DRAFT FOR COMMENT

TOKAI/CECILIA Management Framework

Prepared for SANParks

South African
NATIONAL PARKS

Table Mountain National Park

By:
GEOSTRATICS CC

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TABLE OF CONTENTS

Figure

TABLES

ANNEXURE REPORT

GLOSSARY OF ABBREVIATIONS

CARA: Conservation of Agricultural Resources Act

CCT: City of Cape Town

CDF: Conservation Development Framework

CMP: Conservation Management Plan

CPNP: Cape Peninsula National Park

CPPNE: Cape Peninsula Protected Natural Environment

DWAF: Department of Water Affairs and Forestry

EPWP: Extended Public Works Programme

EMP: Environment Management Plan

IEMS: Integrated Environmental Management System

MTO: Mountain to Ocean Pty (Ltd)

NSBA: National Spatial Biodiversity Assessment

PAWC: Provincial Administration: Western Cape

SANBI: South African National Botanical Institute

SANParks: South African National Parks

TMNP: Table Mountain National Park

Structure of report

This report represents the draft proposal for the future management of Tokai and Cecilia as an integral part of the Table Mountain National Park. It formulates the vision for Tokai and Cecilia and then focuses on the finer detail of management actions. The report is accompanied by plans indicating the spatial implications and proposals set out in the vision.

Chapter 1: Background
The background to compiling a Management Framework is briefly explained in this chapter. It further outlines the process of compiling this report and provides a summary of information presented in the Base Information Report.

Chapter 2: The vision
The proposed overall vision for Tokai and Cecilia is aligned to the Park Management Plan and CDF proposals and refined into broad themes for biodiversity, heritage, ecotourism development, recreational activities and management.

Chapter 3: Objectives
This chapter developes the themes into more detailed objectives as a means to guide the following chapter dealing with detailed management strategies.. For each theme a broad description of the issues, informing that specific theme, is provided as a basis for formulating specific objectives.

Chapter 4: Strategies, actions and time frame
The detailed actions and their scheduling to achieve the objectives of chapter 3 are set out in this chapter. The intention is to guide management and link the Management Framework to SANParks' operational and financial management systems in five-yearly phases. Both strategic and landscape proposals are thus made for the first five year period up to 2010 and then four further 5-year phases namely 2011 to 2015; 2016 -2020 and 2021 to 2025 to reflect the 20 year vision. The intention is for this chapter to be updated on an annual to 5-year basis to monitor progress.

Chapter 5: Spatial Proposals
The purpose of this section is to explain the spatial configuration of the management framework, i.e. the spatial vision and future use of areas. The previous sections refer to the figures in these sections and should thus be read as an integral part of the previous sections.

The landscape plan for each phase illustrates the landscape and spatial use implications for that specific period. The 20-year vision is illustrated in the final phase i.e. the 2025 plan for Tokai and for Ceclia.

The CDF zoning indicates the proposed broad use zones which would guide future management and development decisions.

Annexure Report

The annexure report provides useful information gathered through the compilation of the Management Framework and can be used by management as an easy reference. The intention is to expand this section as more information becomes available and should almost serve as a resource file for Park management.

EXECUTIVE SUMMARY

On 1 April 2005, South African National Parks was assigned the management of Tokai and Cecilia plantations as part of the Table Mountain National Park. TMNP is responsible for the management of the plantations and the 'exit lease' whereby the forestry company, MTO Forestry (Pty) Ltd., has the right to harvest about 600 hectares of plantations over a 20-year period. The remainder of the land, about 400ha comprising the picnic area, arboretum and conservation land, currently falls under the management of SANParks.

Due to the requirements of the lease, Tokai and Cecilia will be transformed over the next 20 years and SANParks realised that a common vision needs to be put in place for the management, rehabilitation and use of the areas. A long term strategic and spatial framework is necessary to address issues related to biodiversity conservation, heritage resources, recreational activities and ecotourism relevant to the future management and rehabilitation of the plantations.

In early 2006, a process was initiated to compile such a Management Framework. The process commenced with the appointment of a consultant team who compiled a Base Information Report reflecting all status quo information and data relevant to the project. A public engagement process was initiated to identify the issues and concerns which are captured in an Issues and Response Report released on 23 September 2006.

The draft Management Framework, based on the input of the previous documents, is now presented for review and comment.

This draft Management Framework report presents the vision, objectives, management program and spatial proposals for Tokai and Cecilia plantations to 2025.

The proposed overall vision for Tokai and Cecilia is to "manage the areas into the future in terms of legal requirements, applicable policies and agreements and to accommodate the conservation of biodiversity and heritage, development of eco-tourism opportunities and the provision of areas for recreational activities".

More specific visions are proposed for each major theme related to the future of the plantations: biodiversity, heritage, recreation, ecotourism and economic development and management. For each theme, objectives are identified and strategies, actions and timeframes set out. These are spatially illustrated in a series of five-yearly landscape plans for both Tokai and Cecilia.

The biodiversity vision and objectives make provision for the restoration of critically endangered Sandplein fynbos, endangered granite fynbos, ecological corridors and Afromontane forests.

The heritage vision and objectives protect the key heritage resources related to the Tokai Manor precinct and Arboretum and the history of plantations, the colonial and precolonial history are recognised through appropriate interpretation.

The vision and objectives for recreation provides for the main current activities to continue at Tokai and Cecilia and for the retention and creation of 'shaded landscapes' in appropriate locations.

The ecotourism and economic development vision and objectives provide for the creation of a high volume, mixed use visitor site at the Tokai Manor precinct and job creation through rehabilitation of the plantations.

The Tokai landscape plans show that in twenty years time most of the plantations would have been harvested and much of the fynbos, Afromontane forest and the ecological and riverine corridors re-established. The Tokai Manor will house the TMNP head office with a range of visitor and tourist facilities and activities established in the precinct. The Arboretum, re-aligned picnic/braai area and associated shade will be in place and dog walking, horse riding and mountain biking will be accommodated on designated routes in the rehabilitated lower plantation areas and in the designated shaded areas. Mountain biking on the upper slopes will be on tracks and paths in open fynbos and shaded Afromontane forests.

The Cecilia landscape will change over the next 20-year period as the plantations are harvested from the upper slopes towards the lower areas. Restoration of not only fynbos but also Afromontane forest where appropriate, will have taken place. The Afromontane forest will create pockets of new shaded areas. It is proposed that the lower slopes of Cecilia remain shaded to accommodate current recreation activities. The existing forest station will be scaled down and no additional development is proposed for Cecilia.

The above proposals are now presented for comment. Opportunities will be provided to present and discuss the proposals with stakeholders, the public and the authorities. Once these comments have been collected, assessed and analysed, a comments and response report will be released setting out SANParks response to the comments. The draft Management Framework will then be amended and submitted to management for approval.

CHAPTER 1:BACKGROUND

1.1 Brief history

On 1 April 2005, SANParks was assigned the management of more than 1000 hectares of publicly owned land within the CPPNE by DWAF in terms of the National Forests Act. This flows from the original Cabinet decision of 1997 that all public and other conservation worthy land within the CPPNE be consolidated into a National Park. TMNP has taken over the management of the Tokai and Cecilia plantations in terms of the 'exit lease' whereby the forestry company, MTO Forestry (Pty) Ltd., has the right to harvest about 600 hectares of plantations over a 20-year period. The lease excludes the replanting of trees in the cleared areas for commercial harvesting. The remainder of the land, about 400ha comprising the picnic area, arboretum and conservation land, currently falls under the direct management of SANParks.

In terms of the assignment, SANParks is mandated to effect the long-term management and rehabilitation of the Tokai and Cecilia plantations. In order to carry out this mandate, TMNP is committed to develop an overarching Management Framework, which will provide an opportunity for public, specialist and management input.

A common vision needs to be formulated for the management of the plantations into the future rather than a detailed plan for implementation. It will provide a strategic and spatial framework for addressing issues related to biodiversity conservation, heritage, recreational uses and ecotourism relevant to the future management and rehabilitation of the plantations.

This project has to provide a common vision and framework for the future management and rehabilitation of the plantations. It should indicate broad areas for use as recreational areas, plantation for rehabilitation or areas to be maintained as shaded landscape, and tourism and other management uses. The objective of the final Management Framework is to guide management and should not be regarded as a fixed document but rather as a dynamic, living management tool, which needs regular updating.

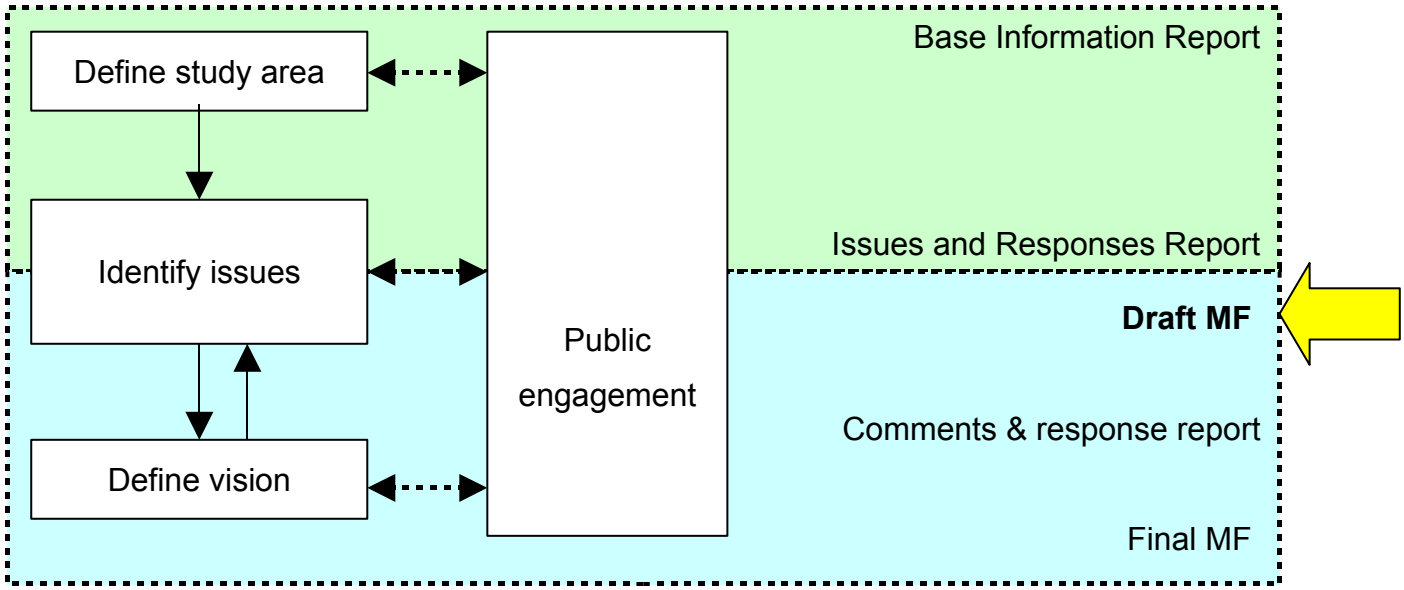
1.2 Process and purpose of this report

Previous documentation prepared as part of this process to inform this draft management report are the Base Information Report, which set out the status quo conditions and the Issues and Response Report, which reflects the issues pertaining to the future management of the areas as identified through public involvement and expert input.

The purpose of this draft Management Framework is to provide the future vision for Tokai and Cecilia, set objectives, management strategies and guidelines. The report includes spatial proposals which are an integral part of the report. Therefore Chapters 2 to 4 have to be read with the figures in Chapter 5.

The report describes the vision with regard to land use, activities and landscape elements based on the Base Information Report and the identified issues as discussed in the Issues and Response Report.

The diagram below indicates where this draft Management Framework fist into the process.



1.3 Background information

Tokai and Cecilia plantations are located on the eastern flanks of the Table Mountain range. From colonial times to the present, the areas were used for commercial plantations. Cape Town residents use the plantations for recreational activities and the plantations provide access to other areas on the mountain. Tokai is accessed from Tokai Road and Cecilia from Rhodes Drive.

Tokai extends from the lowlands to the mountain. Cecilia however, is located above the 90m contour and borders residential development on the lower slopes of the mountain. Both areas are important in terms of creating a biological link from the mountain to the lowlands through the riparian zones. Tokai represents not only one of the last opportunities to effectively link ecological processes from the mountain to the lowlands but also one of the few remaining opportunities to rehabilitate a substantial area of critically endangered Sandplain fynbos. Both Tokai and Cecilia provide sufficient areas of soils suitable for the restoration of the endangered Granite fynbos. These biodiversity imperatives provide the basis for the high priority to rehabilitate the threatened habitats and re-enforce the reason for assigning the plantations to SANParks.

Tokai furthermore has a strong colonial history reflected in the plantation landscape but more specifically in the Manor House and Arboretum.

The Base Information Report and the Issues and Response Report provide full details on the biophysical, social and heritage elements of Tokai and Cecilia.

CHAPTER 2:THE VISION

2.1 The approach

In formulating the vision and management framework proposal, various alternatives were considered. Two contrasting alternatives were initially assessed. On the one hand commercial forestry with certain conservation objectives and the provision of recreational areas in the plantations, This does not adequately provide for biodiversity restoration. On the other, a purist biodiversity restoration approach does not provide adequately for heritage aspects and the need for 'shaded landscapes'.

The preferred approach has been guided by SANParks mandate to manage Tokai and Cecilia in terms of international conventions and national legislation, the Protected Areas Act, the TMNP Management Plan and the assignment as Gazetted. This mandate requires SANParks to focus on the conservation of biodiversity but also to accommodate recreational activities, heritage resources as well as future use and access by the public to the Park.

The vision for Tokai and Cecilia, as new additions to the Table Mountain National Park, is furthermore embedded in the Vision for the Park: "A Park for all, Forever" as formulated in the Park Management Plan. The elements of the vision deals with *A Park*, i.e. a biodiversity park, *for all*, embracing the people attached to sites within the urban context and *forever* dealing with long-term sustainability.

As the Management Framework will deal with management and spatial proposals on a site level, the key elements forming the vision will deal with setting a desired state for biodiversity, cultural heritage management, tourism and economic development and recreational activities. The Management Framework is seen as a process to achieve over time a certain desired state for Tokai and Cecilia plantations as expressed through the CDF zoning. The vision for the Tokai Cecilia plantations as integral parts of the TMNP is expressed in the CDF zoning as per Figures 3 and 8.

2.2 The vision statement

The following draft vision statement thus underlies the Management Framework:

> To manage Tokai and Cecilia into the future in terms of legal requirements, applicable policies and the lease agreement and to accommodate the conservation of biodiversity and heritage, development of eco-tourism opportunities and recreational activities.

The above broad vision statement identifies the following themes biodiversity, heritage, recreation, eco-tourism and management. A specific vision is formulated to achieve the desired state for each of the themes

1. Biodiversity

To manage and restore threatened and critically endangered vegetation types, not only for species conservation, but to sustain ecosystems (patterns and processes), linking different vegetation types from the mountain to the lowlands so as to achieve the national biodiversity goals and support the faunal species. To manage fire during the restoration

period as well as into future. To maintain systems in such a manner that risks to the urban environment is minimised.

2. Heritage
To conserve and celebrate the heritage of Tokai and Cecilia to link the precolonial past through the colonial past to the living history. The celebration of heritage should be used as a tool to inform and educate different groups of society to nurture an understanding of cultural differences and to link society to the Park.

3. Recreation
To continue to provide opportunities for urban recreational activities in a growing city to relieve pressure on high priority conservation areas. To manage recreational activities so as to minimise the risk of accidental fires and the impact of fire on recreational activities. To maintain Tokai and Cecilia as access points into the Park for various recreational activities.

4. Eco tourism and Economic development
To utilise and develop Tokai as a gateway to the Park by placing high-intensity opportunities in an identified visitor site and to channel access through this site, which holds the potential to serve as a catalyst for local job creation. To provide opportunities for local job creation through rehabilitation and operational functions..

5. Management and monitoring
To manage Tokai and Cecilia within their urban context and develop monitoring mechanisms in line with the Park Management Plan and CDF to ensure sustainability.

The implementation of this vision is detailed in Chapter 3, through the setting of more detailed objectives for each theme.

CHAPTER 3:OBJECTIVES

3.1 Biodiversity

The core objective of Cabinet, when assigning the Tokai and Cecilia plantations to SANParks, was to manage conservation-worthy land in the national interest. Key to' this biodiversity conservation mandate of SANParks, is the rehabilitation of threatened and endangered ecosystems. Biodiversity restoration is thus the underpinning objective informing the Management Framework proposals.

Various alternatives have been considered to balance the biodiversity restoration with other obligations of SANParks, such as recreation requirements and the conservation of heritage elements. The preferred option is based on the following priorities:

- restoration and management of riparian zones,
- restoration of the highly threatened sand-plain fynbos.
- restoration of the endangered Granite Fynbos
- re-establishment of Afromontane forest where viable and the
- creation of viable ecological corridors from the mountain to the lowland.

It is recommended that the clear-felling schedule be re-assessed in cooperation with MTO in 5-year intervals to create viable restoration "pockets". This re-assessment will assist in streamlining operational actions and align these actions with the financial system of SANParks.

The restoration of the lowland wetlands is important not only for ecosystem conservation but also in protecting the urban area against potential flooding during peak rainfall periods. As such, the restoration of the wetlands is a priority that needs to be undertaken prior to the harvesting of plantation compartments, as such harvesting may result in increased runoff.

The urban interface requires special attention as restoration of the area may have a significant impact on the surrounding area in terms of fire risk, visual impact and fauna distribution. In the case of Tokai, the interface can be described as an 'open area interface zone' to the north abutting mainly agricultural land and a 'built interface zone' to the south (Figure 1a). Where there is an 'open area interface zone', it is anticipated that less conflict will occur between the park area and the neighbours with regard to faunal encroachments. The fire risk to property and humans in these areas is also lower than at the "built interface zone" However, the risk of fire starting on open land spreading to the Park is potentially higher in the "open area zone" than in the 'built interface zone'. Rehabilitation of fynbos abutting the 'open area interface zone' would thus pose less threat than it would in areas abutting a 'built interface zone'. The principle is therefore to create firebreak zones along the 'built interface zone', which can in future accommodate urban recreation activities and provide the potential for planted landscapes. In the case of Cecilia, the interface is clearly demarcated by Rhodes Drive and can thus be dealt with as if it is an 'open area interface zone.'

The current studies on bird species and baboon troops will in future further inform the management of these species. Trends from the existing data indicate that habitat change should occur incrementally to allow the faunal species to adapt. For this reason, it is

proposed that these populations be monitored and if required, the felling schedule be reassessed in cooperation with MTO. As the plantations provide artificial habitats, it is anticipated that the faunal species will revert to utilising the indigenous vegetation, as they would have before the establishment of the plantations. The restoration of Afromontane forest must be prioritised to alleviate shortages of nesting and roosting sites.

Strategies to accommodate recreational activities are twofold. The first is to utilise restored areas, which provide shade (i.e. Afromontane forest, Arboretum). The second is to maintain "artificial" areas i.e. areas replanted and managed for the sole purpose of recreation. For this reason, areas have been identified for replanting of trees where trees would not naturally occur. Replanting can include indigenous species and/or exotic species. Where the term "replant" is used in this document it refers to planting trees after harvesting with the main objective to provide shaded areas for recreational purposes. The principle followed is that no invasive species must be planted and these areas should be managed as such to ensure shade, but also openness under the canopy for unrestricted movement and security. Annexure D provides guidelines for replanting of areas.

The following objectives have been identified in order to achieve the long-term biodiversity vision:

(a) Prioritise biodiversity conservation initiatives and establish requirements for each vegetation type.
(b) Ensure the maintenance of suitable habitat to sustain indigenous faunal populations.
(c) Minimise impact of fire on urban environment by creating firebreaks.
(d) Balance biodiversity conservation with other activities and obligations.
(e) Manage invasive alien fauna and flora.
(f) Link conservation initiatives to other conservation initiatives in the area to ensure ecologicall corridors.
(g) Undertake the necessary measures to restore wetlands to prevent erosion and flooding which may cause a threat to the urban area.

The strategies, actions and timeframes to implement the biodiversity objectives for Tokai and Cecilia are set out in section 4.1 of this report.

3.2 Heritage

There is a very strong and obvious link between the history of forestry and the colonial past at Tokai. Very few tangible precolonial elements exist. The Manor House precinct and in particular the old reformatory/jail provide the opportunity to revive strong social connections. Tokai as a place of social significance should be to linked to the wider Cape Town community through educational and economic opportunities. An immediate priority is, however, to restore elements of high significance to prevent further deterioration. One such element that needs urgent attention is the old reformatory/jail.

The plantation landscape is recognised in the Management Framework as a heritage element. The Management Framework will seek to conserve some elements of this landscape. It should, however, be realised that landscape is a dynamic feature. As the first forestry school in South Africa was located at Tokai, the history of forestry with specific reference to the forestry school should be told through information and interpretation material. The early colonial use of resources and the role that forestry played in both the

settlement in the Cape as well as conservation efforts of early generations should be captured in interpretation materials and displays at a museum .

Refer to Annexure A for a detailed assessment of the heritage significance and vulnerability of heritage elements in Tokai and Cecilia. The vulnerability and significance rating has been considered in preparing the recommendations made in the Management Framework. The goal is thus to introduce the celebration of heritage into the activities and economic endeavours in Tokai.

Very few heritage elements are left in Cecilia and the focus would be the plantation landscape. In the case of Cecilia, the visual impact of elements at the forest station and Rhodes Drive as a scenic route should be considered in future landscape proposal.

Based on the assessment and correlation with other objectives the following are regarded as the long-term heritage objectives for Tokai and Cecilia:

(a) Undertake more in-depth research to expand the knowledge base of the heritage and utilise the heritage resources of as an educational tool to communicate the significant role of the areas in our history.
(b) Celebrate heritage through interpretation opportunities.
(c) Promote and manage sensitive development of heritage resources and the surroundings in order to conserve heritage resources in Tokai.

The proposed strategies, actions and timeframes for these heritage objectives are set out in Section 4.2

3.3 Recreational Activities

In order to determine the future activities to be accommodated and areas to be allocated for these uses, the revised CDF, various Recreational Environmental Management programmes and current usage have been used as the main informants. . However this is not fixed and may change over time provided that the principles embedded in the CDF are adhered to.

It is proposed that the following recreational activities that currently occur in Tokai and Cecilia will be retained:
Tokai: Mountain biking, walking, hiking, walking with dogs, picnic, braai and horse riding.
Cecilia: Walking, hiking, walking with dogs and horse riding.

Areas and tracks will be earmarked for the different activities and a range of environments including shaded areas will be provided for. Although areas currently used may be rehabilitated, activities should not necessarily be excluded until alternatives areas have been made available. The Management Framework proposes the rationalisation of tracks in the upper areas of Tokai as well as in Cecilia so as to eventually reduce the number of tracks. No new activities have been introduced and no exclusions have been made from the current permitted activities. Applications for future recreational use will be considered in terms of the Parks EMP process. It would at that stage require an assessment of the requirements and impacts of the proposed activity and a decision should be based primarily on the appropriateness of the activity.

Based on the above, the following are proposed as the long-term recreational objectives for Tokai and Cecilia:

(a) Compare current vs. future zoning delineation to accommodate the different urban recreation activities and minimise conflict between activities
(b) Assess and rationalise the use of tracks
(c) Determine the spatial and management informants for the different recreational activities
(d) Link areas with park hiking trails and path system
(e) All recreational activities to be undertaken and managed in terms of applicable Recreational Environmental Management Programmes

The CDF has indicated that paint ball is not appropriate as a permanent activity and will only be allowed on a permit basis. Thus the area currently utilised for paint ball has been re-assigned and in future only events on a permit system will be allowed in designated areas.

The proposed strategies, actions and timeframes for these recreational objectives are set out in Section 4.3.

3.4 Ecotourism Development

The financial viability of the Park is an important objective. Financial viability allows for the creation of opportunities in the growing tourism industry with important local spin-offs such as job creation.

The assignment of Tokai and Cecilia to TMNP will allow for substantial investment into facilities, infrastructure and the environment. Funds have been secured for the upgrade of the proposed “Bosdorp” research centre (R2m) and the upgrade of Tokai Manor precinct (R8m). TMNP is submitting a further EPWP funding application, of which a large portion will be used for the rehabilitation of Tokai and Cecilia. The original EPWP funding grant secured R33m for the TMNP in 2003.

Various alternative economic opportunities as well as the potential spatial allocations of such ventures were considered. Ecotourism and recreational opportunities should be concentrated in a node as to minimise the footprint impact. Tokai and Cecilia are not considered suitable for providing substantial visitor accommodation and only the possible conversion of some of the existing houses for low key visitor accommodation (eg Wood Owl Cottage) should be considered.

The disturbed area where the field managers’ office and outbuildings are located, provides an appropriate opportunity to concentrate ecotourism activities and development, and also provides space for central access control and parking.

No major economic development is envisaged for Cecilia due to its difficult access and being a Park entry point for low intensity recreation activities.

