
INTRODUCING LION INTO PILANESBERG: AN ECONOMIC ASSESSMENT

by

Deborah Vorhies & Frank Vorhies

ECO PLUS (PTY) LTD
Box 2067, Parklands 2121
Johannesburg, South Africa
(27 11) 880 4463

21545 W Pine
Lake Villa IL 60046 USA
(1 708) 356 7532

for

Bophuthatswana National Parks & Wildlife Management Board

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1. The Proposal to Introduce Lion

The Bophuthatswana National Parks and Wildlife Management Board (Bop Parks) is evaluating the introduction of lion into the Pilanesberg National Park. The basic premise is that the introduction would help Bop Parks to accomplish its mission: "Bop Parks is committed to the upliftment of the quality of life in Bophuthatswana through the conserving of wild plants, animals and landscapes for the benefit of the people."

Plans to introduce lion into Pilanesberg began with the initial inception of the reserve well over a decade ago. The architect of the Park, Professor Willem van Riet of the University of Pretoria, actually designed the Park to accommodate lion. Furthermore, the original warden of the Park, Jeremy Anderson, was hired because of his experience in managing lion. The initial decision to introduce lion however was postponed.

In recent years Sun International (Bophuthatswana) Limited, owners of the adjacent Sun City resort complex, requested that introducing lion be reconsidered. With the introduction of lion Pilanesberg will be home to the *Big Five*. Peter Wagner, Director of Public Affairs for Sun Bop, strongly believes that this feature will enable Sun City to attract more international tourists. Wagner's position is discussed in more detail below.

According to Roger Collinson, Executive Chairman of Bop Parks, there have already been extensive discussions with Bop Parks officials, government officials, tribal chiefs, and other interested and affected parties on the matter of introducing lion. Only after considerable review and discussion has Lucas Mangope, President of Bophuthatswana, approved in principal the introduction of lion. The final decision lies with the Bop Parks Board and its Executive Chairman and as of this assessment has not yet been made.

At this stage Bop Parks plans to introduce 20 lion. There will be several impacts from this introduction—ecological, social, economic and perhaps even political. Our report focuses on the economic impacts of introducing lion. We begin by reviewing the demand and supply for lion and then proceed to quantify where possible the expected benefits in terms primarily of net revenues and the expected costs from their introduction.

We develop worst, likely and best scenarios dependent on such variables as changes in the number of visitors, the fees charged and the rate of interest. These scenarios have been developed with the aim of assisting the decision makers. Thus the spreadsheet model (in Quattro Pro and Lotus 123 formats) is also available to allow the decision makers to assess the impact of changes in any of the variables.

We must emphasise however that the decision whether to introduce lion cannot be made purely on economic grounds. Our report serves as only one specialist report for an overall impact assessment of the plan to introduce lion.

2. The Demand for Lion

The primary demand for lion from an economic perspective is to view them in their natural habitat. This means that the primary revenue to be generated from introducing lion will come from increased tourism expenditures in Pilanesberg and in the resorts in the region, specifically the Stocks Leisure Developments (Pty) Ltd resorts in the Park and the Sun City resort complex adjoining the Park.

The introduction of lion is necessary to make Pilanesberg a Big Five destination. The Big Five are considered by Sun Bop, as well as by other tourism companies such as the Conservation Corporation (Cons Corp), as necessary for attracting foreign tourists to an African bushveld destination. Simply put, tourism companies believe that international travel agents will not promote or sell tours to African game reserves that do not have the Big Five.

Recently lion were introduced in Cons Corp's Phinda Resource Reserve in northern Natal. Jane Conyngham, Cons Corp Communications Director, stated to us quite strongly that Phinda would have been a nonstarter without the introduction of the Big Five, especially lion. Without the Big Five she explained Cons Corp would have been unable to get investors for Phinda as well as vital air links and international travel agent support. Thus because Cons Corp management viewed lion as indispensable to the very existence of Phinda, they did not even attempt to project the net benefit of introducing lion.

Cons Corp is also aware that though lion may be necessary, they are not sufficient to draw international tourists. The eastern Transvaal is perceived to be the major Big Five viewing destination within South Africa. Drawing international tourists away from the eastern Transvaal to see the Big Five elsewhere will not be easy. In addition to Phinda, Cons Corp also manages two top-end lodges in the eastern Transvaal—Londolozzi in the Sabi Sand Reserve and Ngala, the first private camp in the Kruger National Park. They believe that even with the introduction of the Big Five it will be several years before Phinda can really compete with the eastern Transvaal.

The implication for Pilanesberg is that the introduction of lion may not have an immediate impact on the number of international tourists visiting the region. Sun Bop feels however that lion will establish Pilanesberg and Sun City as a strongly competitive African destination. They contend that because Pilanesberg has had four of the Big Five for some time and the Park is already well-known, the introduction of lion will allow Sun Bop to compete immediately with the eastern Transvaal. Thus we assess in detail the expected impact on various segments of the Pilanesberg tourist market from local day visitors to international guests at Sun City.

A secondary economic demand for lion is to hunt them. In addition to photo safaris, Pilanesberg is also a destination for sport hunting. We thus also assess the impact of introducing lion on the hunting operations in the park. Though the revenues from hunting lion are expected to be small, as shown in a later section the introduction of lion will have a negative impact on hunting other species.

A third possible demand for lion is the market for live wildlife. Bop Park plans at least for the next few years to limit the number of lion in Pilanesberg to approximately 20. One possible method of limiting stocks is to sell the excess. Other methods include hunting, culling or sterilisation. For the purpose of this study we assume that the excess stock will be eliminated by means of culling or commercial hunting. Thus we do not model any possible revenue from selling live lion.

