

The Economic Contribution of Table Mountain National Park



South African National Parks

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Executive Summary

Table Mountain National Park (TMNP) was established in 1998 when land and the management of the Park were transferred from the City of Cape Town to SANParks. TMNP commissioned the Graduate School of Business at the University of Cape Town to undertake an assessment of the economic impact of the Park. The Park was specifically interested in four elements. These are the macroeconomic contribution of the TMNP to the national and local economies; the efficiency gains as a result of having the TMNP run by a national organisation; the financial investment in the natural capital of the mountain and the sea; the broader economic impact of the Park on the local economy.

It was found that the operation of the Table Mountain National Park has had a significant macroeconomic effect on Cape Town, the Western Cape and South Africa. After taking account of all multiplier effects, it is estimated that expenditure at the Park has made a cumulative contribution to gross domestic product of R 377 million (table 1, page 4) over the last six financial years.

Total sustained direct jobs in Cape Town fluctuated between 300 and 600. Nationally there has also been indirect job creation as a result of multiplier effects associated with spending at the Park. Over the last six years between 76 and 104 indirect jobs were sustained from operational expenditure; while at the same time between 18 and 73 indirect jobs were created from project expenditure. This is a total of between 103 and 158 indirect jobs that have been sustained over the last six years

Gross Geographic Product (GGP) is the provincial equivalent of national GDP. It is estimated that between 1999 and 2004 the Park has contributed between R 12.8 million and R 16.2 million annually to the Western Cape GGP from operational expenditure. At the same time, contribution to GGP from project expenditure varied between R 2.6 million and R 11.5 million. The Park has added more than R 132 million to provincial GGP over the last six years.

A number of clear efficiency gains have been achieved as a result of the unification of the Park, its transfer to a national entity and its declaration as a National Park. These include: an integrated and focused; reduction of duplication on overheads and services; personnel rationalisation; ability to leverage other funding; and a freeing up of resources at the City of Cape Town. While the number of people employed in the operation and management of the park has decreased, the area of the park

under management has increased since the management of the park was transferred in 1999. The area of the park under management has increased by 41% since transfer took place. In addition to this a total of over R178 million (72% of the total funding) in funding has been leveraged over the last five years. This would have been unlikely had the Park continued to be managed by the City.

One of the most important functions of the Park is to maintain and invest in the natural capital of the mountain and the sea although not all Park expenditure can be directed towards natural capital. It is calculated that investment in the natural capital of the park has varied between 65% and 87% of all expenditure since the inception of the Park.

The Park has a broader economic impact on the local economy. Part of this broader economic impact is its contribution to tourism and private residential sectors. There have also been contributions to the provision of ecosystem services, harvesting opportunities and increased property values.

In the first five years of the park :

- 85% of invasive aliens cleared and restoration of fynbos
- Increase in land since park establishment - 41%
- Leveraging of R178 million (72% of total funding) in donor funding
- Cumulative GDP contribution of R377 million
- Cumulative GGP contribution R132 million

In planning for the next five years:

- Improvement of path network through the use of poverty alleviation funding. This will also result in significant job creation.
- Improving access to the Park for locals and tourists
- Decrease cost of operating the Park
- Increasing operating income
- Continuing investment from donors into the park
- Transforming park structure to reflect demographics
- Transfer of learning and support to parks in the Cape Floristic Kingdom

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1 Introduction

Table Mountain National Park (TMNP) was established in 1998 when land and the management of the Park were transferred from the City of Cape Town to SANParks. The City of Cape Town has remained a key stakeholder and has contributed about R56 million over the last five years to funding the Park.

TMNP commissioned the Graduate School of Business at the University of Cape Town to undertake an assessment of the economic impact of the Park. The Park was specifically interested in:

1. The macroeconomic contribution of the TMNP to the national and local economies. This refers particularly to contribution to gross domestic product (GDP) and job creation.
2. The efficiency gains as a result of having the TMNP run by a national organisation whose agenda was to conserve biodiversity.
3. The extent of the financial investment in the natural capital of the mountain and the sea.
4. The broader economic impact of the Park on the local (Cape Town) economy. Part of this broader economic impact is the extent to which the size of the tourism and private residential sectors can be attributed to the management of the Park. Also included are the provision of ecosystem services, harvesting opportunities and increased property values.

This phase of the study focussed on quantifying the impact of the activities of the Park itself. In this regard we have been able to take into account the operation and management of the Park and project funding. This phase of the study was not able to take account of the economic impact of the public-private partnerships at Table Mountain under TMAACC, through Concor at Cape Point and at Rhodes Memorial. Nor does this study attempt to quantify the financial benefits to tourism, etc, because of the Park.

It will be shown that the Park has made a significant contribution to the local and national economies both directly and indirectly. The cumulative contribution to GDP since 1998 is more than R 377 million. There are currently 472 direct jobs in the Park and 137 indirect jobs have been generated as a result of the economic activities in

the Park. There have been significant efficiency gains both in terms of a more productive use of scarce resources as well as a significant leveraging of external funding that might not have happened had the Park remained within the City.

In addition to this a large part of the funding within the Park goes to investing in the physical capital of the mountain and the sea. In the 2004 financial year over 76% of the total spending at the Park contributed to this physical capital.

It will also be shown, in a more qualitative manner, that the Park makes a significant contribution to the overall economy and quality of life of people living in the Greater Cape Town area.

This report is arranged in five main sections:

- Section one reports on the macro economic impact of the Park
- Section two outlines the efficiency gains resulting from the unification of the Park.
- Section three shows the extent of the financial investment in the natural capital of the mountain and the sea.
- Section four describes the broader economic impact of the Park on the local economy.
- Section five (which is an appendix) details some of the methodology used in this study.

Tabled along side this report is a report compiled by Jane Turpie on "A preliminary economic assessment of the Cape Peninsula National Park (now Table Mountain National Park): use, values, public preferences and financing. This was a class project of the Conservation Biology MSc and Economics Honours Class of 1998 at the University of Cape Town.

2 Macro Economic Impact

The operation of the Table Mountain National Park has had positive macroeconomic effects on Cape Town, the Western Cape and South Africa. This section outlines these macroeconomic effects, describes briefly some of the methodology used in determining these effects and reports on specific macroeconomic impacts.

The macroeconomic impact of the Park is described in two manners. The first is the historic impact, based on actual expenditure for the last six years, from 1999 to 2004. The second is the anticipated impact, based on projections regarding expenditure in the Park for the next five years, from 2005 to 2009.

2.1 General description of macroeconomic effects

While there are a number of different types of macroeconomic effects, the two most important are contribution to gross domestic product (GDP) and the creation of jobs. The importance of job creation is obvious. Increases in GDP are synonymous with increases in peoples' economic standards of living. Increased GDP – i.e. increased production – is experienced in the form of more jobs, higher wages and reduced economic hardship. It is clearly an important measure.

The actual task of calculating the macroeconomic impact of the Table Mountain National Park demanded a detailed and multifaceted approach because of multiplier effects. The simple act of spending – upgrading pathways or clearing alien vegetation, for example, - leads to other economic effects. Demand for equipment used to upgrade the paths or to clear out the alien vegetation, for example, can lead to increased production in those industries. Increased demand for equipment, in turn, leads to demand for steel, which in turn, leads to increased demand for mining output that uses wood, water, electricity and so on.

As this process unfolds, each industry employs people and pays wages. Employees, in turn, spend their wages and cause a further ripple effect through the economy. Measuring this is further complicated by the fact that different industries demand different types of skills. This leads to different wage structures across the various industries. People earning different wages have different spending patterns. Thus, the change in overall spending patterns is dependent on which industries are affected.

The estimates that are reported take account of all these interrelated economic forces. The components adding to the overall macroeconomic effect include the operation and management of the Park, as well as by project spending in the Park.

2.2 Contribution to Gross Domestic Product

Gross Domestic Product is the total value of all final goods and services produced in the country. It is clearly fundamental to the economic quality of life of all people in the country. It is also the most important and all encompassing measure of the

macroeconomic effect of expenditure at the Table Mountain National Park. Table 1 and Figure 1 report on the contribution to GDP.

Contribution to Gross Domestic Product - South Africa											
Rand million, 2004 Prices											
Financial Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Operational Costs	37.0	45.5	44.7	35.2	39.7	46.6	47.6	49.4	51.2	53.1	55.0
Project Costs	7.4	23.3	22.3	31.9	29.8	14.5	50.6	37.1	23.9	3.9	2.8
Total Contribution	44.4	68.9	67.0	67.0	69.4	61.1	98.2	86.5	75.1	57.0	57.8
Cumulative Contribution	44.4	113.3	180.3	247.4	316.8	377.9	98.2	184.7	259.9	316.8	374.6

Table 1: Contribution to GDP from historic and future committed funding.

After taking account of all multiplier effects, it is estimated that expenditure at the Park has made a cumulative contribution to GDP of R 377.9 million over the last six financial years. While the impact of the project expenditure is large, it is really the operational expenditure that has the greater economic impact. All values are given in 2004 prices.

The contribution to GDP from operational expenditure has fluctuated over the last six years. It started at R 37.0 million in 1999, increased to R 45.5 million in 2000 and then dropped to R 35.2 million in 2002. After 2002 the contribution to GDP from operational expenditure increased, with the contribution in 2004 at R 46.6 million.

The contribution to GDP from project expenditure also fluctuates. It begins at R 7.4 million in 1999, peaks at R 31.9 million in 2002 and then drops to R 14.5 million in 2004.

The contribution from operational expenditure is expected to increase steadily from R 47.6 million in 2005 to R 55.0 million in 2009. The contribution from project expenditure is not fully known at the moment. What is shown in Table 1 is the impact of funding that is currently committed. It is expected that further commitments will be made as time progresses. The committed funding will make a R 50.6 million contribution in 2005 and is currently R 2.8 million in 2009.

GDP is important not just because it is income but also because income has the capacity to add to wealth. Based on these projections, the proposed operational and committed project expenditure could add another R 374.6 million to South African GDP over the next five years. See table 1 page 4.

Table 2 shows the GDP multipliers that result from the spending of the Park. Generally projects have a higher multiplier effect than operational expenditure. The average multiplier for the project costs is 1.38, as opposed to 1.31 for the operational costs. These average multipliers have been applied to the operational

and project spending from 2005 onwards to determine their respective contribution to GDP.

GDP Multipliers											
Financial Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Operational Costs	1.29	1.31	1.30	1.31	1.33	1.33	1.31	1.31	1.31	1.31	1.31
Project Costs	1.31	1.39	1.39	1.38	1.41	1.34	1.38	1.38	1.38	1.38	1.38

Table 2: GDP Multipliers

Figure 1 illustrates the historic and anticipated contribution to GDP for each of the operational and project expenditure. It can be seen from the graph in Figure 1 that the contribution due to operating expenses is set to increase each year from 2005 onwards. The committed project spending tapers off but is expected to increase as further commitments are made.

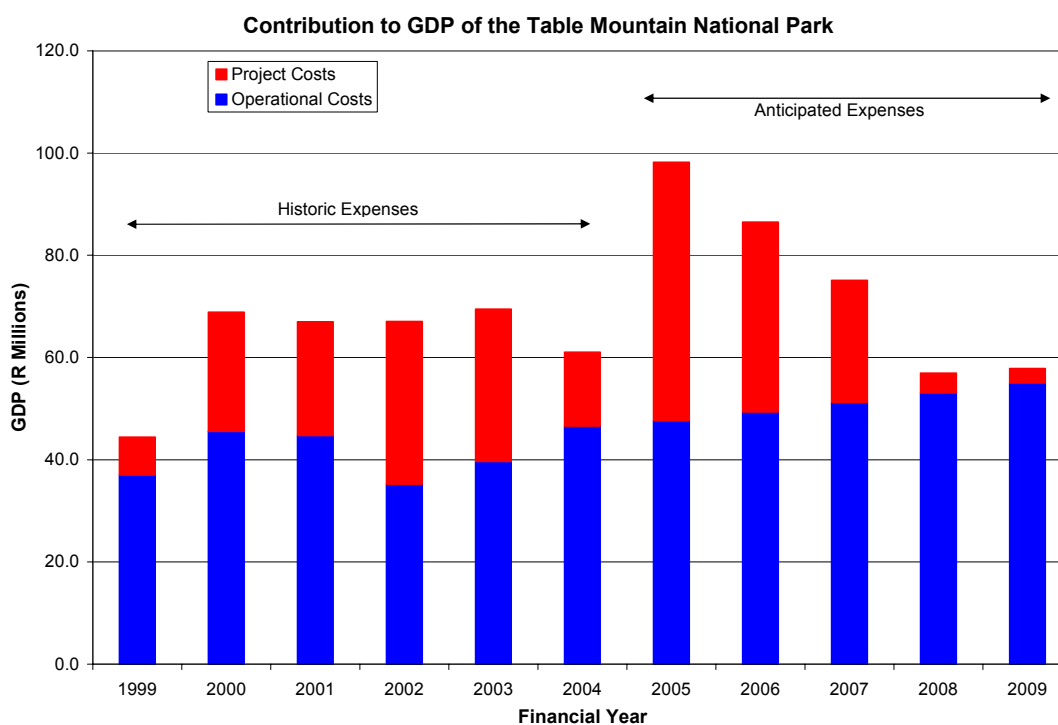


Figure 1: Contribution to GDP

2.3 Job Creation

The Park has contributed to two kinds of jobs. The first are the direct jobs created within the Park. The second are the so-called indirect jobs that are due to multiplier effects.