The following objectives outline the potential economic and tourism development for Tokai:

(a) Seek to incorporate the Provincial owned Tokai Manor and outbuildings into the Park to serve as the Park Head Office

(b) Create a high-volume, mixed-use visitor site around Tokai Manor and consider alternative uses in the node to accommodate visitor needs, provide support services, establish a gateway to the park and create economic opportunities to facilitate job creation
(c) Rationalise and audit all infrastructure to the financial benefit of SANParks.
(d) Evaluate all economic initiatives appropriate to Tokai and Cecilia which will generate income to contribute to the Park's financial sustainability.

The proposed strategies, actions and timeframes for these economic development and tourism objectives are set out in Section 4.4

3.5 Management and monitoring

In order to achieve the objectives set for biodiversity, heritage, recreation and eco-tourism and development themes, certain management and monitoring actions should be undertaken.

The objectives identified for the themes can only be achieved through effective management and it is important that SANParks explore partnerships to supplement both the financial and operational management of Tokai and Cecilia. The area provide economic, societal and academic opportunities which is necessary in establishing such partnerships.

The following objectives pertaining to management and monitoring goals have been identified:

(a) Undertake visitor surveys to inform recreational use areas and management programmes, visitor satisfaction, etc.
(b) Monitor visitor behaviour, operational activities and rehabilitation initiatives to assess progress on achieving goals
(c) Establish public private partnerships and social partnerships to support the Management Framework objectives
(d) Establish a research unit and links with research institutions and undertake focused research to inform future management decisions with regard to Tokai and Cecilia
(e) Reinforce and supplement current communications system with the public regarding harvesting and other initiatives
(f) Ensure safety of visitors through access and management measures
(g) Clean up areas for example areas used for forestry operations and residential purposes. Implement appropriate signage

CHAPTER 4:STRATEGIES, ACTIONS AND TIMEFRAME

4.1 Biodiversity

Objective 3.1(a). Prioritise biodiversity conservation initiatives and establish requirements for each vegetation type

Strategy/actions	**Tokai Cecilia**	**Current to 5 years 2006–2010**	**To 10 years 2011–2015**	**To 15 years 2016–2020**	**To 20 year + 2021 onwards**
Establish restoration goals for critical endangered sand-plain fynbos	Tokai	• Current indication is that 30 ha have to be restored in total to be sustainable. Areas of priority are those with highest rehabilitation potential linked to plantations to be harvested within this cycle. Compartments to be rehabilitated are as per Figure 1a. • Secure urban perimeter in terms of fire threat.	• Compartments to be rehabilitated as per figure 1b. • Consider active restoration where not enough seeds remain in seed banks as per guidelines in Annexure B.	• Maintain and assess against latest national targets. If need be, adjust management practices or spatial extension.	• Maintain and monitor.
Design guidelines for most effective restoration practices for sand-plain fynbos	Tokai	• Refer Annexure B for preliminary guidelines. • Implement guidelines and monitor progress.	• Refine guidelines and implement.	Refine guidelines and implement.	Refine guidelines and implement.
Engage in restoration and conservation of Afromontane forest	Tokai Cecilia	• Remove invasive alien vegetation in river corridors as indicated in Figures 1a and 6a. • Enforce environmental guidelines on MTO to clear compartments, 25 m from rivers and streams.	• Identify areas for restoration. • Plant trees in identified areas.	• Continue restoration through planting.	• Monitor progress and reassess actions. • Continue replanting where necessary.

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
		• Submit EPWP project proposal for extension of seed collection and tree planting programme to Tokai and Cecilia. • Link seed collection specifically from Tokai and Cecilia areas to Newlands nursery. • Map potential forest rehabilitation areas.			
Establish goals for endangered Granite fynbos	Tokai Cecilia	• Determine and map areas with high rehabilitation priority.	• Utilise as biological corridor and rehabilitate identified corridors to link mountain to lowlands.	• Rehabilitate corridors.	• Reassess replanting of shaded areas vs. rehabilitation for compartments replanted in first 5 years and those to be harvested in 20-year period.
Rehabilitate freshwater systems of Prins Kasteel and Keyser rivers	Tokai	• Identify priority wetlands and watercourses as part of the corridor system, Figure 1a. • Remove alien vegetation from the wetlands and watercourses. • Link wetland with the city open-space system and storm water system, Figure 1a. • Undertake storm water study to assess impacts of increased runoff, especially peak runoff.	• Implement recommendations of storm water study. • Expand wetland areas. • Implement monitoring system/indicators to determine progress of ecological system. • Invite research institutions to undertake specie surveys on an ongoing basis and submit this data into IEMS. • Continue source to sea	• Continue Source to Sea action plan.	• Continue Source to Sea action plan.

Strategy/actions	**Tokai Cecilia**	**Current to 5 years 2006–2010**	**To 10 years 2011–2015**	**To 15 years 2016–2020**	**To 20 year + 2021 onwards**
		• Implement the Source to sea Action plan.	action plan.		
Rehabilitate freshwater systems in Cecilia	Cecilia	• Remove alien vegetation from the watercourses. • Link freshwater system to city open space, Figure 6a. • Use Source to Sea study as guideline.	• Implement monitoring system/indicators to determine progress of ecological systems.	• Continue rehabilitation and maintenance. • Monitor and Audit.	• Continue rehabilitation and maintenance. • Monitor and audit.
Establish indicators to monitor restoration of sand-plain fynbos, freshwater systems, Afromontane and Granite fynbos	Tokai	• Develop indicators.	• Use indicators to monitor and refine if necessary. • Adjust management interventions where necessary.	• Implement, monitor and audit.	• Implement, monitor and audit.
Ensure restoration initiative support establishment and maintenance of ecological corridors	Tokai Cecilia	• Ensure that above actions are coordinated to support the establishment of ecological corridors	•	•	•

Objective 3.1 (b) Ensure the maintenance of suitable habitat to sustain indigenous faunal populations

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
Manage the impacts of restoration on the baboon troops	Tokai	• Obtain final study currently underway to fully understand current patterns. • Continue monitoring of the troops to establish change in patterns and potential conflict with urban areas. • Implement Baboon Monitoring Management programme.	• Undertake regular surveys to determine changes in behaviour and patterns.	• Monitor and reassess management actions if necessary.	• Monitor and reassess management actions if necessary.
Monitor avian changes	Tokai Cecilia	• Encourage the raptor research programme to continue to establish impact of landscape change on behaviour and distribution. • Undertake bird survey and encourage volunteers or friends groups to undertake as long-term project to establish database of birds over a longer period of time. • Research historical distribution ranges of species before the introduction of plantations.	• Undertake regular surveys to monitor species and patterns.	• Monitor and audit.	• Monitor and audit.

Survey and monitor other faunal species in the areas	Tokai Cecilia	• Initiate regular report or survey of fauna. • Establish reporting system for surrounding residents for any animals, which venture into the urban area. • Develop guidelines and measures to discourage animals from entering the urban area. • Develop response protocols for problem animals.	• Undertake research into the possible re-establishment of fauna species. • Monitor impact of recreational activities on fauna.	• Implement recommendations of the reintroduction report.	• Monitor and audit.
Encourage fauna research	Tokai Cecilia	• Approach research institutions to undertake fauna research to assist Park management in management decisions and monitoring system.			

Objective 3.1 (c) Minimise impact of fire on urban environment by creating firebreaks

Strategy/actions	**Tokai Cecilia**	**Current to 5 years 2006–2010**	**To 10 years 2011–2015**	**To 15 years 2016–2020**	**To 20 year + 2021 onwards**
Correlate felling schedule with rehabilitation actions and planned and prescribed burns	Tokai Cecilia	• Agree 5-year felling and burning schedule with MTO and reassess annual felling dates accordingly. • Implement guidelines for cleared compartments not to be burned immediately according to Annexure B..	• Monitor and audit.	• Monitor and audit.	• Monitor and audit.
Protect the urban interface according its characteristics	Tokai Cecilia	• For urban interface zones (Figures 1a, 6a) ensure that firebreaks are maintained and where planted, these areas are kept clear of fuel load. • Gain Peninsula FPA approval for proposed firebreak network • For natural interface areas communicate potential fire risk from these areas into the Park with landowners and educate owners to minimise the risk.			

		• Implement the Park's fire management plan. • Establish communication between adjoining landowners and Tokai area management as to ensure quick response and advisory service. • Support the Fire Mgt guidelines in terms of the city of Cape Town Urban Edge study.

Objective 3.1 (d) Balance biodiversity conservation with other activities and obligations

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
Implement Management practices to reduce the impacts of recreational activities on conservation and rehabilitation areas. .	Tokai Cecilia	• Communicate the delineation and codes of conduct of activities to the public. • Improve signage to ensure that users implement measures to protect restoration areas against inappropriate use.	• Relocate recreation areas as rehabilitation proceeds as to ensure integrity of restoration areas. • Use visitor survey to establish recreational requirements and determine areas required to accommodate these activities.	• Monitor and audit.	• Monitor and audit.

Objective 3.1 (e) Manage invasive alien fauna and flora

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
Prioritise clearing initiatives and align with current initiatives	Tokai Cecilia	• Undertake the removal of invasive alien vegetation in the river corridors. • Remove saplings from clear felled areas. • Ensure MTO removes listed alien species in lease areas	• Continue clearing of river corridors. • Remove saplings from clear felled areas. • Remove all invasive plant species, which are not plantations, firebreaks or of historical significance • Ensure MTO removes	• Remove saplings from clear felled areas. • Remove all invasive plant species, which are not plantations, firebreaks or of historical significance. • Ensure MTO removes listed alien species in lease areas	• Remove saplings from clear felled areas. • Remove all invasive plant species, which are not plantations, firebreaks or of historical significance. • Ensure MTO removes listed alien species in lease areas

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
			listed alien species in lease areas ..		
Manage alien fauna	Tokai Cecilia	• Identify any invasive fauna species and design project to remove them	• Identify any invasive fauna species and design project to remove them	• Identify any invasive fauna species and design project to remove them	• Identify any invasive fauna species and design project to remove them
Ensure that MTO abide by their management plan	Tokai	• Arrange regular site inspections with MTO to ensure compliance. • Strengthen communication to ensure that public comments in this regard are dealt with adequately. . .			

Objective 3.1(f) Link conservation initiatives to other conservation initiatives in the area to ensure ecological corridors

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
Establish management agreement with the City of Cape Town, SANBI and other institutions involved in conservation	Tokai	• Identify current conservation projects in the areas and determine the relevance to Tokai and Cecilia or visa versa. • Communicate initiative with affected private landowners and obtain their involvement/support.	• Coordinate conservation efforts as to minimise conflicts and maximise efforts.	• Coordinate conservation efforts as to minimise conflicts and maximise efforts	• Coordinate conservation efforts as to minimise conflicts and maximise efforts

Objective 3.1(g) Undertake the necessary measures to prevent erosion and flooding causing a threat to the urban area

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
Ensure integrity of cleared compartments	Tokai Cecilia	• For each compartment cleared measures should be taken to prevent erosion of that specific compartment by using felled material. • Negotiate felling dates with MTO to ensure that sufficient time is available after harvesting to implement measures before peak rain seasons.	• For each compartment cleared measures should be taken to prevent erosion of that specific compartment by using felled material. • Negotiate felling dates with MTO to ensure that sufficient time is available after harvesting to implement measures before peak rain seasons.	• For each compartment cleared measures should be taken to prevent erosion of that specific compartment by using felled material. • Negotiate felling dates with MTO to ensure that sufficient time is available after harvesting to implement measures before peak rain seasons.	• For each compartment cleared measures should be taken to prevent erosion of that specific compartment by using felled material. • Negotiate felling dates with MTO to ensure that sufficient time is available after harvesting to implement measures before peak rain seasons.
Ensure that sufficient retention facilities exist to manage peak flow events	Tokai	• Hydrology study to inform volume of wetland to be rehabilitated.	• Prioritise wetland restorations to serve as retention for peak flow events.	• Monitor and audit.	• Monitor and audit.

4.2 Heritage

Objective 3.2(a) Undertake more in-depth research to expand the knowledge base of the heritage and utilise the heritage resources as an educational tool to communicate the significant role of the areas in our history.

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
Undertake research into precolonial and colonial history to understand its significance	Tokai Cecilia	• Request research institute to undertake research as to broaden knowledge but also to inform interpretation. • Acknowledge precolonial and colonial history through the provision of interpretation but also opportunities for celebration of life ..	• Ongoing research. • Review and update interpretation material.	• Ongoing research. • Review and update interpretation material .	• Ongoing research. • Review and update interpretation material.
Develop forestry museum	Tokai	• Utilise current tearoom to develop interpretation centre for forestry industry. • Develop interpretation material.			

Objective 3.2(b) Celebrate heritage through interpretation opportunities.

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
Establish opportunities for different heritage components to "meet" in the Manor House precinct	Tokai	• Develop living museum displaying all heritage and interpretation of the sites history. • Encourage economic opportunities in tourism to celebrate history e.g. selling of medicinal plants, mule wagon trips and local guides for heritage routes. • Allow events displaying current heritage e.g. shows, theatre and concerts.			

Objective 3.2(c) Promote and manage sensitive development of heritage resources and the surroundings in order to conserve heritage resources in Tokai.

Strategy/actions	**Tokai Cecilia**	**Current to 5 years 2006–2010**	**To 10 years 2011–2015**	**To 15 years 2016–2020**	**To 20 year + 2021 onwards**
Prioritise restoration of heritage elements based on their significance and current status and conditions	Tokai Cecilia	• Use heritage assessment (Annexure A) to establish conservation priorities. • Assess current use of heritage elements and determine potential future use to conserve but also celebrate the specific elements. • Draft area specific management guidelines for specific heritage elements.	• Implement conservation plan.	• Monitor and audit.	• Monitor and audit.
Establish the heritage vulnerability of the Cecilia forest station to removal	Cecilia	• Maintain buildings in use. • Remove buildings no longer in use. • Remove infrastructure, no longer in use. • Implement landscape guidelines to counter visual impacts..	• Reassess use of buildings and remove any buildings not linked directly to the management of Cecilia.	• Restore areas where buildings and infrastructure have been removed as to decrease impact footprint.	• Only maintain infrastructure critical in managing Cecilia. • Rehabilitate areas where buildings and infrastructure have been removed.
Consider community involvement in creating opportunities to nurture an	Tokai	• Provide space for cultural performances. • Train local people to provide story telling and cultural events.	• Provide space for cultural performances. • Train local people to provide story telling and cultural events.	• Provide space for cultural performances. • Train local people to provide story telling and cultural events.	• Provide space for cultural performances. • Train local people to provide story telling and cultural events.

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
understanding for different cultures.					
Create natural resource harvesting opportunities	Tokai	• Determine the viability of harvesting and maintaining the buchu plantation. • Demarcate the buchu plantation and draft management plan for harvesting. • Identify other natural resources with economic value and design job creation projects.	• Identify groups/individuals to undertake management and harvesting of buchu plantation and/or other resources as an economic venture but related to Tokai tourism development.	• Identify groups/individuals to undertake management and harvesting of buchu plantation and/or other resources as an economic venture but related to Tokai tourism development.	• Identify groups/individuals to undertake management and harvesting of buchu plantation and/or other resources as an economic venture but related to Tokai tourism development.
Redevelop the Manor House precinct	Tokai	• Prepare a detailed precinct plan for the Manor House precinct, which include the Manor house, the old reformatory jail and the outbuildings. • Compile Heritage Conservation plan for the Manor house precinct. • Phased implementation of Conservation Heritage Plan and precinct plan.	• Implement the heritage Conservation plan. • Remove all inappropriate buildings from the precinct.	• Maintenance programme	• Maintenance programme
Prevent deterioration of old Reformatory jail	Tokai	• Remove all inappropriate uses from the Reformatory jail. • Clear site. • Secure structural	• Restore and renovate building according to intended future use.	• Maintenance programme	• Maintenance programme

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
		integrity. • Undertake detail assessment of potential use of the building.			
Compile a conservation management plan for the declared heritage sites	Tokai	• Compile CMP for the Manor House precinct, arboretum, trees of heritage significance.	• Implement CMP	• Implement CMP	• Implement CMP

4.3 Recreational Activities

Objective 3.3(a) Compare current vs. future zoning delineation to accommodate the different urban recreation activities and minimise conflict between activities

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
List the recreational activities and compare their requirements	Tokai Cecilia	• Map areas used for different activities and illustrate future use areas, Figures 2 and,7). • Implement Recreational Environmental Management Programmes as valid for the rest of the Park.	• Undertake visitor survey to inform further management decisions on recreational areas. • Reassign recreational areas according tovisitor survey and other inputs. • Assess suitability of any new activity requests.	• Monitor and manage activities.	• Undertake visitor survey to establish recreational requirements. • Reassign recreational areas according visitor survey.
Provide picnic and braai facilities at Tokai in appropriate areas on a phased basis.	Tokai	• Demarcate area to continue to be used for picnicking and identify new area. • Investigate safety of trees in current picnic area and assess most appropriate felling time. • Phase out picnic area to be closed and phase in new picnic/braai area. • Undertake upgrade of new picnic area as per Figure 1a by pruning trees, rationalising and upgrading braai facilities, upgrading ablution facilities, improving access.	• Assess safety of trees and determine appropriate felling time and replanting. • Undertake upgrading of facilities in replanted area.	• Assess safety of trees and determine appropriate felling time and replanting. • Undertake upgrading of facilities in replanted area.	• Assess safety of trees and determine appropriate felling time and replanting. • Undertake upgrading of facilities in replanted area.
Provide range of	Tokai	• In conjunction with the	• Compile operational	• Monitor and audit.	• Monitor and audit.

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
mountain biking opportunities		mountain biking clubs, design a course for children in lower Tokai in close proximity to the picnic area. • In conjunction with the mountain biking clubs, identify an appropriate site for a skills course..	environmental management plan for monitoring mountain biking tracks and courses.		

Objective 3.3(b) Assess and rationalise the use of tracks

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
Rationalise tracks	Tokai Cecilia	• Assign certain tracks to specific activities so as to prevent conflict areas, Figures 2 & 7. • Reduce vehicle tracks to single tracks where possible.	• Develop monitoring system to ensure the environmental integrity of tracks. • Reassess the use of tracks and amend if necessary. • Remove duplicate tracks.	• Monitor and maintain.	• Monitor and maintain.

Objective 3.3(c) Determine the spatial and management informants for the different recreational activities.

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
Compare requirements of different activities	Tokai Cecilia	• Draw table comparing informants for different activities in order to establish spatial requirements as per guidelines (Annexure E)	• Reassess informants and amend areas. • Re-establish shaded areas as plantations are harvested.	• Reassess informants and amend areas. • Re-establish shaded areas as plantations are harvested.	• Reassess informants and amend areas. • Re-establish shaded areas as plantations are harvested.

Objective 3.3(d) Link areas with park hiking trails and path system.

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
Link hiking trails	Tokai Cecilia	• Earmarked routes that give access to hiking trails in Silvermine and Constantia. Provide access routes through Tokai and Cecilia to these routes.	• Earmarked routes that give access to hiking trails in Silvermine and Constantia. Provide access routes through Tokai and Cecilia to these routes.	• Earmarked routes that give access to hiking trails in Silvermine and Constantia. Provide access routes through Tokai and Cecilia to these routes.	• Earmarked routes that give access to hiking trails in Silvermine and Constantia. Provide access routes through Tokai and Cecilia to these routes.
Link mountain biking routes.	Tokai	• Link MB routes in Tokai to the Silvermine routes.	• Link MB routes in Tokai to the Silvermine routes.	• Link MB routes in Tokai to the Silvermine routes.	• Link MB routes in Tokai to the Silvermine routes.

Objective 3.3(e) All recreational activities to be undertaken and managed in terms of applicable Recreational Environmental Management Programmes.

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
Introduce existing EMPs into the area	Tokai Cecilia	• Revised current TMNP EMP's to accommodate Tokai and Cecilia recreational activities • Communicate the implementation of the EMP to the user groups	• Update or supplement EMPs should it require area specific stipulations	• Update or supplement EMPs should it require area specific stipulations	• Update or supplement EMPs should it require area specific stipulations

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
		• Implement the revised EMPs			
Compile EMPs for activities currently not managed under EMPs	Tokai	• Identify activities currently not covered and initiate drafting of such EMPs .	• Identify activities currently not covered and initiate drafting of such EMPs .	• Identify activities currently not covered and initiate drafting of such EMPs .	• Identify activities currently not covered and initiate drafting of such EMPs .

4.4 Ecotourism development

Objective 3.4(a) Seek to incorporate the Provincial owned Tokai manor and outbuildings into the Park to serve as the Park Head Office.

Strategy/actions	Tokai Cecilia	Current to 5 years 2006–2010	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
Negotiate with PAWC to secure the Manor House for TMNP headquarters.	Tokai	• Secure land availability agreement. • Secure funds to upgrade Manor House from DEAT Infrastructure funding programme. • Appoint Conservation Architect and Landscape Architect to prepare upgrade plans. • .	• Implement development proposals in line with par 4.2 (heritage). • Implement building, infrastructure and landscape plans	• Maintain and monitor	• Maintain and monitor

Objective 3.4(b) Create a high-volume, mixed-use visitor site around Tokai Manor and consider alternative uses in the node to accommodate visitor needs, provide support services, establish a gateway to the park and create economic opportunities to facilitate job creation.

Strategy/actions	Tokai Cecilia	Current to 5 years • 2006–2010	To 10 years • 2011–2015	To 15 years • 2016–2020	To 20 year + • 2021 onwards
Undertake precinct planning and development of visitor site.	Tokai	• Demarcate visitor site “development area” as per Figure 4. • Prepare precinct plan. • Initiate phased implementation of the precinct plan.	• Investigate public private partnerships for development. • Implement precinct plan. • Upgrade or realign vehicle access according to alternatives (par 5 and figure 5).. • Create central parking areas and prevent visitor vehicle access above Tokai Manor House.	• Implement precinct plan. • Compile management plan for precinct to monitor impacts.	• Monitor and audit.
Require local procurement with	Tokai		• In allocating development		

training spin-offs when developing the visitor site			opportunities ensure local involvement as to support local job creation.		

Objective 3.4(c) Rationalise and audit all infrastructure to the financial benefit of SANParks.

Strategy/actions	Tokai Cecilia	Current to 5 years • **2006–2010**
Prepare audit of existing facilities	Tokai Cecilia	• Refer to facility Tables 1, 2 for detail actions required. • Assess lease agreements and enter into negotiations with lessors or cancel contracts where facilities will be reassigned.

Objective 3.4(d) Evaluate all economic initiatives appropriate to Tokai and Cecilia which will generate income to contribute to the Park's financial sustainability.

Strategy/actions	Tokai Cecilia	Current to 5 years • **2006–2010**	To 10 years 2011–2015	To 15 years 2016–2020	To 20 year + 2021 onwards
Utilise the rehabilitation of Tokai and Cecilia plantations as an opportunity for job creation and training.	Tokai Cecilia	• Apply for funding and implement programmes such as WfW, EPWP and initiatives such as forest rehabilitation, footpath maintenance program etc • Expand the EPWP poverty relief programme to Tokai and Cecilia for footpath maintenance, access point upgrade, disused infrastructure removal etc	• Apply for funding and implement programmes such as WfW, EPWP and initiatives such as forest rehabilitation, footpath maintenance program etc • Expand the EPWP poverty relief programme to Tokai and Cecilia for footpath maintenance, access point upgrade, disused infrastructure removal etc	• Apply for funding and implement programmes such as WfW, EPWP and initiatives such as forest rehabilitation, footpath maintenance program etc • Expand the EPWP poverty relief programme to Tokai and Cecilia for footpath maintenance, access point upgrade, disused infrastructure removal etc	• Apply for funding and implement programmes such as WfW, EPWP and initiatives such as forest rehabilitation, footpath maintenance program etc • Expand the EPWP poverty relief programme to Tokai and Cecilia for footpath maintenance, access point upgrade, disused infrastructure removal etc

4.4.1 Tokai

Table 1: Tokai infrastructure and facilities:

Facility and current use	**Current civil infrastructure**				**Potential future use & upgrade**
	Storm water	**Water**	**Sewage**	**Electricity**	
Tokai Manor House Private lease	Channels & limited piping onto soft area into river north of house	Municipal supply	Porter gravity linked into municipal system	ESKOM (Mains from Porter School distributed to plantations)	TMNP head office Upgrade building and outbuildings Landscape, upgrade electricity and link to City grid.
Forestry operational centre SANParks office, outbuildings, stables					This area with the Manor House to be developed into a visitor site(Figure 4 (see below for details)
Tea room (leased to operator)	No formal	Fire water reservoir/ Brand Dam	Conservancy/septic tanks	Ditto	Convert tearoom into interpretation/education facility. Relocate tearoom in central visitor site. Possible expansion of arboretum when parking is relocated.
Forestry housing Private leases	No formal	Fire water reservoir/ Brand Dam	Conservancy/septic tanks	Ditto	Recreation activities operation centres, staff accommodation, operational offices, corporate conference facilities, Volunteer facilities

Facility and current use	**Current civil infrastructure**				**Potential future use & upgrade**
	Storm water	**Water**			
Bosdorp Working for Water administration Private lease for residences	Ditto	Plantation Reservoir	Ditto	Ditto	Research facility with staff accommodation, upgrade electricity, and sewer.
Picnic area	Ditto	Municipal	Ditto	Ditto	Phased realignment, Upgrade ablutions, Braai facilities etc.
Wood Owl Guest house		Brand Dam	Ditto	Ditto	Retain
Staff house		Plantation reservoir	Ditto	Ditto	Staff accommodation, tourism accommodation
Orpen Road house Private lease					Rehabilitation centre Staff accommodation Demolish Commercial opportunities
Fire reservoirs					Retain

4.4.1.1 Tokai Manor Precinct:

Tokai Manor precinct is designated as a high volume, mixed use visitor site in the revised TMNP CDF. Such sites have potential to enhance their current role, existing facilities should be rehabilitated and upgraded and investigations carried out inot possible new facilities that enrich the visitor's experience and enhance the site's carrying capacity. High volume visitor sites should accommodate over 100,000 visitors a year.