Other demands for lion include opportunities for scientific research, their contribution to the natural ecosystem of Pilanesberg, and their contribution to the preservation of the species. Because of the complexities of quantifying ecological and existence values of a wildlife species, we have not included such demands in this economic evaluation. A more extensive assessment should however include estimates of the various positive and negative existence values of lion irrespective of any consumptive or non-consumptive demand for lion.

Finally, we focus on two major potential beneficiaries of the demand for lion—Bop Parks and the Pilanesberg region, the latter of which includes the Stocks Leisure and Sun Bop resorts. Our assessment of the returns from introducing lion indicates that the economic value of lion is based almost exclusively on a non-consumptive demand to view lion in its natural habitat. Thus this assessment essentially evaluates the viewing value of lion.

3. The Supply of Lion

The southern African market for viewing lion in its natural habitat has a number of suppliers. The primary market in the Transvaal is the Kruger National Park and neighbouring private reserves such as Sabi Sand and Timbavati. Also in addition to Pilanesberg, Bop Parks plans to introduce lion to its newest park, Madikwe, located near Gaborone, Botswana. Lion in Pilanesberg will however be the closest lion in their natural habitat to Pretoria and Johannesburg, the population centre of southern Africa. From an international perspective they will also be the closest lion to Jan Smuts Airport.

Lion may also be viewed in Natal at the Hluhluwe and Umfolozi reserves of the Natal Parks Board and at the Phinda Resource Reserve. As noted above, the recent introduction of lion at Phinda makes for an interesting comparison with plans for Pilanesberg. In the Cape, lion are currently resident only in the Kalahari Gemsbok Park. There are plans however to introduce them to other national parks in the province.

There are also lion throughout the lower elevation regions of Zimbabwe, in northern Namibia (where Pilanesberg plans to purchase its lion) and in northern Botswana. If and when the Mozambique extension of Kruger Park occurs, lion will also be able to be viewed there.

Lion can be hunted in northern Botswana, Zimbabwe and to a limited extent in South Africa. The possibility of supplying lion for sport hunting in Pilanesberg could increase Bop Park's attractiveness as a Big Five hunting destination. It could however also reduce its attractiveness as a plains game hunting destination.

Bop Parks plans to purchase 20 lion from Etosha National park in Namibia. The costs of supplying these lion are much greater than their direct purchase price. Additional costs include transportation, monitoring, "lion-proofing" Pilanesberg, monitoring and food requirements. These costs are detailed below in the sections on capital and operation costs.

4. The Structure of the Assessment

The framework for our economic evaluation of introducing lion focuses on the annualised net returns to Bop Parks and to the Pilanesberg region. We assess both the net revenues from increased tourism and costs of introducing and maintaining lion in Pilanesberg. The estimated annualised net returns are calculated throughout in 1993 rands.

There are a number of variables dependent on developments in the macro environment including the state of the political transition in South Africa and the state of the southern African economy. These variables include probable increases in visitors to Pilanesberg and real market rates of interest. We thus carry out a sensitivity analysis by assessing the impacts of various scenarios which we label worst, likely and best.

In any study of this sort, the choice of an interest rate is crucial. The interest rate or discount rate normally includes a number of components. One component is inflation. A market rate of interest must account for depreciation in the value of money. A second component is the risk associated with the cash flow. Risk emanates both from the level of uncertainty associated with the cash flow itself and from the environment surrounding the activity.

In this case we have taken inflation out of our projected cash flows. Therefore we also leave inflation out of our interest rate assessment. Thus both the cash flows and interest rates used are in real terms, as opposed to nominal terms.

Concerning risk, the tourism industry globally is a high-risk industry. It is very susceptible to changes in the macro environment. For example, in recent years the tourist industry in southern Africa was hit by an external shock—the Gulf War. The continuing violence in the internal environment has also seriously hurt the industry. Our scenarios are therefore based on relatively high interest rates of 6%, 8% and 10% with 8% being the likely rate.

The assessed impacts on Bop Parks and on the region are structured to indicate annualised cash flows or revenues and costs in constant 1993 rands. This approach provides the decision-makers with projections of annual profits or losses from the introduction of lion.

In addition we also comment on other economic dimensions such as job creation, small business development, and foreign exchange earnings. The impact on these dimensions give a further indication of the likely economic impact of introducing lion into Pilanesberg.

5. Pilanesberg Visitors

Greg Stuart-Hill of Bop Parks provided us with recorded figures of visitors to Pilanesberg. In 1991, the number of visitors, excluding those to the Bakgatla Mass Recreation Facility, was 59 000. In 1992 this number increased to 79 200 of which 18 000 were residents of Bophuthatswana and 61 200 were non-residents. TABLE 1 details the composition of visitors.

TABLE 1: PILANESBERG VISITORS, 1992

	BOP RESIDENTS			NON-BOP		TOTAL
	ADULT	CHILD	PUPIL	ADULT	CHILD	
JAN	748	308	150	3560	762	5,528
FEB	418	50	120	2940	558	4,086
MAR	259	69	578	3295	670	4,871
APR	298	82	0	3537	990	4,907
MAY	439	64	287	3745	636	5,171
JUN	387	103	197	3919	939	5,545
JUL	350	80	120	4636	1038	6,224
AUG	507	78	3831	3620	674	8,710
SEP	929	86	2747	4968	1220	9,950
OCT	370	286	1707	4199	1262	7,824
NOV	608	86	0	4725	727	6,146
DEC	1344	297	0	7125	1477	10,243
	6,657	1,589	9,737	50,269	10,953	
TOTAL	17,983			61,222		79,205

The entrance fee to Pilanesberg varies for adults and children and for Bop residents and non-residents. As of April 1993 the entrance fees ranged from R1.60 to R6.75. Alf Wills of Bop Parks estimates that average current entrance fees are approximately R3 for Bop residents and R6 for non-residents. The average fees will be increased as a result of the lion introduction. An average fee R4 for residents and R10 for non-residents is likely. At best they could become R5 and R15 respectively.

