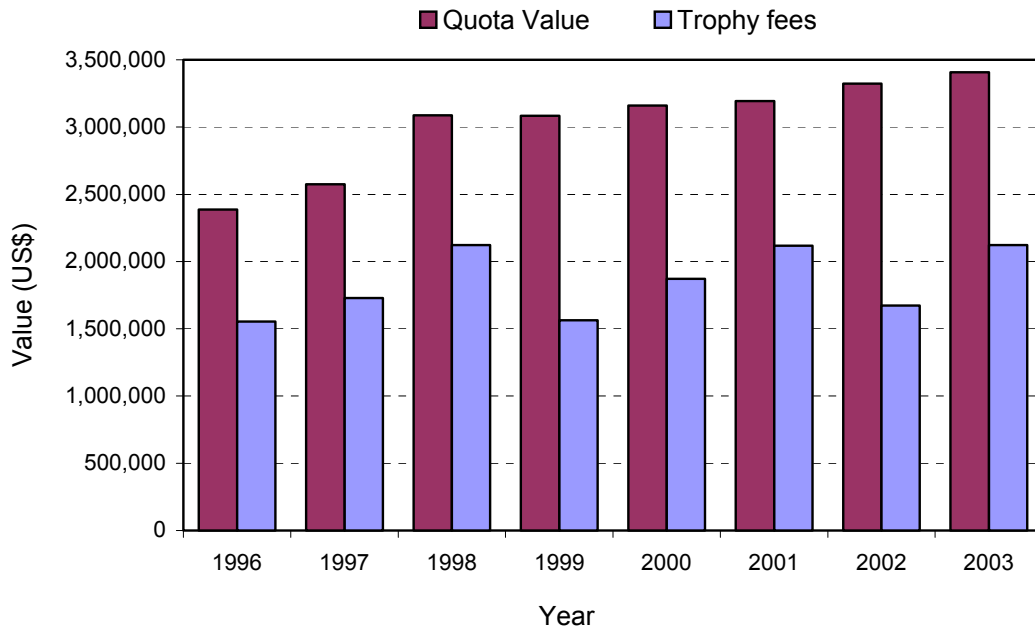


Figure 6: Value of the annual hunting quota for the Selous Game Reserve in comparison the income accrued by the Wildlife Division from trophy fees.

The income presented in Table 1 for observer fees appears to be grossly underestimated, it is possible that much of this data has not been recorded as observers are not officially shown on the hunting permits.

Income is also generated from professional hunter fees whereby each professional hunter is required to register at a cost of US\$ 1,000 per annum (Tanzanian citizens) or US\$ 2,000 per annum (non-citizens). Prior to 1998 the registration cost was standard at US\$ 1,000 per annum. A list of professional hunters is provided in Table 8, but interpretation of this data and income accrued by the SGR is complicated by the fact that many professional hunters operating in Selous also hunt elsewhere in Tanzania where their annual registration is also valid. The actual income accrued by the Selous retention scheme is therefore uncertain in this analysis.

Breakdown of income

The income from tourist hunting as shown in Table 1 is heavily dependant on trophy fees, but little income is generated from lease of concessions (Block fees). The percentage breakdown of the various fees averaged from 1988 to 2003 is presented below in Table 2.

Table 3: Percentage breakdown of fees charged for tourist hunting calculated from the Selous hunting data for the years 1988 to 2003

Fee	Percentage contribution to total income
Permit fees	7
Conservation & Observer fees	20
Trophy fees	59
Trophy handling fees	3
Block fees	11

Income generated per hunting block

Trophy fees represent approximately 60% of the total fees. The estimated total income per hunting block was therefore estimated on this basis from the income generated for the years 1996 to 2001. The estimated income generated per block is presented in Figure 8 on the following page. Many of the higher earning blocks have frontage on large rivers in the central and northern parts of the reserve. The large rivers attract greater wildlife populations and increase the diversity of wildlife available.

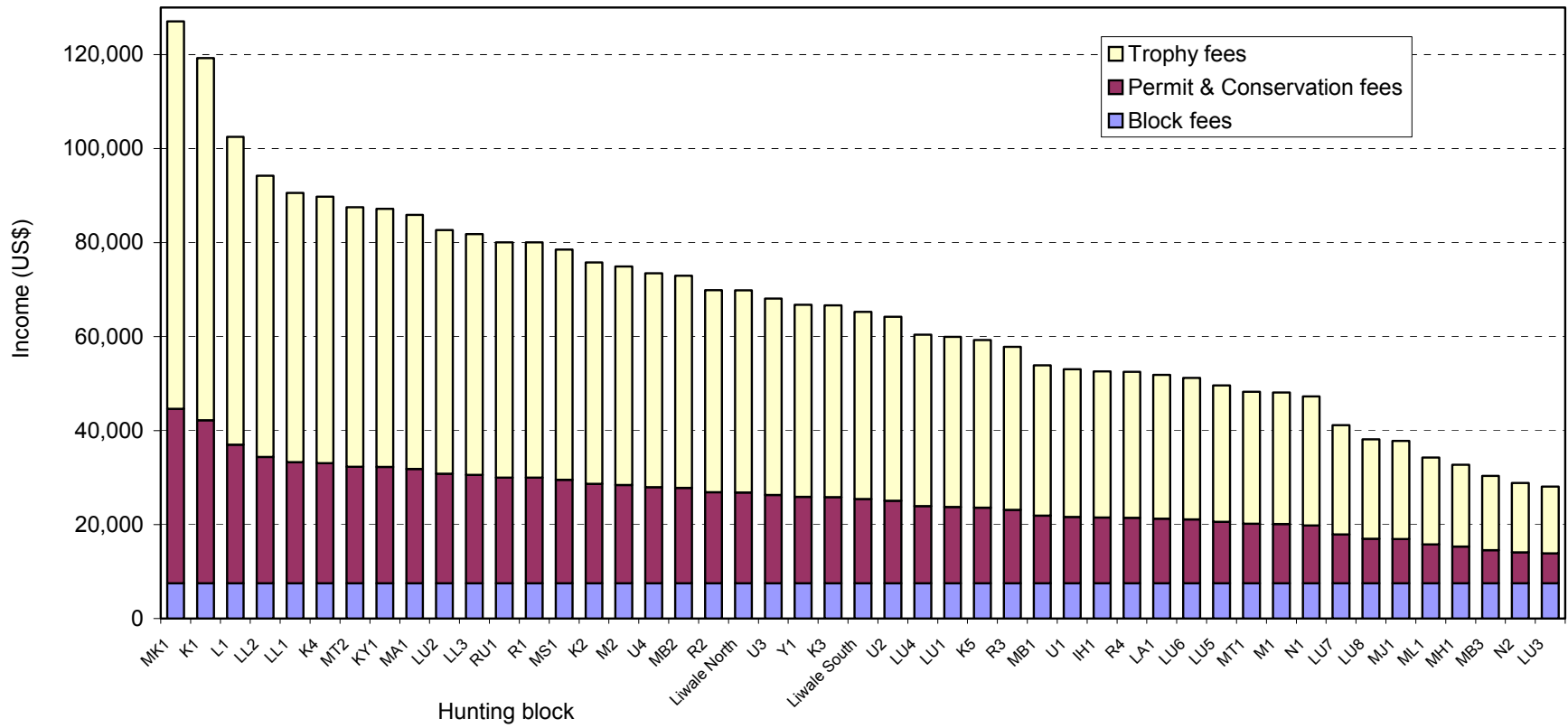


Figure 7: Estimated average annual income for blocks in and around the Selous Game Reserve for the period (1996 – 2003)