There are different types of direct jobs some of which are funded from the operational budget and some of which are paid for from project funding. The jobs funded from the operational budget include people involved in operating and

managing the Park. Those involved in projects within the Park (such as the people clearing alien vegetation) and contract staff required to monitor the projects on behalf of SANParks are paid from project funds. There are two categories of people paid from project funding. These are TMNP staff seconded to projects and the actual people who do the projects.

It shows the number of jobs from funding that is already committed.

Table 3 reports on the number of direct jobs in Cape Town. It shows the number of jobs from funding that is already committed.

Contribution to Direct Jobs - Cape Town											
Financial Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Operational Costs	199	276	282	171	186	193	207	215	214	213	211
Management of park	184	182	159	123	108	119	132	140	140	140	140
Contract staff	7	7	7	7	7	7	7	7	7	7	7
Alien vege.clearing	8	87	116	41	71	67	68	68	67	66	64
Project Costs	111	268	253	453	440	278	718	527	339	55	39
TMNP Contract Staff	2	7	17	14	23	37	42	31	20	3	2
Contracting Labour	109	261	236	438	417	242	676	496	319	52	37
Total Jobs	310	543	534	624	626	472	925	742	553	268	250

Table 3: Contribution to direct jobs in Cape Town from historical spending and future committed funds

Total direct jobs due to operational expenditure peaked in 2001 at 282 jobs, and have declined to 193 jobs in 2004. This number is expected to increase slightly over the next five years. In 2005 it is estimated that there will be 207 direct operating jobs increasing to 211 in 2009.

From the table it can be seen that the number of people needed to operate and manage the Park has decreased from 184 in 1999 to 119 in 2004. This is the result of a more streamlined organization since the Park was established. This number is expected to increase to 132 in 2005 and to 140 by 2006 as more personnel are needed for the management of the newly integrated marine park. The number of contract staff paid out of the operational budget has remained constant and is expected to remain constant at seven. The number of people involved in alien clearing fluctuated quite widely over the last six years. In 1999 there were only eight direct jobs. This number increased to 116 in 2001 when alien clearing was at its peak and has subsequently fallen back to 67 in 2004. The number of direct jobs in alien clearing in the operations budget is expected to be around 66 over the next five years. The park budgeted for alien clearing on their operational budget for 2005. The alien clearing costs for 2005 has since been committed by the Dept of Water Affairs and Forestry.

The number of people employed from project funds has fluctuated from 111 in 1999 to 453 in 2002. There were 278 such direct jobs in 2004. It is not known how many people will be employed on projects over the next five years. The table shows the number of jobs from funding that is already committed.

Analysing the breakdown of direct jobs created from project spending, the number of jobs required to monitor the projects by the TMNP has increased from 2 in 1999 to 37 in 2004. The table shows jobs from committed funding going into the future. The number of people employed on projects has fluctuated from 109 in 1999 to 438 in 2002 when project spending was at its highest and then dropped back to 242 in 2004. As mentioned above the table shows jobs from committed funding going into the future.

Total direct jobs in Cape Town fluctuated between 310 in 1999 and 626 in 2003. In 2004 there were 472 direct jobs. The table shows jobs from committed funding going into the future.

Contribution to Indirect Jobs - South Africa											
Financial Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Operational Costs	85	104	101	76	87	103	107	111	115	119	123
Project Costs	18	54	51	73	68	34	117	86	55	9	6
Total Jobs	103	158	152	150	155	137	223	196	170	128	130

Table 4: Contribution to Indirect Jobs in South Africa from historical spending and future committed funds

Nationally there has also been indirect job creation as a result of multiplier effects associated with spending at the Park. Table 4 shows that over the last six years between 76 and 104 indirect jobs were created from operational expenditure; while at the same time between 18 and 73 indirect jobs were created from project expenditure. Total indirect jobs for the last six years varied between 103 and 158. The table shows indirect jobs from committed funding going into the future.

Contribution to Total Jobs - South Africa											
Financial Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Operational Costs	283	380	382	248	274	296	313	325	329	332	334
Project Costs	129	321	304	526	508	312	834	613	394	64	46
Total Jobs	412	701	686	774	782	609	1148	938	723	396	380

Table 5: Total jobs in South Africa from historical spending and future committed funds

Table 5 shows the total number of direct and indirect jobs sustained in South Africa from total expenditure. In 1999 a total of 412 direct and indirect jobs were sustained. This number increased to 774 in 2002, before dropping to 609 in 2004.

One of the most pressing problems in South Africa is unemployment and poverty. As demonstrated above, the Park has the capacity to contribute to job creation. It also has the capacity to contribute to poverty alleviation because of the significant number of people employed at the unskilled and semiskilled positions as well as through economic empowerment. The nature of conservation is labour intensive and has the ability to generate significant employment.

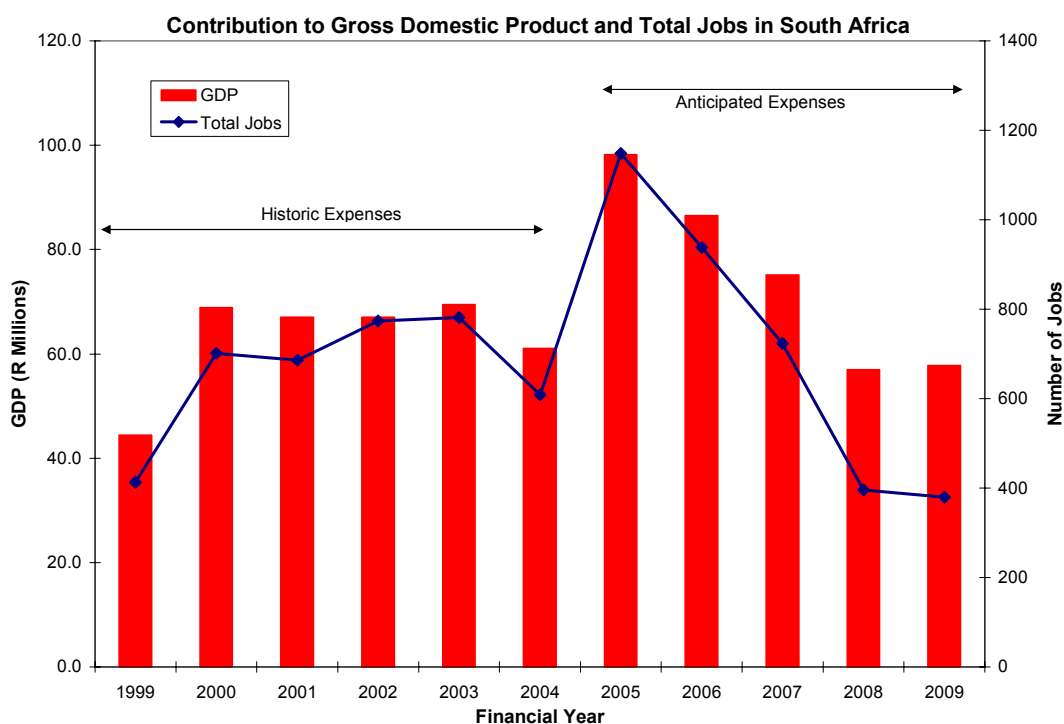


Figure 2: Contribution to GDP and total job creation from historical spending and future committed funds

Figure 2 shows the comparisons between contribution to GDP and creation of total (direct plus indirect) national jobs from total expenditure.

2.4 Contribution to Gross Geographic Product

Gross Geographic Product (GGP) is the provincial equivalent of national GDP. Naturally, while many of the direct benefits would be felt within the province, there will be indirect effects on other provinces. As the Park is maintained, for example, materials from all over the country are used in the process. Although the Western Cape can boast about producing the best wine and some of the best food in the country, other products such as paper tissues, toilet soaps and cleaning materials are often brought in from other provinces. Hence a project's contribution to provincial

GDP, in the province that the project is located, can be expected to be less than its contribution to GDP. The contribution to provincial GDP is reported in Table 6.

Contribution to Gross Geographic Product - Western Cape											
Rand million, 2004 Prices											
Financial Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Operational Costs	12.8	15.6	15.4	12.4	13.7	16.2	16.5	17.1	17.7	18.4	19.0
Project Costs	2.6	8.5	8.1	11.5	10.7	5.2	18.2	13.4	8.6	1.4	1.0
Total Contribution	15.4	24.1	23.5	23.9	24.4	21.4	34.7	30.5	26.3	19.8	20.0
Cumulative Contribution	15.4	39.4	63.0	86.9	111.3	132.6	34.7	65.2	91.6	111.3	131.4

Table 6: Contribution to Western Cape GGP from historical spending and future committed funds

After taking account all of the multiplier effects, it is estimated that between 1999 and 2004 the Park has contributed between R 12.8 million and R 16.2 million annually to the Western Cape GGP from operational expenditure. At the same time, contribution to GGP from project expenditure varied between R 2.6 million and R 11.5 million. The Park has added a cumulative R 132.6 million to provincial GGP over the last six years.

2.5 Other macroeconomic effects

Apart from the key macroeconomic effects discussed above there are a number of other macroeconomic effects that would flow from expenditure at the Park. These include the generation of direct and indirect taxes, indirect household income and RSC Levies. Table 7 reports on total direct taxes and license fees that are paid by the Park, while Table 8 does the same for indirect taxes. Table 9 reports on the indirect generation of household income and Table 10 reports on the contribution to RSC Levies.

Contribution to Direct Taxes and License Fees - South Africa											
Rand million, 2004 Prices											
Financial Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Taxes	2.06	2.35	2.21	1.63	1.57	1.94	2.25	2.34	2.42	2.51	2.60
License Fees	0.04	0.05	0.06	0.05	0.07	0.08	0.07	0.07	0.07	0.07	0.08
Total Contribution	2.09	2.40	2.28	1.68	1.64	2.02	2.32	2.41	2.49	2.59	2.68
Cumulative Contribution	2.09	4.50	6.77	8.45	10.09	12.11	2.32	4.72	7.22	9.80	12.48

Table 7: Contribution to direct taxes and license fees

Over the last six years, the Park has cumulatively paid R 12.1 million in direct taxes and license fees from operations alone. It is estimated that over the next five years it will pay a total of R 12.5 million.

Contribution to Indirect Taxes - South Africa											
Rand million, 2004 Prices											
Financial Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Operational Costs	3.5	4.4	4.3	3.3	3.8	4.5	4.5	4.7	4.9	5.1	5.2
Project Costs	0.7	2.3	2.2	3.1	2.9	1.3	4.9	3.6	2.3	0.4	0.3
Total Contribution	4.2	6.6	6.4	6.4	6.7	5.8	9.4	8.3	7.2	5.4	5.5
Cumulative Contribution	4.2	10.8	17.2	23.6	30.3	36.1	9.4	17.7	24.9	30.3	35.8

Table 8: Contribution to indirect taxes

The Park has contributed over R 36 million to indirect taxes since 1999. Another R 35 million could be paid in indirect taxes over the next five years.

Contribution to Indirect Household Income - South Africa											
Rand million, 2004 Prices											
Financial Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Operational Costs	18.0	22.2	21.6	16.7	19.1	22.6	23.0	23.9	24.7	25.7	26.6
Project Costs	3.5	11.2	10.7	15.3	14.4	6.8	24.2	17.8	11.4	1.9	1.3
Total Contribution	21.5	33.4	32.3	32.0	33.5	29.4	47.2	41.6	36.2	27.5	27.9
Cumulative Contribution	21.5	54.9	87.1	119.1	152.6	182.0	47.2	88.9	125.0	152.6	180.5

Table 9: Contribution to indirect household income

Cumulatively, over the last six years the Park has contributed R 182 million to indirect household income and is expected to contribute another R 180 million over the next five years from know committed funding.

Direct Contribution to RSC Levies - Cape Town											
Rand million, 2004 Prices											
Financial Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Operational Costs	0.09	0.13	0.11	0.10	0.09	0.12	0.12	0.13	0.13	0.14	0.14
Cumulative Contribution	0.09	0.21	0.32	0.43	0.52	0.64	0.12	0.25	0.38	0.52	0.67

Table 10: Contribution to RSC Levies

RSC Levies collected by the province from operations totalled about R90,000 in 1999. This has increased to R120,000 in 2004. Cumulatively over the last six years the Park has paid R640,000 in RSC Levies. It is expected that over the next five years the Park will pay another R670,000 in RSC Levies from know committed funding.