The purpose of the Tokai Manor precinct visitor site is to provide for recreational activity support services, tourism opportunities and facilities from where activities will radiate into the Park. The intention is that this node can accommodate the following:

Table 2: Tokai Manor precinct

- Park headquarters
- Tearoom/restaurant
- Information, interpretation kiosks and displays
- Parking
- Curio shop
- Tourism activity, operator-specific to Tokai area e.g. guided hiking, guided cultural walks, mountain biking trips, bicycle hire, etc.
- Central amphitheatre for events
- Living museum
- Gateway to the park

4.4.2 Cecilia

Table 3: Cecilia infrastructure and facilities

Facility	Water	Sewage	Potential future use
Forester house Timber house Office (new) Office (old) Blacksmith store Fuel store Fire store Mule stables	Municipal and plantation reservoir	Soak away	Remove all vacant buildings, only retain necessary staff accommodation
Rhodes Drive cottage	Reservoir	Ditto	Staff accommodation
Reservoirs (x2)			Retain

4.5 Management and monitoring

4.5.1 Visitor surveys:

Undertake visitor surveys every five years to correspond with the management program. The surveys should investigate inter alia the number of recreational activity users as well as the requirements as to establish any changes in trends, which would require change in management or spatial delineation. Surveys should correspond with the TMNP visitor and use survey. Once the visitor node has been established the survey should also include tourism numbers and perceptions.

4.5.2 Monitoring and auditing

A monitoring and auditing system should be implemented to assess progress and impacts of rehabilitation, recreational activities, operational activities and tourism. A set of indicators should be designed, which are easy to measure and administer by field staff.. Audits should be undertaken at least on a 5-year cycle.

4.5.3 Partnerships

TMNP should explore the potential engagement with partners to support not only financial but also operational sustainability of the areas.

Restoration provides the perfect opportunity to be linked operation to the research centre and other research institutions. Partnerships with the private sector to undertake ecotourism developments in the visitor node should be encouraged. Local interest groups NGO's, Friends groups, volunteers, etc. should be involved in all sectors as to supplement the capacity of SANParks and develop societal support.

4.5.4 Research and Research Centre

The rehabilitation of Tokai and Cecilia provides a perfect opportunity to broaden knowledge with regard to restoration of these habitats. Other research and academic institutions should be encourage to undertake research project which would be relevant to the management of the Park as to further inform management decision by SANParks.

The development of a SANParks research centre to focus research in the Cape Floral Kingdom should be supported. An appropriate site an internal assessment was undertaken by SANParks to identify an appropriate site for the research centre. The old "Bosdorp" opposite the Tokai picnic area was selected as the most appropriate site. Funds have been secured from the DEAT infrastructure funding programme for the initial upgrade of this facility in order to accommodate SANParks researchers and visiting scientists.
The following actions should be implemented:

- Prepare phased upgrade design plan for Bosdorp.
- Implement second phase to upgrade accommodation

4.5.5 Public communication

The intended harvesting of specific compartments should be clearly communicated by SANParks and MTO, to the public prior to clearing commences.

4.5.6 Visitor safety

Recreational areas have been designed in such a manner that spatial arrangements attempt to improve security. Signage and other measures should be implemented to ensure visitor safety. Information about safety measures should be communicated to

visitors through signage and brochures. The visitor safety and security plan of the Park is to be expanded to Tokai and Cecilia.

4.5.7 Clean-up of site

- Remove infrastructure in both Tokai and Cecilia, which have fallen into disuse. An audit of disused infrastructure should be compiled and a removal plan prepared.
- The gardens of some of the houses overlap into the natural areas and these need to be cleaned up and garden areas must clearly demarcated and controlled for as long as they continue to exist.
- All waste and rubble is to be removed.
- All outdated signage should be replaced with correct TMNP signage.

CHAPTER 5:SPATIAL PROPOSALS

5.1 CDF zoning

The revised CDF is an important informant to formulate the vision for Tokai and Cecilia as stated in Chapter 1. The CDF proposals have been translated to a landscape and site level by applying the appropriate zonings as illustrated in figures 3 and 8. The previous (2001) and recent draft CDF indicated the lower sections of Tokai as Low Intentisy leisure. Based on the detail landscape and use recommendations in this draft Management Framework, the zoning has been changed.

In terms of the revised CDF, the remote zone is on of relative solitude and wilderness, away from the city and requiring more physical exertion to reach. The Quiet zone is a natural place for relaxation, within the sights and sounds of the city, requiring some physical exertion to reach.

In both Tokai and Cecilia the contour level up to which casual, low energy recreation is exercised (e.g. casual walk with your dog, leisurely walk, leisurely horse riding), is proposed as the boundary between the quiet and remote zones. In the case of Tokai, indications are that the level 2 road represents this boundary and in the case of Cecilia the road from the parking area to just below the forest station towards the Constantia Nek entrance is the approximate level for such leisurely activities. The slopes above these identified levels require more effort to reach and thus, activities associated with this level of effort, would occur here. In terms of the revised CDF these type of activities are associated with the remote zone.

The proposed 'Bosdorp' research centre and accommodation fall into the Low intensity leisure zone. Manor House precinct including the , current offices and outbuildings and picnic area will zoned for Low Intensity leisure.

The CDF provides for visitor sites of various nature and the most appropriate categories has been applied to Tokai and Cecilia. In the case of Tokai the following visitor sites have been identified:

- Picnic site in Tokai to include the future proposed picnic area as per Figure 1a.
- Mixed use Visitor site to include the proposed TMNP head quarters (Manor House precinct), the research centre and the proposed visitor node in Tokai.
- The Tokai Manor precinct and the main access point to Cecilia namely off Rhodes Drive are designated as Park Entry Points in the CDF.
- There are numerous other lower volume access points to both Tokai and Cecilia.

5.2 Landscape

The Landscape plans indicate the envisioned landscape proposals at the end of the respective 5-year phases.
The outline below is a brief description of the main actions in each 5-year phase for Tokai and Cecilia as illustrated in the accompanying figures 1a to 1d for Tokai and figures 6a to 6d for Cecilia. These should be read in conjunction with the detailed management actions in Chapter 4 as well as Figures 2 and 7 illustrating the recreational areas.

5.2.1 Tokai Landscape Proposals

Figure 1a: Broad landscape proposals up to 2010 (current till end of 2010)
- Initiate the rehabilitation of Sandplain fynbos in the compartments to be cleared in the lower plantations.
- Initiate clearing of alien vegetation from watercourses in accordance with the Source to Sea project proposals.
- Clearing of trees in the lower section of the picnic area due to the danger posed by their age. Simultaneously upgrade the area north of the river to replace the area cleared (on the plans indicated as “new picnic area”).
- Demarcate the visitor node, secure the Manor House and commence with the upgrade of the area.

Figure 1b: Broad landscape proposals up to 2015 (2011 to 2015)
- Expand the rehabilitation of Sandplain fynbos as most of the plantations in the sand plain area would be harvested in this phase.
- Initiate the rehabilitation of Granite fynbos to the southeast of the Arboretum to initiate the establishment of the biological corridor.
- Undertake the restoration of Afromontane forest based on detailed study to indicate appropriate locations there of.
- Undertake the development of the visitor node and assess the need to change the access route.
- Implement the Source to Sea action plan to rehabilitate the freshwater systems.

Figure 1c: Broad landscape proposals up to 2020 (2016 to 2020)
- Continue rehabilitation as plantations are harvested as well as the implementation of Source to Sea action plan.
- Continue rehabilitation of Afromontane forest to expand shaded areas for recreational activities.

Figure 1d: Broad landscape proposals up to 2025 (2021 to 2025)
- The plan indicate the 20 year vision for Tokai. By this time it is envisaged that the hard boundaries of the plantation compartments will begin to disappear and a more natural landscape would have evolved.
- The remaining lower plantations will be harvested in this period and a reassessment should be made whether to replant for recreational purposes or to rehabilitate.
- At this stage it is envisaged that a functioning ecological corridor links the mountain to the lowland.
- Furthermore it is envisaged that the riparian zones are linked into the downstream freshwater systems to serve as natural corridors.
- Tokai be fully incorporated into the TMNP systems

5.2.2 Cecilia Landscape proposals

Figures 6a to 6d indicate how the landscape in Cecilia will change over the next 20 year period as the plantations are harvested. The harvesting in Cecilia is scheduled to be cleared from the upper slopes downwards with the rehabilitation of fynbos and Afromontane forest where appropriate. Figures 6a to 6d indicate areas most probably suitable to accommodate Afromontane forest although there will be site variations locally. These Afromontane forest will create new shaded areas. It is proposed that the lower slopes of Cecilia remain planted however older trees may need to be replaced to ensure continuation ofshaded landscapes.

Riparian zones should be cleared in the first 5-year phase and rehabilitation should continue to establish healthy freshwater corridors leading into the city.

5.3 Recreational Activities

Figures 2 and 7 indicate the areas and routes to be utilised for recreational purposes for Tokai and Cecilia respectively. A brief description of what areas and tracks can be utilised for the different recreational activities follow. These plans should be read with paragraphs 3.3 and 4.3.

5.3.1 Tokai recreational activities

The existing service road leading to the masts should be retained as a "multi-purpose spine". This route will be used by vehicles (with a permit) for management and maintenance purposes but also serve as a main distributor for all the other recreational activities such as mountain biking and horse riding. Individual, activity-specific routes will turn off this spine into loops back to the Visitor site or linking onto other routes toward Constantiaberg or Silvermine. The proposed routes for the different activities are colour code on the plan.

The Level 2 Road (indicated in pink on figure 2) should serves as a secondary 'spine' and represents the upper level of leisurely activities. Only MTO and SANParks vehicles will be allowed on this route for operational and management purposes. This secondary 'spine' will accommodate walking/hiking and horse riding, but not mountain biking.

Links are provided for both hiking trails and mountain biking (Level 5 Road as indicated in purple on figure 2) to the Silvermine routes.

The long term vision is that any routes not designated for recreational activities or required for management purposes, be phased out. The option should however remain to keep some routes as alternative options for future use. Routes not required for management purposes should be downgraded to single tracks i.e. not suitable for vehicles, so that the visual impact can be reduced.

In the lower section of Tokai specific routes are not demarcated at this stage. Recreational activities will continue in the plantations as is currently the situation. Tracks/paths to accommodate walking, dog walking and horse riding will be established in compartments harvested and rehabilitated. Clear management guidelines will apply in these areas to prevent damage to the rehabilitated areas. Figure 2 indicates the proposed use of areas in the long term.

5.3.2 Cecilia Recreational areas

The long term proposal for recreational use is indicated in Figure 7. It is proposed that the current activities permitted in Cecilia continue to be permitted subject to re-evaluation at the end of each 5-year phase. The red lines indicate existing routes to remain as multi-purpose routes accessible by vehicle for management purposes. The routes indicated in yellow are intended for hiking and are to be reduced to single tracks. Links to hiking trails to other sections of the Park is retained.

5.4 Access alternatives for Tokai

Access to Tokai has been problematic during peak visiting times/events, creating problems for management, surrounding neighbourhoods and visitors. The following alternatives are proposed and need to be assessed during the planning of the Tokai visitor site.
See Figure 5 for potential alignment proposals.

Alternative 1:

	Advantages	Problems/challenges
Retain existing access via Tokai Road but assess need to upgrade traffic circle at the Orpen Road intersection and widen after Zwaanswyk turn-off to provide additional stacking for picnic area.	• No additional roads to be constructed.	• Widening options restricted. • Upgrade of intersection to follow process with CCT. • Crosses ecological corridor.

Alternative 2

	Advantages	Problems/challenges
Change access point to the point where the original Orpen Road diverted from the current alignment. Align the route along the new picnic area to intersect with Tokai Road in the area of the current picnic access point..	• Safe intersection with Orpen Road. • Improved stacking options with no impact on neighbouring properties. • Boundary of the conservation area.	• Process with CCT for new access point. • New road construction expensive. • Potential crossing of biological corridors.

Alternative 3:

	Advantages	Problems/challenges
Relocate access to the old farm road alignment via stone church. An option is to access via a portion of Porter estate to be exchanged for compartment A8b (triangular compartment between Orpen Rd and the "ondertuine").	• Existing road to be upgraded to hard surface. • Can secure boundary with Porter Estate. • Access to new picnic area. • Prevent crossing of biological corridor.	• Unsafe intersection with Orpen Road. • Long access road. • Costly to upgrade and maintain.

HERITAGE SIGNIFICANCE AND VULNERABILITY ASSESSMENT OF TOKAI AND CECILIA

TABLE OF CONTENTS

1. INTRODUCTION

Heritage encompasses that which we inherit, value or want to pass on to future generations (Deacon et al 2003). It consists of tangible elements such as prehistoric shell middens and historic houses as well as intangible elements, for example song, dance and narrative. Places and objects of cultural significance that form part of the national estate are protected by the National Heritage Resources Act (no 25 of 1999, section 2 xvi, NHRA section 3(2)). Heritage include:

a) places, building, structures and equipment of cultural significance,
b) places to which oral traditions are attached or which are associated with living heritage,
c) historical settlements and townscapes,
d) landscapes and natural features of cultural significance,
e) geological sites of scientific or cultural importance,
f) archaeological and palaeontological sites,
g) graves and burial grounds,
h) sites of significance relating to the history of slavery in South Africa,
i) movable objects.

The preservation of cultural heritage is an integral part of SANPark's Corporate Plan and the Park's IEMS: Management Policy (2000). SANParks prioritises conservation and celebration of the heritage in the park (http://www.sanparks.org/conservation/park_man/tmnp.pdf). One of the principles underpinning the TMNP Conservation Development Framework (CDF, 2006) is 'Celebration of heritage sites, places and areas as a community resource'. This assessment aims to identify which of the heritage resources in Tokai and Cecilia lends itself to such celebration.

The purpose of this heritage significance and vulnerability assessment is to formulate a heritage statement for the heritage of Cecilia and Tokai forests. Conservation management of heritage resources involve two levels of planning – a Heritage Statement, and a more detailed Conservation Management Plan or CMP (SANParks 2004 TMNP heritage management plan 2005-2010). This Heritage Statement represents is a first level of conservation management and is intended to identify sensitivities and vulnerabilities of heritage resources prior to further planning or development.
The CMP needs to be planned around issues identified in this heritage statement and in accordance with specific strategies or actions of the overall TMNP policy and CDF.

This assessment is based on site inspection; desktop study (see bibliography) and insights gained at the open day and stakeholder group meetings. The significance assessment was undertaken according to the guidelines of the National Heritage Resources Act (no 25 of 1999), which stipulate that the aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological significances must be determined. These categories, with the exception of linguistic and technological significance, have been included in the significance assessment. In addition, indigenous spiritual, experiential, and uniqueness and representative significance have been assessed (Wurz & Van der Merwe 2005). The Heritage Asset Sensitivity Gauge (HASG) which incorporates these criteria as well as criteria from the New South Wales Heritage Manual 2001; International Cultural Tourism Charter, ICOMOS 2002; Du Cros 2001; McKercher & Du Cros 2002) was used to quantify the significance. Site vulnerability was also assessed and quantified using HASG.

The four-value scoring range for each criterion (Table 1: 0=None, 1=Low, 2=Moderate and 3=High) is based on an unambiguous scoring principle: The higher the rating score on the criterion, the higher the significance and vulnerability attribute value. A score of above 66% indicate high significance and vulnerability; a score of above 33% indicate medium significance and vulnerability, and a score of below 33% indicate low significance and vulnerability. These are arbitrarily assigned levels of significance and vulnerability and are field ratings (SAHRA minimum standards) that should be confirmed by SAHRA should mitigation be necessary. This gauge is intended to form part of a comprehensive evaluation process that would include aspects of overarching integrated community and environmental management prescribed in the National Environmental Management Act 107 of 1998 (Glazewski 2000; Naudé 2000; Kotze & Jansen van Rensburg 2003).

The significance and vulnerability of two landscapes, one precinct and several sites have been assessed. The polemic debate in local newspapers on the meaning and significance of Tokai and Cecilia plantation forest cultural landscapes demonstrates the sensitivity of landscapes to differential interpretation and human response. This necessitates further discussion on the significance and definition of landscapes.

A cultural landscape is a characteristic kind of place, 'fashioned out of a natural landscape by a culture or group. Culture is the agent and the natural area is the medium (Lennon 2001). It thus includes the physical landscape and the human response to the landscape. Cultural landscapes can be placed on a continuum of social significance and tangible values. Landscapes of low significance are simply a characteristic kind of place to which certain cultural values are attached whereas highly significant landscapes are known as inspirational landscapes. Inspirational landscapes (Johnston 2002) are those places associated with positive and inspiring aesthetic or cultural perceptions and significant stories. They elicit powerful emotional responses that may vary from awe, excitement, creativity, action, and reflection to curiosity. In a truly inspirational landscape clear links between culture, history and perceptions can be traced. Inspirational landscapes are often iconic because artists have depicted them over more than one generation. Iconic landscapes are sometimes used to lure tourists. Cultural values attached to the landscape may vary from tangible and substantial to intangible and insubstantial. One of the aims of the significance assessment of the plantation forests landscapes was to determine whether they are inspirational landscapes.

The significance and vulnerability of the heritage resources of high and medium significance are discussed in detail following the criteria of HASG. The significance and vulnerability of the heritage resources of low significance are discussed in condensed form. Tables 1, 2 & 3 and Figures 1 & 2 contain the scores and criteria used in this assessment.

Tokai and Cecilia forests are not sensitive in pre-colonial terms, and only a few stone tools in secondary context have been observed (ACO 2001). This significance and vulnerability assessment concern currently identified heritage resources. However, there is some possibility that unidentified colonial and pre-colonial sites exist. Therefore phase 1 archaeological impact assessments are imperative before any large-scale development takes place.

2. TOKAI: SITES OF HIGH SIGNIFICANCE

2.1. TOKAI MANOR HOUSE PRECINCT

The Manor House precinct, an area of ±5 ha, consists of the Tokai Manor House, the Porter Reformatory, barns and outbuildings and three separate residences, including the thatched cottage, the Stone House and 'the residence'. The Manor House itself dates to 1795 and the two clusters of buildings, the Old Orpen House to the north and the Outbuildings to the south, that form the forecourt, date back from 1883. The Tokai Manor House precinct represents several historical layers over 250 years. It has been used as farmstead reformatory and convict station.

The precinct is of high colonial heritage significance as it reflects the changing pattern of the Cape political and architectural history. Its setting is as important as the buildings. The precinct is not sensitive in pre-colonial terms.

The Constantia-Tokai Valley Local Area Growth Management and Development Plan already identified the Manor House and Reformatory as an 'action area' and proposed to transform the Manor house into a public amenity and to use it as gateway to the forest and mountain with social functions. Subsequently the precinct has been identified by the CDF (2006) as high volume (> 100 000 visits) 'mixed use leisure' visitor site and entry point and as a 'proposed head office' site. It is further planned to consolidate access point to the Table Mountain National Park at major 'gateway' visitor sites. Activities potentially accommodated by the precinct include a museum of forestry/agriculture/tea garden/ restaurant / curiotype shops, public offices/back-packer's lodge and overnight accommodation.

Significance

The precinct is of **high** heritage significance.

It is a special, exceptional aesthetic asset and because of its picturesque and natural qualities it has been identified as an ideal gateway to the Table Mountain National Park (SANParks 2005). The condition of the Reformatory, howeer, detracts of the sense of place.

The precinct is potentially of high experiential significance because it provides a connection to a special historical landscape within a beautiful setting. Physical, documentary and oral evidence on the role that the precinct played in the history of forestry, penal and correctional system, education for special needs, rural Cape architecture and small settlements exist (Aikman et al 2001:35) and should be exploited to increase the experiential significance. Its potential to facilitate significant experiences will be improved by the restoration and upgrading of the reformatory and by establishing an information/educational centre at the precinct.

Connections to two important figures in the history of the Cape can be made - Joseph Storr Lister, the Chief Conservator of forests for the government of the Cape Colony, and Sir William Porter, whose bequest led to the establishment and development of the Reformatory. The precinct could be of historical importance for the community if the links are re-established and celebrated.

The information of the site is of high importance to primary and secondary learners and the setting potentially facilitates the learning experience. Since private individuals currently lease the precinct, this potential is not realised. This is a highly inappropriate situation and results in limited access to a resource that belongs to the public, a point of view shared by SANParks (2005).

The inaccessibility of the precinct is the main reason why its high social significance is not realised. The precinct could become central to the community's identity if it is used regularly in important events.

The Tokai Manor House precinct is of very high scientific significance. It is a microcosm of the Cape Colony of the past 200 years and the detailed study of archaeological, historical and oral resources will make significant contributions to heritage knowledge of the area.

The precinct is of high uniqueness significance because of its special links to the origins of forestry and correctional educational system in South Africa. There could be some indigenous spiritual significance attached to the precinct, but the documented oral histories (Aikman et al 2001) did not identify any.

The precinct is associated with historical figures like Storr Lister and Porter, and the origins of the forestry industry and the correctional education system in South Africa. These associations are not communicated through information boards or other sources. The development of an information/.educational centre will address this deficiency. The precinct has no particular representative value.

Vulnerability

The vulnerability of the precinct is **high**.

The buildings of the precinct are in uneven state of repair with the outbuildings in the south in a much better state of repair than the reformatory. The reformatory is in a derelict state. Due to the poor maintenance of the buildings the vulnerability of the precinct is high to natural damage.

At present, the risk to human damage to the precinct is not high. If the development plans for the precinct are carried out, the vulnerability of the precinct will be high to human damage. However, it will be relatively easy to protect the precinct against the impact of high visitation once it has been restored adequately. High visitation will impact positively on the cultural traditions and values of local communities and it will have a positive effect on the normal functioning of local economic activities. The damage already present is largely reversible.

The precinct is made more vulnerable because there are only preliminary Heritage Statements and no Conservation Management Plan. Relationships between the key conservation stakeholders have been established and increased communication may decrease the vulnerability of the precinct.

Impact

The impact of clear felling on the precinct is **low**. However, plans to develop the precinct will have a high impact on the landscape.

Recommendations

- Re-instate the heritage value of the precinct through restoration of the appropriate structures and use of the buildings in a more appropriate way. This has cost implications and funds will have to be secured. The Proposal for the Incorporation of the Tokai Manor House into the Table Mountain National Park (2005), considers SANParks to be the appropriate institution to be tasked with re-instating and celebrating the Tokai Manor House Precinct's heritage value to society. The linkages and associated heritage

significance would be strengthened if the complex were made available to, and developed as an integrated entity, by SANParks.

- Prepare a Site Development Plan for the precinct with a view to formulate an integrated, culturally, socially and economically viable management plan (The Porter Estate Development Framework (November 2001 in SANParks 2005).
  - Undertake a series of trial archaeological excavations to test for subsurface deposits or features before any development such as the laying of new services or repairing of water supplies take place. Two studies (ACO 2001; Aikman et al 2001) emphasise that archaeological excavation is vital before any further development at the precinct. This will increase the contextual knowledge of the of this important heritage resource. Material from these excavations should be displayed in an interpretation centre/ reception area.
- Compile a Conservation Management Plan. It would be ideal if the different state agencies that control various components of the precinct could pursue a coordinated approach. Province, SANParks and SAHRA should confer with each other and appoint a heritage consultant to prepare the CMP, as proposed by the Porter Estate development Framework (2001).
- Include the reformatory in plans to develop the Manor House as a public facility - the Porter Estate Development Framework (November 2001) suggested that the Manor House Precinct be dealt with as a single entity. The majority of the Development plans and Frameworks focus on the restoration and use of Manor House only. This will enhance the significance of the precinct considerable and will facilitate experiences related to the many layers of history captured by the Manor House and the Reformatory.
- A suitable building should be made available for the display of the Manor House and Porter Reformatory's rich history (SANParks 2005). Objects from the Manor House and Reformatory such as the slave bell, books, and furniture should be reclaimed and displayed (Aikman et al 2001) in this building.