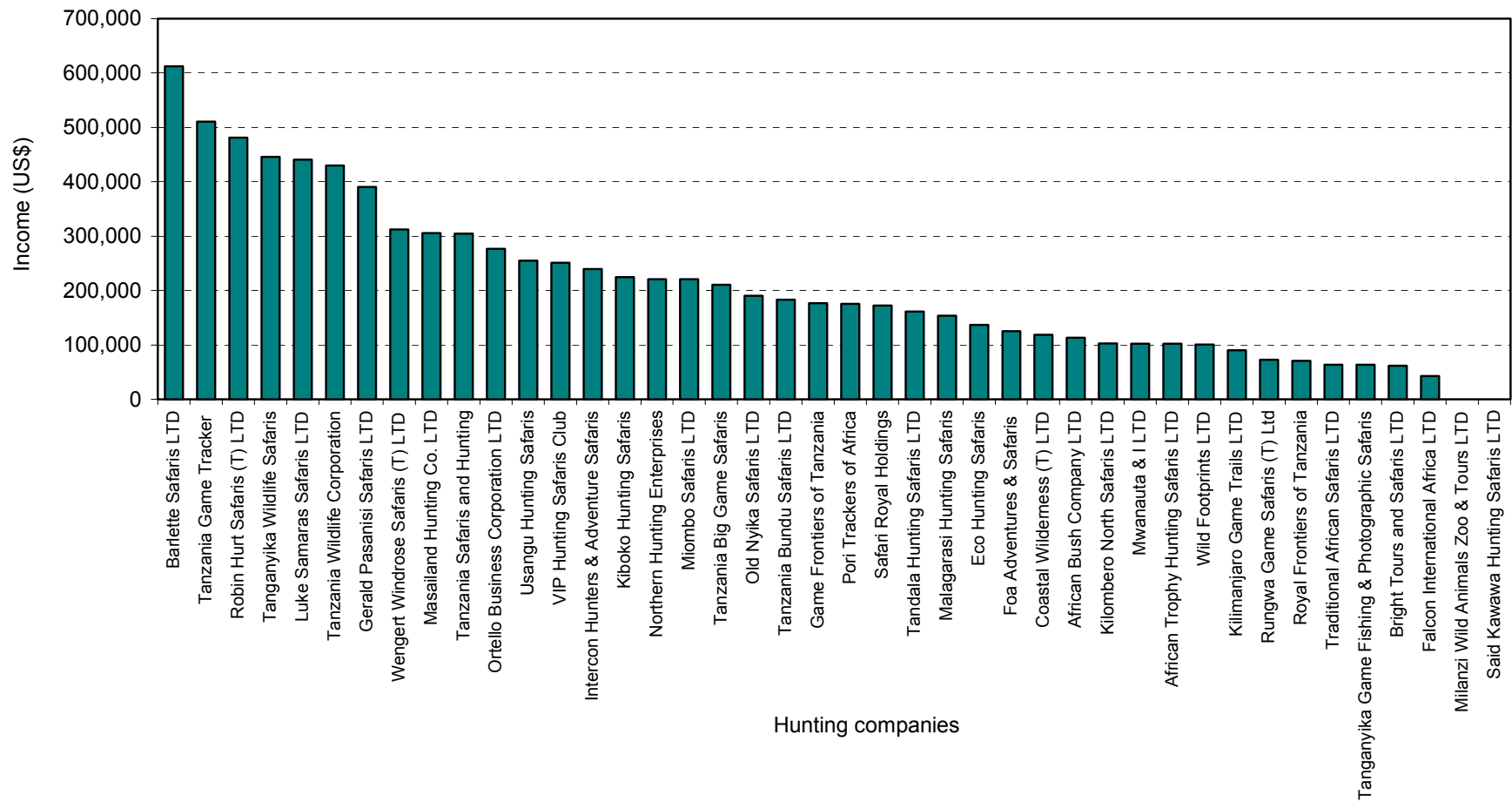


Figure 8: Income paid to the Wildlife Division by hunting outfitters in 2003

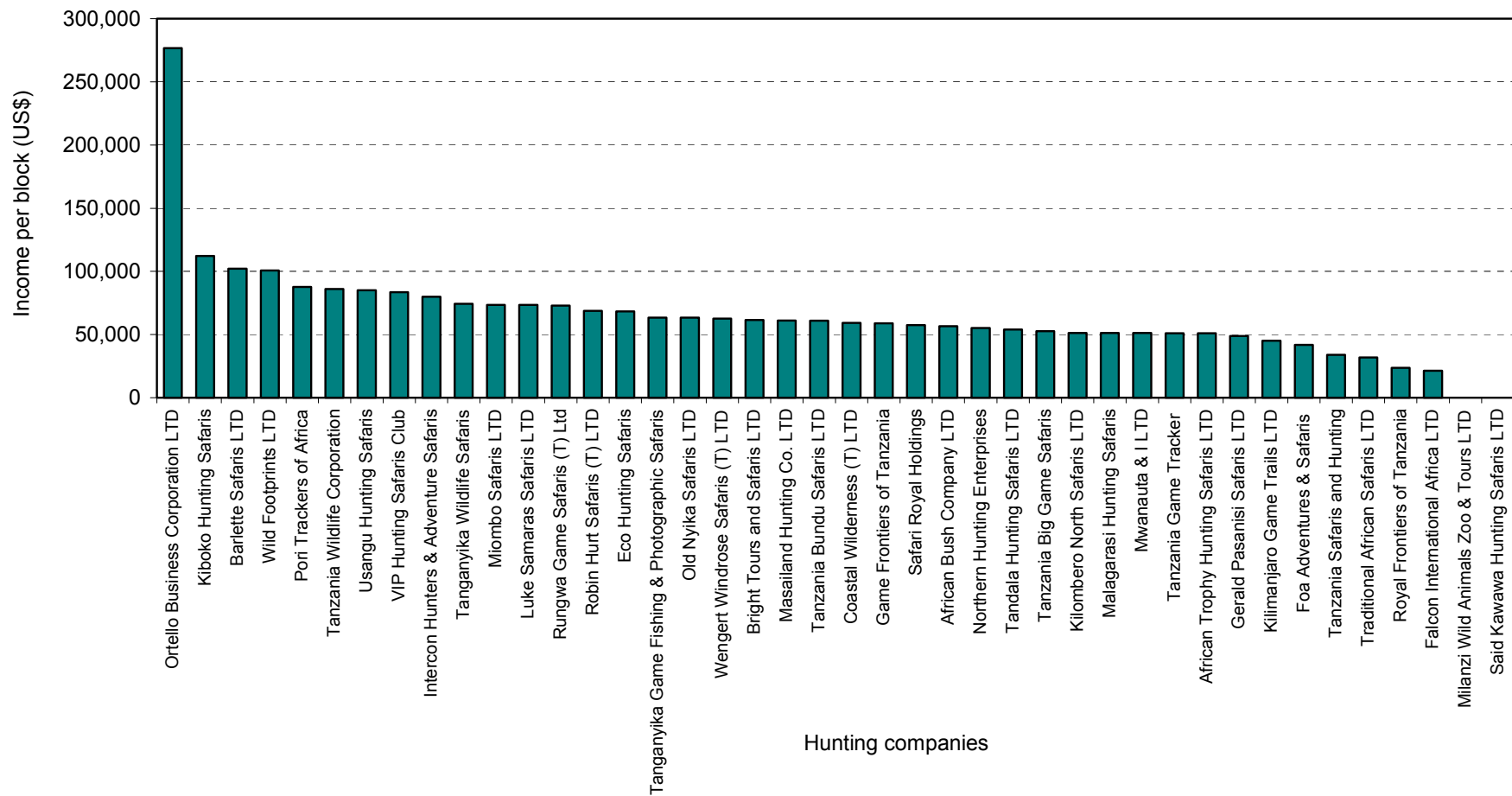


Figure 9: Income generated for the Wildlife Division per hunting concession by outfitters in 2003 for all of Tanzania

Hunting Intensity

Hunting intensity is assessed here in two different ways: Firstly through a comparison of income generation against the size of hunting blocks. This method has an advantage of providing actual figures, which can be directly compared to one another to develop clear trends. The method does however assume that all hunting takes place inside the blocks as shown on the hunting permits. The second approach to measuring hunting intensity is more direct through mapping the actual location of many hunted animals. This method does not provide clearly comparable figures, however does show that the basic assumption of the first method is not always entirely valid.

Hunting intensity assessed through income generation

The estimated income at first glance shows no correlation to the area of a block as shown in Figure 10. However a more careful inspection of the graphic relationship between area and income generation reveals a gradient with three logical groupings, i.e. heavily utilised blocks, optimally utilised and under-utilised blocks. The sizes of the blocks used for this analysis are presented in Figure 2. Utilisation of the blocks by the hunting companies can be obtained from Tables 6 and 7.

This analysis is prejudiced by the allocation of quota. Many of the quota allocations are to a certain extent based on the previous season's hunting success. As a result, those exclusive companies bringing fewer clients but leasing large blocks tend to get lower quota allocations and hence less pressure to perform from the Wildlife Division. Similarly companies utilising their blocks heavily tend to get higher quota allocations that further encourage over-utilisation of their blocks. Companies leasing many blocks do not always stick rigorously to hunting the specific quota in a specific block. This leads to an apparent over-utilisation of one block and a corresponding under utilisation of another.

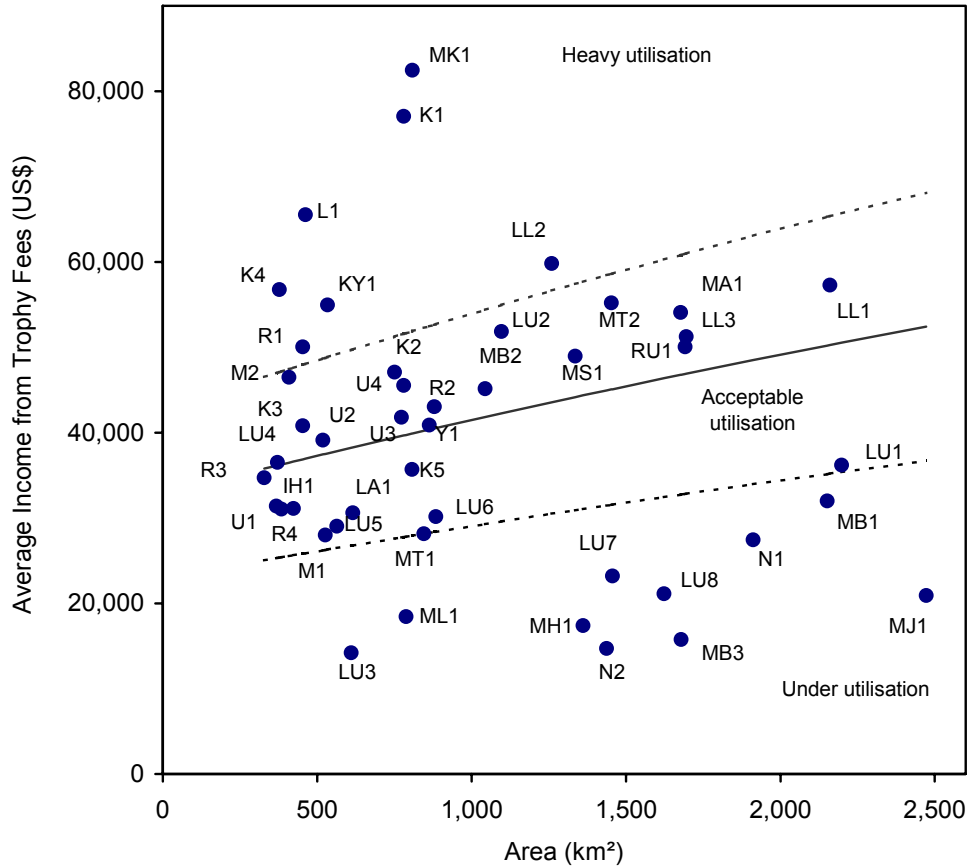


Figure 10: Relationship between average income generated from trophy fees (1996 to 2003) and area of blocks to show various levels of hunting intensity grouped into heavy, acceptable and under utilisation; Dotted lines show estimated limits of acceptable utilisation.

Procedure for delimiting hunting intensity groupings

The relationship between trophy fees and area is established;
 To establish a normal level of utilization, extreme levels of hunting intensity (both high and low intensity) are excluded, which exclude the following blocks MK1, K1, L1, MJ1, MB3, N2, MH1, LU8, N1 & MB1.
 The remaining blocks are used to develop a regression equation between area and average trophy income. 30% above and below the normal level of utilisation is used as the upper and lower limits of acceptable utilisation.

Blocks K1 and MK1 show excessively high levels of utilization well above what is normal for conditions in the Selous Game Reserve. This immediately raises concern about the sustainability of hunting in those areas, and the impacts on the surrounding areas.