In a 1990 marketing study by Markinor both Bop and non-Bop visitors expressed a strong desire to view lion in the Park. Lion were actually perceived to be a key feature of an African game park. The increase in visitors wanting to see lion, however, might be partially offset by a decline, especially in non-Bop visitors, who come primarily to bird watch. Bird watchers might react negatively to the increased security required because of the presence of lion. After extensive discussions with Bop Parks officials and interested parties such as the Wildlife Society of Southern Africa, we feel confident that the net change in numbers of visitors due to the introduction of lion will be positive.

Because of strong well-established competition, especially from the eastern Transvaal, we do not believe that visitor numbers will grow radically. Thus our worst, likely and best scenarios project increases in visitors of 5%, 10% and 15% respectively. TABLE 2 presents Pilanesberg visitor data based on 1992 statistics for visitors and average 1993 entrance fees. The table also provides current gate revenue; projected changes of numbers of visitors and projected gate fees.

TABLE 2: PILANESBERG VISITORS DATA

	WORST	LIKELY	BEST
VISITORS - BOP		18,000	
VISITORS - NON-BOP		61,200	
VISITORS - TOTAL		79,200	
AVERAGE FEE - BOP		3	
AVERAGE FEE - NON-BOP		6	
GATE REVENUE - BOP		54,000	
GATE REVENUE - NON-BOP		367,200	
GATE REVENUE - TOTAL		421,200	
% CHANGE: VISITORS	5%	10%	15%

	WORST	LIKELY	BEST
VISITORS - BOP	18,900	19,800	20,700
VISITORS - NON-BOP	64,260	67,320	70,380
VISITORS - TOTAL	83,160	87,120	91,080
PROJECTED GATE FEE - BOP	3	4	5
PROJECTED GATE FEE - NON-BOP	6	12	18

Our projections for gate fee revenues from visitors thus combine three scenarios for the fees and three scenarios for the number of visitors. TABLES 3, 4, and 5 each focus on a different fee structure and assess the impact of the different changes in the numbers of visitors.

For our cash flow scenarios we use the worst fee and worst visitor increase for our worst scenario, the likely fee and increase for our likely scenario and the best fee and increase for our best scenario. This results in net gate revenue of R21,060 worst, R465,840 likely, and R949,140 best.

The Park is currently operating below capacity with regard to visitor entrances. Therefore we assume that there will be no marginal costs associated with these levels of increases in visitor numbers. Also, though the Park does have many more visitors on weekends, we assume that the weekend peaks will not generate any additional costs or revenues. We therefore treat the entire revenue increase as an increase in cash profit.

TABLE 3: GATE REVENUE - WORST

	WORST	LIKELY	BEST
WORST FEE - BOP	3		
WORST FEE - NON-BOP	6		
% CHANGE: VISITORS	5%	10%	15%
GATE REVENUE - BOP	56,700	59,400	62,100
GATE REVENUE - NON-BOP	385,560	403,920	422,280
GATE REVENUE - TOTAL	442,260	463,320	484,380
NET GATE REVENUE: BOP	2,700	5,400	8,100
NET GATE REVENUE: NON-BOP	18,360	36,720	55,080
NET GATE REVENUE: TOTAL	21,060	42,120	63,180

TABLE 4: GATE REVENUE - LIKELY

	WORST	LIKELY	BEST
LIKELY FEE - BOP		4	
LIKELY FEE - NON-BOP		12	2
% CHANGE: VISITORS	5%	10%	15%
GATE REVENUE - BOP	75,600	79,200	82,800
GATE REVENUE - NON-BOP	771,120	807,840	844,560
GATE REVENUE - TOTAL	846,720	887,040	927,360
NET GATE REVENUE: BOP	21,600	25,200	28,800
NET GATE REVENUE: NON-BOP	403,920	440,640	477,360
NET GATE REVENUE: TOTAL	425,520	465,840	506,160

TABLE 5: GATE REVENUE - BEST

GATE REVENUE - BEST FEE	WORST	LIKELY	BEST
LIKELY FEE - BOP			5
LIKELY FEE - NON-BOP			18
% CHANGE: VISITORS	5%	10%	15%
GATE REVENUE - BOP	94,500	99,000	103,500
GATE REVENUE - NON-BOP	1,156,680	1,211,760	1,266,840
GATE REVENUE - TOTAL	1,251,180	1,310,760	1,370,340
NET GATE REVENUE: BOP	40,500	45,000	49,500
NET GATE REVENUE: NON-BOP	789,480	844,560	899,640
NET GATE REVENUE: TOTAL	829,980	889,560	949,140

6. Pilanesberg Camps

A major source of revenue for Bop Parks in addition to the entrance fee comes from visitors to camps in Pilanesberg. TABLE 6 lists the various types of accommodation available from Bop Parks in Pilanesberg, most of which are operated by Golden Leopard Resorts. The Stocks Leisure resorts in the Park and the Sun Bop resorts adjacent to the Park are treated separately.