2.2. TOKAI MANOR HOUSE

The manor house is of **high** significance.

The Dutch period dwelling of 9ha was built in 1795 and was previously known as 'Aan de Buffelskraal'. It is situated at the western terminal of Tokai Road. The Manor house, (1.695 morgen on erf 3346) was declared as a Grade 2 Provincial Heritage Site under the National Heritage Resources Act of 1999.

The Tokai manor house was built for Andreas Georg Hendrik Teubes (Fransen & Cook 1985) and his second wife Anna Christine Bosman in 1795. It is thought that the famous architect Thibault designed the house. Alys Fane Trotter (1863-1962) made a pencil drawing of the house, including a rare perspecitive of the back of the house (Figures 3 & 4). The property changed hands several times. After neighbouring farmers objected to the house being used as an asylum, as intended by the Cape Colonial Government in 1883, the property was offered to the Department of Forestry for the establishment of the country's first commercial forest. Joseph Storr Lister established a nursery behind the manor house with the help of convicts, to plant trees at the Arboretum. *Pinus insignis*, the seed of which was collected from a tree in Cape Town gardens, was the first species propagated in this nursery (Zahn & Neethling, 1929).

Significance

The Tokai Manor House's distinctive design features (Aikman et al 2001; Mauve 1984; Porter Estate Development Framework 2001) and the design of Thibault contributes to the exceptional aesthetic significance of the Manor House.

The homestead was deliberately placed in the centre of the ridge lying between the farm's two main streams (Aikman et al 2001). The scenic qualities of the landscape, for example the forest against the backdrop of the mountains and the line of oaks along the Tokai Road, contribute to high experiential significance of the manor house.

The Manor House has the potential to be of exceptional historical significance. It is associated with a rich and complex layering of historical evidence. This evidence, if properly applied, will enhance understanding of the house and associated historical figures, but further detailed study is necessary to fulfil the its historical potential (Aikman et al 2001; ACO 2001).

A particular historical layer that needs to be developed is the manor house's link to slavery. A tangible link to this history is the slave bell that dates to the 18th century. The Dutch East India Company used slave labour imported from Africa, India and the East Indies, and there is a strong possibility, that in the days when Buffelskraal served as a cattle station, indigenous Khoekhoen cattle-keepers would have been 'employed'. Slaves played a central role in the transformation of the property from cattle station to an important wine estate. Developing the link to slavery at the manor house would contribute greatly to understanding the significance of the Manor house.

The information of the site is highly relevant to primary and secondary learners and the setting facilitates the learning experience. However, the educational significance of the Manor House is not communicated effectively because the Manor House is currently leased to a private individual (SAN Parks 2005). Public access is thus restricted. This seriously impedes the educational contribution that this house could and should make to learners' knowledge of the history of the house and the area.

All the reports on the Manor House describe it as of very high social significance. Unfortunately the opportunity to celebrate the social heritage value of the house is not exploited.

The manor house has the potential to make a significant scientific contribution to the history of the Cape if the necessary in-depth archaeological, historical, architectural and social scientific studies are undertaken. The werf is capped with concrete or tarmac surfaces which could be lifted to obtain archaeological information. The excavation of possible domestic middens may yield particularly interesting results.

The Manor house represents a rare aspect of South Africa's cultural heritage. It is a rural farm werf with a formal symmetrical layout typical of the 18/19th century. The werf consisted of the 'H' plan homestead and a series of long outbuildings, a housing wine cellar, slave quarters, wagon house, workshops and stores. Initially four buildings made up the farmstead - two long structures placed to the rear of the homestead and two others perpendicular to the house. Only two of these remain (Aikman et al 2001).

It is highly probably that indigenous spiritual significance is associated with the Manor House, but none is known.

The Manor House has served as residence of Teubes and his wife, Storr Lister and his wife, Georgina, granddaughter of Andrew Geddes Bain, and several headmasters of Porter Reformatory. If adequately researched and communicated, special associations with the history of forestry, penal and correctional system and special needs education will contribute to the significance of the house.

The Manor house is a symbol of a typical rural farm werf with a formal symmetrical layout characteristic of the 18/19th century.

Vulnerability

The vulnerability is **high** (Table 1).

The house is vulnerable to natural damage because of its current state of disrepair. Maintenance is costly and fragile materials require special attention. This increases the vulnerability of the house.

At present the Manor house is not very sensitive to human damage, since visitation to the house is low. It is proposed to transform the Manor house into a public amenity and to use it as gateway to the forest and mountain. This will compliment and extend the public function of the Tokai area, but it will increase the vulnerability of the house to insensitive development. As mentioned in previous assessments (SANParks GIS database, Aikman et al 2001), the house is highly vulnerable to insensitive development as this may cause intrusive elements to ruin the historic character of the house. Some insensitive development, three modern structures in close proximity to the Manor House, already subtract from the historical character of the Manor House. This damage is reversible if these elements are removed. A low level of irreparable structural damage already occurs, but this can be negated by sensitive restoration.

A high level of visitation will not have negative impacts on the cultural traditions and values of local communities or normal functioning of economic activities. On the contrary, high visitation rates will increase the cultural capital of the local communities and perhaps provide impetus for economic growth.

A development management plan exists and a budget has been proposed. The conservation management planning, however, is not on the same level. This report and the other heritage assessments serve as basic heritage statement and these initial assessments need to be developed into a full CMP after the necessary phase 1 and phase 2 archaeological studies have been undertaken. The importance of these actions is underscored by all the heritage documents studied.

At present very limited monitoring takes place. The potential for damage is limited because the house is rented, but there is a need for extensive monitoring, especially if it is developed as tourism node.

Extensive consultation between the stakeholders is necessary to successfully negotiate the balance between the use and conservation of the Manor House. The communication channels already established may be used to work towards an optimal solution, but a well-planned concerted effort is necessary.

Impact

The impact of clear felling on the manor house is **low.**

The plans to develop the Manor House as institutional base and node for tourism will have a **high** impact on the house.

Recommendations

- Restore the Manor House on the basis of recommendations made after a Phase 1 archaeological impact assessment and architectural study have been undertaken.

- Undertake a series of trial archaeological excavations to test for subsurface deposits or features before any development at the Manor House take place.
- Further detailed architectural and archival research should be undertaken to fulfill the significance potential of the Manor House.
- Compile a CMP that includes a monitoring programme. This should be updated every five years.

2.3. PORTER REFORMATORY

The reformatory has been used continuously as a corrective governmental institution for 100 years. In 1878 William Porter bequeathed £20 000 'for the establishment and maintenance, at the Cape, of one or more reformatories'. It was his ideal to work in a more progressive way with young offenders (Mauve 1984b). In 1898, 136 morgen of the original farm (including the manor house) was allocated to the Porter School.

The Porter School was first housed in the long outbuilding of the Manor House as indicated on an 1883 map (convict blocks) (Tokai Manor House Precinct, Position statement, 2002). In 1890, a new complex of buildings, designed by Sir Herbert Baker (SANParks 2005) was erected. The original convict block was incorporated into this larger reformatory facility which became known as the 'Old Orpen House. The first schoolmaster lived in the Manor House. Over the next decades a number of significant structural changes were made to the reformatory.

Significance

The Reformatory is of **high** significance.

The Porter Reformatory has noteworthy form and composition attributes, being designed by Sir Herbert Baker. However, later insensitive additions detract from it aesthetic qualities.

The aesthetic setting of the reformatory coupled with its unique associations with corrective education, have the potential to provide unique experiences. The graffiti on some of the walls establishes an experiential link to the past. The degradedness, degree of disrepair and complete lack of interpretive material detract from the reformatory's experiential significance.

There are significant historical connections to the Porter reformatory: William Porter donated the capital for its establishment and Sir Herbert Baker was responsible for the design of the first large block of buildings (Mauve 1984b). The important historical connections to the penal and correctional system and education for special needs are not optimised because no opportunities for interpretive communication have been created.

The information from the reformatory is relevant to primary and secondary learners, but the derelict condition of the buildings and lack of interpretive material prevent the facilitation of learning experiences.

The reformatory has a strong social connotation with a large section of the metropolitan community (CPNP 2002) and identities of institutional life. The institutional identity, based on 'a total institution' and 'self-sufficiency' played a role in the social engineering of the 'coloured' and 'white' working class community at the Cape, and in the institutionalization of predominant political attitudes toward race, class and the 20th century (Aikman et al 2001:41). However, none of the stakeholder websites or comments, or comments of the open days highlighted the reformatory as a place that the local community honours. This is

probably because the reformatory is inaccessible to the public, and its dilapidated, unattractive state precludes the community from re-establishing social bonds.

The reformatory has scientific research value that is detracted from by its lack of intactness. The reformatory is moderately unique, but a few similar buildings exist in the area. Although it is probable that indigenous spiritual significance is associated with the reformatory, none is known. The reformatory is further associated with the ideals and generosity of Sir William Porter and the stylistic genius of Sir Herbert Baker, but these associations are not celebrated or widely known. The features and style of the reformatory has some representative value.

Impact

The impact of the clear felling on the Reformatory is **low.**

Plans to develop the Manor House precinct as an entrance to the park will have a **high** impact on the reformatory. The reformatory may be endangered by insensitive development of the precinct, and may lose its important connection to the Manor House if the link is not promoted through information dissemination and sensitive landscape architecture.

Vulnerability

The current state of neglect and poor condition of the buildings contribute to it being highly vulnerable to natural damage. Other reports also mention that the reformatory requires urgent attention to avoid complete deterioration (e.g. SAN Parks 2005). The lack of maintenance of the buildings and danger of material collapse pose a significant threat to the reformatory. These factors also increase the risk that human interference will impact negatively on the fabric of the reformatory. The reformatory can easily be damaged by tourist activity and incidental visits at any time, by even unsophisticated means.

The level of irreparable damage present is substantial, but careful restoration and intelligent demolishing may offset this. The impact of high visitation on the cultural traditions and values of local communities and the normal functioning of economic activities would be positive.

This report and the other heritage assessments serve as basic heritage statement that lowers the vulnerability of the reformatory somewhat, but the need for a full CMF cannot be overstated. This should take place after the necessary historical, archival, phase 1 and phase 2 archaeological studies have been undertaken.

At present no monitoring of the reformatory takes place. Because unlawful entry is relatively easy, the potential for vandalism is very high. Consultation and planning have focused on the Manor House, and not the reformatory. Extensive consultation between the stakeholders is necessary to negotiate the future of the reformatory.

Recommendations

- A phase 1 and 2 archaeological impact assessment must be undertaken to adequately record the layout of the structure as it stands, to determine the sequence of additions, and to require additional information that cannot be gained from historical and oral resources. This information should be used to determine which of the more recent structures should be demolished.

- Compile a CMP that includes a monitoring programme. This should be updated every five years.
- Compile a business plan to model the cost of the renovation and structural repairs that are required to render the buildings usable. The CPNP regards it as important to give the reformatory back to the people rather than to let it deteriorate beyond restoration or become an elite facility, not affordable to the people who has strong social ties with the site (The Tokai Manor House Precinct Position Statement, 2002). To this end it is planned to incorporate the reformatory into the TMNP as Visitor centre that can be used for interpretation, tourism information, sales and bookings. This will have to be undertaken in a second phase, since no budget is allocated to achieve this in the current planning Proposed Upgrading Programme (5.2).

2.4. TOKAI ARBORETUM

The Tokai arboretum, dating to the British colonial (1850 - 1910) period, is south-west of Tokai Manor House and covers 28ha. The Arboretum has been declared a Grade 2 Provincial Heritage Site under the National Heritage Resources Act of 1999.

In 1886 the arboretum was laid out adjoining the nursery at the Tokai Manor House. The site was chosen where a small wood of stone pines (*Pinus pinea*), which probably originated very early in the 19th century, was already in existence. The arboretum has been planted by J Storr-Lister in 1886 and several species of trees, e.g. *P. pinaster*, *Quercus cerris*, *Eucalyptus ficifolia* and a number of shrubby plants were added for ornamental effects (Zahn & Neethling 1929). At present it contains over 600 species of trees. The mixture of species and discrepancies between the ages of the various light demanding trees planted detract from the arboretum's value for sylvicultural purposes (Zahn & Neethling 1929) but it is valued as a display of a large number of specimens of different exotic trees.

After the first plantings at Tokai, around 1895, a systematic effort was made to test the adaptation of species from countries of similar climatic condition. Lister originally planted trees that occurred in the landmass of Gondwanaland, the ancient Southern Supercontinent (180 million years ago). Trees from Australia, India, the Southern States of North America and Mexico were thus planted. This project's ideals are still being promoted by the Friends of Tokai Forest who drive the Gondwanaland Project at the Arboretum (Attwood 1999).

Several other potentially significant tree groups exist in Tokai, but only the official Tokai Arboretum qualifies as a *bona fide* arboretum according to the following definition: "A protected park-like environment where trees, shrubs, and herbaceous plants that are studied for their capacities to thrive in the ecological zone where the arboretum is located; more recently, to that function has been added the role of helping to sustain the genetic diversity of the various species" http://www.solutions-site.org/reference/glossary.htm) .

Significance

The arboretum is of **high** significance.

The Arboretum's distinctive natural attributes, design features and intactness produce an exceptional asset that is one of the most visited sites at Tokai. The harmony between the Arboretum and the surrounding landscape provides an experience of 'pristineness' and being close to nature.

The Arboretum is one of the oldest plantations in South Africa and for this reason and its historical significance, it has been declared a Grade 2 National Monument. Lister Storr is associated with the origin of the arboretum, but the contribution of his helpers and especially convict labourers are not known or celebrated. The structure at the Arboretum, currently used as a tea room, is ideally situated to be utilised as an interpretation centre where these facts and also the role of Tokai in the history of forestry in South Africa can be disseminated.

School groups often visit the Arboretum because its information is highly relevant to primary and secondary learners. Although the setting already facilitates learning, an interpretation centre will optimise these learning experiences.

The local community visits the Arboretum regularly, confirming its social significance. The activities of the Tokai Friends of the Forest and Gondwanaland project (Attwood 1999) increase the significance of the Arboretum in the community, but this can be communicated more effectively through an interpretation centre.

The arboretum consists of eucalyptus, pines, oaks and yellowwoods, and many of the trees are well over 100 years old. The Arboretum is of scientific significance because it probably has the best collection of eucalyptus trees outside of Australia (Aikman et al 2001). The Arboretum is further of scientific importance because it species that originally occurred in Gondwanaland grow here.

The arboretum has some uniqueness because of its species representation and historical context. There could be some indigenous spiritual significance attached to the Arboretum, but none is known. The Arboretum is associated with the life and work of Lister Storr, but this association is not widely known or celebrated. The Arboretum is a good example of its type, and therefore has some representative value.

Impact

The impact of the clear felling on the arboretum is **low.**

The impact of future development on the Arboretum is **low.**

Vulnerability

The Arboretum's vulnerability is **medium**.

There is some risk to natural damage, for instance fire. The Arboretum is not sensitive to human damage and will not be negatively impacted by high visitor numbers. High visitation will also have no effect on cultural traditions and economic functioning in and around the Arboretum. However, as mentioned by the SAN Parks database, the arboretum's vulnerability is increased by the absence of a CMP. The CMP should address the exposure monitoring measures and schedule. The potential involvement with key stakeholders is high because these relationships have already been established, but communication with local tourism authorities may improve visitor numbers.

Recommendations

- Compile a Conservation Management Plan that include maintenance and monitoring measures.

- Consider changing the function of the structure at the Arboretum from a tea room to an interpretation centre. The high significance of the Arboretum should be celebrated and communicated.

3. TOKAI: SITES OF MEDIUM SIGNIFICANCE

3.1. TOKAI FOREST LANDSCAPE

The Tokai Forest as a landscape comprises the totality of the planted area (610 ha) (Mauve 1984). It has been identified as productive cultural landscape (SAN Parks 2004). The forest, dating to the British colonial period (1850-1910) covers the east facing slopes of Constantiaberg from Vlakkenberg to Steenberg and is 6.5km in length. The Tokai Forest is identified as a 'low intensity leisure zone' (Draft CDF 2006). The recreational activities include hiking, mountain biking and horse riding trails. Footpaths crisscross the forest and there are three picnic areas in the forest. Different areas of the forest plantation may carry different social significances.

Significance

This assessment identifies the landscape as of **medium** significance. The forest plantation is not of high significance because it is not associated with living heritage (e.g. initiation sites, use of indigenous vegetation for medicinal purposes by traditional healers), displacement and contestation; it is not a site of political conflict/struggle and is also not associated with an historic event or public memory. Therefore it cannot be regarded as an inspirational landscape.

The forest plantation is of distinctive aesthetic quality. It has numerous sense of place qualities. It provides a sense of history, gateway, picturesque, natural setting, it is located on an important scenic route and it provides a sense of enclosure (Aikman et al 2001). Aikman et al (2001) describes its significance as 'enormous'. However, it is important to also consider that some members of the community regard the plantation as unattractive and a 'moon' landscape. At the open day representatives of an indigenous group of Khoekhoen descent, stressed that they would prefer the natural vegetation of the area to return, because it is the fynbos that they value. Reinstating the fynbos would also visually and experientially enhance the spiritual link between Tokai and the Elephants Eye Cave (Mr Brown).

The landscape is of high experiential significance, mainly because of associations with naturalness and pristineness that it provides in an urban environment. There are strong historical associations to plantation, being one of the oldest plantations in South Africa. Van der Stel planted 4379 oaks at Tokai in 1694. It is also the first commercial forest in South Africa and contributed significantly to the development of commercial forestry in South Africa (Aikman et al 2001:39).

The social significance of the forest is high because the local community honours it as central to their identity and use it regularly in important recreational events. On the other hand, the plantation is of relatively low educational and scientific significance. The information from the site is of some relevance to primary and secondary learners but the species diversity and limited fauna associated with the forest limit its educational and scientific value. Some of the features within the Tokai forest, for example the Diastella colony has very high scientific research value.

The plantation is not significant from a uniqueness or indigenous spiritual point of view. Its significance for its strong or special association with the life or work of a person, group or organization of importance in the history of South Africa is not high. Although there is a strong association with Storr Lister the forest is not celebrated for this historical connection, but rather for its recreational value. Similarly, in terms of representativeness, the forest has low significance.

The following features within the Tokai forest landscape are considered, even though their cultural connotations are uncertain. The Prinskasteel River, Diastella colony, forest edge and a number of significant tree groupings are discussed.

- ***Prinskasteel Rivier***

This river of 4.2 km, previously known as Prinseskasteel Rivier, rises in the kloof on south east flank of Constantiaberg, flows north east to join rivers of Sand River Catchment, terminating in Zandvlei. It is significant because it is a structuring element of landscape and is important for historical agricultural and institutional development and recreation.

- ***Diastella Colony***

This colony occurs in the lower Tokai Forest, and covers an area of about 20x20m. It is a scarce resource, a red data book species *D. proteoides*, once abundant in Cape Flats sand plain fynbos. This colony represents an isolated occurrence that flowers all year. The Diastella colony's habitat will be enlarged by the managed rehabilitation of the threatened Sandplain fynbos.

- ***Forest Edge***

The forest edge of 4.9 km comprises the southern interface zone between forest and residential areas of Zwaanswyk, Forest Glade and Dennendal. It represents a distinctive landscape change between urban and forest environment.

Significant tree groupings

a) 'Arboreta'

Zahn & Neethling (1929) mention that plots of pines and other conifers were established as arboreta, in addition to a few stands of *Pinus taeda, P. longifolia, P. echinata, P. muricata.* These stands were cultivated was to test the sylvicultural potential of different species, but they were sometimes so small that less rapid growing species were influenced in their development by faster growing trees in adjoining plots. Mr Green has confirmed the presence of these stands at the open day and the Aikman et al 2001 report also refer to their existence.

These groupings of special trees in the Tokai forest are not regarded as arboreta, because they have not been declared as such and must be known and studied for its scientific value to qualify as arboreta.

b) *P. Radiata* trees

There is a cluster of *P. Radiata* trees in the Tokai forest, at least one of which has been planted in 1886 and formally declared as a national monument (Water Affairs, Forestry & Environmental Conservation 1981).

Impact

The impact of clear felling on the forest landscape is **very high and unavoidable** as felling dates for the different compartments have already been determined. However, SAN Parks may request MTO to change that schedule to maximise sensitive rehabilitation of the forest.

Vulnerability

The landscape in its current state is **highly vulnerable** due to its certain demise. Therefore vulnerability assessment followed for the other heritage resources was not undertaken.

SANParks' mission is "To acquire and manage a system of national parks that represents the indigenous wildlife, vegetation, landscapes and associated cultural assets of South Africa, for the joy and benefit of the nation."(SANParks 2005). In this view, the priority in rehabilitation of the forests is to restore the indigenous vegetation and landscape in areas previously disturbed by non indigenous plantations. Therefore restoration of the plantation to indigenous forest and fynbos is both desirable and unavoidable. However, to lessen the impact that this will have on the public the following recommendations could be implemented:

Recommendations

Determine the socially most sensitive areas of the forest. Restoration of the forest in a way that put in place forest-based assets that are good for both people and nature (Marginnis & Jackson 2003) could be undertaken, perhaps by restoring corridors that can serve as 'stepping stones' whilst postponing harvesting of the most socially significant areas.

- A management plan is needed that discuss the schedule of restoration and species that will be used. This must be undertaken to address some of the public's emotional distress at losing a valued recreational resource. How opportunities for the current leisure activities facilitated by the forest (e.g. walking, dog exercising, bird watching, picnicking and braaing, mountain biking, horse riding, orienteering and cross-country running) will be created need to be stipulated.
- The Prinskasteel River is ecologically highly sensitive. Although there will be no felling in the riverine corridors, felled trees must be cleared away effectively to prevent the river to become polluted and from the natural vegetation to be destroyed. Ongoing management and monitoring is required to ensure the environmental health of the river.
- The significant tree groupings or 'arboreta' should be mapped and their significance should be assessed.

3.2. TOKAI FOREST PICNIC AREA

The 19ha site was created in the time of the Union of SA (1911 - 1961) and lies to the north of Tokai Road and west of the Steenberg/Tokai Road intersection. It attracts 180 000 visitors a year and is a windfree, atmospheric area in which braais, childrens' parties takes place. The picnic area facilitates a sense of a relaxation and safe forest experience (SanParks GIS database).

Significance

The picnic area is of **medium** significance.

Associations of a 'pristine' area in a metropolitan environment determine the picnic area's sense of place quality. It is an area of high experiential significance - it is easily accessible and provides a safe environment for relaxation. For this reason it is also of high social significance communities from the area.

The picnic area is of low historical, educational, scientific, uniqueness, indigenous spiritual and representativeness significance. It is not visited or celebrated for its historical connections, its low biodiversity decreases its significance for learners and for scientific research; there are several similar picnic settings; no indigenous spiritual significance is known and it is not representative in any way.

Impact

The impact of the clear felling on the picnic area is **low**

a) Vulnerability

The vulnerability of the picnic area is low, since SANParks already manages the area and it is designed to avoid natural and cultural damage. However the trees will become a threat to the safety of the visitors once it has reached a certain age at which stage they will have to be felled.

b) Recommendations

Compile a management plan to ensure continuity (SANParks database). An alternative picnic site should be created.

4. TOKAI: SITES OF LOW SIGNIFICANCE

The following resources do not lend themselves to educational, spiritual, social, education significance celebration or tourism development, but they are important heritage resources that are protected by the National Heritage Resources Act. They may not be damaged without a professional assessment and all the Heritage Act regulations apply.

4.1. TOKAI STATE FOREST ROAD

This road is on the eastern flanks of Constantiaberg. It commences at Tokai Manor House, continues for 6 km and terminates at Silvermine Forest Reserve. It is an historical popular hiking route. It was constructed in the 1880's under JS Lister by convict labour and represents an engineering achievement.

The **impact** of clear felling on the road will be **medium**, and it will not threaten the integrity of the road. However it will be more exposed through the removal of trees.

The vulnerability of the road is **medium**.

If the forestry function is no longer needed, maintenance cost will be too high and this represents a threat to the road's integrity. MTO Boland Roads is responsible for managing the roads on Tokai. The MTO management plan (4.2.3 Infrastructure; 5.6 Management of roads and quarries) mentions that unnecessary roads will me identified and removed.

Recommendation

- A management plan should be compiled in which this historic road is clearly mapped. The MTO Boland Roads management strategy should be planned in consultation with SANParks and heritage consultants to ensure that the road is not damaged or destroyed. The management plan should outline the monitoring measures and schedules to ensure the protection of the road.

4.2. TOKAI FORESTER'S HOUSE

The house is historically known as the District Forester's Office. The Forester's House is 150m west of the Tokai Manor House and is situated to the north of Arboretum. It is 2000sqm in extent. It is significant because it was built pre 1934 and is an attractive building under thatch, well related to its setting. It is also a landmark in the forestry road system.

The **impact** of clear felling house is low and will not threaten the integrity of the house.

The vulnerability of the house is **medium**.