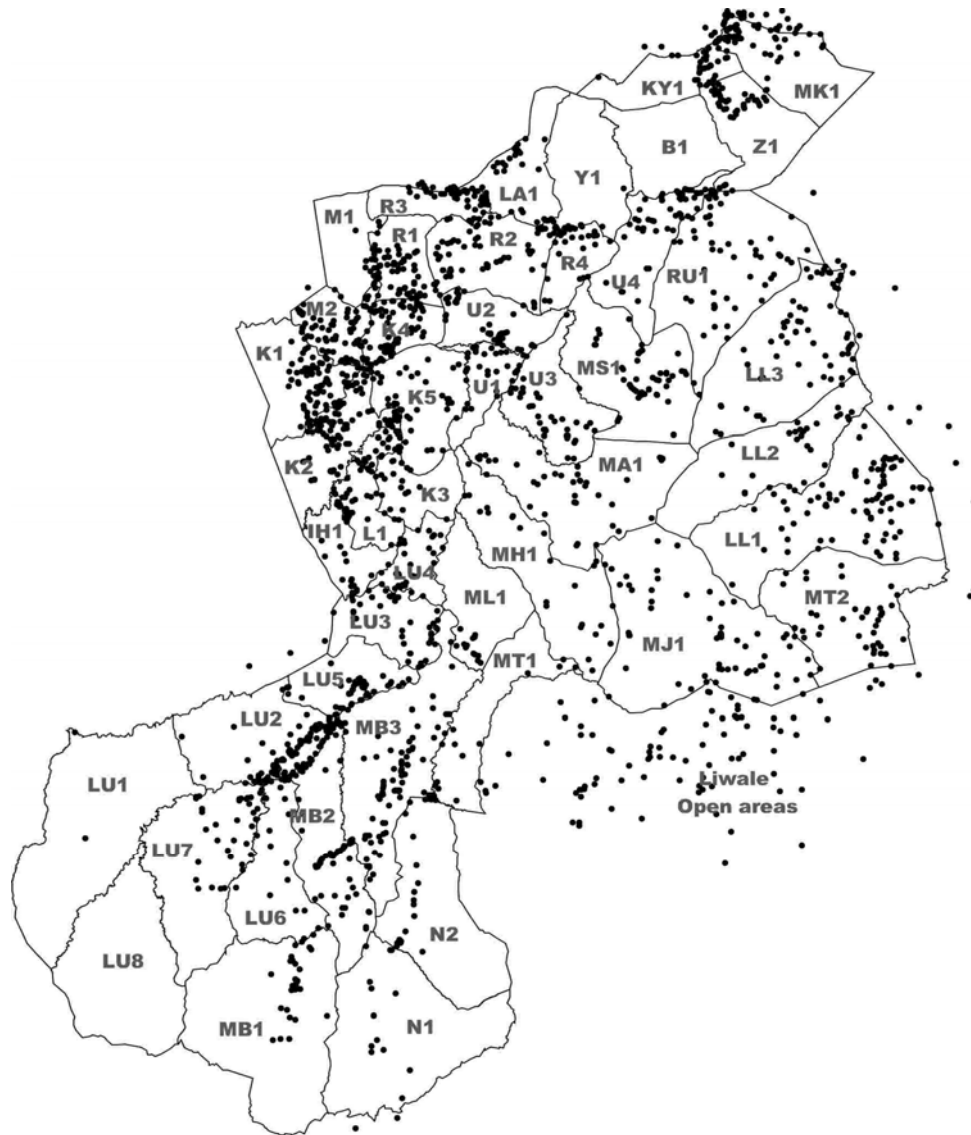


Figure 11: Location of hunts recorded with GPS in the Selous Game Reserve during 2003

Hunting intensity assessed through mapping of hunts

Figure 11 above presents the location of 2245 hunts recorded with GPS coordinates within the SGR during 2003 representing 67% of the hunting that year. Records reveal a total of 3375 animals hunted, of which 86% have GPS coordinates. From Figure 11 it appears that in some instances block boundaries and respective quota are not being well respected. Blocks M1, LU1 and LU8 have little or no hunting taking place, yet the records reveal that 22, 50 and 66 animals are listed as hunted in these blocks respectively. There are also serious incursions into the photographic area (Blocks KY1 and B1) from block MK1, yet an unequal distribution of hunts within the allocated block.

Little hunting takes place along the western boundary of the SGR, despite intense hunting pressure in the western parts of the reserve. Hunting in the southern parts of the SGR is focussed along the major rivers there.

UTILISATION OF WILDLIFE

Priority species for generating income

The 20 most important animals for generating income are presented in Table 3 in order of priority and animals per client are presented as a ratio. Each client visiting the SGR hunts on average 7.75 animals. Buffalo are by far the most important species for income generation. Clearly the viability of the SGR as a hunting area depends on maintaining a healthy buffalo population that will continue to provide quality hunting trophies. In 2001 elephant rated seventh in income generation contributing 5.4% of income from trophy fees, but by 2003 have since risen to fourth position contributing 7.6% of the income from trophy fees. The actual numbers of animals of selected species hunted per block per year are presented in Table 4. The total hunting quota per species per year are presented in Table 5.

Table 4: Ranking of the top 20 animals by contribution to income generation from trophy fees, and approximate numbers of each species hunted per client, from 1988 to 2003

No.	Species	Percentage contribution to trophy fees	Approximate ratio of clients per animal hunted	Average percentage use of quota (1996 – 2003)
1	Buffalo	21.5	3 per 2 clients	83.4
2	Leopard	10.4	1 per 4 clients	69.0
3	Lion	9.4	1 per 5 clients	52.2
4	Elephant	7.6	1 per 11 clients	not listed on quota
5	Zebra	7.0	1 per 2 clients	65.1
6	Hartebeest	6.0	1 per client	76.4
7	Hippo	5.7	1 per 3 clients	68.0
8	Wildebeest	4.6	2 per 3 clients	64.3
9	Sable	4.3	1 per 6 clients	43.6
10	Warthog	4.2	2 per 3 clients	70.7
11	Impala	3.9	1 per client	65.7
12	Eland	3.2	1 per 5 clients	38.8
13	Kudu, Greater	2.9	1 per 8 clients	31.4
14	Waterbuck	2.7	1 per 3 clients	50.5
15	Crocodile	2.7	1 per 6 clients	42.2
16	Reedbuck	1.3	1 per 4 clients	52.1
17	Hyaena	0.6	1 per 6 clients	49.9
18	Bushbuck	0.5	1 per 12 clients	25.3
19	Duiker	0.4	1 per 8 clients	31.7
20	Bushpig	0.4	1 per 9 clients	40.0
	Remainder (21 species)	0.5		
	All species		7.8 animals per client	

Table 5: Numbers of various species hunted in and around the Selous Game Reserve

Animal	1996	1997	1998	1999	2000	2001	2002	2003
Buffalo	453	518	671	506	678	773	643	788
Elephant	39	14	19	16	18	43	19	55
Lion	86	98	115	81	63	83	81	78
Leopard	100	105	106	78	80	89	71	94
Hyaena	58	72	94	55	64	65	61	70
Wildebeest	231	291	313	245	279	301	264	240
Zebra	158	218	264	206	292	266	168	266
Crocodile	44	59	89	69	84	71	63	60
Sable	40	72	67	51	74	66	64	66
Hippo	97	123	161	102	132	163	131	164
Hartebeest	258	261	374	283	338	356	290	342
Warthog	193	229	315	225	274	266	241	263
Impala	241	289	350	316	331	363	322	315
Bushbuck	24	29	47	20	25	42	28	43
Eland	43	67	88	51	60	71	53	62
Kudu, Greater	38	39	40	35	38	48	30	48
Waterbuck	70	96	112	102	136	119	89	116
Reedbuck	70	80	116	55	106	72	41	88

Table 6: Annual hunting quota for selected species for the Selous Game Reserve (including Liwale North & South Open Areas)

Species	1996	1997	1998	1999	2000	2001	2002	2003
Buffalo	517	593	732	758	835	925	911	920
Lion	148	140	187	179	170	177	167	167
Leopard	132	123	138	119	134	141	151	166
Hyaena	110	129	144	143	146		153	162
Wildebeest	340	380	449	418	441	490	456	457
Zebra	263	322	361	376	388	436	402	416
Crocodile	108	133	167	166	186	191	172	181
Sable	121	134	145	160	147	148	139	146
Hippo	152	165	219	203	201	219	218	222
Hartebeest	303	344	445	440	433	465	477	483
Warthog	256	286	351	358	411	444	432	436
Impala	367	403	506	517	516	546	509	511
Bushbuck	103	116	138	164	129	138	127	131
Eland	134	149	172	171	173	170	160	166
Kudu, Greater	117	117	135	140	135	141	134	128
Waterbuck	173	187	217	213	218	237	226	234
Reedbuck	132	148	163	167	169	179	172	173
Bushpig	94	103	127	133	124	133	128	130
Oribi	16	15	19	22	25	25	27	27

Trophy quality trends

Trophy quality has been collected for animals hunted in the SGR since 1995, but a serious attempt to collect data has only been implemented after 1999. Analysis of the data is not easy as methods have not been adequately standardised. Measurements have been taken using either metric and imperial systems without clearly indicating which system is used. Also a number of clearly impossible records are presented. Prior to the analysis, data have had to be tested for a sense of normality. This has been done by plotting one measurement against another for all individuals of a species, for example plotting skull width against skull length for lion, or tusk circumference against tusk length for elephant. Records that do not fit a normal trend are then deleted from the dataset.