TABLE 6: PILANESBERG CAMPS

MANYANE CARAVAN PARK	100 CARAVAN STANDS, 60 CAMPING SITES
MANYANE CHALET CAMP	60 SELF-CATERING CHALETS
MANYANE CAMP SAFARI TENTS	SELF-CATERING SAFARI TENTS
MANKWE CAMP BUNGALOWS	10 SELF-CATERING SINGLE-ROOM CABINS
MANKWE CAMP SAFARI TENTS	10 SELF-CATERING SAFARI TENTS
KOLOLO PRIVATE CAMP	4 SELF-CATERING SAFARI-STYLE TENTS
METSWEDI CAMP	7 SAFARI-STYLE TENTS
BOSELE DORMITORY CAMP	UP TO 180 BUNK BEDS
BAKGATLA RECREATION FACILITY	PLANNED LOW COST UNITS

As TABLE 6 indicates, the types of accommodation available in Pilanesberg are quite varied. Naturally the rates also vary considerably. With the assistance of Johann Klopper, managing director of Golden Leopard Resorts, we have been able to model the impact on the camps as a group. Klopper expects most of the camps to be impacted positively by the introduction of lion. He also feels that the increased number of camp visitors will however be primarily from within South Africa and thus will not have an effect on foreign exchange.

The one venue that is unlikely to be impacted by the lion is the Bakgatla Recreation Facility. This facility attracts mostly Bop residents for recreation activities such as music festivals and picnics rather than game viewing. The music festivals generate about 90,000 rands per year. In 1992 there were about 4,100 visitors. Klopper does not expect the number of users of the facility to change because of the introduction of lion. Thus we do not model any changes in net revenues for this facility.

For the other camps as a group Klopper estimated the likely increase in net profits from trading, catering and accommodation. From these we worked backwards to determine turnover estimates. From the turnover estimates we projected worst and best scenarios for increases in net profits. For the camps our scenarios are based on changes in the numbers of visitors of 5%, 10% and 15%. Our projections are in TABLE 7.

TABLE 7: PILANESBERG CAMPS REVENUE

	WORST	LIKELY	BEST
EST TURNOVER: TRADING		2,560,000	
EST TURNOVER: CATERING		2,080,000	
EST TURNOVER: ACCOMMODATION		3,800,000	
EST NET PROFIT		2,200,000	
% CHANGE: VISITORS	5%	10%	15%
CHANGE: TRADING	128,000	320,000	384,000
CHANGE: CATERING	104,000	260,000	312,000
CHANGE: ACCOMMODATION	190,000	475,000	570,000
NET CAMPS PROFIT	110,000	275,000	330,000

7. Pilanesberg Photo Safaris

Jules Turnbull-Kemp, managing director of Pilanesberg Safaris, manages the photographic safaris originating from Sun City and from Manyane Gate. He estimates that he currently has about 1,200 to 2,000 customers per month paying either the full rate of R51 per game drive or the group discount rate of R46. The profit per customer is approximately R12.

The photo safari operations are operating with significant excess capacity. Turnbull-Kemp estimates that introduction of lion could increase business by about 20% with no additional direct costs required. Rather than using 20%, however, in line with our other projections, we project a more conservative

likely increase of 12.5%. We again assume that there will be no increase in fixed overhead and that the profit per head is the full cash profit. Our calculations are in TABLE 8.

TABLE 8: PILANESBERG PHOTO SAFARIS

	WORST	LIKELY	BEST
CURRENT CUSTOMERS		19,200	
AVERAGE RATE PER GAME DRIVE		49	
PROFIT PER GAME DRIVE		12	
TURNOVER		940,800	
PROFIT		230,400	
% CHANGE: CUSTOMERS	5%	12.5%	25%
CUSTOMERS	20,160	21,600	24,000
TURNOVER	987,840	1,058,400	1,176,000
PROFIT	241,920	259,200	288,000
NET PHOTO SAFARI TURNOVER	47,040	117,600	235,200
NET PHOTO SAFARI PROFIT	11,520	28,800	57,600

Visitors can also go on guided walks. Because of the lion, some aspects of the walks, such as routing, may have to change. Turnbull-Kemp feels that the walks are already adequately protected and the lion will impose no additional costs. Also the walks do not attract people wishing to view lion and therefore no additional revenue due to lion is expected.

8. Pilanesberg Hunting Safaris

It is unlikely at least in the early years that hunting of lion will take place in Pilanesberg. Current thinking is to maintain a stable population of 20 lion. Thus Jules Turnbull-Kemp, who is also the managing director of Kgama Safaris, estimates that one surplus male per year will be available for hunting starting only from the third year after they are introduced. This hunt will generate an addition US\$ 2,000 or R7,000 per year of profit.

The US\$ 2,000 represents the trophy fee that will be paid by the hunter. It is turn paid over to Bop Parks as a fee. Turnbull-Kemp estimates that lion will not increase any other revenues from hunting. The net revenue from Big Five hunting will remain unchanged.

Turnbull-Kemp also estimates that lion will have a negative impact on the existing hunting business in Pilanesberg. Hunting can be divided into two categories—plains game and the Big Five. Due to the food requirements of the lion and also the increased development and traffic associated with the lion, Turnbull-Kemp anticipates that plains game hunting will cease 5 years earlier than otherwise.

He expects an increasing amount of non-consumptive or photographic tourism from the expansion of game numbers and the improvement of facilities. Thus even without lion revenues from hunting are expected to decline. Without lion plains game hunting is anticipated to continue for only another 8 years. Thus with lion plains game hunting revenue will be lost for years 3 to 8.

IN TABLE 9 we project the revenues from hunting lion starting in year 3 and the loss revenues from reduced plains game hunting in years 3 to 8. To do this we have to calculate the present values (PV) of these revenue flows and then calculate annualised profits. For the purposes of consistency we use a time period of 15 years, the same period used below for annualising capital cost.