Its secluded position, costly maintenance, fire risks and baboons scavenging increase its vulnerability. The house is also vulnerable to inappropriate maintenance that may destroy its historical character.

Recommendation

- A Phase 1 archaeological impact assessment, archival and historical studies should be undertaken to determine the full extent of the Forester's house's significance and vulnerability.

4.3. TOKAI GUEST HOUSE

The guest is property is 100m north of Forester's House and is 1000sqm in extent. It was built pre 1934 and renovated in 1995. It is an attractive house used by SAFCOL as a guest house.

The impact of clear felling house is **low.**

The vulnerability of the house is **medium.**

Its vulnerability is increased by costly maintenance, fire risks and baboon scavenging. The house is vulnerable to inappropriate maintenance that may destroy its historical character.

Recommendation

- A Phase 1 archaeological impact assessment, archival and historical studies should be undertaken to determine the full extent of the Tokai guest house's significance and vulnerability.

4.4. BUCHU PLANTATION

This plantation of 5ha of valuable medicinal plants established by Cape Colonial Government in the 1880-1890's is 50m west of Forester's house. It consists of a hybrid of *Agothosma crenulata/betulina*.

The **impact** of clear felling on the buchu plantation is low.

The vulnerability of the plantation is **high** because it is easily accessible to prospective 'harvesters'.

Recommendation

- A CMP that addresses future development and monitoring of the site should be compiled. The plantation may be developed in collaboration with interested local communities and an agreement on sustainable harvesting may be reached.

4.5. FORESTRY WORKERS VILLAGE

The village dates to the British colonial (1850 - 1910) period and is situated 1km west of the intersection of Tokai and Steenberg Road (150x120m). It is indicated on a map of 1934 with regard to forestry labour policy (migrant labour and families). Not all of the current structures in the workers village are historic.

The impact of clear felling on the village is **low**.

The vulnerability of the village is **low**. Its vulnerability is increased by the reduction in forestry operation that could lead to abandonment, unauthorised use and vandalism. Security is important. The village will be developed as a research centre and this will address these vulnerability issues.

Recommendation

- A Phase 1 archaeological impact assessment and archival and historical studies should be undertaken to determine which of the buildings should be conserved. If any historic structures (older than 60 years) are to be altered or destroyed, a permit must be obtained from the relevant heritage authority (SAHRA Western Cape).

4.6. TOKAI ROAD

The road runs in straight line from Main Road to Prinskasteel River bridge where it cranks to align with Manor House. It is 3.8 km in total (1km through forest). The Tokai Road was built in 1892 to link the forest station to the railway line. The Tokai road is currently the only access road to the picnic area, plantations, arboretum as well as the Chrysalis Academy. It carries a relatively high volume of traffic during peak recreational times.

The **impact** of clear felling on the road will be **low.**

If the Manor House precinct is developed as the entrance to the Table Mountain National Park, the road will carry significantly more traffic and this will have a **high** impact on the road.

The vulnerability of the road is **medium**.

It is threatened by increased use, increased cost in its maintenance and upgrading to facilitate increasing visitor numbers. The presence of the historic avenue of oak trees precludes the possibility of substantially widening the road. The SAN Parks report (2005) mentions that the road will require considerable maintenance work to restore it to an acceptable level.

Recommendation

- The upgrading and maintenance must not harm the historic avenue of oak trees in any way, as this provides much of the experiential cultural significance of the gateway to the Tokai Forest. It is vital that a CMP be compiled if the road is widened with 1m, as suggested by the Tokai Manor and Tokai Cecilia Business Plan (according to the SANParks proposal of 2005). Details of how the trees will be protected during this process have to be provided. A monitoring schedule must be included in the management plan.

4.7. OLD ORPEN ROAD

Sections of the Old Orpen road cut through the forest and the main remaining section forms the eastern boundary to the picnic area. The main section is 500m long. It was constructed 1902 and in use until it was replaced by Orpen Road in 1960's. It is lined with trees and provides potential access for picnic area.

The impact of clear felling on the road is **low**.

The vulnerability of the road is **medium**. The road is only used intermittently since formal closure and no maintenance is undertaken. The road may be threatened by clearing of surfaces, building of structures or landscaping.

Recommendation

- A Phase 1 archaeological impact assessment should be undertaken to determine the state of the road. A CMP that discusses the conservation and monitoring schedule must be compiled.

4.8. ORPEN FORESTER'S HOUSE

This house is situated at the intersection of original farm road from Tokai Manor House and Orpen Road. It is a 50 x 50m area with outbuildings and a garden. It is a landmark thatched roof house, stylistically related to others at Tokai and Porter (PWD) and largely unchanged. It was probably built in the 1940's.

The impact of clear felling on the house is **low**.

The vulnerability of the house is **medium**.

The house's vulnerability is increased by its inappropriate current use that makes monitoring and conservation of its historical character very difficult. The thatch roof requires ongoing maintenance and alteration and additions need to be done with sensitivity because the property's landmark status is easy to lose.

Recommendation

- A Phase 1 archaeological impact assessment and archival and historical studies should be undertaken to determine the full extent of the house's significance and vulnerability.

4.9. TOKAI FOREST STATION

The Forest station (Historical name: Tokai School of Forestry) covered an area of 75m x 75m and is north of the Tokai Road and 50m east of Manor House. It was created between

1911 and 1961 and is the site of the first School of Forestry in SA. The landscape is completely altered and consist of a scruffy disparate collection of 'temporary structures'. The original building has been demolished but an old gate pillar is still visible close to an old oak that appears in a photograph showed by Chris Botes (SANParks GIS database). This site is associated with an historic V-shaped tree alignment. This line of trees appears on a map dated 1883 (Aikman et al 2001) on the approach to the manor house along the waterleiding and is still evident today.

The impact of clear felling on the house is **low**.

If developments related to the development of the area as gateway to the park go ahead, it will have a high impact on the site.

The site's vulnerability is **low** as none of the original buildings or associations remain. The line of trees, however, is **highly vulnerable** to removal.

Recommendation

- The V shaped line of trees should be retained. Monitoring of the development process should take place to ensure that this happens.

4.10.OLD TOKAI FARM ROAD

The route links the Tokai Manor House to the Ondertuine of Porter Reformatory and Tokai Forest, and covers 1,2 ha within CPNP. It is an historical link to the Bergvliet Farm and represents a link from the Reformatory to the vegetable gardens. It is a popular hiking trail and horse trail that has been in use for 200 years.

The impact of clear felling on the road is **low**.

The vulnerability of this road, as for the other roads is medium.

The main threat is in erosion from poor stormwater management and insufficient monitoring.

Recommendation

- A CMP that discusses the conservation and monitoring schedule and that address the threat of erosion must be compiled.

4.11.MUSLIM GRAVES

Six to eight Muslim graves occur on 'Slamse Kloof' in a gum belt of Section C20 in the Tokai Forest. More Muslim graves occur not the property adjacent to C20. The graves are circular structures covered with green rags that are periodically moved. These graves are of low significance, but there are specific heritage regulations that must be followed. The graves may not be disturbed in any way without a permit from SAHRA. MTO has identified the Muslim Graveyard as an area of special interest and therefore treat it as a conservation priority area.

The impact of clear felling on the graves is **high**.

Recommendation

- A detailed assessment of the significance of the graves and consultation with the local community on the conservation and maintenance of the graves should take place. A CMP that discusses the conservation and monitoring schedule must be compiled.

5. CECILIA: SITE OF MEDIUM SIGNIFICANCE

5.1. CECILIA FOREST LANDSCAPE

The Cecilia Forest Landscape comprises the totality of the planted area and has been identified as productive cultural landscape (SAN Parks 2004). The forest dates to the British colonial period (1850-1910). The Cecilia Forest is a very popular recreational area and is used mainly for hiking, dog walking and horse riding.

Significance

This assessment identifies the landscape as of **medium** significance. The forest plantation is not of high significance because it is not associated with living heritage (e.g. initiation sites, use of indigenous vegetations for medicinal purposes by traditional healers), displacement and contestation, it is not a site of political conflict/struggle, and is also not associated with an historic event or public memory. Therefore it cannot be regarded as an inspirational landscape.

The forest plantation is of distinctive aesthetic quality and for some, an exceptional asset. Its sense of place and experiential significance come from the outdoor experience that a treed environment provides in an urban context. Similarly to the Tokai Forests, there are strong historical associations with the Cecilia plantation. The information from the site is of some relevance to primary and secondary learners but the species diversity and limited fauna associated with the forest somewhat limits its educational value.

The local community use it regularly in important recreational events and therefore its social significance is high. On the other hand, the plantation is of little scientific and educational significance and it is not significant from a uniqueness or indigenous spiritual point of view either.

Its significance for its strong or special association with the life or work of a person, group or organization of importance in the history of South Africa is low and the forest is not celebrated for its historical connections, rather for its recreational value. In terms of representativeness, the forest is of low significance.

Impact

The impact of clear felling on the forest landscape is **very high** as felling dates for the different compartments have already been determined. However, SAN Parks may request MTO to change that schedule to maximise sensitive rehabilitation of the forest.

Vulnerability

The landscape in its current state is **highly vulnerable** due to its certain demise. Therefore vulnerability assessment has not been undertaken.

Recommendations

The same recommendations as those made for the Tokai Forest apply:

- The priority in rehabilitation of the forests will be to restore the indigenous vegetation and landscape in the areas previously disturbed by non-indigenous plantations. A management plan is needed that discuss the timing of restoration and species that will

be used to address some of the public's emotional distress. How the rehabilitated areas will provide opportunities for the current leisure activities ranging from walking, dog exercising, bird watching, picnicking and braaing, horse riding, orienteering and cross-country running also need to be mapped.

6. CECILIA: SITES OF LOW SIGNIFICANCE

6.1. RHODES DRIVE / AVENUE

Rhodes drive also known as Rhodes's Road, dating to between 1850 and 1910, is located at the M63 from intersection at Union Avenue to Hout Bay Road via old Rhodes Road in Cecilia Forest. It was a carriage road constructed by Cecil John Rhodes to link Groote Schuur with Hout Bay Road and defines the edge of the CPNP along most of its route.

The impact of clear felling on the road is **low**.

The vulnerability of Rhodes Drive is **medium**.

According to the vulnerability statement by Antonia Malan (SANParks GIS database) sections of the old road not replaced by M63 may be disassociated with the original route and allowed to degenerate and be demolished.

Recommendation

- A Phase 1 archaeological impact assessment should be undertaken to map and determine the state of the road. A CMP that discusses the conservation, monitoring schedule and communication procedures between stakeholders must be compiled.

6.2. CECILIA FOREST STATION

This resource is said to date to the British colonial (1850 - 1910) period (SANParks Database). A site visit has shown that the structures on the Forest Station almost certainly are not historical and thus fall outside of the ambit of the National Heritage Resources Act of 1999. In its current state the Forest Station detracts from the experiential significance of the Forest.

The impact of clear felling on the road is **low**.

The vulnerability is l**ow**.

Recommendation

No recommendation relating to heritage management is necessary. Removal of certain structures may enhance the experiential significance of the adjacent natural areas.

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Figure 1: Significance Assessment of the heritage resources of Tokai Forest

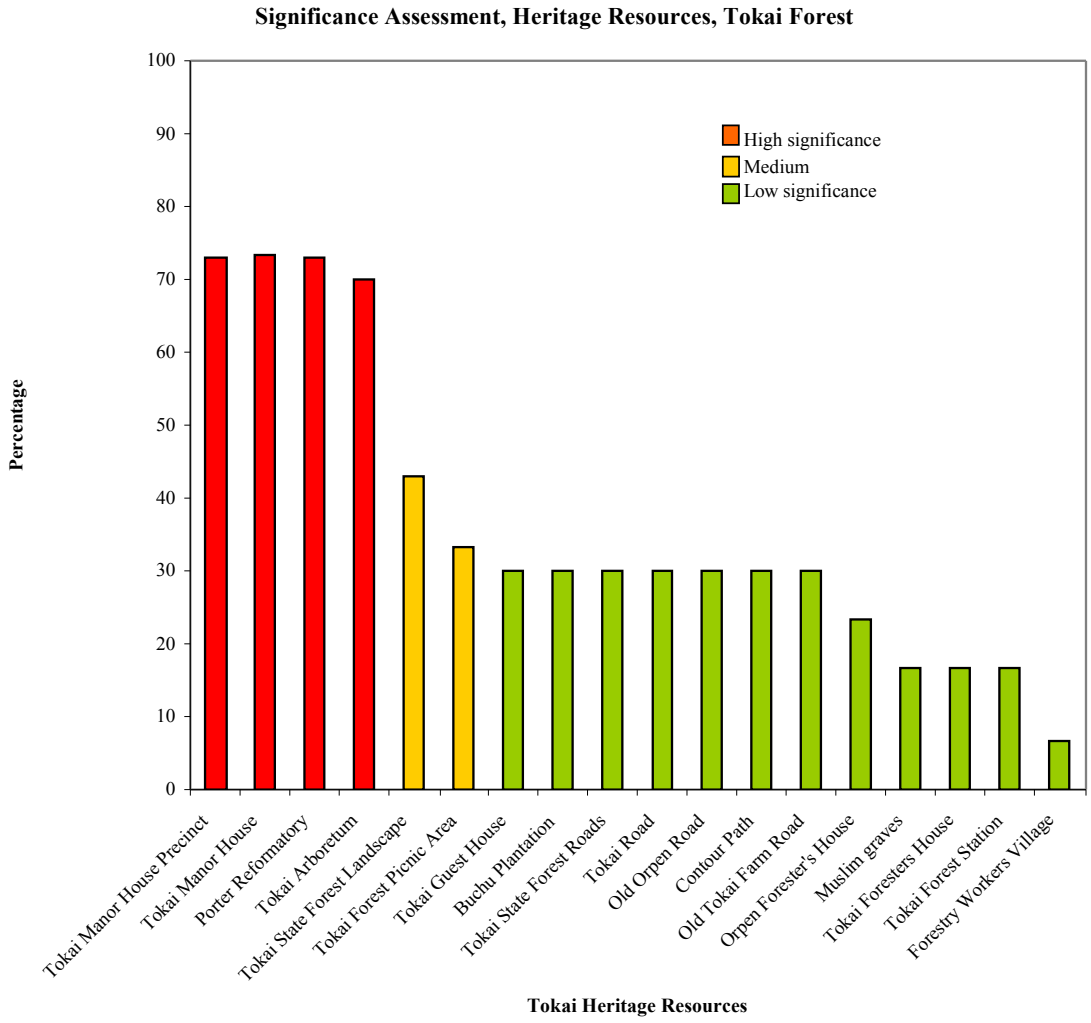

Figure 2: Significance Assessment of the heritage resources of Cecilia Forest

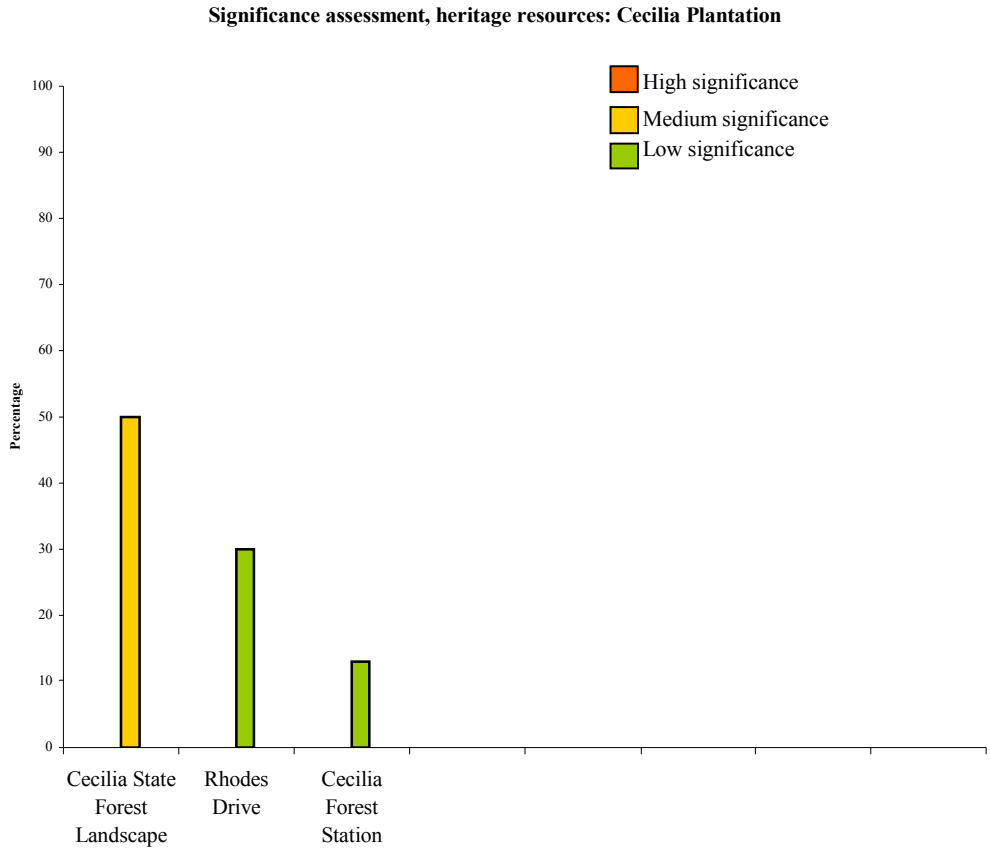

Figure 3. Pencil Drawing of the Tokai Manor House, by Alys F Trotter (1863-1962; Iziko William Fehr Collection): Front View.

Figure 4. Pencil Drawing of the Tokai Manor House, by Alys F Trotter (1863-1962; Iziko William Fehr Collection): View from the back.

Table 1: Cultural Significance and Vulnerability scoring criteria

CULTURAL SIGNIFICANCE
1. Aesthetic significance of the asset (its importance in demonstrating particular aesthetic characteristics valued by a community or cultural group) : 0=no aesthetic significance; 1= some form and composition contributes to the aesthetic attributes of the asset; 2= noteworthy form and composition attributes 3: distinctive aesthetic attributes in natural or secondary (e.g. plantation, landscape, vineyard) elements, form or composition, design and technical integrity produce an exceptional asset
2. Experiential significance of the landscape surrounding the cultural asset : 0 = environmental setting damaging to the experience of the cultural heritage asset; 1= the conflict between the landscape and the asset spoils the experience; 2= the proximity of degradedness and degree of change of the landscape detracts somewhat from cultural heritage; 3 = the pristine, or perceived original environmental condition provides an optimum experience
3. Historical significance: 0=no historical significance; 1=there are vague idiosyncratic historical connections to the site; 2=there are strong associations to the history of the site; 3= there are major international and national historical associations with the site
4. Educational value and potential : 0=no educational value; 1= the information from the site is relevant to primary and secondary learners but the setting does not facilitate a learning experience; 2=the information of the site is of high importance to primary and secondary learners and the setting facilitates the learning experience; 3=the information from the site is of high importance to primary, secondary and tertiary learners and the setting facilitates the learning experience.
5. Social Significance (importance in the community): 0= no social significance; 1= few members of the local community value the sense of place; 2=the local community values the significance, but the place is not associated with any events; 3= the local community honours the place as central to their identity and use it in important events (or very regularly).
6. Scientific research value (its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage): 0= site of no scientific significance or ruined; 1=some scientific significance, but no intactness 2= moderate scientific significance and intactness; 3= universal significance for international scientific community due to intactness and meaning
7. Uniqueness of the asset (its possession of uncommon, rare or endangered aspects of SA's natural or cultural heritage): 0 = common (everywhere); 1= fair number similar; 2=few similar/moderately unique; 3= unique
8. Indigenous spiritual significance : 0= no spiritual significance; 1= some spiritual significance but links severed; 2=spiritual links weakly maintained; 3=the asset has major spiritual significance that is widely maintained through spiritual practices.
9. Significance for its strong or special association with the life or work of a person, group or organization of importance in the history of South Africa): 0= no association; 1= association, but unexploited; 2=limited association with some exploitation; 3= the asset has major association that is widely exploited.
10. Representativeness of the resource (feature, style, structure, type etc) : 0= no representative significance; 1= some representative significance; 2= noteworthy representative significance; 3= archetypal distinctive representativeness

SITE VULNERABILITY
1. Fragility: risk to natural damage, e.g. fire, water:
2. Fragility: risk to human damage and potential for negative impacts of high visitation on the fabric of the assets: 0= the fabric of the asset is such that it cannot be damaged by human agents; 1=Well protected; 2= Poorly protected; 3= Unprotected: the asset can easily be damaged by any human (tourist activity and incidental visit) at any time by even unsophisticated means
3. Level of irreversible damage already present: 0= Site irreparably damaged; 1=some repairable, some irreparable damage; 2= there are limited repairable damages; 3=site is in its original pristine condition.
4. Potential for negative impacts of high visitation on the cultural traditions, values of local communities and normal functioning of economic activities: 0=no potential impact; 1=low potential for impact; 2= medium potential for impact; 3=high potential for impact
5. Level of management plan initiation (0=Heritage Statement completed; 1=Heritage statement in progress; 2= Heritage agency contacted; 3=No action)
6. Implementation level of conservation management plan (0=Conservation Management Plan (CMP) approved or not applicable; 1=Permit for phase 2 AIA obtained; 2= Permit application lodged; 3=None)
7. Level of exposure monitoring measures in place (eg. human/animal entry, human/animal interference, atmospheric, fire, water)
8. Potential/ongoing involvement of or consultation with key stakeholders (SAHRA, Bewarea, local community, local tourism authority, landowners) (List total: None= 3; 1-2=2; 3-4=1; 5=0)

Table 2: Heritage Asset Sensitivity Gauge, Tokai Forest

Heritage Resource	Tokai Manor House Precinct	Tokai Manor House Precinct	Porter Reformatory	Tokai Arboretum	Tokai State Forest Landscape	Tokai Forest Picnic Area	Tokai Guest House	Buchu Plantation	Tokai State Forest Roads
CULTURAL SIGNIFICANCE									
1. Aesthetic significance of the asset	3	3	2	3	3	3	2	1	1
2. Experiential significance of the landscape surrounding the cultural asset	3	3	2	3	3	3	3	2	3
3. Historical significance	3	3	3	2	2	1	1	1	2
4. Educational value and potential	2	2	3	3	1	0	0	1	1
5. Social Significance	2	2	2	2	3	2	1	0	1
6. Scientific research value	3	3	2	1	0	0	0	2	0
7. Uniqueness of the asset	2	2	2	2	1	0	1	1	0
8. Indigenous spiritual significance	1	0	2	0	0	0	0	0	0
9. Significance for its strong or special association with the life or work of a person, group or organization of importance in the history of South Africa	2	2	2	2	1	0	0	1	1
10. Representativeness of the resource (feature, style, structure, type etc)	1	2	1	2	1	1	1	0	0
TOTAL SCORE	22	22	21	20	15	10	9	9	9
Percentage value: (x/30*100)	**73**	**73**	**70**	**67**	**50**	**33**	**30**	**30**	**30**
SITE VULNERABILITY									
1. Fragility: risk to natural damage, e.g. fire, water,	3	3	3	2		1	2	2	2
2. Fragility: risk to human damage and potential for negative impacts of high visitation on the fabric of the assets:	3	3	3	1		1	1	3	2
3. Level of irreversible damage already present:	2	2	2	0		0	0	2	1
4. Potential for negative impacts of high visitation on the cultural traditions, values of local communities and normal functioning of economic activities:	0	0	0	0		0	1	3	0
5. Level of management plan initiation	1	1	1	1		1	1	1	1
6. Implementation level of conservation management plan	3	3	3	3		3	3	3	3
7. Level of exposure monitoring measures in place	2	2	3	2		1	1	2	2
8. Potential/ongoing involvement of or consultation with key stakeholders	2	2	3	2		2	2	2	2
TOTAL SCORE	16	16	18	11	0	9	11	18	13
Percentage value: (x/24*100)	**67**	**67**	**75**	**46**	**0**	**38**	**46**	**75**	**54**

Heritage Resource	Tokai Road	Old Orpen Road	Contour Path	Old Tokai Farm Road	Muslim graves	Orpen Forester's House	Tokai Foresters House	Tokai Forest Station	Forestry Workers Village
CULTURAL SIGNIFICANCE									
1. Aesthetic significance of the asset	1	1	1	1	0	2	1	0	0
2. Experiential significance of the landscape surrounding the cultural asset	3	3	3	3	1	2	2	0	0
3. Historical significance	2	2	2	2	1	1	1	2	1
4. Educational value and potential	1	1	1	1	0	0	0	1	0
5. Social Significance	1	1	1	1	1	1	1	0	0
6. Scientific research value	0	0	0	0	0	0	0	1	0
7. Uniqueness of the asset	0	0	0	0	0	0	0	0	0
8. Indigenous spiritual significance	0	0	0	0	2	0	0	0	0
9. Significance for its strong or special association with the life or work of a person, group or organization of importance in the history of South Africa	1	1	1	1	0	0	0	1	0
10. Representativeness of the resource (feature, style, structure, type etc)	0	0	0	0	0	1	0	0	1
TOTAL SCORE	9	9	9	9	5	7	5	5	2
Percentage value: (x/30*100)	**30**	**30**	**30**	**30**	**17**	**23**	**17**	**17**	**7**
SITE VULNERABILITY									
1. Fragility: risk to natural damage, e.g. fire, water,	1	2	2	2	1	2	2	0	1
2. Fragility: risk to human damage and potential for negative impacts of high visitation on the fabric of the assets:	3	2	2	2	3	1	1	0	0
3. Level of irreversible damage already present:	1	2	2	2	1	0	0	0	1
4. Potential for negative impacts of high visitation on the cultural traditions, values of local communities and normal functioning of economic activities:	0	0	0	0	1	1	1	0	0
5. Level of management plan initiation	1	1	1	1	1	1	1		1
6. Implementation level of conservation management plan	3	3	3	3	3	3	3	0	3
7. Level of exposure monitoring measures in place	2	2	2	2	2	1	1	0	1
8. Potential/ongoing involvement of or consultation with key stakeholders	2	2	2	2	2	2	2	2	2
TOTAL SCORE	13	14	14	14	14	11	11	2	9
Percentage value: (x/24*100)	**54**	**58**	**58**	**58**	**58**	**46**	**46**	**8**	**38**

Table 3: Heritage Asset Sensitivity Gauge, Cecilia Forest

Heritage Resource	Cecilia Forest Station	Rhodes Drive	Cecilia State Forest (landscape)
CULTURAL SIGNIFICANCE			
1. Aesthetic significance of the asset	0	1	3
2. Experiential significance of the landscape surrounding the cultural asset	1	3	3
3. Historical significance	0	2	2
4. Educational value and potential	1	1	1
5. Social Significance	1	1	3
6. Scientific research value	0	0	0
7. Uniqueness of the asset	0	0	1
8. Indigenous spiritual significance	0	0	0
9. Significance for its strong or special association with the life or work of a person, group or organization of importance in the history of South Africa	1	1	1
10. Representativeness of the resource (feature, style, structure, type etc)	0	0	1
TOTAL SCORE	4	9	15
Percentage value: (x/30*100)	13	30	50
SITE VULNERABILITY			
1. Fragility: risk to natural damage, e.g. fire, water,	1	2	
2. Fragility: risk to human damage and potential for negative impacts of high visitation on the fabric of the assets:	1	2	
3. Level of irreversible damage already present:	2	1	
4. Potential for negative impacts of high visitation on the cultural traditions, values of local communities and normal functioning of economic activities:	0	0	
5. Level of management plan initiation	0	1	
6. Implementation level of conservation management plan	0	3	
7. Level of exposure monitoring measures in place	1	2	
8. Potential/ongoing involvement of or consultation with key stakeholders	0	2	
TOTAL SCORE	5	13	
Percentage value: (x/24*100)	21	54	

1 Introduction

The following guidelines are applicable to restoration and rehabilitation initiatives of the sand-plain Fynbos in the lower Tokai area. The guidelines are based on:

1) Dr. Patricia M. Holmes, 2003. Management and Restoration Plan for an Area of Tokai Plantation East of Orpen Road and between the Two Car Park Areas.
2) Dr. Patricia M. Holmes, 2004. Management Plan for the Extension of the Core Cape Flats Flora Conservation Site in the Lower Tokai Forest.
3) De Villiers et al, 2005. Ecosystem Guidelines for Environmental Assessment in the Western Cape,
4) Forestry Industry Environmental Committee, 2002. Environmental Guidelines for Commercial Forestry Plantations in South Africa.
5) Conservation of Agricultural Resources Act (Act No. 43 of 1983).
6) National Water Act (Act No. 36 of 1998).