3 Efficiency Gains and Cost Savings

Table Mountain National Park (TMNP) was established in 1998 when land and the management of the Park were transferred from the City of Cape Town. Prior to the handing over of the Park to SANParks in 1996, what is now the Park was managed piece meal by the various and separate Cape Town municipalities. A number of clear efficiency gains were expected as a result of the unification of the Park, its transfer to a national entity and its declaration as a National Park. Included in these efficiency gains are:

- Integrated, focused and single management;

- The City of Cape Town is now freed up to focus on other activities and no longer has to be concerned with the running of a Park
- Reduction of duplication on overheads and services;
- Personnel rationalisation;
- Ability to leverage other funding;

One of the constraints faced in this study was that we were not able to determine the value City funding while the various parts of the Park were still controlled by the City. It appears that there was not a single budget dedicated to the Park but rather different aspects of the management and delivery were the responsibility of different Directorates. However, there are a number of indicators that exist and that will assist in forming a picture on what the efficiency gains have been.

It is expected that the management of the National Park by a single, independent entity has resulted in a more efficient and streamlined operation. To illustrate by means of an example, previously the Park was run by different municipalities, such as the Cape Town Metropolitan Council and the South Peninsula Municipality. This would have resulted in the duplication of overheads and possible replication of services. In addition to this, part of the focusing of management has meant that where the City used to concentrate on maintaining roads but not footpaths. Today the conservation value of footpaths is well recognised and the emphasis is now on maintaining footpaths. This will allow easier access to the mountain for locals and tourists.

One example of efficiency gains is illustrated by the number of people employed in the Park. In 1999, the Park had a staff complement of 191 at the time of the consolidation of the Park. In 2003 this number had fallen to 126 as a result of more efficient management and the elimination of duplication. This is indicated in Table 11.

Operational Staff	1999	2000	2001	2002	2003	2004
Total HR Costs	18,094,959	18,234,909	16,325,273	13,004,691	11,746,641	15,013,238
Personnel payment	13,636,197	13,741,662	12,302,577	9,800,217	8,852,162	11,313,839
No of employees	191	189	166	130	115	126
Ave salary/emp	71,394	72,789	74,185	75,580	76,975	89,792
Sal as % of Exp.	45.7%	38.7%	35.4%	36.0%	29.0%	31.7%

Table 11: Park Employees and Average Salaries

What the table also shows is while real salaries have increased (from R71,394 in 1999 to R89,792 in 2004 – in 2004 values), salaries as a percentage of total expenses have dropped from 45.7% in 1999 to 31.7% in 2004. This is illustrated in Figure 3, where the total investment in the natural capital of the park is shown relative to the falling proportion of salaries and wages in the overall operating budget. Section 4 has a more in depth discussion on the investment in the natural capital of the park.

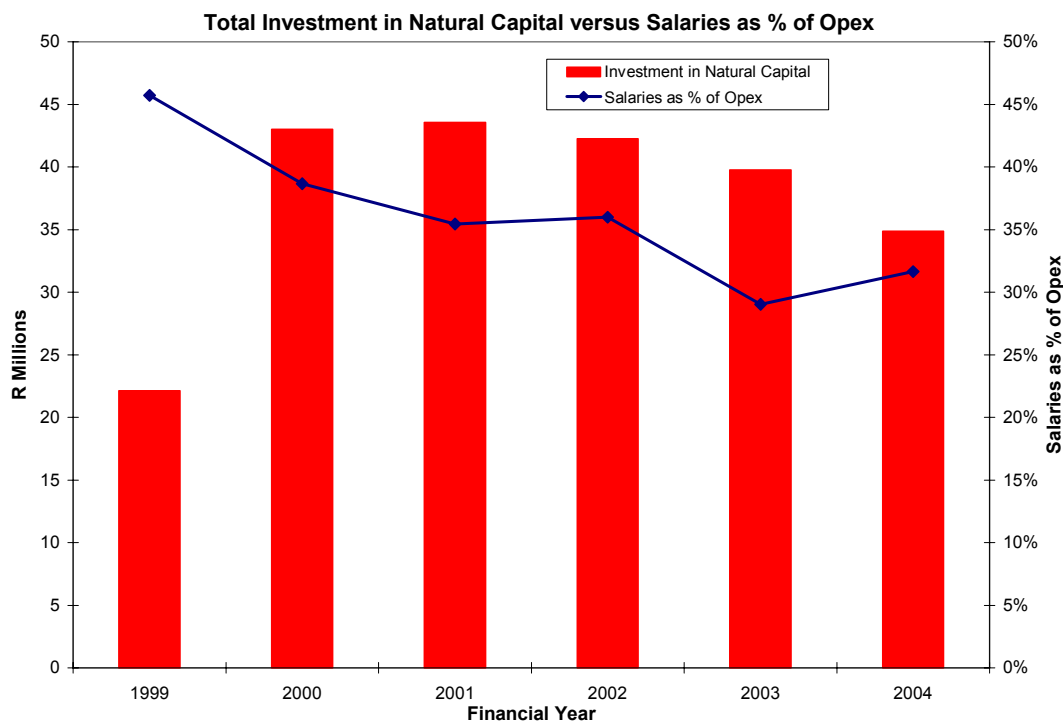


Figure 3: Total investment in the natural capital of the park contrasted against salaries and wages as a percentage of opex

While the number of people employed in the operation and management of the park has decreased, the area of the park under management has increased since the management of the park was transferred in 1999. This is indicated in Figure 4. The area of the park under management has increased by 41% since transfer took place.

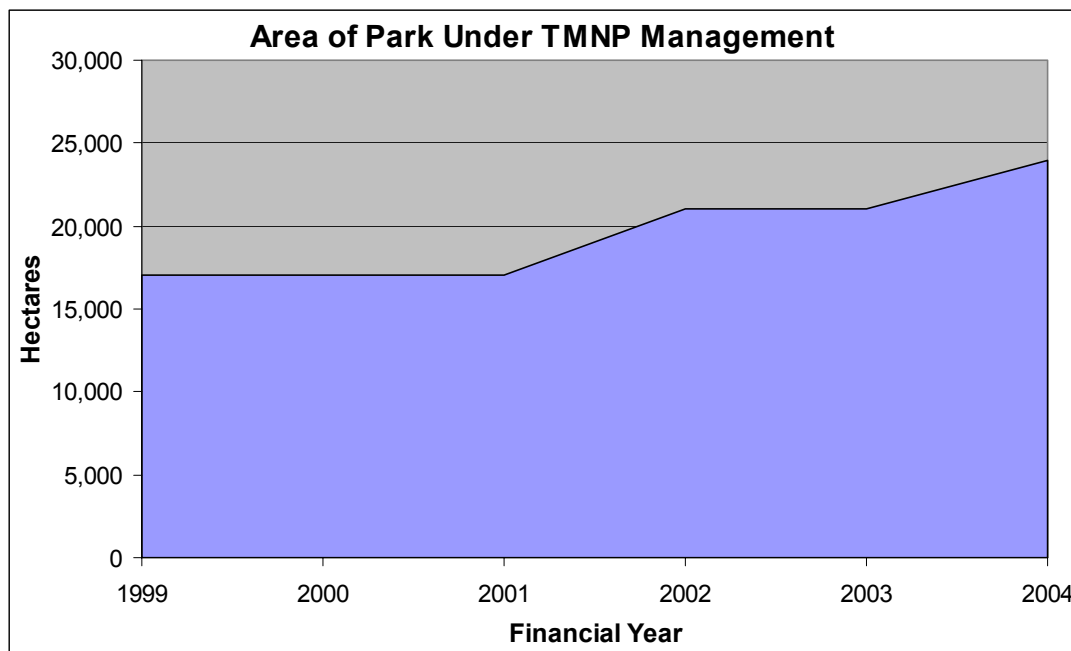


Figure 4: Area of park under management

One of the clear efficiency gains from the establishment of the National Park is the ability to leverage funding. Table 12 indicates the sources of funding for the Park for the years 1999 to 2003.

	1999 Actual	2000 Actual	2001 Actual	2002 Actual	2003 Actual	Total 1998 -2003		Would funding have occurred if park was still run by Cape Town Municipality?
Total Investment by Investors	25,592,154	60,816,570	42,271,910	63,770,097	55,702,638	248,153,369	100.0%	
City of Cape Town	8,973,320	10,804,187	10,745,888	11,530,172	11,506,230	53,559,797	21.6%	Yes
City of Cape Town - Upgrading of Capital Infr.				2,471,651		2,471,651	1.0%	Yes
Dept of Environmental Affairs and Tourism				1,625,889	1,818,012	3,443,901	1.4%	No
Global Environmental Facility (GEF)	3,609,607	10,851,831	7,474,865	7,254,581	8,186,916	37,377,800	15.1%	No
Fonds Francais I pour Environmental Mondial	2,296	269,875	912,027	435,325	1,290,038	2,909,561	1.2%	No
Table Mountain Funds		370,617	241,786	482,742	249,789	1,344,934	0.5%	No
Department of Water Affairs and Forestry	1,447,002	1,866,323		4,156,766	507,007	7,977,098	3.2%	No
Ukuvuka Operation Firestop			2,896,351	7,069,886	3,373,978	13,340,215	5.4%	Yes
SANParks	11,509,929	18,953,737	19,800,993	23,468,085	28,770,668	102,503,412	41.3%	No
Land Acquisition Funds	50,000	17,700,000	200,000	5,275,000		23,225,000	9.4%	No
Total "Yes" Funding	8,973,320	10,804,187	13,642,239	21,071,709	14,880,208	69,371,663	28.0%	

Table 12: Table Mountain National Park Sources of Income 1999-2003

The City of Cape Town remains one of the major funders of the Park with its contribution accounting for 22% of all income over the last five years. This funding includes the income used for the upgrading of capital infrastructure. The table also shows which expenditure could have been expected had the Park remained with the City. It is believed that only Ukuvuka Operation Firestop would have occurred under those conditions. This funding totalled R13.3 million and constituted less than 6% of total funding over the last five years.

It is expected that the rest of the funding, totalling R178.8 million over the last five years, would probably not have occurred had the Park been managed by the City. This is funding that the City of Cape Town would have had to provide had it hoped to achieve what has been done to date. This R178.8 million equates to 72% of the total funding for the Park and includes the amounts used for land acquisition. These figures are shown graphically in Figure 5.

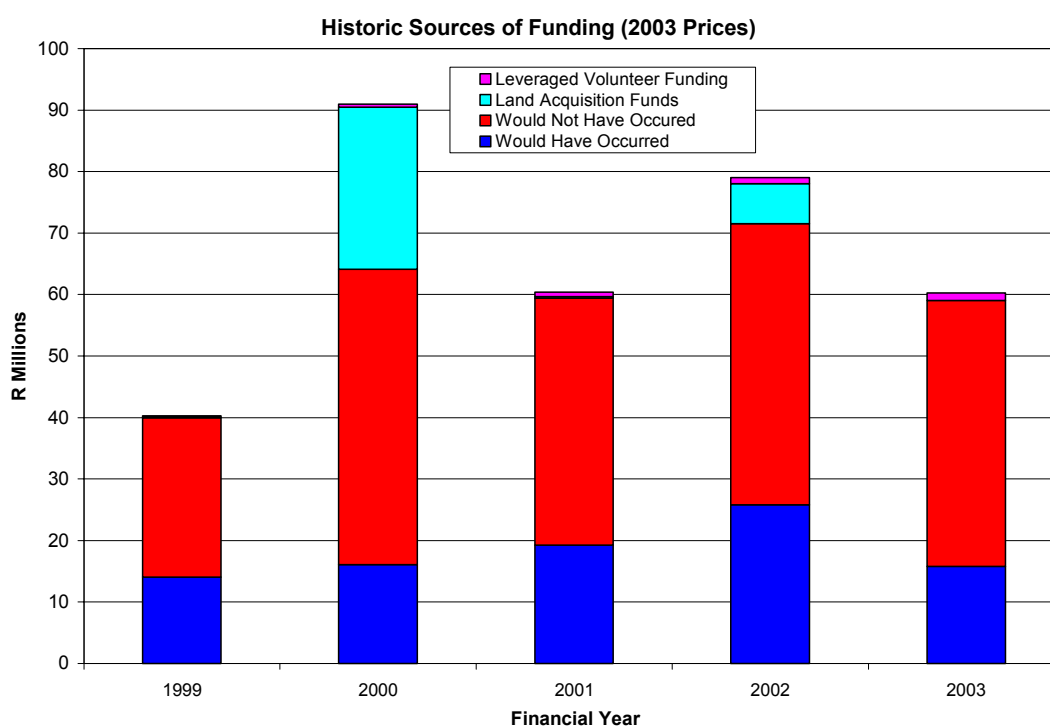


Figure 5: Historic sources of funding for the Park

Figure 5 also indicates another source of funding. This is volunteer work. It is estimated that the total value of volunteer work has increased from around R250,000 in 1999 to about R1.5 million in 2004.

In conclusion it is clear that there have been efficiency gains and cost savings with the transfer of the Park from the City to SAN Parks. While it has not been possible to quantify all of these benefits it is known that at least four types of gains have occurred. These are integrated and focused single management; reduction of duplication on overheads and services; personnel rationalization; and ability to leverage other funding. In addition to this move has freed up City resources and allowed the City to focus on its core competencies.