TABLE 9: PILANESBERG HUNTING SAFARIS

	WORST	LIKELY	BEST
DISCOUNT RATE (REAL)	10%	8%	6%
TURNOVER - PLAINS GAME		350,000	
PROFIT – PLAINS GAME		100,000	
PROFIT – LION		7,000	
PLAINS GAME - YRS 3-8			
PV: TURNOVER	(996,826)	(1,109,340)	(1,237,874)
PV: PROFIT/(LOSS)	(284,807)	(316,954)	(353,678)
1 LION HUNT YRS 3-15			

PV: PROFIT/(LOSS)	35,835	41,877	49,275
NPV	(248,973)	(275,078)	(304,404)
ANNUALISED PROFIT/(LOSS)	(32,733)	(32,137)	(31,342)

Our scenarios are based on three different real discount rates: 6%, 8% and 10%. As previously discussed, by calculating all revenues and costs in 1993 rands, our projections are in real terms rather than nominal or inflationary terms. We thus also use real rather than nominal interest rates. A real rate of interest reflects the noninflationary cost of capital including associated risk. A higher interest rate reflects a riskier business environment. The real rates of interest that we use are relatively high because of the high risk associated with the hunting industry and the high risk of doing business within South Africa.

Depending on the level and timing of expected future gains and losses, either high or a low discount rate would be preferable. In this case the future losses from reducing plains game hunting exceed the future gains from hunting lion. Thus the preferred discount rate is the lower rate of 6%. The best scenario results from a 6% rate and the worst from a 10% rate.

9. Stocks Leisure Resorts

Within the Pilanesberg National Park are two luxury resorts, Bakubung and Kwa-Maritane. These are owned and operated as a joint venture between Stocks Leisure Developments (Pty) Ltd and Bop Parks. Because Bop Parks are dependent on dividends declared from cash flows from the resorts, they do not have control over their entire cash flow. Thus we treat these resorts as part of the region, not part of Bop Parks.

TABLE 10: STOCKS LEISURE RESORTS

BAKUBUNG	50 ROOMS, 28 SUITES, 22 STUDIOS
KWA-MARITANE	22 STUDIOS, 50 CHALETS

Our projections of the impact of introducing lion are based on discussions with Peter Fowden, managing director of Stocks Leisure. The resorts are time-share lodges with both time-share visitors and normal lodge visitors. Fowden does not expect any impact on the time-share activities from the introduction of lion. He believes however that the lion will enable them to increase their occupancy by attracting overseas visitors. Thus the expected additional revenues generated will contribute to foreign exchange earnings within South Africa.

Because both resorts are currently operating at about 50% capacity, Fowden estimates that 70% of net turnover will be profit. In other words, the marginal cost for additional guests is only 30% of the rate that they pay.

Additional profit will also generated from game drives. The game drives bring in R35 per customer and a cash profit of R7. We assume that all additional guests will buy one game drive for every night of their occupancy. Since game drives are varied by including drinks, braais, walks and so on, it is common for guests to take a game drive daily. Thus total net profit for Stocks Leisure includes net revenues from accommodation and from game drives.

TABLE 11: STOCKS LEISURE REVENUE

	WORST	LIKELY	BEST
BAKUBUNG			
AVAILABLE ROOM NIGHTS		22,200	
OCCUPIED ROOM NIGHTS		11,544	
OCCUPANCY %		52%	
AVERAGE RATE		224	
ROOM TURNOVER		2,585,856	
NEW RATE		232	
NEW OCCUPANCY %	57%	62%	67%
TURNOVER	2,935,728	3,193,248	3,450,768
NET ROOM TURNOVER	349,872	607,392	864,912
NET ROOM PROFIT	244,910	425,174	605,438
NET GAME DRIVES TURNOVER	38,850	77,700	116,550

	WORST	LIKELY	BEST
NET GAME DRIVES PROFIT	7,770	15,540	23,310
NET BAKUBUNG TURNOVER	388,722	685,092	981,462
NET BAKUBUNG PROFIT	252,680	440,714	628,748
KWA-MARITANE			
AVAILABLE ROOM NIGHTS		22,200	
OCCUPIED ROOM NIGHTS		12,432	
OCCUPANCY %		56%	
AVERAGE RATE		314	
ROOM TURNOVER		3,903,648	
NEW RATE		310	
NEW OCCUPANCY %	61%	66%	71%
TURNOVER	4,198,020	4,542,120	4,886,220
NET ROOM TURNOVER	294,372	638,472	982,572
NET ROOM PROFIT	206,060	446,930	687,800
NET GAME DRIVES TURNOVER	38,850	77,700	116,550
NET GAME DRIVES PROFIT	7,770	15,540	23,310
NET KWA-MARITANE TURNOVER	333,222	716,172	1,099,122
NET KWA-MARITANE PROFIT	213,830	462,470	711,110
NET STOCKS LEISURE TURNOVER	721,944	1,401,264	2,080,584
NET STOCKS LEISURE PROFIT	466,511	903,185	1,339,859

10. Sun Bop Resorts

Sun Bop, owners and managers of the Sun City complex of resort hotels, believe that the introduction of lion into Pilanesberg will have a significant positive impact on their business and thus on the regional economy. As indicated in TABLE 12, Sun City has sufficient room capacity to service an increase in visitors.

TABLE 12: SUN CITY VENUES

THE LOST CITY	338 ROOMS (OPENED 1993)
THE CASCADES	245 ROOMS (OPENED 1984)
SUN CITY CABANAS	284 ROOMS (OPENED 1981)
SUN CITY ENTERTAINMENT CENTRE	0 ROOMS (OPENED 1981)
SUN CITY HOTEL & CASINO	340 ROOMS (OPENED 1979)

Peter Wagner, managing director of Sun Bop and public affairs director of Sun International, told us that because of the political situation within South Africa, Sun City is currently attracting virtually no foreign visitors. In past years however approximately 20% of the visitors have been foreign. Sun Bop feels that if could improve significantly on this percentage of foreign visitors if it could market Pilanesberg as having the Big Five. An optimistic assessment of the impact of introducing lion expressed by Wagner was that the number of foreign visitors could double.