1.1 Management

It should be appreciated that restoration is a process that does not happen in one step, but rather in several steps of recovery along a course of natural repair, with occasional interventions being required to redirect this trajectory along the desired path.

- Focus initially on regenerating fynbos vegetation structure (i.e. plant composition and development) and once a structurally-representative stand of indigenous vegetation has regenerated, natural ecosystem functioning will be in place. In essence, this means that the aim is to regenerate a fynbos stand that includes all the major growth forms (e.g. short and tall shrubs, graminoids, annual and perennial herbs, geophytes) that would have been present in undisturbed sand-plain fynbos historically.
- Based on previous experience and observations, recolonisation by indigenous vertebrates and invertebrates will occur from adjacent vegetation remnants following the reinstatement of vegetation structure providing that corridors are created.
- Successful plant reintroductions by seed are only possible in the first autumn after a fire, and one generally plans restoration actions in relation to fire-cycles. Thus reintroductions should be confined to those areas planned for a management burn.
- In fynbos wetland or riparian areas, the planting of some species may be possible during the interfire period.
- Where Red Data and endemic species exist in plantations, an area around these should be cleared to protect the species until the plantation is harvested.

1.2 Alien plant control

- Neither terrestrial nor wetland areas can be restored without effective alien plant control. Several “transformer” alien species (i.e. those that invade and alter ecosystem structure and functioning) are established in the area, including wattle, pine and gum species. A list of undesirable alien species present in the extended conservation area (including the wetland areas), together with their recommended control methods, are provided in Table 1.

- Those species that resprout after felling will require herbicide treatment and those that have soil-stored seed banks will require repeated follow-up control, and will regenerate in pulses, especially after fires.

1.3 Preparation after harvesting

- In preparation for a controlled slash fire to promote natural vegetation recovery, the larger trunks and branches (> 6 cm diameter) of all woody alien species should be removed from the block burn area.
- Logs that are too small to be of timber value could be used in a number of ways:
  - given away for firewood or wood chip material (i.e. removed from site);
  - used as logs to demarcate paths through or around the conservation area;
  - chipped then used to delineate the paths or used to fill depressions in paths in other parts of Lower Tokai; and
  - lastly the finer branches (stem diameter < 6 cm) could be scattered over the cleared compartment (avoid firebreaks) and left to decompose and dry out for several weeks until the management burn is done. It is important to remove the larger wood to prevent heat damage to the soil in the event of a wildfire.
- In the seasonally wet areas there is the alternative option of stacking the finer alien slash and burning it once the soils are wet after the first soaking autumn rains.
- Follow-up clearance should be done every six months until few new alien seedlings reappear. In most cases, hand-pulling is the best possible method. Follow-up work is extremely important, especially after a fire, to prevent reinvasion and nullification of the initial clearance work.
- Fynbos species are extremely sensitive to herbicide, thus it is not recommended to kill the aliens by knapsack spraying in any of the areas in which indigenous species regenerate.
- In patches where alien regrowth is very dense, and no indigenous species are present, a dicot-specific herbicide (e.g. comprising triclopyr) could be sprayed to kill alien seedlings as instructed, if it is done carefully and under wind-free conditions to prevent drift into nearby natural areas.

1.4 Fire management

- It is important that no vehicles are allowed to drive onto or across the blocks.
- For future fire management, fynbos blocks under 1 ha in size should be left until a minimum of eight years post-fire age and burnt as part of a larger block.
- To be effective in stimulating germination in all types of fynbos species, the fire should be done during summer (Box 1). Unfortunately owing to the current burning regulations this will not be possible to organise.
- However, the burn must be done in early autumn, prior to the first penetrating autumn/winter rains (during March or early April). The day of the fire need not be hot, but should be dry, with little or no wind to facilitate control of the fire.

- A late autumn fire would have a negative effect on fynbos germination success, especially of the larger seeded species (including some of the local endemic and endangered *Serruria*, *Leucospermum* and *Diastella* species) and should be avoided.

Box 1. Fynbos fire requirements

In order to optimise fynbos restoration potential and plant biodiversity conservation, fires with the following characteristics are required:

- Fires must be in the first summer/autumn season post-clearance (of pines or aliens)
- Fires ideally should be in summer, but at latest early autumn (before April)
- Fires should burn the vegetation at intervals of 12–20 years., however, an unplanned fire in vegetation older than eight years old should be allowed to continue as a block burn
- By the second burning cycle, blocks should be at least 5 ha in size, and blocks smaller than 1 ha should be amalgamated with larger blocks
- Stumps and roots that ignite should be allowed to burn through for 24 hours
- Trampling and disturbance by vehicles should be prevented and other fire control activities agreed to before burning

- Fire belts (5–15 m wide, depending on local risk factors) should be cleared of slash and/or brush cut around the block to facilitate the control of the block burn, in addition to the usage of watercourses and jeep tracks as extended fire belts.
- The normal procedure is to first light the fire on the upwind side of the block to slowly burn (as a back-burn) into the block, then to light the fire from the downwind side so that the two fronts meet inside the block and extinguish each other.
- It is important that a back-burn is not positioned over any endangered species, such as *Diastella proteoides*, and that the latter receive a frontal fire. Fires should be planned with this in mind.
- Stacks may be any diameter that is convenient to work with but should not exceed two metres in height and be positioned at least fifteen metres away from any pine compartment.
- There is a further third option for the wetland blocks of removing all woody material completely and chipping it for use on paths etc.
- Sand-plain fynbos in the Cape Town area should be burnt on a 12–20-year cycle to maintain maximum levels of plant diversity. If the vegetation is burnt more frequently (especially younger than eight years) some of the slower-maturing species may be lost. If the vegetation is not burnt for a long time (> 20 years) it becomes moribund, and species without soil-stored seeds may be lost.
- If the remnant vegetation is younger than eight years, it should be protected from approaching fires. After eight years, unplanned fires should be managed as a block burn.
- Requirements i.t.o. the TMNP Fire Management Plan has to be adhered to.

1.5 Restoration in terrestrial areas

- Terrestrial areas currently under pine plantation have fairly good restoration potential following pine removal, alien species control and an autumn fire through the area (provided soil conditions remain dry). This prediction is based on the species composition of the conservation area and the youngest pine rotation in Lower Tokai. However, it would be appropriate to reintroduce growth forms that have been completely eliminated, such as the overstorey proteoids (large shrubs in the family Proteaceae) as these plants play an important ecological role in the vegetation. This particular growth form has been eliminated because it does not have soil-stored seed banks. It is easy to reintroduce overstorey proteoids by seed after a fire, but this should only be done when the vegetation in a particular block requires a management burn.
- In addition to the proteoid overstorey growth form, the only other plant reintroduction to be considered in the first fire-cycle, or restoration stage, are the Red Data List species that historically occurred in the area (Table 2) in order to increase their numbers and reduce their vulnerability to extinction. The species that still survives in Tokai (*Diastella proteoides*) could be propagated in preparation for planting out or seed could be collected for distribution into the new localities. Other Red Data species that once occurred in the area could also be considered for reintroduction.
- All seed and propagation material should be collected from a locality as close as possible to Tokai in order to retain the genetic integrity of the populations. Species introduced to degraded areas should be obtained from similar habitats within the confines of the Constantia Valley to Fish Hoek area.

Box 2. Suitable species for reintroduction

- ❖ Overstorey proteoid species that occurred in Tokai historically included *Protea scolymocephala* and *P. repens* in the terrestrial areas (Table 2).
- ❖ In seasonally wet areas *Leucadendron levisanus* and *L. floridum* would have occurred. The latter two are Red Data List species (both endangered) and establishing additional nodes at this locality would lower their risk of extinction.
- ❖ Permission should be sought both from the nature conservation authorities and landowners to collect seed or plant material for reintroduction to Tokai.

- Attention should first be given to reinstating the major structural components of the vegetation (i.e. tall overstorey shrubs, shorter understorey shrubs, graminoids, geophytes and herbaceous species) and possibly some threatened species that urgently require additional habitat to ensure their long-term survival (e.g. *Erica ferrea*, *Diastella proteoides*, *Serruria cyanoides*, *Adenandra villosa* and *Macrostylis villosa;* Table 2)
- Seed collections should be made in the appropriate season, as different species ripen at different times, and seeds stored in a cool, dry room in porous bags. Seed should be sprinkled with an insecticide (e.g. Karbadust) to prevent predation by invertebrates. Species with canopy-stored seeds (e.g. *Protea repens*) may be collected during the summer prior to burning, and the seed heads allowed to dry in the sun to release the seeds in preparation for sowing.

- Seed of overstorey shrubs or threatened species should be sown in autumn immediately following the fire, and before germination or resprouting of any indigenous plants occurs, or else in very bare areas that escaped fire.
- No soil tillage or disturbance is required, although seeds may be very gently raked into the soil surface to improve the contact between seed and soil necessary for germination.
- The canopy-stored seeds should not be buried however.
- Seeds of similar species may be sown in clumps (about 1–2 m across), clustered across the area to be restored.
- The introduction of any nursery-grown propagated material should be done in late autumn or early winter (June at the latest) after the fire. Plants should be watered weekly for one month to facilitate establishment. Watering of plants may be stopped once the soil is wet following good winter rains.
- Care should be taken to ensure that plants are healthy and pathogen-free. However, this method is more expensive than sowing and unless propagated plants can be watered periodically through the first dry summer season, mortality rates are quite high (up to 70%, unpublished restoration trial data).

1.6 Restoration in wetland and riparian areas

- A brief survey of the wetland areas of Lower Tokai indicates that a few indigenous species, such as *Prionium serratum* (palmiet) and sedges (*Cyperaceae*) persist, both in wet depressions in the plantation or under the alien trees. It is anticipated that removal of pines adjacent to the Prins Kasteel River will become wetter once the pines are removed to extend the flora conservation site.
- These depressions would be very suitable for the reintroduction of local Red Data List species that require seasonally wet conditions, for example *Leucadendron levisanus* and *L. floridum*.
- The Soetvlei wetlands beyond the dense fringe of alien invasive trees, i.e. the central part of the wetlands, are dominated by one species – *Typha capensis* (bulrush). This species is indicative of eutrophic conditions and possibly indicates runoff of nutrient-rich water from the properties and farmland upslope. Although bulrush plays a useful role in removing nutrients from the water, it is a very competitive species and is likely to prevent the colonisation of other indigenous riparian species. For this reason, it is suggested that plans be made to reintroduce indigenous wetland/riparian species following the clearance in order to assist in countering bulrush encroachment.

Box 3. Suitable species for reintroduction

- Remaining patches of palmiet should be protected as far as possible during alien clearance operations, but bulrush encroachment should be prevented. Key species to consider reintroducing to the wetter parts of compartment A24 include graminoids (e.g. *Carex aethiopica*, *Carpha glomerata*, *Juncus* species, *Calopsis paniculata*, *Chondropetalum* species) and shrubs (e.g. *Osmitopsis asteriscoides*, *Berzelia abrotanoides*, *Erica caffra*, *Psoralea* species, *Cliffortia strobilifera*, *Salix mucronata*).
- Other potential wetland/riparian species that could be used are listed in (Table 2). It is possible that some of the wetland graminoid species will colonise from the seed bank and water-dispersed seed.

- Seed of wetland species should be sown in autumn immediately following the block burn, stack burns or block clearance, and before germination or resprouting of any indigenous plants occurs.
- No soil tillage or disturbance is required, although seeds may be very gently raked into the soil surface to improve the contact between seed and soil necessary for germination. The introduction of any nursery-grown propagated material should be done in autumn once the soils are wet.
- Plants should be watered weekly to facilitate establishment until the soil is wet following the winter rains.
- Care should be taken to ensure that plants are healthy and pathogen-free.

1.7 Long-term planning for a restored vegetation network in Tokai

- Natural linkages that are immediately useful among compartments are the riparian areas, which according to South African Forestry best practices should not be planted with any alien trees within 20 metres of each bank[1].
- Furthermore, according to CARA[2] no declared weed or invader plant may occur within 30 metres of the 1:50 year flood line of a watercourse, unless authorised thereto in terms of the NWA[3]. This provides the opportunity to restore Fynbos Riparian Scrub vegetation to the banks of the Prins Kasteel River, grading into Cape Flats Sand Fynbos away from the stream.
- The river should be used to link the current pine-free fynbos conservation area to the area currently being harvested for timber. Ultimately the goal should be to link the Lower Tokai core conservation area to the Peninsula Granite and Sandstone Fynbos on Constantiaberg via one or more corridors of natural vegetation through the exited pine plantation compartments and along the watercourses.

[14] Forestry Industry Environmental Committee (2002). Environmental Guidelines for Commercial Forestry Plantations in South Africa.

[2] Conservation of Agricultural Resources Act (Act No.43 of 1983).

[3] National Water Act (Act No. 36 of 1998).

1.8 Replanting

Where replanting is considered the following guidelines should be followed:

- Once trees have been felled and timber removed, burn remaining slash in a summer or early autumn fire. This will stimulate germination in a wider range of fynbos species than simply disturbing and clearing the ground.
- Plant the next rotation trees one year after the fire. This will allow fynbos species an extra year to establish, grow and set seed before being shaded out by the trees. Alien species should be rigorously controlled during this period.
- Continue to plant trees by disturbing a small area of ground only (e.g. hand-pitting).
- Wherever possible, apply a rotation length under 50 years.
- Where not already done, open up stream banks to a buffer of 20 m, as this could provide additional habitat for indigenous species.

Table 1. List of inappropriate alien species and suggested methods of control.

CARA category 1 = must be removed immediately; 2 = grown under controlled conditions only (permit required); 3 = may no longer be planted.

Species	**Common Name**	**CARA category** *	**Control method for mature plants**
Acacia saligna	Port Jackson's Willow	2	Fell at ground level & immediately apply herbicide $ to cut stump. Old trees with flaky bark do not resprout if cut is clean.
Acacia mearnsii	Black Wattle	2	Fell at ground level & immediately apply herbicide $ to cut stump. Old trees with flaky bark do not resprout if cut is clean.
Acacia melanoxylon	Blackwood	2	Fell at ground level & immediately apply herbicide ** to cut stump.
Acacia longifolia	Long-leaved Wattle	1	Fell at ground level to prevent resprouting.
Pinus radiata	Monterey Pine	2	Fell below lowest branch.
Eucalyptus species	Gum (several)	Mostly 2	Fell at ground level & immediately apply herbicide ^ to cut stump.
Populus x canescens	Grey Poplar	2	In autumn, fell at ground level & immediately apply herbicide #. All trees in a thicket must be cleared at once.
Pittosporum undulatum	Sweet Pittosporum	1	Fell at ground level & immediately apply herbicide # or $ to cut stump.
Spartium junceum	Spanish Broom	1	Fell at ground level & immediately apply herbicide # or $ to cut stump.
Solanum mauritianum	Bugweed	1	Fell at ground level & immediately apply herbicide # or $ to cut stump.
Ipomoea indica	Morning Glory	3	Grub out roots; foliar spray any regrowth +.
Paraserianthes lophantha	Stinkbean	1	Fell at ground level to prevent resprouting, otherwise immediately apply herbicide $ to cut stump.
Rubus fruticosus	European Bramble	2	Slash in spring/ summer & apply herbicide + < to regrowth.
Briza, Avena, Lolium species	Alien annual grass	-	Prevent seeding in restoration areas – remove flowers & destroy

Eragrostis curvula	Weeping love grass	-	Grub out tussock or cut & spray regrowth [<]
Pennisetum clandestinum	Kikuyu	-	Foliar spray [<] while actively growing (late spring – mid-autumn)

[*] Conservation of Agricultural Resources Act 43 of 1983.

[$] Herbicide is triclopyr amine (Lumberjack/Timbrel): 3 l/100 l water, apply to point of run-off; follow-up spray coppice may be required.

[#] Herbicide is imazapyr (Hatchet/Chopper): 500 ml/10 l water – apply 10 ml/ 100 mm of stump diameter to sapwood region.

[+] Herbicide is triclopyr ester (Triclon/Garlon): 500 ml/100 l water, foliar application on young, actively growing shoots.

[^] Herbicide is imazapyr (Hatchet/ Chopper): 12.5 l/100 l water stump application.

[**] Herbicide is triclopyr ester (Triclon/Garlon) 200 ml/10 l Diesel.

[<] Herbicide is glyphosate (Roundup/Ridder): 15 l per hectare foliar application.

Table 2. List of local indigenous higher plant species for terrestrial (sandplain & foothill) and wetland/ riparian habitats in the Tokai area.

This species list was compiled from recent lists: T = Tokai (S. Morris unpublished, Holmes 2003), M = Meadowridge Common (F. Watson unpublished), and S = Silvermine River (riparian species only from Reinecke & King unpublished). The extensive historical collections made during 1915-19 for the Bergvliet area by William Purcell are also included in the list, with the older names updated as far as was possible: B = Bergvliet (Rourke et al. 1981).

Nomenclature follows Goldblatt & Manning (2000) in which growth forms also are listed.

Red Data List species (Hilton-Taylor 1996) are in bold type (sometimes only a particular subspecies is threatened or different subspecies have a different threat status, however); K = insufficiently known, I = indeterminate (threatened, but not sure which category), R = rare, V = vulnerable, E = endangered.

Habitat codes are: T = terrestrial, W = wetland/ riparian.

Family	Species	**Where recorded**	**Habitat**
Aizoaceae	*Aizoon paniculatum*	B	T
Aizoaceae	*Aizoon sarmentosum*	B	T
Aizoaceae	*Carpanthea pomeridiana*	M, B	T
Aizoaceae	*Carpobrotus acinaciformis*	T, M	T
Aizoaceae	*Carpobrotus edulis*	T, M	T
Aizoaceae	*Dorotheanthus bellidiformis*	T, B	T
Aizoaceae	*Erepsia gracilis*	T	T
Aizoaceae	*Lampranthus aduncus*	B	T
Aizoaceae	*Lampranthus aurantiacus*	B	T
Aizoaceae	*Lampranthus bicolor*	T	T
Aizoaceae	*Lampranthus emarginatus*	M, B	T
Aizoaceae	*Lampranthus filicaulis*	B	T
Aizoaceae	*Lampranthus glaucus*	B	T
Aizoaceae	*Lampranthus reptans*	B	T
Aizoaceae	*Ruschia macowanii*	M, B	T
Aizoaceae	*Skiatophytum tripolium*	T	T
Aizoaceae	*Tetragonia fruticosa*	M	T
Alliaceae	*Tulbaghia alliacea*	B	T
Amaranthaceae	*Exomis microphylla*	B	T
Amaryllidaceae	*Brunsvigia orientalis*	T, B	T
Amaryllidaceae	*Crossyne guttata*	B	T
Amaryllidaceae	*Gethyllis afra*	B	T
Amaryllidaceae	*Haemanthus rotundifolius*	B	T
Amaryllidaceae	**Hessea cinnamomea R/V**	B	T
Anacardiaceae	*Rhus angustifolia*	T, B	T, W

Anacardiaceae	*Rhus glauca*	B	T
Anacardiaceae	*Rhus laevigata*	B	T
Anacardiaceae	*Rhus lucida*	T, M, B	T
Anacardiaceae	*Rhus rosmarinifolia*	B	T
Anacardiaceae	*Rhus tomentosa*	T, B	T
Anthericaceae	*Chlorophytum rangei*	B	T
Apiaceae	*Annesorhiza nuda*	B	T
Apiaceae	*Arctopus echinatus*	B	T
Apiaceae	*Itasina filifolia*	B	T
Apiaceae	*Lichtensteinia lacera*	T, B	T
Apiaceae	*Peucedanum strictum*	B	T
Apiaceae	*Sonderina hispida*	B	T
Apocynaceae	*Asclepias crispa*	B	T
Apocynaceae	*Cynanchum africanum*	B	T
Apocynaceae	*Eustegia minuta*	B	T
Apocynaceae	*Gomphocarpus cancellatus*	B	T
Apocynaceae	*Gomphocarpus fruticosus*	T, B	T
Apocynaceae	*Microloma tenuifolium*	B	T
Apocynaceae	*Schizoglossum aschersonianum*	B	T
Araceae	*Zantedeschia aethiopica*	T, B, S	W
Araliaceae	*Centella asiatica*	B	W
Araliaceae	*Centella glabrata*	B	T
Araliaceae	*Centella macrocarpa*	B	T
Araliaceae	*Centella tridentata*	M, B	T
Asparagaceae	*Asparagus asparagoides*	T, B	T
Asparagaceae	*Asparagus compactus*	T	T
Asparagaceae	*Asparagus rubicundus*	T, B	T
Asphodelaceae	*Bulbine favosa*	T, B	T
Asphodelaceae	*Bulbine lagopus*	B	T
Asphodelaceae	*Bulbinella triquetra*	B	T
Asphodelaceae	*Kniphofia uvaria*	B	W
Asphodelaceae	*Trachyandra brachypoda*	B	W
Asphodelaceae	*Trachyandra chlamydophylla*	B	T
Asphodelaceae	*Trachyandra ciliata*	T, M, B	T
Asphodelaceae	*Trachyandra filiformis*	B	T
Asphodelaceae	*Trachyandra hirsuta*	B	T
Asphodelaceae	*Trachyandra hirsutiflora*	T, B	T
Asphodelaceae	*Trachyandra hispida*	B	T
Asphodelaceae	*Trachyandra revoluta*	M, B	T
Asphodelaceae	*Trachyandra tabularis*	T	T
Asteraceae	*Arctotheca calendula*	T, M, B	T
Asteraceae	*Arctotis acaulis*	B	T
Asteraceae	**Arctotis angustifolia K**	B	T
Asteraceae	*Arctotis breviscapa*	B	T
Asteraceae	**Arctotis stoechadifolia K**	T	T
Asteraceae	*Athanasia crithmifolia*	T, B	T
Asteraceae	*Athanasia dentata*	T, B	T
Asteraceae	*Athanasia trifurcata*	B	T
Asteraceae	*Berkheya armata*	B	T
Asteraceae	*Berkheya rigida*	B	T