4 Investment in the Mountain and the Sea

One of the most important functions of the Park is to maintain and invest in the natural capital of the mountain and the sea although not all Park expenditure can be directed towards natural capital. In order to determine the extent to which the Park had invested in natural capital a number of different categories of expenditure were defined. These are:

1. **Direct expenditure** on natural capital is that expenditure which is spent directly on the natural capital of the Park. Examples of direct expenditure include alien clearing, game capture, breeding programmes and spending on herbicides and toxins.
2. **Indirect expenditure** on natural capital is that expenditure that is not spent directly on the natural capital of the Park, but makes an indirect investment in the natural capital. Examples of indirect expenditure include the training of honorary rangers, environmental impact assessment studies and security costs that are aimed at protecting the environment.
3. **Unrelated expenses** are those expenses that do not have an impact on the natural capital of the Park. Examples of these unrelated expenses include the supply of LPG gas to overnight huts and courier costs.
4. **Pro-rata expenses.** These are operational expenses that do not directly or indirectly affect the natural capital of the Park, yet by their existence allow for the direct and indirect expenditure to occur. Examples of pro-rata costs include expenditure on equipment, salaries and wages of office personnel and the maintenance of roads in the Park.

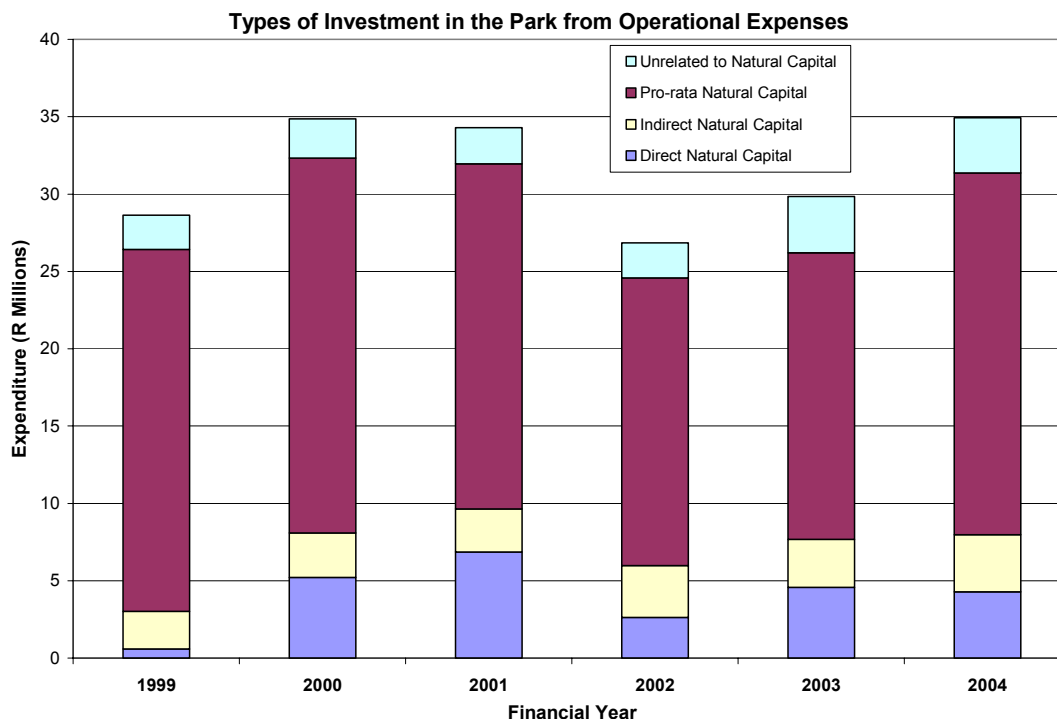


Figure 6: Type of investment in the Park from Operational Budget

Figure 6 displays the allocation of operational expenditure into each of the four categories. Expenditure in the natural capital of the park is then taken as the sum of the direct, indirect and proportionate pro-rata expenses. This is indicated in Table 13.

Investment in the Natural Capital of the Table Mountain National Park from Operational Expenditure												
Category	1999		2000		2001		2002		2003		2004	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
Investment in Natural Capital	16,527,342	58%	26,564,167	76%	27,642,669	81%	19,429,905	72%	20,219,144	68%	24,135,887	69%
Other Investment	12,113,723	42%	8,284,299	24%	6,641,788	19%	7,411,299	28%	9,626,923	32%	10,800,712	31%
Total (excl Depreciation)	28,641,065	100%	34,848,466	100%	34,284,457	100%	26,841,204	100%	29,846,067	100%	34,936,599	100%

Table 13: Type of investment in the Park from Operational Budget

Table 13 indicates that the investment in the natural capital of the park increased from 58% of all operational expenditure (excluding depreciation) to 81% in 2001, before settling back to about 70% from 2002 onwards.

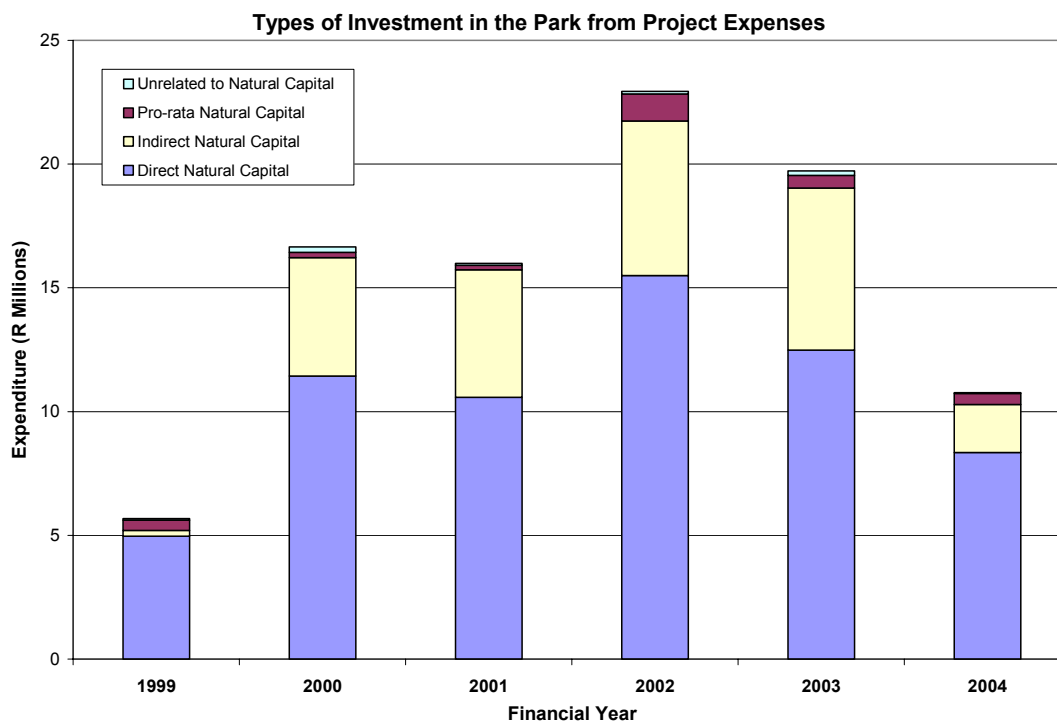


Figure 7: Type of Investment in the Park from Project Funding

Figure 7 graphically displays the allocation of project funding into each of the four categories. Table 14 indicates the type of investment in the Park from project funding. It can be seen that most of the project funding goes to investing in the natural capital of the park.

Investment in the Natural Capital of the Table Mountain National Park from Project Expenditure												
Category	1999		2000		2001		2002		2003		2004	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
Investment in Natural Capital	5,607,990	99%	16,438,845	99%	15,920,085	100%	22,822,175	100%	19,537,119	99%	10,723,046	100%
Other Investment	64,247	1%	211,620	1%	71,533	0%	110,801	0%	183,958	1%	46,170	0%
Total	5,672,237	100%	16,650,464	100%	15,991,617	100%	22,932,976	100%	19,721,077	100%	10,769,216	100%

Table 14: Type of Investment in the Park from Project Funding

Table 15 indicates the total investment in the natural capital of the Park. It can be seen that investment in the natural capital of the park has varied between 65% and 87% of all expenditure.

Combined Investment in the Natural Capital of the Table Mountain National Park from Operational and Project Expenditure												
Category	1999		2000		2001		2002		2003		2004	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
Investment in Natural Capital	22,135,331	65%	43,003,012	84%	43,562,754	87%	42,252,080	85%	39,756,263	80%	34,858,933	76%
Other Investment	12,177,970	35%	8,495,918	16%	6,713,321	13%	7,522,101	15%	9,810,881	20%	10,846,882	24%

Table 15: Type of Investment in the Park from All Expenses

Figure 8 indicates the proportionate investment in the natural capital of the park from operational and project funding.

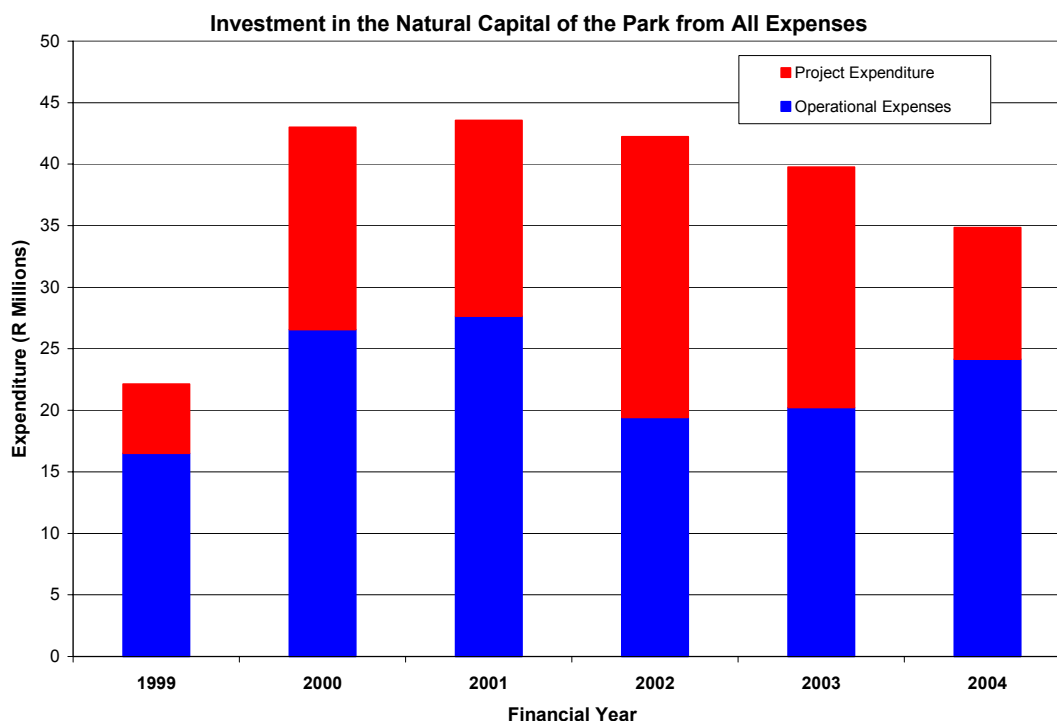


Figure 8: Investment in the Natural Capital of the Park from all Funding

5 Broader Economic Impact

The Park has a broader economic impact on the local economy. Part of this broader economic impact is the extent to which the size of the tourism and private residential sectors can be attributed to the management of the Park. Also included are the provision of ecosystem services, harvesting opportunities and increased property values.

This section of the report outlines and describes the broader economic impact of the Park. The section starts by describing the types of values associated with natural areas. We then give some examples of values of other natural areas. The discussion then moves on to the values that the Park generates.

5.1 Values associated with natural areas

Standard valuation practice is well known and in the majority of cases consists of attaching a total economic value to an area based on investigating each of the value streams associated with it. In order to attach values to each stream, different valuation techniques are necessary. These include production function analysis, the

hedonic approach, the travel cost technique, contingent valuation and conjoint analysis.

Conserved natural areas serve a variety of functions, depending on their type, size and locality. They can range from large, fully functional ecosystems to small fragments of natural systems whose ecological functioning has been reduced. The value of natural areas lies in their supply of goods and services that are 'consumed' by society, and their attributes. Goods are the tangible products provided by these areas, such as firewood, and services encompass benefits such as those associated with ecosystem functioning, for example, water purification. Natural areas also have attributes, such as biological diversity, which contribute to their value, such as ecotourism value, or sense of place, contributing to the overall quality of life for urban residents.

Goods, services and attributes all contribute to the total value of an environmental amenity. In the environmental and resource economics literature, the total economic value of environmental amenities such as nature reserves is categorized into different types of value in order to simplify the description and measurement of value (Figure 9).