Buffalo

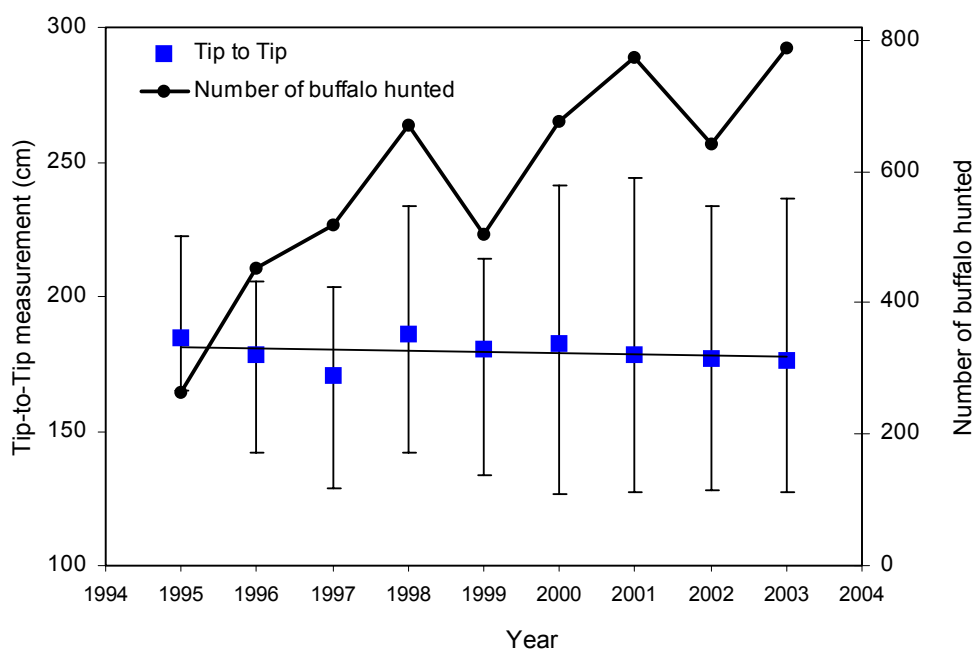


Figure 12: Trends in buffalo trophy quality (tip-to-tip measurement) from 1,621 records from the Selous Game Reserve from 1995 to 2003

The tip-to-tip measurement is used here as an index of trophy quality for buffalo. This is the measurement of the full length of the horns including the curl. It is not an ideal trophy quality index as this measurement is not well correlated to age. Older animals which should be considered to provide better trophies typically have a lower tip-to-tip measurement.

Buffalo trophy quality shows no correlation with levels of offtake over the years 1995 to 2003, despite a large increase in the number of animals hunted. The Buffalo population in the SGR exceeds ... animals, and an offtake of 800 per annum represents less than 1% harvest. A correlation between levels of offtake and trophy quality would therefore not be expected.

Lion

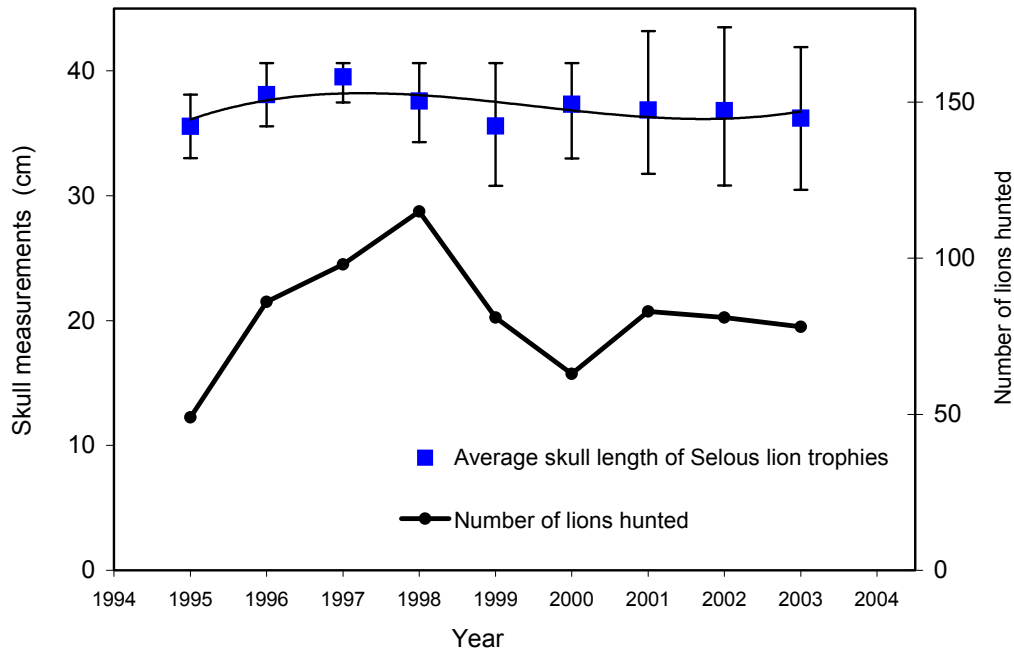


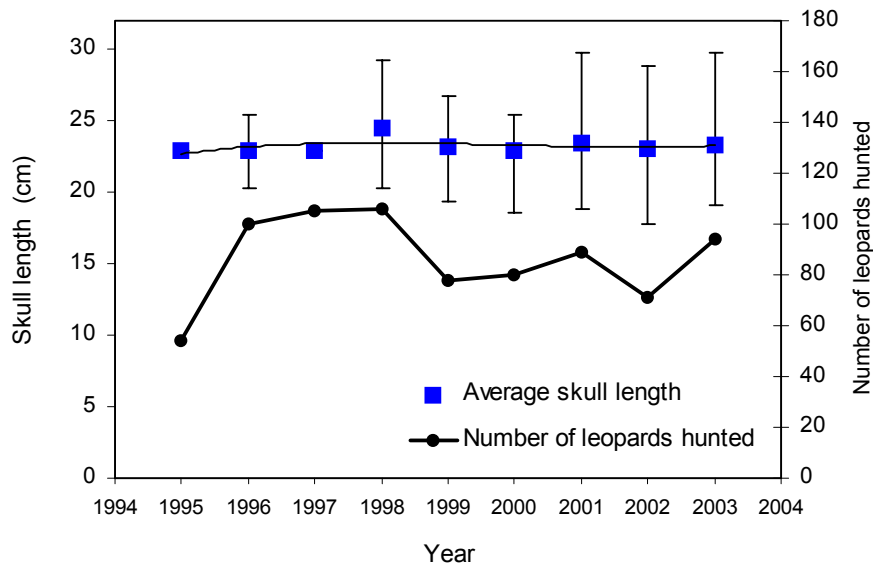
Figure 13: Trends in lion trophy quality (skull length measurement) from 212 records from the Selous Game Reserve from 1995 to 2003

A careful analysis of the lion trophy data, based on 212 records of skull length using various statistical packages has revealed no significant trend in trophy quality over the period from 1995 to 2003. This provides empirical evidence that lion offtake in the Selous Game Reserve is at a level that does not cause a decline in trophy quality and is therefore sustainable.

Some minor trends can however be detected and provide some insights into the dynamics of the Selous lion population over this time. Hunting has increased and the area used expanded in the period up to 1997. This may account for an initial increase in lion trophy quality up to 1997, as some lion prides were being hunted for the first time after a period of rest at that stage. 1998 was a year of heavy hunting and the number of lions hunted reached a maximum level that year. Trophy quality dropped as a result in 1999 but has stabilized and improved thereafter with a reduced lion offtake. The data does suggest that lion trophy quality responds rapidly to hunting intensity and lion populations are able to recover easily. It is assumed from these data that lion populations in the Selous are being heavily hunted, but their rapid recovery in response to reduced hunting pressure indicates that offtake levels are sustainable.

Lion populations elsewhere have shown capacity to recover rapidly from a drop in numbers, as has been the case of the Serengeti lion recovery following the outbreak of disease.

Leopard

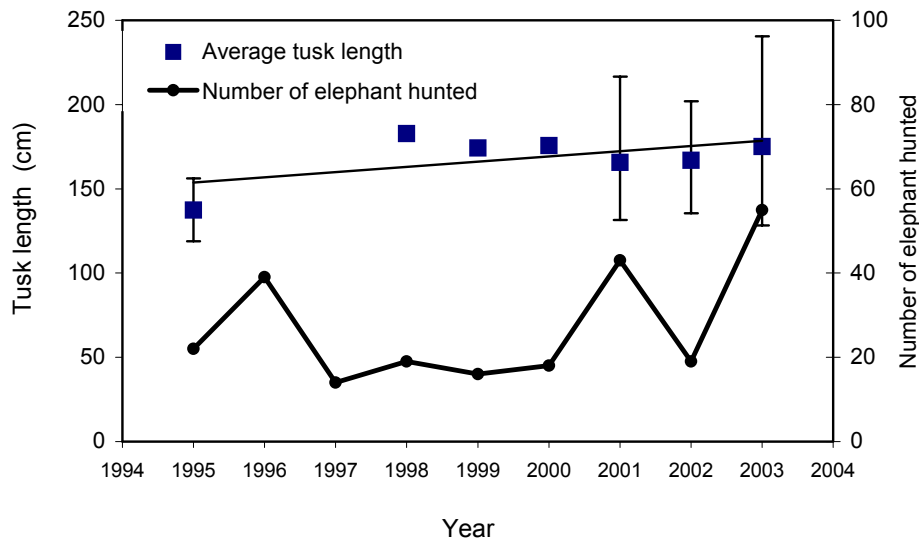


Trophy records analysed: 222

Figure 14: Trends in leopard trophy quality (based on skull length measurement) from 222 records from the Selous Game Reserve from 1995 to 2003

Leopard trophy quality does not show any particular trend over the period under review. From these data, it seems safe to assume that leopard populations in the SGR are unaffected by hunting pressure.

Elephant



Trophy records analysed: 69

Figure 15: Trends in elephant trophy quality (based on tusk length measurement) from 69 records from the Selous Game Reserve from 1995 to 2003

Elephant trophy quality shows an improvement over the period under review, although the number of animals for which trophy quality data are presented is limited, particularly for the early years. There is a wide range in trophy quality in later years, with some small elephants being hunted, but also some large elephants being hunted. The numbers of elephant trophies, has however increased over the period under review. Improved trophy quality seems to correlate with increased numbers of animals hunted.