Asteraceae	*Chrysanthemoides monilifera*	T, M, B	T
Asteraceae	*Chrysocoma coma-aurea*	T, B	T
Asteraceae	*Corymbium africanum*	B	T
Asteraceae	*Corymbium glabrum*	B	T
Asteraceae	*Cotula turbinata*	T, M, B	T
Asteraceae	*Dimorphotheca nudicaulis*	B	T
Asteraceae	*Dimorphotheca pluvialis*	T, M	T
Asteraceae	*Disparago lasiocarpa*	B	T
Asteraceae	*Elytropappus glandulosus*	T	T
Asteraceae	*Elytropappus gnaphaloides*	B	T
Asteraceae	*Elytropappus rhinocerotis*	T, B	T
Asteraceae	*Eriocephalus africanus*	M	T
Asteraceae	*Felicia fruticosa*	T, B	T
Asteraceae	*Felicia heterophylla*	M	T
Asteraceae	*Gazania pectinata*	B	T
Asteraceae	*Gerbera crocea*	B	T
Asteraceae	*Gerbera piloselloides*	B	T
Asteraceae	*Gymnodiscus capillaris*	B	T
Asteraceae	*Helichrysum asperum*	B	T
Asteraceae	*Helichrysum cymosum*	B	T
Asteraceae	*Helichrysum dasyanthum*	B	T
Asteraceae	*Helichrysum foetidum*	B	T
Asteraceae	*Helichrysum helianthemifolium*	B	T
Asteraceae	*Helichrysum indicum*	B	T
Asteraceae	*Helichrysum niveum*	B	T
Asteraceae	*Helichrysum pandurifolium*	T	T
Asteraceae	*Helichrysum patulum*	T	T
Asteraceae	*Helichrysum rutilans*	B	T
Asteraceae	*Helichrysum teretifolium*	T	T
Asteraceae	*Metalasia brevifolia*	B	T
Asteraceae	*Metalasia capitata*	T	T
Asteraceae	*Metalasia cephalotes*	B	T
Asteraceae	*Metalasia densa*	T, M, B	T
Asteraceae	*Oedera capensis*	B	T
Asteraceae	*Oncosiphon suffruticosa*	B	T
Asteraceae	*Osmitopsis asteriscoides*	B	W
Asteraceae	*Othonna bulbosa*	T, B	T
Asteraceae	*Othonna digitata*	B	T
Asteraceae	*Othonna filicaulis*	M, B	T
Asteraceae	*Othonna quinquedentata*	B	T
Asteraceae	*Othonna stenophylla*	B	T
Asteraceae	*Petalacte coronata*	B	T
Asteraceae	*Plecostachys serpyllacea*	B	T
Asteraceae	*Pulicaria scabra*	B	W
Asteraceae	*Senecio abruptus*	B	T
Asteraceae	*Senecio arenarius*	T, B	T
Asteraceae	*Senecio burchellii*	T, M, B	T
Asteraceae	*Senecio cymbalariifolius*	B	T
Asteraceae	*Senecio erosus*	T	T
Asteraceae	*Senecio foeniculoides*	B	T

Asteraceae	*Senecio halimifolius*	T, B	T
Asteraceae	*Senecio littoreus*	T, M, B	T
Asteraceae	*Senecio pinifolius*	B	T
Asteraceae	*Senecio pubigerus*	T, B	T
Asteraceae	*Senecio purpureus*	B	T
Asteraceae	*Senecio rigidus*	T, B	T
Asteraceae	*Senecio rosmarinifolius*	B	T
Asteraceae	*Senecio triqueter*	B	T
Asteraceae	*Stoebe capitata*	T, B	T
Asteraceae	*Stoebe cinerea*	T	T
Asteraceae	*Stoebe fusca*	B	T
Asteraceae	*Stoebe plumosa*	T, B	T
Asteraceae	*Syncarpha gnaphaloides*	B	T
Asteraceae	*Syncarpha vestita*	T	T
Asteraceae	*Trichogyne ambigua*	B	T
Asteraceae	*Tripteris clandestina*	T, M	T
Asteraceae	*Tripteris dentata*	B	T
Asteraceae	*Ursinia anthemoides*	T, M, B	T
Asteraceae	*Ursinia chrysanthemoides*	B	T
Asteraceae	*Ursinia paleacea*	T	T
Asteraceae	*Vellereophyton dealbatum*	B	T
Boraginaceae	*Lobostemon fruticosus*	T, B	T
Boraginaceae	*Lobostemon trichotomus*	B	T
Brassicaceae	*Heliophila africana*	T, M, B	T
Brassicaceae	*Heliophila coronopifolia*	B	T
Brassicaceae	*Heliophila diffusa*	B	T
Brassicaceae	*Heliophila digitata*	T	T
Brassicaceae	*Heliophila pendula*	B	T
Brassicaceae	*Heliophila pusilla*	B	T
Bruniaceae	*Berzelia abrotanoides*	B	W
Bruniaceae	*Berzelia lanuginosa*	S	W
Bruniaceae	*Staavia radiata*	B	T
Campanulaceae	*Cyphia bulbosa*	T, B	T
Campanulaceae	*Grammatotheca bergiana*	B	W
Campanulaceae	*Lobelia anceps*	B	T
Campanulaceae	*Lobelia comosa*	T, B	T
Campanulaceae	*Lobelia coronopifolia*	T, B	T
Campanulaceae	*Lobelia erinus*	T, M, B	T
Campanulaceae	*Lobelia limosa*	B	T
Campanulaceae	*Lobelia pinifolia*	T	T
Campanulaceae	*Lobelia setacea*	B	T
Campanulaceae	*Microdon glomeratum*	B	T
Campanulaceae	*Microdon hispidulum*	M	T
Campanulaceae	*Monopsis debilis* var. *depressa*	**M**	T
Campanulaceae	*Monopsis lutea*	T, B	T
Campanulaceae	*Monopsis simplex*	B	T
Campanulaceae	*Prismatocarpus fruticosus*	B	T
Campanulaceae	*Prismatocarpus sessilis*	B	T
Campanulaceae	*Roella ciliata*	T, B	T
Campanulaceae	*Roella prostrata*	T, B	T

Campanulaceae	*Wahlenbergia capensis*	T, M, B	T
Campanulaceae	*Wahlenbergia cernua*	B	T
Campanulaceae	*Wahlenbergia exilis*	B	T
Campanulaceae	*Wahlenbergia longifolia*	B	T
Campanulaceae	*Wahlenbergia procumbens*	B	T
Campanulaceae	*Wahlenbergia subulata*	B	T
Campanulaceae	*Wimmerella secunda*	B	W
Caryophyllaceae	*Corrigiola litoralis*	B	T
Caryophyllaceae	*Dianthus albens*	B	T
Caryophyllaceae	*Silene pilosellifolia*	B	T
Celastraceae	*Cassine peragua*	B	T
Celastraceae	*Maytenus heterophylla*	T, B	T
Celastraceae	*Maytenus oleoides*	B	T
Celastraceae	*Pterocelastrus tricuspidatus*	B	T
Colchicaceae	*Androcymbium capense*	B	T
Colchicaceae	*Androcymbium eucomoides*	B	T
Colchicaceae	*Baeometra uniflora*	T, B	T
Colchicaceae	*Onixotis punctata*	B	T
Colchicaceae	*Ornithoglossum viride*	B	T
Colchicaceae	*Wurmbea spicata*	B	T
Convallariaceae	*Eriospermum cernuum*	B	T
Convallariaceae	*Eriospermum lanceaefolium*	B	T
Convallariaceae	*Eriospermum nanum*	B	T
Convolvulaceae	*Convolvulus nitida*	B	T
Crassulaceae	*Crassula capensis*	B	T
Crassulaceae	*Crassula cymosa*	B	T
Crassulaceae	*Crassula decumbens*	B	T
Crassulaceae	*Crassula fallax*	B	T
Crassulaceae	*Crassula flava*	B	T
Crassulaceae	*Crassula glomerata*	M, B	T
Crassulaceae	*Crassula natans*	B	W
Crassulaceae	*Crassula nudicaulis*	B	T
Crassulaceae	*Crassula pellucida*	B	T
Crassulaceae	*Crassula strigosa*	B	T
Crassulaceae	**Crassula thunbergiana R**	B	T
Crassulaceae	*Crassula umbellata*	B	T
Cucurbitaceae	*Zehneria scabra*	B	T
Cupressaceae	*Widdringtonia nodiflora*	B	T
Cyperaceae	*Carex aethiopica*	B	W
Cyperaceae	*Carpha glomerata*	S	W
Cyperaceae	*Ficinia bulbosa*	B	T
Cyperaceae	*Ficinia deusta*	B	T
Cyperaceae	*Ficinia indica*	T, B	T
Cyperaceae	*Ficinia pallens*	B	T
Cyperaceae	*Ficinia paradoxa*	B	T
Cyperaceae	*Ficinia radiata*	B	T
Cyperaceae	*Ficinia secunda*	B	T
Cyperaceae	*Ficinia tristachya*	B	T
Cyperaceae	*Fuirena hirsuta*	B	W
Cyperaceae	*Hellmuthia membranacea*	S	W

Cyperaceae	*Isolepis antarctica*	B	T
Cyperaceae	*Isolepis hystrix*	B	W
Cyperaceae	*Pycreus polystachyos*	S	W
Cyperaceae	*Tetraria bromoides*	B	T
Cyperaceae	*Tetraria compar*	B	T
Cyperaceae	*Tetraria cuspidata*	T, B	T
Dipsacaceae	*Scabiosa columbaria*	B	T
Droseraceae	*Drosera capensis*	B	W
Droseraceae	*Drosera cistiflora*	B	W
Droseraceae	*Drosera trinervia*	T, M, B	W
Ebenaceae	*Diospyros glabra*	T, B	T
Ebenaceae	*Diospyros whyteana*	B	T
Ebenaceae	*Euclea racemosa*	B	T
Ericaceae	*Erica articularis*	B	T
Ericaceae	*Erica baccans*	B	T
Ericaceae	*Erica caffra*	S	W
Ericaceae	*Erica cerinthoides*	B	T
Ericaceae	*Erica chamissonis*	B	T
Ericaceae	*Erica coriifolia*	T, B	T
Ericaceae	*Erica decora*	B	T
Ericaceae	*Erica ericoides*	T, B	T
Ericaceae	**Erica ferrea V**	B	T
Ericaceae	*Erica flexuosa*	B	T
Ericaceae	*Erica hirtifolia*	T	T
Ericaceae	*Erica imbricata*	T, B	T
Ericaceae	*Erica lasciva*	B	T
Ericaceae	*Erica mammosa*	B	T
Ericaceae	*Erica mauritanica*	T, B	T
Ericaceae	*Erica multumbellifera*	T	T
Ericaceae	*Erica muscosa*	B	T
Ericaceae	*Erica nudiflora*	B	T
Ericaceae	*Erica plukenetii*	B	T
Ericaceae	*Erica pulchella*	T, B	T
Ericaceae	*Erica subdivaricata*	M, B	T
Ericaceae	*Erica viscaria*	B	T
Euphorbiaceae	*Clutia alaternoides*	B	T
Euphorbiaceae	*Euphorbia erythrina*	B	T
Euphorbiaceae	*Euphorbia tuberosa*	T, B	T
Fabaceae	*Amphithalea ericifolia*	B	T
Fabaceae	**Aspalathus angustifolia R**	B	T
Fabaceae	*Aspalathus callosa*	T, M	T
Fabaceae	*Aspalathus cf. linifolia*	T	T
Fabaceae	*Aspalathus cordata*	T, B	T
Fabaceae	*Aspalathus hispida*	T	T
Fabaceae	*Aspalathus juniperina*	T	T
Fabaceae	*Aspalathus laricifolia*	T	T
Fabaceae	*Aspalathus retroflexa* subsp. *bicolor*	**T, M**	T
Fabaceae	*Aspalathus spinosa*	T, M	T
Fabaceae	*Bolusafra bituminosa*	T, B	T
Fabaceae	*Crotalaria capensis*	B	T

Fabaceae	*Dipogon lignosus*	B	T
Fabaceae	*Dolichos decumbens*	T	T
Fabaceae	*Hypocalyptus trifoliatus*	T	T
Fabaceae	*Indigofera angustifolia*	B	T
Fabaceae	*Indigofera capillaris*	B	T
Fabaceae	*Indigofera cytisoides*	B	T
Fabaceae	*Indigofera incana*	T, B	T
Fabaceae	*Indigofera mauritanica*	B	T
Fabaceae	*Indigofera psoraleoides*	B	T
Fabaceae	*Lebeckia carnosa*	B	T
Fabaceae	*Lebeckia meyeriana*	B	T
Fabaceae	*Lebeckia plukenetiana*	T	T
Fabaceae	*Lessertia capensis*	T, B	T
Fabaceae	*Lessertia frutescens*	B	T
Fabaceae	*Liparia splendens*	B	T
Fabaceae	*Lotononis peduncularis*	B	T
Fabaceae	*Otholobium decumbens*	T, M, B	T
Fabaceae	**Otholobium fruticans V**	B	T
Fabaceae	*Podalyria biflora*	B	T
Fabaceae	*Podalyria calyptrata*	T, B	T
Fabaceae	*Podalyria cuneifolia*	B	T
Fabaceae	*Podalyria sericea*	T, B	T
Fabaceae	*Psoralea aculeata*	T	T
Fabaceae	*Psoralea alata*	B	T
Fabaceae	*Psoralea aphylla*	B	W
Fabaceae	*Psoralea fascicularis*	B	T
Fabaceae	*Psoralea imbricata*	B	T
Fabaceae	*Psoralea laxa*	B	W
Fabaceae	*Psoralea pinnata*	T, B, S	W
Fabaceae	**Psoralea restioides R**	S	W
Fabaceae	*Rafnia angulata*	T, B	T
Fabaceae	*Rafnia capensis*	B	T
Fabaceae	*Rafnia triflora*	T, B	T
Fabaceae	*Rhynchosia capensis*	B	T
Fabaceae	*Tephrosia capensis*	T	T
Fabaceae	*Virgilia oroboides*	M, B	W
Fabaceae	*Wiborgia obcordata*	T	T
Gentianaceae	*Chironia baccifera*	B	T
Gentianaceae	*Chironia linoides*	B	T
Gentianaceae	*Orphium frutescens*	B	T
Gentianaceae	*Sebaea aurea*	B	T
Gentianaceae	*Sebaea exacoides*	B	T
Gentianaceae	*Sebaea micrantha*	B	T
Gentianaceae	*Sebaea schlechteri*	B	T
Geraniaceae	*Geranium incanum*	T, M	T
Geraniaceae	*Pelargonium alchemilloides*	B	T
Geraniaceae	*Pelargonium betulinum*	B	T
Geraniaceae	*Pelargonium capitatum*	T, M, B	T
Geraniaceae	*Pelargonium chamaedryfolium*	T, B	T
Geraniaceae	*Pelargonium cucullatum*	T, M, B	T

Geraniaceae	*Pelargonium ellaphiae*	B	T
Geraniaceae	*Pelargonium grossularioides*	B	T
Geraniaceae	*Pelargonium longifolium*	B	T
Geraniaceae	*Pelargonium myrrhifolium*	T, M, B	T
Geraniaceae	*Pelargonium triste*	T, M, B	T
Gunneraceae	*Gunnera perpensa*	B	W
Haemodoraceae	*Wachendorfia brachyandra*	B	T
Haemodoraceae	*Wachendorfia graminifolia*	T	T
Haemodoraceae	*Wachendorfia multiflora*	B	T
Haemodoraceae	*Wachendorfia paniculata*	T, M, B	T
Haemodoraceae	*Wachendorfia thyrsiflora*	T, B	W
Haloragaceae	*Laurembergia repens*	B	W
Hemerocallidaceae	*Caesia contorta*	T, M, B	T
Hyacinthaceae	*Albuca cooperi*	T, B	T
Hyacinthaceae	*Albuca flaccida*	T, M, B	T
Hyacinthaceae	*Albuca juncifolia*	B	T
Hyacinthaceae	*Drimia exuviata*	B	T
Hyacinthaceae	*Drimia filifolia*	B	T
Hyacinthaceae	*Lachenalia orchioides*	T, B	T
Hyacinthaceae	*Lachenalia reflexa*	T, M, B	T
Hyacinthaceae	*Lachenalia rubida*	B	T
Hyacinthaceae	*Lachenalia unifolia*	T, B	T
Hyacinthaceae	*Lachenalia variegata*	B	T
Hyacinthoides	*Ornithogalum dregeanum*	B	W
Hyacinthoides	*Ornithogalum graminifolium*	B	W
Hyacinthoides	*Ornithogalum hispidum*	B	T
Hyacinthoides	*Ornithogalum thyrsoides*	T	T
Hyacinthoides	*Pauridia minuta*	B	T
Hypoxidaceae	*Empodium plicatum*	M, B	T
Hypoxidaceae	*Spiloxene alba*	B	W
Hypoxidaceae	*Spiloxene canaliculata*	B	T
Hypoxidaceae	*Spiloxene capensis*	T, M, B	T
Hypoxidaceae	*Spiloxene curculigoides*	B	T
Hypoxidaceae	*Spiloxene ovata*	B	W
Hypoxidaceae	*Spiloxene schlechteri*	B	W
Iridaceae	*Aristea africana*	T, B	T
Iridaceae	*Aristea bakeri*	T	T
Iridaceae	*Aristea cuspidata*	B	T
Iridaceae	*Aristea dichotoma*	M	T
Iridaceae	*Aristea glauca*	B	T
Iridaceae	*Aristea macrocarpa*	T, B	T
Iridaceae	*Aristea pauciflora*	T, B	T
Iridaceae	*Aristea spiralis*	B	T
Iridaceae	*Babiana ambigua*	T, B	T
Iridaceae	*Babiana ringens*	B	T
Iridaceae	*Babiana villosula*	T, B	T
Iridaceae	*Chasmanthe aethiopica*	T, B	T
Iridaceae	*Geissorhiza aspera*	T, M, B	T
Iridaceae	*Geissorhiza hispidula*	T	T
Iridaceae	*Geissorhiza humilis*	B	T

Iridaceae	*Geissorhiza imbricata*	M, B	T
Iridaceae	*Geissorhiza juncea*	B	T
Iridaceae	*Geissorhiza ovata*	B	T
Iridaceae	*Geissorhiza tenella*	M, B	T
Iridaceae	*Gladiolus alatus*	B	T
Iridaceae	*Gladiolus brevifolius*	T, B	T
Iridaceae	**Gladiolus carinatus R**	B	T
Iridaceae	*Gladiolus carneus*	B	T
Iridaceae	*Gladiolus gracilis*	T, B	T
Iridaceae	*Gladiolus hirsutus*	T, B	T
Iridaceae	*Gladiolus hyalinus*	B	T
Iridaceae	*Gladiolus liliaceus*	B	T
Iridaceae	*Gladiolus maculatus*	B	T
Iridaceae	**Gladiolus ornatus R**	B	T
Iridaceae	*Gladiolus priori*	B	T
Iridaceae	**Gladiolus tristis**	T	T
Iridaceae	*Gladiolus undulatus*	T, B	T
Iridaceae	*Hesperantha falcata*	B	T
Iridaceae	*Hesperantha pilosa*	B	T
Iridaceae	*Hesperantha radiata*	T	T
Iridaceae	*Ixia dubia*	T, M	T
Iridaceae	*Ixia polystachya*	B	T
Iridaceae	*Lapeirousia anceps*	T, B	T
Iridaceae	*Lapeirousia corymbosa*	T, M, B	T
Iridaceae	*Melasphaerula ramosa*	T	T
Iridaceae	*Micranthus alopecuroides*	T, B	T
Iridaceae	*Micranthus junceus*	B	T
Iridaceae	*Micranthus tubulosus*	B	T
Iridaceae	*Moraea angulata*	B	T
Iridaceae	*Moraea angusta*	T, B	T
Iridaceae	*Moraea bituminosa*	T, B	T
Iridaceae	*Moraea collina*	T, M, B	T
Iridaceae	**Moraea elsiae R**	M, B	T
Iridaceae	*Moraea flaccida*	T, M, B	T
Iridaceae	*Moraea fugax*	T, M, B	T
Iridaceae	*Moraea gawleri*	T, B	T
Iridaceae	*Moraea inconspicua*	B	T
Iridaceae	*Moraea lewisiae*	T, B	T
Iridaceae	*Moraea lugubris*	T, M, B	T
Iridaceae	*Moraea miniata*	B	T
Iridaceae	*Moraea minor*	B	T
Iridaceae	*Moraea neglecta*	T, B	T
Iridaceae	*Moraea papilionacea*	B	T
Iridaceae	*Moraea ramosissima*	T, B	T
Iridaceae	*Moraea tricuspidata*	B	T
Iridaceae	*Moraea tripetala*	M, B	T
Iridaceae	*Moraea vegeta*	B	T
Iridaceae	*Moraea versicolor*	B	T
Iridaceae	*Moraea virgata*	B	T
Iridaceae	*Romulea cruciata*	B	T

Iridaceae	*Romulea flava*	T, B	T
Iridaceae	*Romulea hirsuta*	B	T
Iridaceae	*Romulea obscura*	B	T
Iridaceae	*Romulea rosea*	T, M, B	T
Iridaceae	*Romulea triflora*	**M, B**	T
Iridaceae	*Sparaxis bulbifera*	M, B	W
Iridaceae	**Sparaxis grandiflora R**	T, B	T
Iridaceae	*Thereianthus bracteolatus*	B	T
Iridaceae	*Tritoniopsis parvifolia*	B	T
Iridaceae	*Tritoniopsis triticea*	B	T
Iridaceae	*Watsonia angusta*	B	T
Iridaceae	*Watsonia borbonica*	B	T
Iridaceae	*Watsonia coccineus*	T	T
Iridaceae	**Watsonia humilis E**	B	T
Iridaceae	*Watsonia meriana*	B	W
Iridaceae	*Watsonia tabularis*	T	T
Juncaceae	*Juncus capensis*	S	W
Juncaceae	*Juncus cf. kraussii*	T	W
Juncaginaceae	*Triglochin bulbosa*	T	W
Juncaginaceae	*Triglochin striata*	B	W
Kiggelariaceae	*Kiggelaria africana*	T, B	T
Lamiaceae	*Leonotis leonurus*	T, B	T
Lamiaceae	*Salvia africana-caerulea*	T	T
Lamiaceae	*Salvia africana-lutea*	T, M, B	T
Lamiaceae	*Salvia chamelaeagnea*	B	T
Lauraceae	*Cassytha ciliolata*	B	T
Linaceae	*Linum africanum*	B	T
Loranthaceae	*Viscum capense*	B	T
Malvaceae	*Anisodontea scabrosa*	B	T
Malvaceae	*Hermannia althaeifolia*	B	T
Malvaceae	*Hermannia cuneifolia*	T, B	T
Malvaceae	*Hermannia hyssopifolia*	T	T
Malvaceae	*Hermannia lacera*	B	T
Malvaceae	*Hermannia multiflora*	M	T
Malvaceae	*Hibiscus aethiopicus*	B	T
Menispermaceae	*Antizoma capensis*	B	T
Molluginaceae	*Adenogramma glomerata*	B	T
Molluginaceae	*Pharnaceum dichotomum*	B	T
Molluginaceae	*Pharnaceum elongatum*	B	T
Molluginaceae	*Pharnaceum incanum*	T	T
Molluginaceae	*Pharnaceum lanatum*	B	T
Molluginaceae	*Polpoda capensis*	B	T
Montiniaceae	*Montinia caryophyllacea*	T, B	T
Myricaceae	*Morella quercifolia*	M, B	T
Myricaceae	*Morella serrata*	B	W
Myrsinaceae	*Myrsine africana*	T, B	T
Nymphaeaceae	*Nymphaea capensis*	B	W
Oleaceae	*Olea capensis subsp capensis*	T, B	T
Oleaceae	*Olea europaea subsp africana*	T, B	T
Oleaceae	*Olea exasperata*	B	T