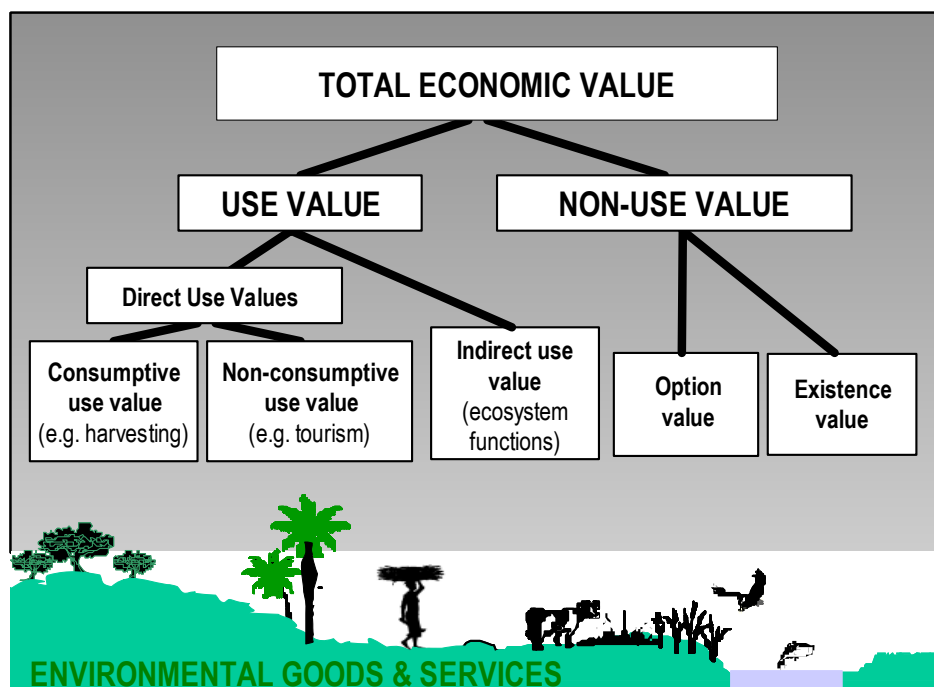


Figure 9: Conventional classification of the values of environmental amenities

5.1.1 Consumptive use value

This is the value associated with direct harvest of 'goods' from an area. These may include firewood, medicinal plants, food plants, flowers, building materials such as reeds and animals. The value of this consumptive use is the gross monetary value of the harvest net of harvesting costs.

5.1.2 Non-consumptive use value

Non-consumptive use value is the value obtained from any use of a resource which does not involve the removal of goods. This includes the value of most tourism and recreation, and also includes the value that natural areas add to property transactions.

5.1.3 Indirect use value - ecosystem functions

Indirect use values are the benefits obtained from ecological functions, or 'services', of natural areas. Thus, in the context of conserved areas, the magnitude of these values is often dependent on the ecological integrity of the areas, or the degree to which they are altered or transformed. Some of the values associated with ecosystem functions have been identified in the international literature as follows:

- Gas regulation
- Climate regulation
- Disturbance regulation
- Water regulation
- Water supply
- Erosion control
- Soil formation
- Nutrient cycling
- Waste treatment
- Pollination
- Biological control
- Refuge for species

5.1.4 Option and existence value

Option value, sometimes called future use value, is the value that people place on retaining the option to use a resource in the future, irrespective of whether it is any use to them at present. The value is variously described as a use value or a non-use value, but its classification is not important in the issue of valuation.

Existence value is the value of knowing that a resource exists, even if that resource is remote and is never used directly. Existence value is often expressed as peoples'

willingness to pay for the conservation of endangered species in far-off places. This would include conservation value as perceived by society.

5.1.5 Total economic value

It is a contentious issue whether the different types of values associated with natural resources can actually be summed. In particular, expressed existence values are fairly difficult to decouple from other types of values. It is also necessary to recognise that many of the values identified are conflicting values or trade-offs. For example, the recreational value of a natural area may conflict with its conservation value.

Natural areas are not uniform, and different areas, even within the same sub-category, will yield different values. The value will be a function of a number of factors such as size, degree of ecological functioning, cleanliness, location, proximity of substitute areas, crime risk etc. For this reason, average values yielded by a broad valuation may not reflect the variation at a local level.

5.2 Examples from the valuation literature

The literature on valuation contains a number of case studies where valuation exercises have been carried out for protected areas and other natural environments. Some of these studies have estimated the total economic value of areas while others have focused on a particular value stream. For example, certain studies are only interested in the value of ecosystem services and not other uses such as tourism.

In South Africa, Turpie (1996) generated preliminary indicative values for the De Hoop Nature Reserve. Using a travel cost survey they found that the Reserve had a recreational use value of R581,000. Its non-use value was estimated at R14 million based on a contingent valuation study. Expenditure in the local area by the reserve, its employees and other Western Cape Nature Conservation officials amounted to R1.6 million annually with tourists spending at least R177,000 annually in the immediate vicinity of the reserve.

At a broader scale, Turpie et al. (2002) estimated the value of terrestrial and marine biodiversity in the entire Cape Floristic Region. Not surprisingly they found that the rich biodiversity of the region makes a substantial contribution to the regional and national economy. The total economic value of the Cape Floristic Region was estimated to be at least R10 billion per year equivalent to over 10% of the annual provincial Gross Geographic Product. Turpie et al. (2002) note that natural resource-

based tourism is one of the greatest income generators in the region and the natural resources in the area contribute indirectly to the region's output: fynbos bees contribute to commercial fruit production, and fynbos mountain catchments provide the region's main water supply.

In 1994 Carson et al. conducted a contingent valuation study to estimate the value that the Australian public attached to the Kakadu Conservation Zone - an area that was under consideration for mining at the time. The total willingness to pay for the conservation of the zone was estimated at AUS\$435 million which exceeded the net present value of mining at AUS\$102 million.

The Monteverde Cloud Forest is one of Costa Rica's most important private biological reserves. In the early 1990s the Tropical Science Centre used the contingent valuation technique to estimate the benefits associated with the park at US\$3 million per year. Note that this was only a partial valuation as it did not capture the value of ecosystem services and tourism use. Tobias and Mendelsohn (1989) used the travel cost estimate to estimate the recreation and tourism value of the reserve and arrived at an estimate of US\$500,000 per year the majority of which was ascribed to foreign visitors.

In 1997 Hadker et al. partially estimated the value of the Borivli National Park in Mumbai, India. Using a contingent valuation survey, Hadker et al. found that the value of the park was approximately US\$31.6 million. This was also compared with the relatively modest annual budget for the park of US\$500,000.

Kramer et al. (1995) estimated the partial value of the Mantadia National Park in Madagascar. The study used the contingent valuation method to determine the willingness to pay of visitors to the parks to set an appropriate level of user fees. The study generated estimates of the value of the park under two different scenarios based on the willingness-to-pay if tourists were able to see the same number of birds and lemurs as they currently were able to view at the Perinet Park. This estimate, aggregated over all tourists, annually amounted to US\$253,000.

The examples above are only a few among many. The literature shows that best practice in valuation is well developed and most studies show similarity in the methods followed. The majority of studies alert authorities to the danger of not considering the economic value of natural areas. The main difference between studies tends to be one of scope. In other words, some studies are more detailed than others in line with their target audience and level of funding.

Studies analysing the economic spin-offs associated with protected areas and the ripple effect of these spin-offs in the economy seem to be less common possibly as this type of analysis is not strictly part of environmental economics practice. Ulph and Reynolds (1981) estimated the value of the Warrumbungles National Park in Australia to the surrounding local economy. The study surveyed tourist expenditure, park expenditure and park employment and then applied multiplier analysis to determine direct and indirect impacts at AUS\$8.5 million per annum. IUCN (1998) also mentions Read-Sturgess (1994) who estimated the direct and indirect impacts associated with expenditure at the Grampians National Park in Australia.

Economic impact studies as a class of study are fairly common and offer lessons for the specific analysis of protected areas. In South Africa they are usually required to form part of environmental impact assessments (EIAs). Economic impact study methodology is also well developed and guidelines exist on how they should be performed within the context of EIAs (See Leiman & van Zyl, 2004). Having said that there are few impact studies that deal specifically with protected areas it is instructive to consider studies that deal with projects that require analyses similar to that required for protected areas. These could include studies of projects that lead to significant tourism spending such as the impact study conducted for the Cape Town International Convention Centre (Standish 2002)

Given that few studies combine environmental valuation with economic impact assessment there is scope for the development of studies that integrate the application of these approaches as in this study.

In addition there is a need to better understand the economic impacts of varying managerial efforts at the margin. That is, one needs to ask what happens to the value and economic impact of protected areas when enhancement measures and managerial effort are varied. The value of the Table Mountain National Park to tourism, the local economy, public welfare, and the civic purse must be distinguished from incremental contributions made to these as a result of its management as a National Park. The economic services that would be provided by the Park no matter how it was managed must not be confused with services that are contingent on the quality of mountain management.

Unfortunately, little of the available data makes this distinction. The contribution of tourism to the Western Cape's regional economy is known (approximately 9.1% of regional domestic product in 2002, making a similar contribution to regional

employment) and one can note the proportion of visitor time spent on “Park related activities”. From a policy maker’s perspective this is useful, yet incomplete, information. Ideally information is needed that establishes how the time spent by the average tourist would be affected by a change in the quality of management of Table Mountain and the Peninsula Mountain Chain. In other words to answer the question: how does a change in the management budget accorded the TMNP impact on tourist spending of time and money in the country as a whole, the Western Cape region, and the city itself?

To provide the kind of information described above a contingent valuation survey is a needed. Unfortunately, the closed ended survey technique regarded as appropriate since the publication of the 1993 NOAA guidelines on CVM, is expensive to initiate. There may be scope for further focused surveys once specific information needs for further analysis of the economic impacts of the Park are determined in subsequent phases of this research programme. The possibility of integrating specific questions into existing Park surveys should also be explored.

5.3 Measuring the value of the Park

In the sections that follow the broader economic value of the Park is outlined using the valuation framework described in the review of the environmental economics literature. In addition this section also draws on the report by Turpie (1998) which is attached as an addendum to this report. The Turpie study was conducted as a practical component of the resource economics modules of the University of Cape Town’s Conservation Biology MSc and Economics Honours courses. The study was based on five different surveys, during which a total of 1154 respondents were interviewed. These surveys comprised:

- a User Survey (n = 419) to describe user profiles and behaviour,
- a Hotel/B&B survey (n = 84) as part of a property value study,
- a Development Preference survey (n = 256) to ascertain opinions on the extent of development that should be allowed in the CPNP,
- a Contingent Valuation survey (n = 225) to investigate willingness to pay towards financing the park in order to avoid the need for over-development (a measure of existence value), and
- a Pricing Survey (n = 183) at the Cape of Good Hope Nature Reserve, to investigate users’ willingness to accept a new pricing system and their willingness to pay for entry to the park.

Data were analysed using various resource economics techniques including hedonic pricing, the travel cost method, contingent valuation and conjoint valuation. The study was carried out over a short time period as a student project, which meant

that their training in interviewing techniques was rudimentary. Nevertheless, the results are considered good enough to be indicative of the situation.

5.3.1 Use and users of the Park

The Turpie study found that in 1998 the total number of user days for the whole Park was estimated to be about 8 million per year. 64% of users interviewed in the Park during August 1998 were residents of the CMA, 7% were domestic tourists and 29% were foreign tourists. The Park plays a major role in attracting tourists to the city. Current use of the Park is primarily by well-educated whites. Use of paying and non-paying areas varies according to visitor origin. The majority of foreigners use paying areas. Non-paying areas are used more by locals. Surveyed sites within the CMA were used predominantly for enjoyment of views, hiking/walking, and peace & quiet. Any future development plans should consider the current Park users and how development proposals could change visitor profiles and numbers to the park as a whole, and at gateways targeted for development.

5.3.2 Consumptive use value

Given the conservation status of the Park one would not expect harvesting to feature prominently as a use value. Indeed there is currently no legal sustainable harvesting of resources in the Park. The only land based activity that can be classified as harvesting is that associated with the felling of alien trees in the Park. Since 2000, private timber felling companies have been given the chance to tender for the right to harvest sections of the pine plantations in Newlands forest and at Orange Kloof. Thus far, two contracts have been awarded. One, for 18.5 hectares of forest, was worth R370,170 in 2000 and the other, for 15.4 hectares, was worth R1.225 million (R79,545/ha) in 2003 and will last until the end of 2005.

It is not clear how much more of the forest will be felled as decisions are partly dependant on consulting the public to help decide how much forest should be left for recreational purposes. However, felling has been loosely planned to last for a ten year period. If one assumes that felling will be evenly spread then this implies that roughly 35 hectares will still be felled between 2005 and 2010 given that 33.9 hectares will have been felled in the first five years of felling between 2000 and 2005. If one uses the per hectare value of the 2003 contract, the projected present

value of felling between 2005 and 2010 should be approximately R2.784 million (35ha X R79 545/ha).