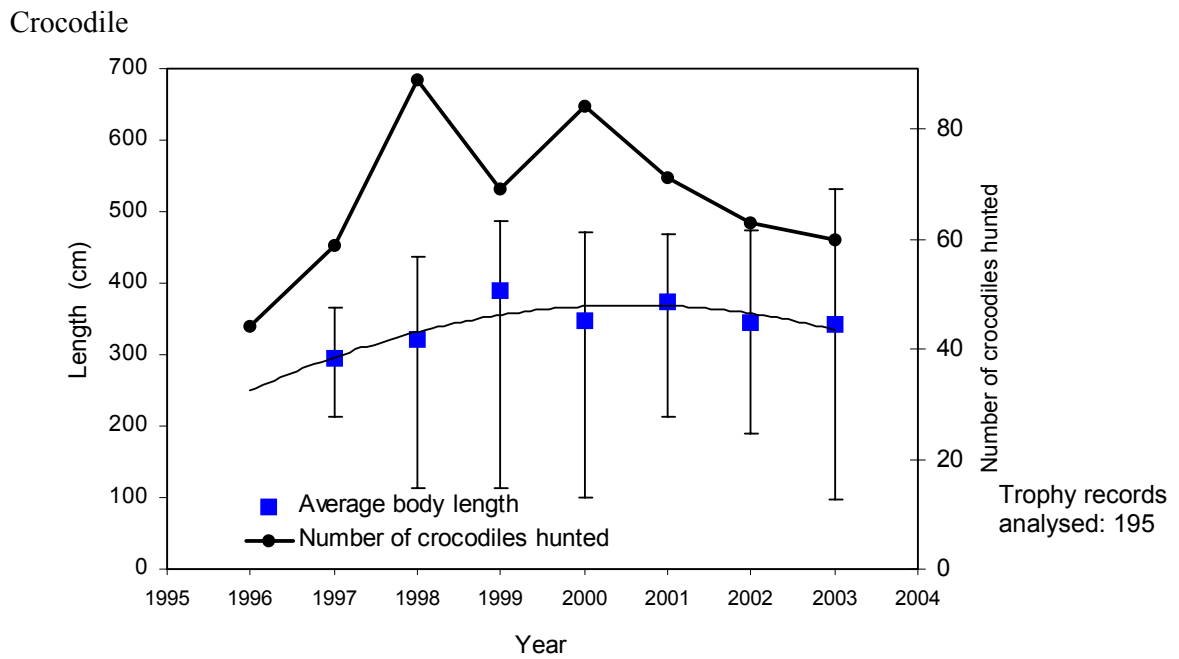


Figure 16: Trends in crocodile trophy quality (body length measurement) from 195 records from the Selous Game Reserve from 1996 to 2003

Quality of crocodile trophy records show no trend in response to levels of offtake. The initial increase in trophy quality is attributed to few records in 1997. The size of crocodiles hunted shows a wide variation. Some very large crocodiles are being hunted, but also some small ones.

PROFILE OF HUNTING COMPANIES

A total of 40 hunting companies are recorded in the database as having brought clients to hunt in the SGR but not all have leased blocks. The years of operation of the various hunting companies leasing blocks in the SGR is presented in Table 6. This table shows a clear trend of longer periods of lease being allocated to companies in the years from 1996 to 2003 than for the preceding period. The confidence of companies and the demand for blocks has increased considerably over the period of the data presented. In 1988 half (50%) of the blocks were vacant, however from 1998 no blocks have been vacant.

The Wildlife Division annually sets hunting quota for many species for each block that is leased and the leasing companies are required to utilise at least 40% of the value of the quota, but should not exceed the quota. The percentage utilisation of the quota value for the period 1996 to 2001 are presented in Table 7 together with the companies leasing the respective blocks. Blocks where 40% of the quota value was not achieved are shaded, and blocks where quota values were exceeded are outlined.

No hunting quota are set for elephant, however revenue generated from elephant hunting has been included in the analysis of the data presented in Table 7. This gives the impression of a higher number of blocks where the value of quota are exceeded. The analysis was therefore repeated excluding the revenue generated from elephant hunting, and those blocks where quotas were still exceeded are marked accordingly with a double outline.

Table 8 presents a long list of approximately 350 professional hunters having hunted in the SGR as revealed by the database. Some unlisted professional hunters claim to have hunted in the SGR, while others claim to have more years of experience in the SGR than shown in Table 8. Reasons for these anomalies could be due to professional hunters having bypassed licensing procedures in the past.

Table 7: Years and areas of operation for hunting companies in and around the Selous Game Reserve

Block	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Gonabis																
MK1						Intercon Hunters & Safaris LTD										
KY1														Photographic		
Y1	Vulture Hunting Safaris					Tanzania Bundu Safaris LTD										
LA1		Northern Hunting				Tanzania Game Tracker Safaris / Miombo Safaris LTD										
R3						Miombo Safaris LTD										
K3						Game Frontiers of Tanzania (GFT)										
K2		TAWICO				Tembo Safaris	Safari Royal		Kiboko Hunting Safaris						ECO	GFT
K1				Tarimo												Afr Bush
K4		Safari East Africa				African Trophy			African Bush Co LTD				African			
R1							TGS					Trophy Hunting Safaris LTD				
R2		Safari East Africa				Tembo Safaris	Francols		Eco Hunting Safaris LTD (ECO)							
R4		Africa														
K5						Tanzanian Big Game Safaris										
LU1						Masailand				Mwanauta & Co LTD						
L1					Hunters Tracks					Bright Tours (T) LTD						
IH1		Bundu														
LU2						Masailand Hunting Co. LTD										
LU5						Tanzania Game Fishing & Photographic Safaris										
LL3																
MS1						Luke Samaras Safaris LTD										
RU1																
U4																

Continued overleaf

Table 7 continued..

Block	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
MA1	Tanzania Wildlife Corporation (TAWICO)															
U3																
LU4	Robin Hurt Safaris						TAWICO									
LU3																
M2	TAWICO		Hunters International Tanzania				Hunters Int. Tz.		Pori Trackers of Africa (PPS)							
M1	TAWICO		Malagarasi Hunting Safaris													
U1	African Bush Company LTD															
U2																
Liwale N	TAWISA															
Liwale S																
LU7	Barlette Safaris LTD															
LL1																
LL2																
LU6																
MT2	Tanganyika Wildlife Safaris LTD (TAWISA)															
LU8																
N1																
MB1																
MB2	Gerald Pasanisi Safaris LTD															
MB3																
MH1																
MJ1																
ML1																
MT1																
N2																

Table 8: Percentage utilisation of hunting quota

Companies	Block	1996	1997	1998	1999	2000	2001	2002	2003
Intercon Hunter & Safari	KY1	69.6	52.8	41.7	36.8	0.9	Photographic		
	MK1	122.8	56.7	51.8	37.1	90.0	86.5	56.9	79.9
Eco Hunting Safaris LTD	R4	45.0	56.6	84.6	26.4	32.6	32.0	48.2	54.2
	R2	59.0	69.5	119.0	33.0	57.7	38.3	47.0	54.5
Africa Trophy (99 – 03)	R1	62.6	55.6	84.5	57.0	119.7	130.5	69.5	63.1
Afr Trophy (01-03)	K4	85.9	70.7	69.5	40.5	61.8	84.8	74.2	68.8
African Bush Co.	U2	54.7	55.6	67.6	23.1	60.3	62.7	58.8	69.6
	U1	44.5	34.6	58.8	37.3	33.2	44.7	34.0	65.0
Bright Tours	L1	0	26.1	68.5	72.2	63.3	56.1	57.1	42.5
Kiboko Hunting	K1	47.1	96.0	101.2	107.1	80.3	54.6	81.9	86.7
	K2	30.5	92.4	66.7	91.2	67.0	33.9	68.5	22.8
Miombo Safaris LTD	R3	69.6	73.3	38.4	52.6	76.2	41.0	51.7	70.0
Tanzanian Game Tracker Saf.	LA1	45.5	67.1	50.3	47.4	100.5	47.6	35.4	31.0
Tanzanian Big Game Safaris	K5	42.6	46.9	44.2	55.2	35.4	71.4	30.9	29.9
Tanzanian Bundu Safaris	Y1	31.4	43.9	45.9	41.8	31.0	72.0	Photo.	
Luke Samaras Safaris LTD	RU1	65.7	76.6	75.2	84.8	41.8	69.7	62.2	79.8
	U4	49.8	87.5	73.1	69.5	NQA	69.6	60.9	60.7
	LL3	34.0	98.5	121.4	74.3	51.1	80.8	63.7	94.5
	MS1	69.8	99.9	73.6	62.4	59.9	63.2	46.8	69.7
Tanzania Wildlife Corporation (TAWICO)	MA1	41.5	61.0	92.2	92.2	NQA	100.9	23.9	81.6
	U3	24.9	33.5	75.6	54.1	41.0	43.9	50.3	79.5
	LU4	Block vacant		50.9	113.6	NQA	34.2	16.9	74.3
Gerald Pasanisi Safaris LTD	N2	80.8	74.6	62.1	36.7	10.4	57.5	15.6	61.0
	MJ1	175.9	112.2	66.5	18.6	12.8	114.4	83.5	24.5
	MH1	117.7	65.6	50.8	18.3	15.3	67.2	11.5	80.9
	MT1	169.1	107.7	45.0	15.2	31.0	87.4	27.0	207.8
	MB3	97.2	65.8	48.2	39.0	8.9	68.9	15.3	63.7
	ML1	86.5	74.0	76.3	35.3	2.7	105.8	12.3	100.1
Barlette Safaris LTD	LL2	84.0	89.9	94.2	55.1	75.6	85.1	77.3	57.0
	LL1	58.0	82.8	74.3	59.3	82.5	80.3	75.0	64.1
	MT2	68.3	82.6	60.3	41.5	61.8	104.1	57.0	89.4
	Liwale North	47.2	NQA	72.8	51.5	9.0	87.5	52.4	49.6
	Liwale South	25.3	NQA	82.0	33.7	8.8	81.3	48.4	41.0
Tanganyika Wildlife Safaris (TAWISA)	N1	106.8	49.5	19.1	0	42.4	37.3	29.7	42.1
	MB2	145.0	50.3	18.9	0.7	79.5	68.3	53.3	69.6
	LU6	100.1	50.6	37.4	9.4	51.7	61.8	32.2	54.3
	LU7	89.8	50.1	60.5	20.3	45.9	37.1	10.3	57.6
	LU8	52.2	59.6	54.6	3.7	48.3	31.9	2.8	67.9
	MB1	63.7	71.9	18.0	0	6.6	45.9	54.8	58.0
Game Frontiers of Tanzania	K3	Vacant	22.1	134.9	51.7	92.2	95.2	43.1	25.2
HIT	Malagarasi (98-03)	NQA	Vacant	34.1	42.6	75.4	61.0	18.6	39.6
	Pori Trackers (98-03)	NQA	55.6	82.5	41.2	58.7	51.5	55.5	87.1
Masailand Hunting LTD	LU2	60.3	66.7	109.7	99.0	44.8	106.8	64.0	66.3
	IH1	62.0	32.4	75.6	92.3	74.7	45.2	49.6	41.0
Traditional African Safaris	LU3	19.8	5.2	12.6	26.0	36.5	35.1	20.4	41.5
Tz Game Fishing & Photo	LU5	19.3	45.1	95.9	25.0	79.4	63.0	51.4	45.9
Mwanauta & Company LTD	LU1	Block vacant		0.3	59.7	35.4	67.8	51.2	52.2