Regarding visitors from within South Africa, on the other hand, Sun Bop believes that the introduction of lion will have a negligible effect. About half of this group of visitors stay at Sun City for conventions. The balance are interested in the gaming and sporting facilities. Wagner believes it is unlikely that many South Africans interested in viewing lion will choose to stay at Sun City rather than at traditional venues in the eastern Transvaal.

Wagner also explained to us that Sun Bop has not developed any formal projections on expected changes in revenue from the introduction of lion. He did note that in order to attract new foreign visitors to Sun City, Sun Bop plans to run a multi-million rand marketing campaign selling the lion of Pilanesberg. However, because marketing plans by Sun Bop or Bop Parks have not been finalised, we have not included marketing expenditures in our economic assessment. To a certain extent marketing the lion will constitute part of existing marketing budgets representing a change in focus rather than implementation of additional marketing plans.

Our approach to assessing the impact of the lion introduction on Sun Bop is based on the value added statement in the company's 1992 annual report. From the statement we can determine the value added or profits per bed generated from Sun Bop. We then interpolate this figure to arrive at

profits per occupied bed in Sun City. For purposes of this exercise we assume a conservative occupancy rate of 50%, slightly less than the rate of the Stocks Leisure resorts.

TABLE 13: SUN BOP REVENUE

	WORST	LIKELY	BEST
1992 SUN BOP CASH PROFIT (k)		457,802	
1992 BEDS		1,593	
1992 CASH PROFIT PER BED		287,384	
1992 SUN CITY BEDS		869	
LOST CITY BEDS		338	
1993 SUN CITY BEDS		1,207	
ESTIMATED OCCUPANCY		50%	
CASH PROFIT PER OCCUPIED BED		574,767	
% CHANGE: OCCUPANCY RATE	5%	7.5%	10%
CHANGE: OCCUPIED BEDS	30	45	60
CHANGE: CASH PROFIT	17,343,597	26,015,396	34,687,195

Our next step is to project worst, likely and best percentage changes in the occupancy rate. We choose a best change of 10% based on Wagner's statement that 20% of the beds have traditionally been occupied by foreigners and that the lion could double this number. Taking 20% of our targeted 50% occupancy rate, we get 10%. Thus doubling this percentage would add another 10% to the occupancy rate.

Because Wagner himself stated that doubling the number of foreign visitors was optimistic, we scaled down the percentage to a likely increase in the occupancy rate of 7.5%. Sun Bop is convinced that the lion will draw tourists and therefore we set the worst increase at 5%.

The change in cash profit calculated in TABLE 13 includes the profit that Sun Bop earns from all aspects of its operations at Sun City, including accommodation, meals, gaming, entertainment, sport and gifts. We have assumed a constant ratio between occupied beds and revenues generated. Although this assumption may not be entirely accurate, it will not be so far out as to distort seriously the impact of the additional revenues for the Sun City resorts. Thus TABLE 13 indicates that total profit that Sun Bop can expect to earn from the introduction of lion into Pilanesberg. Sun Bop is likely to earn about R26 million per year in 1993 rands.

11. Pilanesberg Capital Costs

We have received advice on cost estimates from several Bop Park officials including Keryn Adcock, Roger Collinson, Rich Davies, Greg Stuart-Hill, Steve Johnson, Johann Klopper, Willy Sephton and Alf Wills. As indicated in our projections, it is quite clear that the introduction of lion will be a costly project. We have divided these costs into capital costs discussed here and operational costs discussed in the following section.

For capital costs we have estimated worst, likely and best costs as indicated in TABLE 14. We show all costs in brackets to make clear that they are outflows rather than inflows of revenue.

TABLE 14: PILANESBERG CAPITAL COST

	WORST	LIKELY	BEST
LION PURCHASES	(200,000)	(120,000)	(100,000)
STERILISATION	(3,000)	(2,400)	(1,200)
BOMA FACILITY	(80,000)	(70,000)	(60,000)
LION INTRODUCTION	(12,000)	(6,000)	(4,000)
MONITORING EQUIPMENT	(175,000)	(150,000)	(125,000)
FENCING/SECURITY	(6,000,000)	(5,500,000)	(5,000,000)
SOCIAL PROGRAMME	(500,000)	(450,000)	(400,000)
TOTAL CAPITAL COST	(6,970,000)	(6,298,400)	(5,690,200)

LION PURCHASES refers to the cost of buying lion from Etosha National Park in Namibia and if necessary transporting them to Pilanesberg. The worst scenario includes transport costs as Bop

Parks anticipates not having to pay transport. STERILISATION covers the cost of sterilisation programme. The BOMA FACILITY will be used to house the lion in preparation for their introduction. The LION INTRODUCTION costs are primarily veterinary costs.

The MONITORING EQUIPMENT includes a 4x4 vehicle, a radio and radio collars. FENCING/SECURITY includes major upgrading of the perimeter fence which Roger Collinson notes will eventually have to be done whether or not lion are introduced. It also includes security for the various resorts, camps, hides, picnic sites and centres. The SOCIAL PROGRAMME includes community awareness and community education about the existence of lion in Pilanesberg.

In addition to worst, likely and best scenarios for the various capital costs, these costs have to be annualised so that they can be analysed along with the other revenue and cost flows. We amortise the costs over a fifteen year period for three alternative real rates of interest: 6%, 8% and 10%. The worst scenarios are for a 10% rate, the best for a 6% rate. Capital costs are annualised in TABLES 15, 16 and 17.