The clearing of other unwanted alien plants can be seen primarily as a form of management expense and not harvesting that leads to a net income for the Park. However, the Park negotiates a discount on clearing contracts for older alien stands that contain valuable wood that can be sold by contractors. In a sense this wood represents the harvestable component of alien clearing and allows the Park to save on clearing expenses. Although it is difficult to determine accurate figures the Park estimates that roughly 10% to 15% of all stands cleared for the entire period in which alien clearing has taken place resulted in some level of discounted clearing costs. The average discount for these stands was also 10% to 15% when compared to the clearing costs of stands with no value. Most of the stands with valuable wood have been cleared already as they tended to be the denser older stands, of Rooikrantz in particular, that were prioritised for clearing early on the clearing campaign.

Clearing operations in the Park also lead to benefits for informal wood collectors that live near the Park. They are given the opportunity to collect wood left behind after clearing and either use the wood themselves or sell it for use as firewood often at roadsides. No figures were available on the extent or value of this form of harvesting. While it probably doesn't have a significant rand value, it probably provides a livelihood for a few people or at least supplements low incomes to some degree.

The Park also derives income from the harvesting of marine species found in the water that form part of the Park. Currently fishing permits are sold for R20 up from R10 last year and permits for boat launching cost R40. For the 2003/2004 financial year, R95 000 was generated from the sale of fishing permits while R25 000 was generated from boating permits. It is expected that income from these sources should remain fairly stable at these levels for the foreseeable future. Income from fishing permits was down from approximately R150 000 in the 2001/2002 and 2002/2003 financial years. This was mainly due to new legislation aimed at letting fish stocks recover that restricts fishing to weekend periods. No records were available for income from boating permits in previous years.

5.3.3 Tourism and recreational value

While it is clearly not possible in a report of this nature to separate out the degree to which TMNP attracts tourists to the country and the Province from all other attractions some inferences can be made¹. It could in fact be argued that without the Table Mountain chain there might not be a Cape Town and certainly not a Cape Town as we know it. The original formal settlements at the Western Cape were for the purpose of growing provisions and supplying water to ships travelling between Europe and the East. The mountain chain was ideal for this because of water catchment and the fertility of the soil. In all likelihood if there had been no mountain chain the Cape would have been barren, windswept, sandy and with little fresh water. It would not have been an attractive place for provisioning station.

Wesgro estimates that the tourism industry in the Western Cape accounted for approximately 9.8% of the Gross Regional Product and employed 9.6% of the province's workforce in 2002.

Wesgro also estimates that during 2002/2003 foreign direct investment in excess of R550 million may have been absorbed by the Western Cape tourism sector. This foreign direct investment ranges from hotel projects and guesthouses built and managed by foreigners who invested in the Cape's lucrative property market, foreign owned travel agencies, tour operators, specialised service suppliers and restaurant and other entertainment owners.

Number of visitors in 2002: Foreigners	976 000
African-Air	70 000
<u>African-Land</u>	<u>326 000</u>
Total	1 372 000
Total spend by all foreign visitors	R17.3 billion
Visitor nights by all foreign visitors	12 million
Spend by SA domestic tourists (2001)	R2.9 billion

¹ Formally conjoint analysis could be used for this purpose but this was beyond the scope of this research.

It is estimated that 53% of all overseas visitors to South Africa visit the Western Cape. About 21% of all African-Air and 8% of all African-Land visitors to South Africa visit the Western Cape (Grant Thornton Kessel Feinstein (2002)).

Clearly one of the key attractions for visitors to the Western Cape is TMNP and some of the key features of the Park. According to the Cape Metropolitan Tourism Visitor Research Results, 60.2% of International Tourists used the Table Mountain Aerial Cableway, 56.3% visited Cape Point and 36.3% visited Kirstenbosch Gardens in the Summer of 2002. While Kirstenbosch Gardens are not part of the TMNP, they are a popular access point for the Park.

Table Mountain Aerial Cableway was rated at 89.5%, Kirstenbosch Gardens at 87.8% and Cape Point at 86.0%. Public Transport (Metered Taxis), as a means for comparison, was rated at only 69.2%.

For Domestic Tourists, 50.0% visited the Table Mountain Aerial Cableway, 34.0% visited Cape Point and 24.8% visited Kirstenbosch Gardens in the Summer of 2002. They rated the Table Mountain Aerial Cableway at 90.2%, Kirstenbosch Gardens at 86.1% and Cape Point at 83.1%.

These results are summarised in Table 16

Summer of 2002 Results	% Visited		Rating Level	
	International	Domestic	International	Domestic
Table Mountain Aerial Cableway	60.2%	50.0%	89.5%	89.4%
Cape Point	56.3%	34.0%	87.8%	83.1%
Kirstenbosch Gardens	36.3%	24.8%	86.0%	86.1%

Table 16 Visitors to key features of TMNP and satisfaction rating

5.3.4 Aesthetic and recreational value (impact on property prices)

It should seem fairly obvious that the Park creates significant recreational and aesthetic value for the people of Cape Town. It offers hiking, biking, swimming

picnicking, fishing, bird watching, wildlife viewing, etc. all conveniently close to a number of urban areas. Table Mountain, Cape Point and other natural features make a highly significant contribution to the aesthetic appeal of Cape Town. The Park is not only a landmark, but also an enormous area of reserved parkland in a built up city. It is widely accepted in the environmental economics literature that open-space is a source of utility to city residents, so it is reasonable to attribute some of this "Cape Town premium" to the existence of the Park and mountain range.

While it is not possible to generate an estimate of the recreational and aesthetic value of the Park, one can get some indication of the magnitude of the value by investigating the Park's impact on property values. The property price approach (also known as the hedonic pricing approach) has been in use by economists since the 1960s. It is based on the premise that the price of a property is determined by the set of attributes (including environmental ones) that characterise it. These attributes commonly include property variables such as erf and house size, neighbourhood variables such as the level and quality of public facilities, accessibility variables such as proximity to the central business district and environmental quality variables such as pollution levels and access to parks. The typical property price equation could thus be defined as:

Property price = function of (property variables, neighbourhood variables, accessibility variables, environmental quality variables)

Once data on these variables has been collected for a sample of houses, multiple regression analysis can be used to estimate the influence of the variable of interest (in this case the presence of and proximity to the Park). For a more detailed description of the property price approaches see: Freeman (1994), Pearce & Turner (1990), Oates (1994). Ideally, one should create a statistical model of all houses in Cape Town and use it to predict the housing premium created by the Park. However, this is a complex and resource intensive task that is well beyond the scope of this study. Successful modelling would also stand less chance of succeeding as the Park is such an intrinsic part of the property market.

In the absence of modelling, it is however possible to discuss the role of the Park in the real estate market based on interviews with estate agents operating in areas where the Park plays a role. Discussions were held with seven agents in this regard with experience of the property market in Newlands, Rondebosch, Bishops Court,

Constantia, Tokai, the City Bowl, Green Point, Sea Point and Camps Bay. The focus of these discussions centred around three areas:

1. The impact of the Park on property values in general
2. The impact of the Park on the property values of houses bordering on or within walking distance of the Park
3. The adequacy of Park management

All agents agreed that the Park has a profound influence on the overall property market and that it would be hard to hypothesize what the market would be like without it. It forms an intrinsic part of the balance between natural and developed area that Cape Town properties have to offer buyers. A Park view was cited as an undoubted value creator. This was noted particularly in areas with no or distant sea views such as the Southern Suburbs and parts of the City Bowl. It was noted that the areas in these suburbs with the best views of the Park (and to a somewhat lesser degree access to it) were the highest value areas. Pockets within these areas that did not have any Park views sold at considerable discounts to those that did. Estimates of these discounts would depend on the individual houses concerned, but discounts of 20% were not seen as unreasonable. Agents also noted that for plots with good Park views it was almost impossible to over-capitalise on the building of a house whereas for plots with no or limited views over-capitalisation was something to be cautious of.

In the areas along the Atlantic Seaboard, sea views were seen as relatively more important. However, mountain views are also important and gaining in popularity. Many new developments in these areas were focusing on architecture that allowed for the appreciation of sea and mountain views where in the past the emphasis had been almost solely on sea views. It was noted by some agents that foreign buyers often seemed to have a higher appreciation for Park views and access when compared to the typical local buyer.

The impact of the Park on properties bordering on or within easy walking distance of it can be considered separately from its impact on properties in general. Properties bordering on the Park have the potential to benefit from close contact with a natural area, uninterrupted views and easy access to nature. On the other hand, bordering on the Park can introduce a security risk as well as an increased fire risk. Depending on the situation these positive and negative factors may be positive, negative or neutral on balance. For example, in certain areas, access for criminals using the Park is difficult due to elevation or the lack of a convenient place to park a getaway

vehicle. In these areas the positive impacts associated with bordering on the Park will generally outweigh the negatives. In other areas, criminal access may be perceived as too easy for comfort thus outweighing natural benefits. Examples of where this is more likely to happen that were cited by agents include parts of Newlands. Examples of where natural benefits dominate included parts of Tokai. It was also noted that in certain areas stands of large tree that block views and sunlight can also be seen as a negative by buyers. Unfortunately, due to the number of areas that would need to be investigated, it was not possible to conclude whether the positives of bordering on the Park outweigh the negatives at a city-wide scale.

Properties not bordering on the Park, but within walking distance of it enjoy the benefit of being able to access recreational opportunities with ease without being exposed to the security or fire risk associated with properties bordering on the Park. These properties generally enjoy a more consistent premium over those that are further away due to this access. The magnitude of this premium is hard to estimate, but a figure of two or three percent appears reasonable.

Agents were asked about their perceptions of the upkeep of the Park. All agreed that in general it was of a high standard. Cleanliness was good, walking paths were maintained and fire prevention initiatives were noticeable particularly since the 2001 fires. They did not generally receive complaints from clients and did not feel that lack of upkeep was leading to any kind of negative impact on properties. They did, however, point out that negative impacts could occur should management effort decrease impacting on cleanliness and general upkeep. A well managed Park was seen as crucial to the future potential of the property market. Given that there are good impressions of general upkeep, it would seem that security is the major factor that reduces the Park's potential to lead to increased property values along its borders.

While it was not possible to quantify the impact of the Park on property values, some 'back of the envelope' estimates can allow one to get a feel for the possible magnitude of this impact. The total value of all residential property within, say, six kilometres of the Park is certainly not much less, and possibly even more, than R100 billion. If one attributes only 5% of the total value of property to the Park this translates into a value of R5 billion. Of course this is a highly hypothetical scenario but it does illustrate the order of magnitude of the figures likely to be associated with this value stream.

5.3.5 Educational value

The Park provides a huge open air classroom for environmental education and runs an extensive education programme. The primary thrust of the programme is the training of teachers at previously disadvantaged schools that can then educate the children in their classrooms and take them on field trips to the Park. Teachers are taught using a series of three workshops and one field trip. After this they are allowed to bring one group of learners, usually averaging 60 children in size, on a field trip free of charge. Transport is also provided free of charge using the 2 busses (one 60 seater and one 22 seater) that the Park operates for this purposes. 90 teachers have been trained in the first six months of the programme indicating that an average of 180 teachers will be trained per year. The average number of learners visiting the Park on field trips is 800 children per month.

The Park has seven permanent staff members working on education: one education manager, three education officers, one communications officer, one administrative assistant and one driver. In addition to these staff members two consultants have been contracted on an ad hoc basis for specialist input on curriculum development in particular. Part time volunteers also provide assistance. Park facilities devoted to education can be found at Boontjiesdrift, Silvermine, Buffelsfontein, Boulders and new facilities are being planned for Orange Kloof.

In addition to environmental education primarily aimed at children, the Park is used for a number of mostly university based research projects that increase our understanding of environmental processes.

5.3.6 Indirect use value (ecosystem services)

The Park is internationally recognised as a biodiversity hot-spot within a unique floral kingdom. Its location within a major urban area increases its importance as it demonstrates the potential for unique and sensitive environments to exist alongside urban areas. The Park encompasses a relatively wide variety of ecosystems including areas of fynbos, forest, coastal zones, rivers, wetlands, etc. All of these ecosystems have different ways of functioning thus generating different ecosystem services values. Included in the list of potential values would be:

- Water supply, purification and regulation,
- Absorption of carbon dioxide and other pollutants,
- Soil conservation,

- Pollination services from insects and others in Park,
- Protected nurseries for marine species, etc.
- Refuge for plant and animal species

It was not possible to quantify these services as this requires ecological modelling of the services concerned with a view to valuation. However, it should be noted that the Park's location in an urban area provides it with a number of potential 'customers' for its ecosystem services. This should result in higher values than, say, more remote areas.

5.3.7 Option and existence value

Option values include the potential for value to be derived from bio-prospecting for things like plant compounds that have medicinal or other applications. It is not possible to predict whether any value will be derived from this source. However, it should be noted that the Park's flora is characterised by extremely high levels of diversity and uniqueness and this tends to increase the chances of success.

There seems to be a lack of information on the existence value of major attractions such as the Park as existence values are more commonly sought when arguing in favour of the conservation of lesser known areas that are under threat. While it was not possible to attach a quantified existence value to the Park, it should be noted that the Park and Table Mountain in particular are local, national and even international natural icons. This status ensures that people are likely to attach particularly high existence values to the Park.