Key:
 NQA = No Quota Available

	Under-utilised block (less than 40% utilisation of quota)
	Quota not exceeded excluding elephant hunts
	Quota exceed after excluding elephant hunts
	No hunting taking place (Block vacant or set aside for photographic)

Table 9: List of professional hunters operating in the Selous Game Reserve from 1993 to 2003 showing their years of experience in the SGR and numbers of clients guided

Professional Hunter	Experience	Clients	Final Year	Professional Hunter	Experience	Clients	Final Year
A. J. Van Heerden	4	11	2002	Clint D. Taylor	5	37	1999
Abdul H. Morris	5	22	2002	Cornelius van Wyk	4	12	2003
Abdul Mulla	2	5	2003	Craig Doria	1	2	2002
Adam Buske	3	26	2002	Crispin Mayandika	6	40	2003
Adam Clements	4	16	2003	D. Aoams	1	3	1993
Adam H. Davies	1	1	2002	Damien Nendeuil	1	2	1995
Aguiere Lien	1	6	1993	Dannie Jacobs	2	5	2000
Ahmed Mohamed	1	2	2002	Dave Rademeyer	1	1	2003
Albert Lulinde	6	60	2003	David Messiaen	8	43	2003
Alberto Feu	5	22	2002	David Ommaney	2	3	1996
Albertus Vander	1	1	2002	Dawie Jacobus Groenewald	4	19	2002
Alec mac Cullum	1	6	1999	Deon Goosen	1	4	1996
Alex Bundala	4	18	1998	Derek Mac Pherson	3	20	2003
Alex John Ishabakaki	4	11	2003	Derek Van Staaden	1	4	2002
Alex Walker	8	33	2003	Desmoulez	1	2	1993
Alfredo M. Ferreiro	2	5	1990	Don M. Bower	2	10	2003
Alick Roberts	2	3	1994	Doug Scaundrol	7	21	2003
Allan Burl	1	2	1997	Douglas Mc Neil	1	1	2002
Allan Duckworth	3	3	1999	Douglas Stephenson	1	1	2003
Allan Howard	1	8	2000	E. Eckhardt	1	1	1996
Andre De Kock	1	1	2003	E. Malleko	1	1	1998
Andre Martin Nel	4	7	1999	Ed Wiens	1	9	2000
Andy Wilkinson	5	10	2000	Edmund Mbeya	5	34	2003
Angelo Dacy	1	2	1997	Elias Msange	1	2	1996
Antonio Ferreira	2	15	1990	Eric Pasanisi	12	73	2003
Antonio Guerrero	3	10	1999	Ernst Scholz	1	3	2001
Armando Cordosso	3	8	2003	Errol Winson	1	6	1995
Arthur Kobrine	1	1	1996	Ettore Mocchi	2	8	1994
Augustino Nidoli	4	6	2003	F.M. Shawa	2	9	1997
Austine Wienand	2	7	2003	Fabrizio De Arcayne	6	53	2003
B. Bothma	1	2	1992	Farouk Quaresh	4	6	2001
B.K. Tungu	1	2	1994	Farris Mauro	1	2	2003
Baker	1	2	1995	Federico Gellini	10	50	2002
Barry Gayner	1	1	2000	Felix Barrado	5	38	2003
Barry Van Heerden	3	7	2002	Francois M. Gunter	1	3	1989
Bartholomew Kimario	5	25	2001	Francois Loubsher	2	3	2003
Bashan	1	1	1997	Francois Marchetti	3	7	1999
Bernard Sehabiague	8	42	2003	Frank Maës	12	63	2003
Bill Isemonger	2	13	1999	Frank Molteno	1	1	1998
Billard Georges	1	3	1994	Franz Coupe	2	6	1999
Bob Mchau	3	8	2002	Fred Duckworth	3	11	2001
Bonanzio	1	1	1992	Frédéric Blochet	12	98	2003
Brian Johnson	2	8	1995	Frederico Muntadas-Prim	7	12	2003
Brian Kieth Hakes	1	3	2003	Frederico Vidale	5	59	2003
Brian Van Blerk	2	13	2002	Fulvio Gianola	8	38	2003
Bruce Watson	2	5	2003	Gamshard J. Gamdust	5	45	2003
Carl Straus	1	1	2002	Gary Straus	1	2	1996
Carl Voltare	1	1	1996	Geoff Wainwright	1	4	2002
Carlo Torrani	4	13	1997	Geoffrey Claude	7	17	2003
Carlos Faria	4	7	2003	Geoffrey W. Broom	2	5	1993
Charl Beukes	4	9	2003	Georgia Alley	1	1	1996
Charles Kephart	1	1	1993	George Angelides	1	2	2003
Christian de Tudert	2	2	2000	George Billard	3	6	1999
Christopher Lemee	3	20	2000	George Byabato	3	6	2003
Christopher Lordon	2	18	2002	George Hartley	3	7	1997
Christopher R. Basuben	1	3	1999	Georgio Ferreira	1	2	2003
Claus de Lesgine	1	1	1995	Gerald Melcher	2	10	2001
Cliff Walker	4	43	2003	Gerald Miller	2	2	2001

Table 9 continued..

Professional Hunter	Experience	Clients	Final Year	Professional Hunter	Experience	Clients	Final Year
Gerard Ambrose	1	8	1993	Jean-Louis Masson	8	66	2003
Gérard Pasanisi	7	14	2001	Jeff Covey	2	32	2001
Gerrie van der Merwe	1	1	1995	Jerome M. Latrive	8	31	2003
Gervas Maiko	2	13	2002	Joan Fornel	2	5	2002
Godfrey Chotara	2	16	2000	Joe Coogan	1	1	2002
Godson Saitabau	1	3	2002	Joe O. Bannon	2	2	2000
Gordon B. Anthony	1	1	1998	John Bosch	3	8	2002
Gordon Church	5	16	2001	John Du Plooy	1	9	2001
Graham Jones	1	1	1996	John Miller	2	6	2003
Gregory Butler	1	2	1994	John Oosthuizen	3	7	2003
Guintone Wite	1	1	2002	John Pieterse	1	1	2003
Guy Rowe	6	47	2003	John Reeve	1	2	1991
H. Mkula	1	1	1990	John Yakas	3	3	2003
H. Muller	1	2	1993	Jon Queres	5	10	2001
Hakani Ponzstran	1	3	1991	Jonathan Taylor	1	4	2003
Hamish Manning	2	11	2002	Jose Carlos	3	3	2003
Hannes Wessels	1	1	1993	Jose Cloete	1	2	1996
Hapreet S. Brar	2	16	2003	Jose Faria	3	6	1998
Harry Klimer	1	1	2001	Jose Fitas	5	20	2001
Hartley R. Combrink	5	43	2003	Jose Iglesias	3	8	2000
Haruna Mwanauta	1	4	1999	Jose Louis Tabares	11	58	2003
Hassan Mumbi	1	1	2003	Joseph O. Bannon	3	5	2000
Hayden Glenn	5	19	2003	Joseph Vagner	4	8	2002
Henry Malinga	1	1	1999	Joska G. Magyar	8	50	2002
Hermanus Lemmer	3	39	1998	Jouf Bernard	1	5	1995
Hillary Daffi	1	2	2000	Juan Fornell	4	10	2003
Hubert Boulet	6	32	1998	Karl Luomakoski	1	1	2000
Hugo Seia	1	4	2003	Keith Hendry	2	3	2002
Hugo Seth	1	1	1999	Kissiri	1	1	1996
Ian du Toit	1	1	1995	Kobus De Wet	2	10	2003
Ian Lennox	1	5	1993	Kula Kavali	1	1	2002
Ian Mannins	1	2	1996	Kurt J. Ziegler	9	67	2003
Ian Mc Intoch	1	2	2001	L. Wayne Potterfield	1	1	2001
Ian S. Bachelor	1	1	2003	Lance Ayliffe	3	6	1998
Isaac Kiwia	7	36	2003	Lance Higgins	3	15	2002
Issa Mohamed	1	1	1993	Larry Richard	1	2	1993
Istvan Pletikosic	1	1	2001	Larry Ward	4	15	1998
J. Elloci	1	2	1992	Laurent Garcia	2	5	2003
J.C. Lordans	1	1	2002	Lazaro M	1	1	1994
J.M. Robert	1	3	1993	Len Phillipe	1	1	1998
Jabo Alex Andala	1	1	1998	Lennox	1	1	1993
Jack Leumaux	1	4	1996	Leon Kachel Hoffer	2	11	2003
Jaco Oosthuizen	2	6	2003	Lionel Kaysler	2	5	2003
Jacob Du Plessis	5	24	2002	Louis Masson	1	2	2003
Jacobus De Wet	3	35	2003	Louis Pedro	2	2	1998
Jacobus Steph. Smit	1	1	2000	Louis Von Putbus	1	4	2003
James Kephart	1	3	1993	Lous A. Brito	1	2	1990
James Maynard	2	2	1998	Luke Black Beard	1	4	2002
Jason Bergman	3	10	2003	Luke Samaras	11	83	2003
Jason Stone	2	8	2002	M. Fabris	1	6	2001
Jasper P. L. Samaras	7	19	2002	M.A. Vickery	1	2	1993
Jay Ball	1	4	1993	Maike Bartlett	1	3	1994
Jay Smit	1	4	1999	Marcel Tiran	9	50	2003
Jean Beguerie	3	4	2002	Mark Radloff	1	3	2002
Jean Claude De Crecy	3	3	2001	Mark Selby	4	9	2003
Jean Linox	1	1	1993	Mark Sullivan	4	28	2001
Jean Michel Latrive	7	31	2002	Marshal Busly	1	1	2002
Jean Pierre Le Roux	9	67	2003	Marshall W. Smalling	4	25	2003
Jean-Claude Gauthier	7	9	2003	Massimo De Amicis	2	2	2003

Table 9 continued..