TABLE 15: CAPITAL COST - WORST

	WORST	LIKELY	BEST
ANNUALISED REPAYMENT - 15 YRS BORROWING RATE (REAL)	10%	8%	6%
LION PURCHASES	(26,295)	(23,366)	(20,593)
STERILISATION	(394)	(350)	(309)
BOMA FACILITY	(10,518)	(9,346)	(8,237)
LION INTRODUCTION	(1,578)	(1,402)	(1,236)
MONITORING EQUIPMENT	(23,008)	(20,445)	(18,018)
FENCING/SECURITY	(788,843)	(700,977)	(617,777)
SOCIAL PROGRAMME	(65,737)	(58,415)	(51,481)
ANNUALISED CAPITAL COST	(916,372)	(814,302)	(717,650)

TABLE 16: CAPITAL COST - LIKELY

	WORST	LIKELY	BEST
ANNUALISED REPAYMENT - 15 YRS BORROWING RATE (REAL)	10%	8%	6%
LION PURCHASES	(15,777)	(14,020)	(12,356)
STERILISATION	(316)	(280)	(247)
BOMA FACILITY	(9,203)	(8,178)	(7,207)
LION INTRODUCTION	(789)	(701)	(618)
MONITORING EQUIPMENT	(19,721)	(17,524)	(15,444)
FENCING/SECURITY	(723,106)	(642,562)	(566,295)
SOCIAL PROGRAMME	(59,163)	(52,573)	(46,333)
ANNUALISED CAPITAL COST	(828,074)	(735,839)	(648,501)

TABLE 17: CAPITAL COST - BEST

	WORST	LIKELY	BEST
ANNUALISED REPAYMENT - 15 YRS BORROWING RATE (REAL)	10%	8%	6%
LION PURCHASES	(13,147)	(11,683)	(10,296)
STERILISATION	(158)	(140)	(124)
BOMA FACILITY	(7,888)	(7,010)	(6,178)
LION INTRODUCTION	(526)	(467)	(412)
MONITORING EQUIPMENT	(16,434)	(14,604)	(12,820)
FENCING/SECURITY	(657,369)	584,148	(514,814)
SOCIAL PROGRAMME	(52,590)	(46,732)	(41,185)
ANNUALISED CAPITAL COST	(748,112)	(664,783)	(585,879)

For our cash flow scenarios we use the worst capital cost and worst interest rate for our worst scenario, the likely cost and rate for our likely scenario and the best cost and rate for our best scenario. This results in an annualised capital cost of R916,372 worst, R735,839 likely, and R585,879 best.

12. Pilanesberg Operating Cost

With the assistance of Bop Park officials, we have estimated worst, likely and best scenarios for operating costs associated with the introduction of lion. These costs exclude any possible expenditures on marketing by Bop Parks, Sun Bop, Stocks Leisure, Boptour or any other travel and tourism organisation. Thus any addition marketing costs would have to come out of net revenues as modeled in the following two sections. TABLE 18 summarises the direct operating costs.

TABLE 18: PILANESBERG OPERATING COST

	WORST	LIKELY	BEST
MONITORING OFFICER	(120,000)	(100,000)	(80,000)
MONITORING COSTS	(80,000)	(70,000)	(60,000)
FENCE/SECURITY MAINTENANCE	(350,000)	(300,000)	(250,000)
INSURANCE	0	0	0
FOOD REQUIREMENTS	(550,000)	(500,000)	(450,000)
BREAKOUTS/RETRIEVAL	(50,000)	(40,000)	(30,000)
SOCIAL PROGRAMME	(60,000)	(50,000)	(40,000)
ANNUAL OPERATING COST	(1,210,000)	(1,060,000)	(910,000)

The introduction of lion will require an ongoing monitoring programme with MONITORING OFFICER and associated MONITORING COSTS. The perimeter as well as the camps and other sites in the Park will require ongoing FENCE/SECURITY MAINTENANCE. Though we felt that additional liability insurance would be required with the introduction of lion, officials assured us that their current level of coverage is adequate. Thus we left INSURANCE at 0 for all three scenarios.

The FOOD REQUIREMENTS are based on a market valuation of the estimated diet of wildlife that the lion are likely to hunt and eat. Pilanesberg derives a significant amount revenue from the sale of live game. It also has to purchase new game. Thus food requirement expense is not a shadow price but a very real number. We also budget for possible BREAKOUTS/RETRIEVAL. Finally there is an ongoing component as well as a capital component of the SOCIAL PROGRAMME.

13. Impact on Bop Parks

We project three scenarios for the impact of the introduction of lion into Pilanesberg on Bop Parks. The VERY WORST scenario combines the worst projections for revenues and costs, the MOST LIKELY scenarios combines the likely revenues and costs, and the VERY BEST scenario combines the best revenues and costs.

TABLE 19: IMPACT ON BOP PARKS

	VERY WORST	MOST LIKELY	VERY BEST
NET REVENUE			
GATE FEES (TABLES 3,4,5)	21,060	465,840	949,140
CAMPS (TABLE 7)	110,000	275,000	330,000
PHOTO SAFARIS (TABLE 8)	11,520	28,800	57,600
HUNTING SAFARIS (TABLE 9)	(32,733)	(32,137)	(31,342)
COST			
CAPITAL COST (TABLES 15, 16, 17)	(916,372)	(735,839)	(585,879)
OPERATING COST (TABLE 18)	(1,210,000)	(1,060,000)	(910,000)
TOTAL NET REVENUE	109,847	737,503	1,305,398
TOTAL COST	(2,126,372)	(1,795,839)	(1,495,879)
TOTAL PROFIT/(LOSS)	(2,016,526)	(1,058,336)	(190,481)

TOTAL NET REVENUE to Bop Parks is the sum of net revenues from gate fees, camps, photo safaris and hunting safaris. TOTAL COST is the sum of the annualised capital cost and operating cost.

Bop Parks will lose money from the introduction of lion into Pilanesberg. The losses could range from roughly R200,000 to R2 million. We project that it is most likely that Bop Parks will lose approximately R1 million annually in 1993 rands from the introduction of lion.