The Turpie study of 1998 undertook a contingent valuation study to ascertain the public's willingness to pay towards maintaining the natural character of the CPNP. Respondents were informed of the possibility of development of the 15 gateways and 4 funiculars in order to meet the financial needs of the park. They were offered the opportunity to make an annual contribution to the financing of the park costs in order to reduce the necessity for development, perhaps to a smaller number of nodes or less intensive development at each gateway. 6% of black, 26% of coloured and 32% of white respondents stated they were willing to make such a donation, with an average willingness to pay of R100, R122 and R277, respectively. Extrapolated to the population of the Cape Peninsula, this suggests an overall willingness to pay of R115 million per annum. While willingness to pay derived from an open-ended survey is known to be overstated, it is important to point out that this amount is way

in excess of the R35 million required to run the park. If true willingness to pay was only a third of the stated amount, then the park would not require any outside funding. While this existence value is seldom fully realised, it also serves to justify government expenditure on the upkeep of the park instead of insisting of full self-reliance at the potential expense of its natural character.

6 References

- Carson, R.T., Wilks, L. & Imber, D. 1994. Valuing the Preservation of Australia's Kakadu Conservation Zone. *Oxford Economic Papers* 46: 727-749.
- Grant Thornton Kessel Feinstein. 2002. Western Cape Trends chart. Loose leaf brochure.
- Hadker, N., Sharma, s., David, A. & Muraleedharan, T.R. 1997. Willingness to Pay for Borivli National Protected Ares: Evidence from a Contingent Valuation. *Ecological Economics* 21: 105-122.
- IUCN. 1998. Economic Values of Protected Areas: Guidelines for Protected Area Managers. IUCN, Gland, Switzerland.
- Kramer, R.A., Sharma, N. & Munasinghe, M. 1995. Valuing Tropical Forests: Methodology and Case Study of Madagascar. Environmental Paper Number 31. World Bank, Washington, D.C.
- Leiman, A. & Van Zyl, H.W. 2004. Economics in Impact Assessment: The Role of Environmental Economics. In: Blignaut, J. & de Wit, M. (eds) Sustainable Options: Development Lessons from Applied Environmental Economics. UCT Press, Cape Town.
- Read-Sturgess and Associates. 1994. The Economic Significance of Grampians National Park. Department of Conservation and Natural Resources, Melbourne, Australia.
- Standish, B. 2002 Cape Town International Convention Centre, the Projected Economic Contribution, DPRU Working paper No. 02/70, August 2002
- Tobias, D. & Mendelsohn, R. 1989. Valuing Ecotourism in a Tropical Rain Forest Reserve. *Ambio* 20: 91-93.
- Turpie, J.K. 1996. A Preliminary Economic Assessment of De Hoop Nature Reserve. FitzPatrick Institute, UCT, Cape Town.
- Turpie, J., (1998) A Preliminary economic assessment of the Cape Peninsula National Park: Use, values, public preferences & financing, FitzPatrick Institute, UCT, Cape Town
- Turpie, J.K., Heydenrych, B.J. & Lamberth, S.J. 2002. Economic Value of Terrestrial and Marine Biodiversity in the Cape Floristic Region: Implications for Defining

Effective and Socially Optimal Conservation Strategies. Biological Conservation ??

Turpie, J.K., Joubert, A., Van Zyl, H.W. & Leiman, A. 2001. Valuation of open space in the Cape Metropolitan Area. Report to the City of Cape Town, Environmental Management Department.

Ulph, A. & Reynolds, I. 1981. Economic Valuation of National Parks. Centre for Resources and Environmental Studies, Australian National University, Canberra.

7 Appendix: Description of Methodology

This section describes the methodology used in performing the macro-economic analysis of the Park. It begins by describing how the macro-economic impact analysis was performed for the operations and management of the Park, and the project spending respectively. A brief description is then given regarding the various types of employment that exist in the Park and how these employment figures were projected for the next five years. Finally, a description of the methodology used to determine the investment in the natural capital of the Park is given.

7.1 Macro-economic Impact Analysis

Input output analysis was used to determine the economic impact of the Park. The approach demands that all expenditure in and around and resulting from the refinery be identified and estimated. This expenditure, in turn, needs to be matched up with the Standard Industrial Classification of all Economic Activity (SIC codes). This is not always an easy and straightforward exercise. In addition, if employment is part of the expenditure then estimates must be made of the likely items of expenditure as a result of wage payments. This is further complicated by the fact that workers at different income levels will have different spending patterns. Hence, for each identified area of expenditure, estimates were made of the decomposition of this into SIC categories.

The expenditure areas that were identified are made up of:

- Revenues generated through the operation and management of the Park.
- The project expenditure at the Park

7.1.1 Operation and management expenditure of the Table Mountain National Park

Five steps are required to measure the overall economic impact of the operation and management expenditure of the Park:

- First, is to identify appropriate operating and maintenance expenses. These cost items were supplied by Park, as indicated in Table 17. All historic costs were inflated to 2004 prices using CPI data supplied by the Reserve Bank and Statistics SA.

	1999 Actual	2000 Actual	2001 Actual	2002 Actual	2003 Actual	Total 1998 -2003	
Total Operational Expenses	19,063,712	23,898,103	24,589,038	22,263,538	28,766,607	118,580,998	100.0%
Human Resources Costs	11,563,698	12,261,042	11,564,929	10,631,349	11,081,737	57,102,755	48.2%
Interest, Finance and Bank Charges	64,407	94,625	131,773	169,831	279,628	740,264	0.6%
Office and Operating Costs	978,400	2,563,939	2,206,101	2,670,068	2,862,988	11,281,496	9.5%
Rent Paid	1,626,838	1,212,104	1,465,007	2,274,519	2,397,797	8,976,265	7.6%
Consumable items	237,611	416,795	466,770	494,158	1,052,073	2,667,407	2.2%
Marketing / Promotions/ Adverts	107,116	497,997	1,216,589	1,217,562	1,629,568	4,668,832	3.9%
Subsistence & Travelling Costs	206,394	190,920	166,010	96,180	155,014	814,518	0.7%
Water & Electricity Costs	159,076	474,730	514,205	386,920	705,509	2,240,440	1.9%
General Maintenance - (Buildings, Infrastructu	3,353,410	2,110,491	1,381,027	1,477,558	2,747,494	11,069,980	9.3%
Alien Clearing, Footpath Maintenance, Fire Ma	276,106	3,310,230	4,656,186	1,920,267	3,831,174	13,993,963	11.8%
Vehicle Costs	386,637	544,884	735,217	726,425	1,122,463	3,515,626	3.0%
Inventory Items	97,169	205,404	80,967	136,370	359,608	879,518	0.7%
Losses & Nett Shortages	6,850	14,942	4,257	62,331	541,554	629,934	0.5%

Table 17: Operational expenditure of the Park

- Second, is to determine the relative proportions of profit, labour, plant and material for each cost line item. This was done by using the detailed expenses for 2004 and then applying the relative percentages to the five preceding years.
- Third, is to assign each item of material and plant to a particular SIC code. A sample of this is given in Table 18. The assignment into the various SIC codes was done in conjunction with personnel from the Park.

M010 - Human resource costs		SIC Code	% Split	FY 2004
D010 - Human Resource Costs - Fixed				
	2000-Salaries	Labour	100.0%	7,204,563
	2002-Bonus - Service	Labour	100.0%	673,837
	2008-Uniform Allowance Issues	3220	100.0%	40,187
	2012-Rations	3113	100.0%	2,201
	2013-Allowance - Vehicle	3843	50.0%	502,929
	2013-Allowance - Vehicle	3530	50.0%	502,929
	2017-Allowance - Housing	Labour	100.0%	2,582,095
	2018-Std Uniform Issues	3220	100.0%	148,645
	2020-Contribution - Medical Fund	9330	100.0%	782,099
	2023-Contribution - U I F	Tax	100.0%	102,649
	2080-Allowance - Bicycle	3859	100.0%	138
	2082-Allowance - Subsistence Costs	All	100.0%	0
	2083-Skills Development Levy @ 1% o	Tax	100.0%	76,728
D011 - Restructuring Costs				0
	2062-Once Off Payments	All	100.0%	0
D013 - Retirement Funding				742,159
	2021-Contribution - Pension Fund	8100	100.0%	275,785
	2022-Contribution - Provident Fund	8100	100.0%	466,374
D020 - Human Resource Costs - Variable				1,652,079
	2004-Leave Pay outs	Labour	100.0%	31,283
	2016-Allowance - Meals	3113	100.0%	0
	2024-Contribution - RSC (Personnel)	Tax	100.0%	48,216
	2025-Contribution - Accident Insura	8100	100.0%	91,577
	2027-Allowance - Sleep Out (A & B B	Labour	100.0%	154
	2031-Personnel Recreation	9800	100.0%	0
	2032-Training Fees	9800	100.0%	411,291
	2033-Medical Exp (ie First Aid Kits	9330	100.0%	18,974

Table 18: SIC Codes for Operational Expenditure Items

- Fourth, is to decompose labour into income categories and apportion the total wage bill to each income category. This is illustrated in Table 19.

2003				
Wage Category	No per category	Average Salary	Category Wage Bill	% Split
< 50k	55	39,401	2,167,062	25.2%
50k - 100k	46	74,010	3,404,472	39.6%
100k-250k	12	201,324	2,415,891	28.1%
> 250k	2	309,047	618,095	7.2%
Total	115		8,605,521	100.0%
Total HR Costs			11,746,641	
Salaries as % of HR Costs			73.3%	

Operational Staff	1999	2000	2001	2002	2003	2004
Total HR Costs	18,094,959	18,234,909	16,325,273	13,004,691	11,746,641	15,013,238
Personnel payment	13,636,197	13,741,662	12,302,577	9,800,217	8,852,162	11,313,839
No of employees	191	189	166	130	115	126
Ave salary/emp	71,394	72,789	74,185	75,580	76,975	89,792
Sal as % of Exp.	45.7%	38.7%	35.4%	36.0%	29.0%	31.7%
Growth in sal.		2.0%	1.9%	1.9%	1.8%	16.7%
< 50k	91	90	79	62	55	60
50k - 100k	76	76	66	52	46	50
100k-250k	20	20	17	14	12	13
> 250k	3	3	3	2	2	2
< 50k	3,433,899	3,460,457	3,098,064	2,467,913	2,229,172	2,849,077
50k - 100k	5,394,683	5,436,406	4,867,083	3,877,112	3,502,047	4,475,924
100k-250k	3,828,190	3,857,798	3,453,793	2,751,287	2,485,133	3,176,217
> 250k	979,425	987,000	883,637	703,904	635,810	812,621
Total	13,636,197	13,741,662	12,302,577	9,800,217	8,852,162	11,313,839

Table 19: Table Mountain National Park Labour Income Categories

- Finally, all the items in the SIC coded costs are brought together. The total multiplier effect of the operation and maintenance expenditure is calculated as the aggregate product of the SIC coded spending on plant and material, as well as SIC coded spending by workers multiplied through the national multipliers. The national multipliers are established through the South African input output tables. The annual multipliers for the operations and maintenance expenditure are listed in Table 20.

GDP Multipliers						
Financial Year	1999	2000	2001	2002	2003	2004
Operational Costs	1.29	1.31	1.30	1.31	1.33	1.33

Table 20: Annual national multipliers for operational expenditure

The average national multiplier for the financial years 1999 to 2004 was then used to determine the anticipated contribution to the national economy for the next five years.

7.1.2 Project expenditure in the Table Mountain National Park

The macro-economic impact analysis of project spending was treated in a similar manner to that of the operational expenditure. Once again, five steps are required

to measure the overall economic impact of the project expenditure of the Table Mountain National Park.

- First, is to identify appropriate costs. The project costs funded by different organisations, such as Ukuvuka, the Department of Environmental Affairs and Tourism (DEAT), Fonds Francais l'pour Environmental Mondial, and the City of Cape Town, were examined. These costs are shown in Table 21.

Growth in Project Expenditure (Expressed in 2004 prices)							
	ACTUAL PROJECT EXPENDITURE (Real Prices)						
	1999	2000	2001	2002	2003	2004	
City of Cape Town	0	0	0	0	4,038,071	0	
CCT - Upgrading of Capital Infr.	0	0	0	0	0	0	
DEAT	0	0	0	0	0	1,085,416	
Worldbank (GEF)	5,672,237	16,250,801	10,680,550	9,073,127	8,692,374	5,717,268	
FFEM	0	399,664	1,222,523	296,119	1,367,440	0	
Table Mountain Funds	0	147,035	0	15,193	802,003	0	
DWAF	0	0	0	2,191,524	2,729,765	578,772	
Ukuvuka Operation Firestop	0	0	4,088,544	8,575,920	3,566,237	3,387,759	
Buffelsfontein	0	0	0	2,998,957	0	0	
Marine							
Other							
TOTAL	5,672,237	16,797,499	15,991,617	23,150,840	21,195,890	10,769,216	
Real Annual Growth Rate		196.1%	-4.8%	44.8%	-8.4%	-49.2%	
Compounded annual REAL growth rate between 1999 and 2004						13.7%	

Table 21: Project investment by various organizations.