Professional Hunter	Experience	Clients	Final Year	Professional Hunter	Experience	Clients	Final Year
Mathew Laboureur	2	7	2000	Quintin Whitehead	2	9	2003
Mauro Daulio	8	47	2002	R. Chiffroy	2	4	1994
Mauro Fabris	1	1	2003	R. J. Montivoisin	1	5	1993
Michel Mantheakis	8	40	2003	R. Minja	1	13	1996
Michel Ommay	1	1	1995	R. Rowley	1	1	2001
Mike Branham	1	1	2002	Rainer E. Joesch	1	6	2003
Mike Karaiskos	1	6	1999	Raoul Ramoni	7	20	2003
Mohsin Abdallah Sheni	1	1	2002	Rashid H.S	1	1	1990
Moller	1	3	1992	Ray Stanley	6	49	2003
Moret Polanet	1	2	1992	Reed Morian	1	1	1993
Muiroff Dolf Bohwer	1	1	2002	Renzo Torrani	4	5	2003
N.E. Ndonde	3	13	1995	Richard Bonham	1	2	1997
Natasha I. Berg	1	2	2002	Richard Bresner	1	14	2003
Natie Oelofse	6	37	2000	Richard J. Crispin	7	40	2002
Neil Goss	2	15	2001	Richard Newgass	1	4	2001
Nick Pretorius	3	3	2001	Richard Ramoni	10	27	2002
Nicolas Dubich	5	39	2003	Richard Trappe	1	1	1998
Nicolas Gazelle	2	3	2001	Rick Harleens	2	2	1997
Nicolas Negre	7	47	2003	Rick Hoperaft	2	5	2000
Nicolas Oubika	1	1	2002	Ridge W. Taylor	3	9	1996
Nigel Archer	7	45	2003	Robin Hurt	1	8	1993
Nigel Theisson	11	36	2003	Robin Voigt	2	9	2001
Nodoli Torrani	4	8	2000	Roby Martin	1	1	1993
Norbert Reiner	1	4	2003	Rolf Rohwer	7	36	2003
O. Barton	1	2	1993	Roman Pilon	2	3	2000
Oliver Edwards	1	1	2001	Ronald W. Sparrow	1	6	1998
Orlando Cardoso	4	39	2003	Rory Guthrie	2	14	2003
P. Waddelow	1	2	2002	Roy Carr Hartley	1	2	1993
Paddy Curtis	10	49	2003	Ruby Lubin	1	1	1998
Pano Calavrias	10	70	2003	Rudolf Hornig	2	16	1998
Pascal Coudert	9	56	2003	Ryan Wienand	2	9	2003
Pascal Mageta	1	4	1994	Saitabali	1	2	1998
Patrick Mnahela	11	71	2003	Samuel Meena	2	7	2000
Paulo Shanalingigwa	10	45	2003	Schalck Tait	1	1	2003
Pedro De Sa E Mello	11	78	2003	Sean Combrink	1	1	2002
Penn De Vries	1	4	2001	Sergio	1	1	1996
Pertus Fourie	1	3	2002	Simon Evans	1	2	1994
Peter Baltar	1	1	2002	Stephan Buys	5	28	2003
Peter Bartosz	3	25	2003	Stéphane Cordesse	3	15	2003
Peter Chipman	1	4	2001	Stephano De Amicis	3	14	2003
Peter Dafner	2	5	2003	Steve Atwell	6	43	2003
Peter Jason Stone	1	7	2001	Stewart F. Cooper	1	3	1996
Peter Jasson	1	1	2002	Ted Gorline	2	3	2002
Peter Swanepoel	4	18	2002	Tiran Marcel	3	14	1999
Peter Waddelau	1	3	2003	Tony Calavrias	2	15	1997
Petrus Fourie	5	26	2003	Tony Moore	2	3	1997
Phillip D. Lozano	6	20	2003	Tony Sanchez Arifo	6	13	2003
Phillipe Chardonette	2	3	1997	Trosky	1	2	1997
Phillipe Clero	8	58	2003	U. Matomolos	1	1	1990
Phillipe Lué	12	53	2003	Wade Bale	1	2	1999
Pierre Caravati	10	37	2003	Wayne Clark	2	13	2003
Pierre Jon Queres	2	7	2001	Wayne Stanton	1	1	2003
Pierre Van Tonder	3	13	2003	Webster Kapaliswa	6	16	2001
Pierre van Wyk	1	1	2000	William Cloete	3	9	1999
Piet Fourie	1	1	2002	Willy Blomme	6	33	2003
Piet Hougard	1	4	1993	Xavier L.	1	1	2003
Placid Mgedzi	4	17	2001	Zayne Van Der Merwe	1	8	2002
Quico	1	2	1997	Zdenek Vagner	4	12	2002

PROFILE OF HUNTING CLIENTS

Table 10: Nationalities of clients hunting in the Selous Game Reserve

Nationality	Percentage of clients
American	34.2
Spanish *	17.7
French *	13.4
Italian *	7.2
German *	6.1
Austrian *	3.5
Hungarian	2.1
Belgian *	1.8
Mexican	1.7
British *	1.5
South African	1.4
Russian	1.3
Danish *	0.8
Swedish *	0.8
Polish	0.7
Portuguese *	0.7
Canadian	0.6
Czechoslovakian	0.6
Australian	0.4
Swiss *	0.4
Other nationalities	3.1

* Origin Europe

Clients come from a wide range of countries to hunt in Tanzania (Table 9), with American clients representing the largest single nationality. A more careful inspection of the nationalities in Table 10 reveals that the majority of clients actually come from Europe. This has important implications for the marketing strategies used by the Tanzanian Government and hunting operators.

Table 11: Breakdown of hunting clients from major countries

Country	Percentage of clients
Europe	54.2
United States	34.2
Other countries	11.6

Table 12: Percentage of clients taking various lengths of hunting safari in and around the Selous Game Reserve from 1988 to 2003

Safari length	Percentage of clients
1 to 7 days	19.9
8 to 14 days	12.3
15 to 20 days	8.0
21 days	51.4
Greater than 21 days	8.4

Table 13: Annual numbers of clients, hunting days, permits and trend in days taken per client

Year	Clients	Hunting days	Permits	Days / Client
1988	99	1,779	150	18.0
1989	185	3,707	278	20.0
1990	177	3,483	264	19.7
1991	115	2,124	183	18.5
1992	163	3,305	254	20.3
1993	198	3,409	246	17.2
1994	174	3,210	206	18.4
1995	168	3,139	197	18.7
1996	325	5,340	364	16.4
1997	346	5,688	407	16.4
1998	436	7,049	558	16.2
1999	343	5,420	429	15.8
2000	431	6,639	600	15.4
2001	483	7,599	644	15.7
2002	417	5,475	455	13.1
2003	479	7,287	600	15.2

Concerns are frequently raised by hunting operators that clients are showing an increasing tendency to take shorter safaris, and that the classic 21-day safari is becoming difficult to sell. The above data in Table 12 does indicate a limited trend of shorter safaris over time.

Months of safari

The most popular months to hunt are July to October as shown below in Figure 17. The relatively high demand for safaris in July suggests that the hunting season could start earlier to accommodate more hunters, but extending the hunting season beyond the New Year would not yield any benefit. Climatic conditions (inaccessibility due to rain and tall grass) limit the practical possibilities of hunting earlier than July for most areas of Tanzania, but some outfitters believe that bringing forward the season would be an advantage.

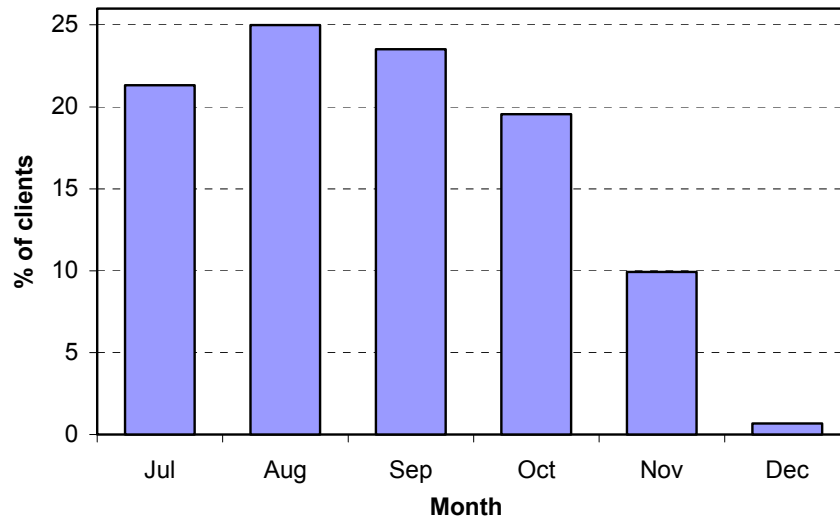


Figure 17: Percentage of clients hunting per month

The best lion hunting is said to take place early in the season before fires are widespread and while the grass is tall. At this time lions seem to have difficulty hunting possibly due to wildlife being dispersed and lions are thus more likely to be attracted to baits. Incidence of man-eating by lions tends to increase prior to the end of the rainy seasons for the same reason.

Table 14: Twenty most popular rifle calibers used by tourist hunters in the Selous Game Reserve

No.	Rifle calibre	% popularity	No.	Rifle calibre	% popularity
1	.375	35.4	11	.460	1.3
2	.416	13.4	12	.378	1.3
3	.300	13.0	13	.22	1.1
4	.458	4.5	14	Shotgun (12 Bore)	1.0
5	7 mm	4.4	15	9.3 x 64	1.0
6	.470	3.8	16	.450	0.8
7	.30-06	3.1	17	8 x 68	0.8
8	.500	2.0	18	7 x 64	0.6
9	.338	1.9	19	9.3 x 74	0.6
10	.270	1.5	20	.577	0.6
Other calibres		7.8			

COMPARISON BETWEEN HUNTING AND PHOTOGRAPHIC TOURISM

A detailed analysis of photographic tourism in the Selous Game Reserve shall be compiled into another document. However, former hunting areas are being set aside for photographic tourism, and a brief comparison between these two forms of income generation is valid here.