14. Impact on the Region

We project three scenarios for the impact of the introduction of lion into Pilanesberg on the region. The VERY WORST scenario combines the worst projections for revenues and costs, the MOST LIKELY scenarios combines the likely revenues and costs, and the VERY BEST scenario combines the best revenues and costs.

TABLE 20: IMPACT ON THE REGION

	VERY WORST	MOST LIKELY	VERY BEST
NET REVENUE			
GATE FEES (TABLES 3, 4, 5)	21,060	465,840	949,140
CAMPS (TABLE 7)	110,000	275,000	330,000
PHOTO SAFARIS (TABLE 8)	11,520	28,800	57,600
HUNTING SAFARIS (TABLE 9)	(32,733)	(32,137)	(31,342)
STOCKS LEISURE (TABLE 11)	466,511	903,185	1,339,859
SUN BOP (TABLE 13)	17,343,597	26,015,396	34,687,195
COST			
CAPITAL COST (TABLES 15, 16, 17)	(916,372)	(735,839)	(585,879)
OPERATING COST (TABLE 18)	(1,210,000)	(1,060,000)	(910,000)
TOTAL NET REVENUE	17,919,955	27,656,084	37,332,451
TOTAL COST	(2,126,372)	(1,795,839)	(1,495,879)
TOTAL PROFIT/(LOSS)	15,793,583	25,860,245	35,836,573

TOTAL NET REVENUE to the region is the sum of net revenues from gate fees, camps, photo safaris and hunting safaris plus the net revenue from the Stocks Leisure resorts of Bakubung and Kwa-Maritane and the Sun Bop resorts at Sun City. TOTAL COST is the sum of the annualised capital cost and operating cost.

The region will make money from the introduction of lion into Pilanesberg. The profits will range from roughly R16 million to R36 million. We project that it is most likely that the Pilanesberg region will earn approximately R26 million annually in 1993 rands from the introduction of lion.

15. Other Economic Dimensions

Decision-makers are often interested in economic dimensions other than profit and loss. Two such dimensions are job creation/small business development and foreign exchange earnings. This section briefly looks at these two dimensions.

JOB CREATION/SMALL BUSINESS DEVELOPMENT

Because the facilities in Pilanesberg and the resorts in the region have significant excess capacity, increased tourism from the introduction of lion will not generate much new construction. The only major construction will be to "lion-proof" the Park. Depending on regional capacity some of this work could be contracted out to local small businesses.

Also because of the excess capacity, ongoing direct job creation will also be minimal. The Park will hire a monitoring officer and may need to hire extra staff for fence/security maintenance. Neither Stocks Leisure or Sun Bop should need to hire many more workers to meet the needs of the projected increases in visitors. In short, the introduction of the lion will be capital intensive rather than labour intensive. Again depending on regional capacity, some of the ongoing work, such as fence maintenance, could be contracted out to small businesses.

The largest opportunities for job creation and small business development will come through the linkages to the Pilanesberg region. The increase in tourism both in the Park and in the resorts means that more supplies such as food, drink, cleaning materials, petrol and curios will be required. With a commitment by Pilanesberg, Stocks Leisure and Sun Bop to source their supplies whenever possible

locally, then the impact of the lion on regional job creation and small business development could be significant. A detailed study of the Pilanesberg tourism industry and its associated multipliers would be necessary to project the extent of job and business opportunities that could development.

FOREIGN EXCHANGE EARNINGS

Bophuthatswana is part of the Rand Monetary Union and thus any foreign exchange earnings will benefit generally the southern African region. Bophuthatswana's direct share of these earnings will depend in the short run on policy decisions within the Rand Monetary Union and in the long run on political developments within Southern Africa.

Both Stocks Leisure and Sun Bop expect that the new visitors in response to the lion introduction will come from abroad. Bop Parks, on the other hand, does not expect any of the new visitors to the camps to come from abroad. Bop Parks will however generate some foreign exchange earnings through the expenditures in the Park of the foreign visitors staying in the region.

A rough, conservative estimate of the direct impact of the lion on foreign exchange can be calculated by combining the projected increased turnover in the Stock Leisure and Sun Bop resorts. We do not have calculated turnover figures for Sun Bop and therefore use net profit instead. Our very rough estimate is in TABLE 21. It indicates that there would be significant foreign exchange earnings potential from the introduction of lion.

TABLE 21: FOREIGN EXCHANGE EARNINGS

	WORST	LIKELY	BEST
NET STOCKS LEISURE TURNOVER	721,944	1,401,264	2,080,584
NET SUN BOP PROFITS	17,343,597	26,015,396	34,687,195
TOTAL EARNINGS	18,065,541	27,416,660	36,767,779

16. Conclusion & Recommendation

Our economic assessment of the introduction of lion focused on key revenues and costs to Bop Parks and to the Pilanesberg region. There are certainly some minor revenue and cost variables that we have missed. For example, we have not estimated increased revenues to regional petrol stations or cafes. Nevertheless we suspect that our overall assessment would not be altered by their inclusion.

Bop Parks stands to lose roughly R1 million per year in 1993 rands from the introduction of lion. The region including Bop Parks, on the other hand, stands to gain roughly R26 million per year. Thus the introduction of lion into Pilanesberg makes good economic sense.

There is however an income distribution problem. Under current arrangements, the lion's share of the profits will go to Sun Bop while Bop Parks must cover all the costs. We suggest that some form of joint venture relationship be set up including at least Bop Parks, Sun Bop and Stocks Leisure to finance and manage the lion introduction programme. This joint venture relationship should ensure that all parties share in a mutually acceptable manner the costs and revenues associated with the introduction of lion.