All historic costs were inflated to 2004 prices using CPI data from the Reserve Bank and Statistics SA.

- Second, is to determine the relative proportions of plant, material and labour for each project. Refer to Table 22 for an example of this exercise.

No	DEAT Projects	Project Code	Paid to date	Community	SANParks	Transport -	
				Wages	Labour	Consultants	Fuel
7	Colin D Brown Consulting T/A Sekun	59	304,404	304,404			
6	Wilfred Krohn	59	166,309	166,309			
9	GF Contractors	59	132,173	132,173			
16	Trustprop property managers	61	81,196			81,196	
33	Salaries	61	80,658		80,658		
36	AST		65,619				
5	Community Employment Initiative	59	54,920			54,920	
15	Environmental Design & Management	61	33,909			33,909	
1	Saatchi & Saatchi	58	20,581				
12	C Braaf Builders	59	18,650	18,650			
14	Orms - Mike Ormrod	60	16,658				
27	Koeker Industries	59	15,380			15,380	
23	Message Link	59	11,900			11,900	
13	Scala Cameraland	60	10,148				
19	United Commercial Bus	61	10,124				10,124
22	Green's Electrical	59	10,013			10,013	
28	WBHO - Footpath Implementation	59?	8,584			8,584	
4	567 Capetalk	58	8,564			8,564	
8	Cristy Sports	59	8,429			8,429	
34	Affordable Blinds		4,795			4,795	
10	Central Mica Hardware - Footpath im	59	3,101				
25	Federated Timbers	59	2,978				
3	Two Oceans	58	2,868				
18	Subsistence and Travel - James & M	61	2,599		2,599		
24	Freshly Ground	59	2,300				
2	Judy Jacobs - Photography	58	2,075			2,075	
26	Plumbink Waud and Blackman	59	1,960			1,960	
21	Newlands Avenue Motors	61	1,325				1,325

Table 22: Dividing projects into labour, material and profit

- Third, is to assign each item of plant and material to a particular SIC code. Refer to Table 23 for a sample of the SIC coding of the items.

SIC Code	Description	Amount
L1	< R50,000 p.a.	522,976
L2	R50,000 to R100,000 p.a.	152,464
L3	R100,000 to R250,000 p.a.	23,373
L4	> R250,000 p.a.	5,980
3310	Wood and wood products, except furniture	3,647
3411	Pulp, paper and paper board	0
3420	Printing and publishing	20,581
3512	Fertilizers and pesticides	0
3530	Petroleum refineries & products of petroleum and coal	1,325
3691	Structural clay products, bricks etc.	2,431
3692	Cement	0
3813	Structural metal products	0
3822	Agricultural machinery and equipment	0
3824	Special industrial machinery and equipment	27,948
3825	Office, calculating and accounting machinery	66,930
3832	Radio, television and communication equipment	0
3843	Motor vehicles, parts and accessories	0
5100	Building construction	0
5200	Civil engineering and other construction	2,300
6300	Catering and accommodation services	2,868
7100	Transport and storage	0
8320	Business services	242,469
8330	Machinery and equipment renting and leasing	10,124
TOTAL		1,085,416

Table 23: Project spending by SIC Code

- Fourth, is to decompose labour and profit into income categories and apportion the total wage bill and profits to each income category. This is also illustrated in Table 23. Following from this, estimates of expenditure patterns by income category are used to determine total spending patterns.
- Finally, all the items in the SIC coded costs are brought together. The total multiplier effect of the capital expenditure is calculated as the aggregate product of the SIC coded spending on plant and material. The national multipliers are established through the South African input output tables. The overall multipliers for the capital expenditure items are indicated in Table 24.

GDP Multipliers						
Financial Year	1999	2000	2001	2002	2003	2004
Project Costs	1.31	1.39	1.39	1.38	1.41	1.34

Table 24: Annual national multipliers for project expenditure

7.2 Direct Employment in the Park

The estimates of economic impact include direct jobs and wages that would be created by the operational and project expenditure of the Park.

There are three types of direct jobs created in the Park. The first type is those personnel who are involved with the management and daily operation of the Park. These personnel are termed operations personnel and the Park permanently employs these people. The second type of job is those personnel hired by the Park on a contract basis to oversee the implementation of the various projects. Finally, the third type of job is those people hired to execute the projects. Examples of this third type of job include people employed to clear alien vegetation and to maintain footpaths.

7.2.1 Operations Personnel

For each of the last six financial years, the proportion of salaries and wages to total spending by the Park was calculated. The number of people permanently employed to operate and manage the Park was known for the 1999, 2003 and 2004 financial years. By dividing the amounts paid out in salaries and wages by this number of personnel, the average salary per operational job could be determined for these respective years. To calculate the employment numbers for the years where no figures existed, the amounts paid out in salaries and wages for those years were divided by the average salary for the year. The average salaries for the year were calculated by linearly interpolating between the average salaries where they were known.

It was assumed that the number of operating personnel increase by eight in 2005 and by another eight in 2006 because the management of the marine reserve, which fell under the Park's auspices in the 2005 financial year, would require additional personnel. Furthermore, an extra five people from Tokai were also absorbed into the TMNP.

A number of job opportunities are created by funding the clearing of alien vegetation from the operational budget. Eighty percent of the operations budget line item dedicated to alien clearing is paid as salaries and wages to the teams that perform the actual alien clearing. The remaining twenty percent is used to pay insurances, such as UIF and workmen's compensation, to buy equipment and clothing and for transport. The amount paid out in salaries and wages is then divided by the total

salary for a working team, as described in section 7.2.3, to determine the number of teams required for the activity.

7.2.2 Contract Staff

In 2004 there was 43 contract staff of whom seven were paid from the operations budget. The remaining 36 were paid out of the project budgets under categories specifically allocated to SANParks labour charges.

An average salary of R50,000 p.a. was assumed for the seven contract staff monitoring the execution of the projects for the Park. No information could be obtained for contract staff prior to 2004 and it was therefore assumed that these seven remained constant over time. The scope of their work remained relatively constant over the previous six financial years and Park personnel were confident that their numbers remained unchanged.

Table Mountain National Park hired additional contract staff to monitor their projects. These staff members have also been assumed to earn R50,000 per annum. The number of contract staff required to monitor projects is calculated by dividing the amount allocated to the SANParks Labour Charge column for each of the project types by their annual average salary of R50,000.

7.2.3 Community Workers

For each of the project types the amount of money allocated to the contractors who execute the projects is known. It was agreed that 80% of this money is used for salaries and wages. The remaining twenty percent is used to pay insurances, such as UIF and workmen's compensation, to buy equipment and clothing and for transport.

A typical team that is used on a project consists of one contractor, one supervisor, three operators and six general workers. Table 25 indicates their wage rates. Table 25 also distinguishes between two types of project teams, where the daily wage rate for general projects and Working for Wetlands projects differs.

General Projects Market Estimates	Daily Rate	Equip Sal p.a.	Number in Team	Tot Cat Salary
Contractor	R 175.00	45,500	1	45,500
Supervisor	R 120.00	31,200	1	31,200
Operator	R 90.00	23,400	3	70,200
General Worker	R 65.00	16,900	6	101,400
TOTAL			11	248,300

Salary Bands	Number	Tot Sals	%
< R50 000 p.a.	11	248,300	100.0%
R50,000 to R100,000	0	0	0.0%
R100,000 to R250,000	0	0	0.0%
> R250,000 p.a.	0	0	0.0%
Total	11	248,300	100.0%

Working for Wetlands Market Estimates	Daily Rate	Equip Sal p.a.	Number in Team	Tot Cat Salary
Contractor	R 124.00	32,240	1	32,240
Supervisor	R 65.00	16,900	1	16,900
Operator	R 53.00	13,780	3	41,340
General Worker	R 39.00	10,140	6	60,840
TOTAL			11	151,320

Salary Bands	Number	Tot Sals	%
< R50 000 p.a.	11	151,320	100.0%
R50,000 to R100,000	0	0	0.0%
R100,000 to R250,000	0	0	0.0%
> R250,000 p.a.	0	0	0.0%
Total	11	151,320	100.0%

Table 25: Typical project teams

The number of project teams required to execute all the projects in any one year is determined by dividing the total amount of project money allocated to salaries and wages by the total salary amount for a project team.

7.3 Investment in the Natural Capital of the National Park

The Table Mountain National Park wished to understand how much of their money was invested into the natural capital of the Park. In order to understand this, four categories of expenditure were formulated. These are:

1. **Direct expenditure** is that expenditure which is spent directly on the natural capital of the Park. Examples of direct expenditure include alien clearing, game capture, breeding programmes and spending on herbicides and toxins.
2. **Indirect expenditure** is those expenses that are not spent directly on the natural capital of the Park, but through their existence lead to an indirect

investment in the natural capital. Examples of indirect expenditure include the training of honorary rangers, environmental impact assessment studies and security costs (aimed at protecting the Park environment).

3. **Unrelated expenses** are those expenses that do not have an impact on the natural capital of the Park. Examples of these unrelated expenses include the supply of LPG gas to overnight huts and courier costs.
4. **Pro-rata expenses.** These are operational expenses that do not directly or indirectly affect the natural capital of the Park, yet by their existence allow for the direct and indirect expenditure to occur. Examples of pro-rata costs include expenditure on equipment, salaries and wages of office personnel and the maintenance of roads in the Parks.

The operational expenditure and project expenditure were treated differently. For the operational expenditure, each item in the detailed expenses for the 2004 financial year was coded according to the categories above. An example of part of the coding is indicated in Table 26. The symbols "d, i, n & p" refer to the categories of direct, indirect, unrelated and pro-rata expenditure respectively.

Item	Code
G040 - Operating Leases	
2221-Rent Paid - Buildings	p
2222-Rent Paid - Equipment	i
2223-Rent Paid - Vehicles	p
2224-Rent Paid - Plants	n
2225-Rent Paid - AST Computers, etc	p
G050 - Consumable Stock	
2230-Chemicals & Veterinary Remedie	d
2232-Packing Material - Non-Trade	n
2233-Ammunition	i
2234-Herbicides & Toxins	d
2235-Fodder	n
2236-Fuel & Oil (Non-Vehicles)	p
2237-Gas	n
2239-Cleaning Material	n

Table 26: Coding of the operational expenses for investment in the natural capital of the Park

The amounts in each category are summed and presented in a table, as illustrated in Table 26. The pro-rata expenses are then proportionately divided up between the direct and indirect expenses and the unrelated expenses to give the amount invested in the natural capital of the Park and the amount invested in other items not related to the natural capital of the Park.

The project spending is treated in a similar manner to that of the operational expenditure. Each project was allocated into a spending category during the macro-economic impact analysis (see Table 22). These spending categories have in turn been coded according to expenditure in the natural capital of the Park. This is illustrated in Table 27. Once again, the symbols "d, i, n & p" refer to the categories of direct, indirect, unrelated and pro-rata expenditure respectively.

No	DEAT Projects	Project Code	Paid to date	d				
				Community Wages	SANParks Labour	i Consultants	p Transport - Fuel	p Transport - Rental
7	Colin D Brown Consulting T/A Sekun	59	304,404	304,404				
6	Wilfred Krohn	59	166,309	166,309				
9	GF Contractors	59	132,173	132,173				
16	Trustprop property managers	61	81,196			81,196		
33	Salaries	61	80,658		80,658			
36	AST		65,619					
5	Community Employment Initiative	59	54,920			54,920		
15	Environmental Design & Management	61	33,909			33,909		
1	Saatchi & Saatchi	58	20,581					
12	C Braaf Builders	59	18,650	18,650				
14	Orms - Mike Ormrod	60	16,658					
27	Koeker Industries	59	15,380			15,380		
23	Message Link	59	11,900			11,900		
13	Scala Cameraland	60	10,148					
19	United Commercial Bus	61	10,124					10,124
22	Green's Electrical	59	10,013			10,013		
28	WBHO - Footpath Implementation	59?	8,584			8,584		
4	567 Capetalk	58	8,564			8,564		
8	Cristy Sports	59	8,429			8,429		
34	Affordable Blinds		4,795			4,795		
10	Central Mica Hardware - Footpath im	59	3,101					
25	Federated Timbers	59	2,978					
3	Two Oceans	58	2,868					
18	Subsistence and Travel - James & M	61	2,599		2,599			
24	Freshly Ground	59	2,300					
2	Judy Jacobs - Photography	58	2,075			2,075		
26	Plumbink Waud and Blackman	59	1,960			1,960		
21	Newlands Avenue Motors	61	1,325				1,325	

Table 27: Coding project expenditure for investment in the natural capital of the Park

The total spending in each of the four natural capital expenditure categories is then determined. The pro-rata spending is treated in the same manner as for operational expenditure, where it is proportionately divided up between the direct and indirect expenditure and the unrelated expenditure.