Human densities are compared between the photographic area and the hunting area of the Selous Game Reserve. Human density was calculated based on the total number of tourist bed nights per square kilometer each year, and compared to the number of hunter days sold on hunting permits. A dramatic difference in human densities exist between the different areas with the photographic area having 42 times the number of people than in the hunting areas.

The real difference is even more dramatic due to the following factors:

1. Bed nights do not include the day of departure. The most common duration of a photographic tourist safari is 2 to 3 days. Therefore the number of days tourists are present in the area should be increased by 25 to 30%.
2. Many hunting clients will not utilize the full number of days purchased on a hunting permit, and the hunting tourist densities are less than what is stated.
3. Support staff are not considered in these figures which account for large additional number of people in the photographic tourist area.

Photographic tourism is however generating 1.8 times (almost double) the income generated from hunting tourism per unit area as shown in Table 16.

Table 15: Comparison of human densities between the photographic and hunting areas of the Selous Game Reserve

Year	Photographic tourist days	Tourist hunter days
1997	10,452	5,688
1998	11,690	7,049
1999	4,156	5,420
2000	9,994	6,639
2001	11,263	7,599
2002	10,374	5,475
2003	8,642	7,287
Average	9,510	6,451
Area (km ²)	1,600	46,055
Density (Tourists / km ²)	5.94	0.14

Human densities (tourists only) is substantially higher in the northern photographic area of the SGR than in the hunting area. The differences are dramatic with densities in the northern photographic area being 42 times greater than beyond that area. This high density of tourists is despite many of the lodges in the area operating at low capacity.

Table 16: Comparison of income generated per square kilometer by photographic and hunting tourism in the Selous Game Reserve

	Photographic tourism	Hunting Tourism
Income (US\$)	214,320	3,200,000
Area (km ²)	1,600	46,055
Income (US\$/ km ²)	133.95	69.48

The income generated per square kilometer by photographic tourism is approximately double that generated from hunting, but generated from 42 times the density of people. The higher income is attributed to only a small area until now having been available to the tourist lodges. The actual income from hunting is 15 times greater than the income generated from tourism. This is the proverbial comparison of apples to pears, but it is also the comparison of a dwarf against a giant.

SOME HUNTING ISSUES IN THE SELOUS GAME RESERVE NEEDING ATTENTION

The hunting permits, trophy data sheets and GPS coordinates for the hunting in the Selous Game Reserve in 2003 were computerized. Based on a picture of the data that has emerged, the following anomalies have been noticed and need attention:

1. The company Intercon Hunters and Safaris LTD has been hunting within the area set aside for photographic tourism, while the block MK1 that is allocated to this company is partly un-utilised.
2. Hunting is not always taking place within the blocks in which it is registered to take place. The following blocks appear to have minimal hunting taking place in contravention to what the statistics reveal:
 - LU1
 - LU8
 - M1
 - ML1
3. The following blocks appear to have had more hunting taking place within their boundaries than is shown by the hunting data:
 - K4
 - LU2
 - LU3
 - R1
4. Documents of the Wildlife Division indicate that block LU2 is leased to Masailand Hunting Company LTD. The hunting data however show that this block is utilized by both Masailand Hunting Company LTD and Mwanauta & Co LTD.
5. Statistics show blocks K1 and MK1 have been exposed to particularly heavily hunting intensity, raising concerns about the capacity of these areas to sustain such high levels of offtake.
6. Observer fees are inconsistent between different companies, as shown by the table overleaf. Approximately 50% observers per client would seem to be normal.
7. Declared wounding rates are inconsistent between different companies, as shown by the table overleaf. Experienced hunters know that wounding rates of approx 5% are normal, less than 5% suggests that wounded animals are not being declared.
8. Percentages of trophy records submitted are inconsistent between different companies, as shown by the table overleaf. Trophy records should be submitted for every animal hunted (should = 100%). Some companies are submitting dubious trophy records (e.g. Buffalo boss width = 50 cm).

Figures in Table 22 below suggest that the presence of observers and wounded animals have been under-estimated by some companies, and none are submitting trophy records for every animal hunted.

Table 23: Percentage trophy records and wounding rates per animal hunted, and percentage observers per client by the various companies currently operating in the Selous Game Reserve for 2003

Company	Percentage Trophy records submitted	Percentage animals declared as wounded	Percentage Observers present
African Bush Company Ltd	76.0%	0%	45.0%
African Trophy Hunting Safaris	70.6%	0.6%	105.9%
Barlette Safari Ltd	67.2%	0%	36.4%
Bright Tours Safaris Ltd	91.1%	0%	66.7%
Eco Hunting Safaris Ltd	84.4%	2.5%	38.9%
Game Frontiers of Tanzania	61.1%	5.6%	57.1%
Gerald Pasanisi Safaris	55.6%	0%	0%
Intercon Hunter and Safari	72.9%	0.4%	4.7%
Kiboko Hunting Safaris	78.0%	2.0%	34.3%
Luke Samaras Safaris Ltd	84.2%	0.9%	72.7%
Malagarasi Hunting Safaris	59.6%	3.5%	8.7%
Masailand Hunting Ltd	82.4%	2.2%	68.6%
Miombo Safaris	84.8%	2.5%	11.8%
Mwanauta & Company Ltd	69.6%	1.8%	59.1%
Pori Trackers of Africa	78.0%	0%	82.4%
Tanzania Big Game Safaris	70.0%	5.0%	33.3%
Tanzanian Game Fishing & Photo	73.0%	4.8%	80.0%
Tanzanian Game Trackers	73.0%	2.7%	14.3%
TAWICO	38.5%	0%	2.1%
TAWISA	73.6%	2.3%	11.6%
Traditional African Safaris Ltd	77.6%	4.1%	33.3%

APPENDIX 10: Log frame of proposals to improve Tourist Hunting

Group	Problem	Actions to resolve associated problems
1. Low income generation	Real value of hunting product not achieved	<ul style="list-style-type: none"> • Implement the management plan on tourist hunting (1995) which includes: <ul style="list-style-type: none"> - Competitive bidding by operators for hunting blocks - Simplification of the hunting regulations - Involvement of rural communities - Distribution of fees among stakeholders - Procedures to promote continuity of the lease by operators occupying a block provided appropriate criteria are satisfied
		<ul style="list-style-type: none"> • Revise the tourist hunting management plan using a consultative process
		<ul style="list-style-type: none"> • Promote diversified use of the hunting areas
2. Lack of standards	<ul style="list-style-type: none"> • Unethical procedures used by hunters • Poor quality trophies hunted • Disregard of hunting regulations and false declaration of results 	<ul style="list-style-type: none"> • Trophy quality standards and monitoring introduced • Introduce effective control on export of under-sized trophies • Clarification and precise mapping of all hunting block boundaries, including DW approval on maps • Consolidation of hunting blocks / revision of boundaries in some areas • Spot checks on hunting activities conducted by Hunting Section
	<ul style="list-style-type: none"> • No training facilities for professional hunters • Low standard of professional hunting 	<ul style="list-style-type: none"> • WD to provide a suitable area to TAHOA for training / testing of PHs • Internal control mechanisms of TAHOA authorised and promoted • TAHOA to be responsible for licensing of PHs based on their experience in Tanzania • DW to approve standards established by TAHOA for PHs including minimum age, qualifications, procedure for apprenticeship / in-service training, skills assessment
	<ul style="list-style-type: none"> • No external control mechanisms on the hunting industry 	<ul style="list-style-type: none"> • WD to collaborate with external institutions to facilitate the development of independent certification for operators
3. Lack of information	<ul style="list-style-type: none"> • Poor monitoring 	<ul style="list-style-type: none"> • Computerisation of hunting licenses and issuing procedures including the financial aspects thereof
	<ul style="list-style-type: none"> • Shortage of data for quota setting 	<ul style="list-style-type: none"> • Increased census of wildlife populations • Promote research / inventories of key species, particularly lion and buffalo populations

4. Declining wildlife populations	<ul style="list-style-type: none"> • Shortage of wildlife staff for patrol 	<ul style="list-style-type: none"> • Significantly increase the game scout force
	<ul style="list-style-type: none"> • Communities not involved in wildlife management 	<ul style="list-style-type: none"> • Boost establishment of WMAs and empowerment of communities to control who hunts what animals on WMA land and enable the communities to accrue financial benefits
	<ul style="list-style-type: none"> • Low effectiveness of operator's involvement 	<ul style="list-style-type: none"> • Provide incentives to improve participation of operators in management (operators encouraged to contribute / introduce technologies into antipoaching activities, WD to provide patrol personnel) • WD to produce specific guidelines to operators and value of expected contributions for community support, road construction etc.
	<ul style="list-style-type: none"> • Over-hunting of key spp. 	<ul style="list-style-type: none"> • Reduction of quota • Restructuring of safari package system
5. Uncertainty on the way forward	<ul style="list-style-type: none"> • Limited understanding of mgmt requirements for hunting among WD personnel 	<ul style="list-style-type: none"> • Each game reserve office to keep better (computerised) record of hunting activities • Circulate the management plan (1995) on tourist hunting, and invite comments • Computerise old hunting data, analyse and circulate results
	<ul style="list-style-type: none"> • New ideas needed to guide reform of tourist hunting 	<p>Source information / opinions from within (Mweka / UDSM / SUA) and outside the country on the following topics:</p> <ul style="list-style-type: none"> • Past hunting data e.g. Selous • Initiate market research into value and demand for hunting • Invite opinions from existing and potential operators • Invite opinions from international hunting organisations • Understand developments in hunting from other wildlife management authorities in Africa / globally
6. Difficult trends for WD to control	<ul style="list-style-type: none"> • Too much foreign control of the hunting industry 	<ul style="list-style-type: none"> • Introduce affirmative action incentives for employment of professional Tanzanian staff (PHs, camp managers etc.) for example a formula for reduced lease fees • Amend regulations such that operators are required to show at least 55% of their income is received into Tanzanian-based bank accounts. • Involve TRA to clarify taxation of hunting (particularly subleasing)
	<ul style="list-style-type: none"> • Monopolisation tendencies 	<p>Amend regulations to include the following:</p> <ul style="list-style-type: none"> • Restrict the maximum number of blocks leased to an outfitter / group of companies under common ownership • Stipulate a minimum number of outfitters / operators active in Tanzania to ensure adequate competition exists

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