Orchidaceae	**Acrolophia bolusii V**	B	T
Orchidaceae	*Acrolophia lamellata*	B	T
Orchidaceae	*Ceratandra atrata*	B	T
Orchidaceae	*Corycium orobanchoides*	B	T
Orchidaceae	*Disa atrorubens*	B	T
Orchidaceae	*Disa bracteata*	T, B	T
Orchidaceae	*Disa cornuta*	B	T
Orchidaceae	*Disa hians*	B	T
Orchidaceae	*Disperis capensis*	B	T
Orchidaceae	*Eulophia aculeata*	B	T
Orchidaceae	*Holothrix villosa*	T, B	T
Orchidaceae	*Pterygodium catholicum*	T, M, B	T
Orchidaceae	*Satyrium bicallosum*	B	T
Orchidaceae	*Satyrium bicorne*	T, B	T
Orchidaceae	*Satyrium bracteatum*	B	T
Orchidaceae	*Satyrium candidum*	T	T
Orchidaceae	*Satyrium coriifolium*	B	T
Orchidaceae	*Satyrium odorum*	T, M, B	T
Orobanchaceae	*Alectra sessiliflora*	B	T
Oxalidaceae	*Oxalis bifida*	B	T
Oxalidaceae	*Oxalis caprina*	T	T
Oxalidaceae	*Oxalis commutata*	B	T
Oxalidaceae	*Oxalis compressa*	B	T
Oxalidaceae	*Oxalis dentata*	B	T
Oxalidaceae	*Oxalis depressa*	B	T
Oxalidaceae	*Oxalis eckloniana*	T, B	T
Oxalidaceae	*Oxalis glabra*	B	T
Oxalidaceae	*Oxalis hirta*	B	T
Oxalidaceae	*Oxalis incarnata*	T, B	T
Oxalidaceae	*Oxalis lanata*	B	T
Oxalidaceae	*Oxalis luteola*	T, M, B	T
Oxalidaceae	*Oxalis nidulans*	B	T
Oxalidaceae	*Oxalis obtusa*	T, M, B	T
Oxalidaceae	*Oxalis pes-caprae*	T, M, B	T
Oxalidaceae	*Oxalis polyphylla*	T, B	T
Oxalidaceae	*Oxalis punctata*	T, B	T
Oxalidaceae	*Oxalis purpurea*	T, M, B	T
Oxalidaceae	*Oxalis versicolor*	T, M, B	T
Penaeaceae	*Penaea mucronata*	B	T
Penaeaceae	*Stylapterus fruticulosus*	B	T
Poaceae	*Cynodon dactylon*	T	T
Poaceae	*Ehrharta bulbosa.*	B	T
Poaceae	*Ehrharta calycina*	T	T
Poaceae	*Eragrostis capensis*	B	T
Poaceae	*Merxmuellera stricta*	T	T
Poaceae	*Pennisetum macrourum*	T	T
Poaceae	*Pentaschistis curvifolia*	T	T
Poaceae	*Stenotaphrum secundatum*	T	T
Poaceae	*Stipagrostis zeyheri*	B	T
Poaceae	*Tribolium uniolae*	T	T

Podocarpaceae	*Podocarpus latifolius*	T	T
Polygalaceae	*Muraltia brevicornu*	B	T
Polygalaceae	*Muraltia ericoides*	B	T
Polygalaceae	*Muraltia filiformis*	B	T
Polygalaceae	*Muraltia heisteria*	T, B	T
Polygalaceae	*Muraltia thunbergii*	B	T
Polygalaceae	*Muraltia thymifolia*	T, B	T
Polygalaceae	*Nylandtia spinosa*	T, M, B	T
Polygalaceae	*Polygala garcini*	B	T
Polygalaceae	*Polygala myrtifolia*	T, B	T
Polygalaceae	*Polygala refracta*	B	T
Polygonaceae	*Emex australis*	B	T
Polygonaceae	*Rumex cordatus*	T, M, B	T
Polygonaceae	*Rumex lativalvis*	M, B	T
Polygonaceae	*Rumex sagittatus*	B	T
Prioniaceae	*Prionium serratum*	T, S	W
Proteaceae	*Brabejum stellatifolium*	T	W
Proteaceae	**Diastella proteoides V**	T, M, B	T
Proteaceae	**Leucadendron floridum E**	B	W
Proteaceae	*Leucadendron laureolum*	B	T
Proteaceae	**Leucadendron levisanus E**	B	W
Proteaceae	*Leucadendron salignum*	M, B	T
Proteaceae	*Leucospermum conocarpodendron*	T	T
Proteaceae	*Leucospermum hypophyllocarpodendron*	B	T
Proteaceae	*Protea acaulis*	B	T
Proteaceae	*Protea coronata*	B	T
Proteaceae	*Protea cynaroides*	B	T
Proteaceae	*Protea repens*	B	T
Proteaceae	*Protea scolymocephala*	M, B	T
Proteaceae	**Serruria cyanoides V**	T, B	T
Proteaceae	*Serruria fasciflora*	T, B	T
Proteaceae	*Serruria glomerata*	T, B	T
Pteridaceae	*Pteridium aquilinum*	T	T
Ranunculaceae	*Knowltonia vesicatoria*	B	T
Ranunculaceae	*Ranunculus multifidus*	B	W
Restionaceae	*Calopsis cf. paniculata*	T	W
Restionaceae	*Chondropetalum microcarpum*	B	T
Restionaceae	*Chondropetalum nudum*	T	W
Restionaceae	*Chondropetalum tectorum*	T	W
Restionaceae	*Elegia thyrsifera*	S	W
Restionaceae	*Hypodiscus aristatus*	T	T
Restionaceae	*Ischyrolepis capensis*	T	T
Restionaceae	*Mastersiella digitata*	T	T
Restionaceae	*Restio bifurcus*	T	T
Restionaceae	*Restio tetragonus*	T, B	T
Restionaceae	*Thamnochortus arenarius OR obtusus*	T	T
Restionaceae	*Thamnochortus cf. sporadicus*	T	T
Restionaceae	*Thamnochortus fruticosus*	B	T
Restionaceae	*Willdenowia incurvata*	T	T
Restionaceae	*Willdenowia striata*	B	T

Restionaceae	*Willdenowia sulcata*	T	T
Rhamnaceae	*Phylica cephalantha*	B	T
Rhamnaceae	*Phylica imberbis*	M, B	T
Rhamnaceae	*Phylica parviflora*	B	T
Rhamnaceae	*Phylica plumosa*	B	T
Rhamnaceae	*Phylica pubescens*	T	T
Rhamnaceae	*Trichocephalus stipularis*	T, B	T
Rosaceae	*Alchemilla capensis*	B	T
Rosaceae	*Cliffortia dodecandra*	S	W
Rosaceae	*Cliffortia falcata*	T, B	T
Rosaceae	*Cliffortia ferruginea*	B	W
Rosaceae	*Cliffortia filifolia*	B	T
Rosaceae	*Cliffortia juniperina*	B	T
Rosaceae	*Cliffortia obcordata*	B	T
Rosaceae	*Cliffortia polygonifolia*	T, B	T
Rosaceae	*Cliffortia stricta*	B	T
Rosaceae	*Cliffortia strobilifera*	T, B	W
Rosaceae	*Cliffortia subsetacea*	S	W
Rosaceae	*Rubus pinnatus*	B	T
Rubiaceae	*Anthospermum aethiopicum*	B	T
Rubiaceae	*Anthospermum bergianum*	B	T
Rubiaceae	*Anthospermum galioides*	B	T
Rubiaceae	*Anthospermum prostratum*	B	T
Rubiaceae	*Nenax acerosa*	B	T
Rutaceae	**Adenandra villosa R/I/nt**	B	T
Rutaceae	Agathosma cf. ovata	M	T
Rutaceae	**Agathosma glabrata I**	B	T
Rutaceae	*Agathosma imbricata*	B	T
Rutaceae	*Diosma hirsuta*	B	T
Rutaceae	*Diosma oppositifolia*	M, B	T
Rutaceae	**Macrostylis villosa E/I**	B	T
Salicaceae	*Salix mucronata subsp. hirsuta*	B	W
Santalaceae	*Thesium aggregatum*	B	T
Santalaceae	*Thesium capitatum*	B	T
Santalaceae	*Thesium ecklonianum*	B	T
Santalaceae	*Thesium euphrasioides*	B	T
Santalaceae	*Thesium funale*	B	T
Santalaceae	*Thesium scabrum*	B	T
Santalaceae	*Thesium strictum*	T	T
Santalaceae	*Thesium virgatum*	B	T
Schizaeaceae	*Schizaea pectinata*	B	T
Scrophulariaceae	*Diascia capensis*	B	T
Scrophulariaceae	*Dischisma capitatum*	B	T
Scrophulariaceae	*Dischisma ciliatum*	T, B	T
Scrophulariaceae	*Harveya capensis*	B	T
Scrophulariaceae	*Hebenstretia dentata*	B	T
Scrophulariaceae	*Hemimeris montana*	B	T
Scrophulariaceae	*Hyobanche sanguinea*	B	T
Scrophulariaceae	*Manulea tomentosa*	T, B	T
Scrophulariaceae	*Microdon capitatus*	B	T

Scrophulariaceae	*Nemesia barbata*	T, B	T
Scrophulariaceae	*Nemesia pinnata*	B	T
Scrophulariaceae	*Nemesia versicolor*	B	T
Scrophulariaceae	*Oftia africana*	T, B	T
Scrophulariaceae	*Polycarena heterophylla*	B	T
Scrophulariaceae	*Pseudoselago spuria*	T	T
Scrophulariaceae	*Selago corymbosa*	T, B	T
Scrophulariaceae	*Sutera tristis*	B	T
Solanaceae	*Lycium afrum*	B	T
Stilbaceae	*Stilbe ericoides*	B	T
Tecophilaeaceae	*Cyanella hyacinthoides*	T, M, B	T
Thymelaeaceae	*Gnidia inconspicua*	B	T
Thymelaeaceae	*Gnidia laxa*	B	T
Thymelaeaceae	*Gnidia nana*	B	T
Thymelaeaceae	*Gnidia oppositifolia*	T	T
Thymelaeaceae	*Gnidia pinifolia*	B	T
Thymelaeaceae	*Gnidia tomentosa*	T	T
Thymelaeaceae	*Lachnaea capitata*	T, B	T
Thymelaeaceae	*Lachnaea uniflora*	M, B	T
Thymelaeaceae	*Passerina vulgaris*	T, M, B	T
Thymelaeaceae	*Struthiola ciliata*	T, B	T
Thymelaeaceae	*Struthiola dodecandra*	T, M, B	T
Thymelaeaceae	*Struthiola striata*	T, B	T
Typhaceae	*Typha capensis*	B	W
Zygophyllaceae	*Zygophyllum sessilifolium*	B	T

The following species from Purcell's collection (Rourke et al. 1981) could not be traced to new names in Goldblatt & Manning (2000). Fabaceae: *Priestleya sericea*, *Psoralea capitata*; Thymelaeaceae: *Gnidia viridis;* Asteraceae: *Leontonyx glomeratus*, *Osteospermum imbricatum*. *Lessertia herbacea*; (Asteraceae) is listed in the "PRECIS" database of SANBI, but not in Goldblatt & Manning (2000).

A short history of forestry in South Africa

P E N Britton October 2006
BSc Degree in Forestry (Nature Conservation) – Stellenbosch, with Masters in Landscape Architecture – Pretoria

This short review is intended to give some background to the current debate regarding the plantations at Tokai and Cecilia. More details can be found in the reference used.

The first European settlers found very little timber to establish their colonies. In fact, when Van Riebeeck arrived in 1652 he was aware of this and brought with him a supply of pine beams and planks from Norway, rafters, small joists and planks from Sweden with which the first dwellings were built. A month after he had arrived, van Riebeeck sent out an exploration party which found forests (presumably the Orangekloof forest) behind Table Mountain. On the 5th of June he went to see the forest and described it as being "full of large, tall, straight, heavy, medium and small trees, suitable the largest construction one could desire, but so far and difficult to convey that it would be less expensive to buy timber in Holland or Batavia and have it sent here, than to have it brought from this forest". It is significant that he only later, in September of the same year found timber in the kloofs on the front face of Table Mountain. This discounts the popular belief that the slopes of Table Mountain were clothed with forests.

Van Riebeeck imported various trees to test and many of these were planted in the Companies Gardens. Contrary to popular belief it was him and not van der Stel that introduced the oak trees. In 1656 van Riebeeck reported that oaks and ash trees were thriving well and groves of oaks and ashes were thriving. It was in fact this grove that was supplying households with firewood as the settlers were not only depleting the forest, but the surrounding Fynbos was also being depleted of woody shrubs for the insatiable demand for firewood. .

Later the forests from Rondebosch to Constantia Nek which Van Riebeeck collectively called Boschheuwel (currently Bishopscourt) were discovered. These sources of timber were soon exploited and in 1658 he issued a *Placaat* forbidding burgers to fell trees in the forests. This was the first in a series of *Placaats* which did little to protect the forests and by 1660 the "nuwe lande" were being cleared for agriculture as all the timber had been cleared in that area (this the current Newlands). By 1663 exploitation began in the forests from Constantia Nek to Retreat.

In 1679 when van der Stel arrived, forests were all but depleted and he extended the Boschheuwel road into Hout Bay to exploit the Orangekloof forests. Like van Riebeeck he issued several *Placaats* in an attempt to protect the forests. His attempts to protect the forests were unsuccessful and in 1772 Thunberg wrote that "There are no forests in the vicinity of town except for small ones high up in the clefts of the mountain".

Van der Stel was an enthusiastic tree planter and endevoured to have more oaks trees (which were the most successful of all the imported trees at the time) planted. In 1689 a *Placaat* was issued to make it obligatory for every grantee of land to plant100 oaks per year. His son and successor Willem Adraian van der Stel commented that many of the trees planted were stunted by the wind and the growth was poor in the sandy soils. He thus commenced a formal planting oaks in the Newlands area where the growing conditions were more suitable.

As the sources timber were depleted, the settlers obtained timber from the Swellendam, Riviersonderend and Grootvadersbosch forests. Exploitation then moved to the more extensive Knysna forests in 1711. The Knysna forests continued to be heavily exploited and it was only in the 1880's when the indigenous forests were placed under sound scientific management that the destruction was brought under control. In 1883 the first regulations were issued for the systematic management of the indigenous forests.

In the 1800's foresters realised that the sources of indigenous timber would soon be depleted. In 1875 J Storr Lister was appointed Superintendent of Plantations and the first small plantation of eucalypts was planted at Worcester in 1876 to provide fuel for the steam trains. In 1893 Tokai plantation was established and Cecilia and Devils' Peak followed soon after. The seed for the first plantings of *Pinus radiata* were obtained from the Companies Gardens. It is interesting to note that the Devil's Peak planting was intended to "restore the ravaged slopes" as the area was covered with deep dongas. Count de Vasselot, appointed in 1889 as Superintendent of Woods and Forests favoured the augmentation of natural timber supplies by afforestation and by 1889 the plantation area in the Cape Colony was 3 000 acres (408 ha).

Up to the World War of 1914-1918 most of the timber was imported mainly from the northern coniferous forests. During the war there was a world-wide shortage of timber due to the shipping lanes being cut off. This also seriously affected South Africa. In 1918-19, 75 hectares of *Pinus radiata* were sold from Tokai. The financial return created considerable public interest and proved that commercial plantations of exotic pines were a viable proposition. This, together with post war job creation programmes, stimulated an acceleration of afforestation. This however slowed down and very little further afforestation took place until after the Second World War. As was the case in the First World War, there was a serious shortage of timber during the war and prices boomed. This gave rise to a post war growth in the timber industry with the planting of 8 093 ha per annum. Initially forestry was only conducted by the Department of Forestry, but the boom in forestry and the release of timber from the state plantations gave rise to a growing private timber industry. Thus, over the years the role of the Department of Forestry as the prime supplier of timber began to diminish in favour the establishment of a fully sustainable private timber industry.

During the years of expansion, many of the areas planted were unsuitable for sustainable timber production and it is these areas are now being withdrawn from production. Tokai Cecilia remain the most productive areas in respect of growth and timber quality in the South African timber industry and it is ironic that their original role of protecting the

indigenous timber resources of the Cape now have to make way for the conservation of Biodiversity.

In hindsight it is easy to criticize early settlers and foresters for some of their actions. Indeed, the sowing of seed *Pinus pinaster* on the mountains to improve the paucity of the Fynbos and the planting of trees in water catchments to improve water yield, although based on the best knowledge at the time, were certainly misguided, However it can be said that without the foresight of early foresters, the area currently under indigenous forests in South Africa would have been totally decimated and South Africa would have been totally dependent on diminishing sources of imported timber.

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Preliminary guidelines for the Replanting of trees

The replanting of trees suitable for the timber industry should be compared with the planting of trees for recreational activities requiring shade. The section on recreational activities will inform what type of trees would be suitable for relevant recreational uses. As for the timber industry, the general view is that relatively non-invasive commercial trees, most probably *Pinus radiata*, may be planted and managed according to strict environmental guidelines. These are plants with the proven potential of becoming invasive, but which nevertheless have certain beneficial properties that warrant their continued presence in certain circumstances. CARA makes provision for Category 2 plants to be retained in special areas demarcated for that purpose, but those occurring outside demarcated areas have to be controlled. The exception is that Category 2 plants may also be retained or cultivated in biological control reserves, where the plants will serve as host plants for the breeding of biological control agents. The growing of Category 2 plants in a demarcated area qualifies as a water use, and is subject to the requirements of section 21 of the National Water Act, 1998 (Act No. 36 of 1998). (*Pinus canariensis, P. elliottii, P. halepensis, P. patula, P. pinaster, P. radiata, P. roxburghii* and *P. taeda*.)

The following principles thus have to be met when considering replanting:

- Purpose: For what purpose are the trees required?
- Site selection: The conservation priority on a microscale has to be compared with the suitability of the site for the intended purpose.
- Preference will be given to replanting of indigenous trees i.e. indigenous to TMNP, but where no suitable alternative exists non-invasive alien species could be considered subject to very strong management guidelines not to jeopardize the conservation objectives.

Suitability of indigenous trees for replanting to create shaded landscapes in Tokai

Note that this is an initial overview desktop study. It is intended as an indication of indigenous trees suitable for planting to create shaded landscapes in the Tokai area as a potential replacement for the pine plantations. Should it be decided to carry out such plantings, then an in-depth feasibility study of all factors will be essential.
Note: Common and Botanical names as well as confirmation of species names are currently debate by scientist. The names used in this table do not yet reflect new classifications.

Compiled September 2006 by: Paul EN Britton
BSc Degree in Forestry (Nature Conservation) – Stellenbosch, with Masters in Landscape Architecture – Pretoria

1. Indigenous species. Species indigenous to the Cape Peninsula. Full list (excluding shrubs) from D Euston-Brown1992.

Species	Common name	General characteristics	Habitat	Suitability for creating shaded landscapes in Tokai area √√√= Highly suitable √√= Suitable √= Worth trying	Notes
Apodytes dimidiata	White-pear	A forest tree generally found in moist forests		√	Root bark has medicinal properties
Brabejum stellatifolium	Wild-almond	Multi-stemmed and sprawling	Wet	x	
Canthium inerme	Bokdrol/Turkey-berry	Varies from a shrub to a tall tree		x	
Canthium mundianum	Rockalder/Klipels	Varies from a shrub to a small tree		x	
Cassine peragua	Forest Spoon-wood	A tall tree in moist forests & dry rocky ground		√	

Celtis africana	White-stinkwood	Occurs rarely in the the penisula forest patches, but widely used as street and park trees where sheltered from the wind. Growth form highly suitable	Dry	√ √√	Only occurs in low numbers in a few of the forest patches. It does not occur naturally in the Tokai & Cecilia forest patches. It is deciduous which will allow for sunlight in winter months. Commercially available. If planted, ensure that exotic *Celtis sinensis,* which tends to be invasive, is not used as they can be confused.
Chionanthus foveolatus	Pock-ironwood	Small tree		x	
Cunonia capenis	Rooiels/Red Alder	Prefers moist to wet habitat such as riparian zones		x	
Curtisia dentata	Assegaai	Growth form suitable. Grows in a range of habitats		√√	Available commercially
Diospyros whyteana	Swartbas	A shrub or small tree		x	
Gymnosporia buxifolia (part of Maytenus heterophylla complex)	Gewonependoring	Can become a small tree. Very thorny		x	
Halleria lucida	Notsung	A multi-stemmed shrub to small tree		x	
Cassine shinoides (Hartogiella shinoides)	Spoonwood	A small tree		x	
Ilex mitis	African-holly/Without	Requires a wet habitat such as stream banks		x	
Kiggelaria africana	Wild peach	Very adaptable. Varies from a small to medium tree.		√√	Infestation by caterpillars can defoliate the tree completely every season. Will require pruning to make a canopy.
Maurocenia frangula (Maurocenia frangularia)	Hotentots-cherry	Multi stemmed.		x	

Maytenus acuminata	Sybas/Silky-bark	A small tree unlikely to flourish outside of the forest habitat		x	
Maytenus oleoides	Rock False candlewood/Klipvalsker shout	A small tree.		x	Difficult to propagate
Ocotea bullata	Stinkwood	Requires very wet habitat		x	
Olea capensis subsp *capensis*	Small-ironwood	A small tree which tends to be more shrub like in the Peninsula		√	Likely to be more hardy than Ironwood, but it is less likely to form a tall canopy tree. [Not recorded by D E-Brown)
Olea capensis subsp *macrocarpa*	Ironwood (Black-ironwood)	Tall tree with a spreading canopy.		√√	Can occur in both moist and dry areas. More likely to form a tall tree than the Small-ironwood.
Olea europea subsp *africana*	African olive /Olienhout	Very hardy and easy to grow, but will not form a high canopy		√	
Olinia ventosa	Hard-pear	Large fast growing forest tree.		√√	Seed is difficult to germinate
Podocarpus latifolius	Broad-leaved Yellowwood/Opregtegeelhout	Can become a tall spreading tree. Some are doing well in the "new" picnic area at Tokai.		√√√	Commercially available. Valuable timber
Pterocelastrus tricuspidatus	Rooikershout/Red Candlewood	Can become a small tree, but tends to be a multi-stemmed shrub when growing outside of the forest habitat.		x	
Robsonodendron eucleiforme (Cassine eucliformis)	Witsybas/White Silky-bark	A small tree		x	
Rapanea melanophloeos	Kaapse Boekenhout	Prefers moist to wet habitat such as riparian zones		x	
Scolopia mundii	Red pear	Can become a large tree		√	
Sideroxylon inerme	White milkwood	A sprawling tree. Prefers a coastal habitat.		x	Stench of flowers and very messy fruit make it unsuitable.

Tarchonanthus camphoratus	Camphor-bush	Very fast growing and adaptable to various habitats. Tends to develop multi-stemmed structure. Very drought resistant.		√√	Will require pruning to create a spreading crown.
Virgilia oroboides subsp *oroboides*	Keurboom	Very fast growing but does not form a wide canopy. Very short lived <15 years.		√	If this species is used it must be ensured that the source of seed is from *V. oroboides* subsp *oroboides* and not *V. divaricata or V. oroboides* subsp *ferruginea* which are not endemic to the area. V. divaricata has become a problem in Silvermine. Can be used as a surrogate plant to shelter indigenous trees that require shade in their first stages of growth.
Widdringtonia nodiflora	Mountain cedar	Has narrow crown		x	

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2. Introduced species. Indigenous species not indigenous to the Cape Peninsula

Note that this list is confined to species that are well established as horticultural species that are known to grow well in theTokai area. Note also that early foresters planted species in the indigenous forests particularly Newlands and OrangeKloof which they thought had been totally exploited. Species such as Forest Saffronwood and Forest Alder although they occur in the Knysna forest did not originally occur in the forests of the Cape Peninsula. Some of these, most notably *Virgilea divaricata* and *Podocarpus falcatus* are spreading and may cause threats to the indigenous forest.

Species	**Common name**	**General characteristics**	**Habitat**	Suitability for creating shaded landscapes in Tokai area √√√= Highly suitable √√= Suitable √= Worth trying	**Notes**
Elaeodendron croceum (Cassine papillosa)	Forest Safronwood	Growing well in the 'new' picnic area.		√√	May spread into indigenous forests.
Ekebergia capenis	Cape ash	Growing reasonably well in the "new" picnic area		√√√	
Harpephylum caffrum	Wild plum			√√√	
Podocarpus falcatus	Outeniqua yellowwood	Growing well in the "new" picnic area		√√	It is not endemic to the Peninsula. It has a tendency to spread and seedlings form dense masses. It could be a threat to the indigenous forests

Tokai. A species list of the plantings in the 'new' picnic area.

Compiled September 2006 by Paul EN Britton
BSc Degree in Forestry (Nature Conservation) – Stellenbosch, with Masters in Landscape Architecture – Pretoria

The list covers 2 areas:

1. Trees planted in 1968 after clearfelling of pines which were originally planted in 1917-19.

2. Remnants of early experimental plantings

Note: This list is from a preliminary survey conducted to determine the extent of indigenous species planted in the area.

Species	Common name	Indigenous	Notes
Acacia mearnsii	Black wattle		Highly invasive. Alongside river.
Agonis flexuosa			Part of original plantings.
Casuarina sp	Beefwood		Part of original trials. Is tending to spread
Cedrus deodara	Deodar		Part of original plantings.
Cinnamomum camphora	Camphor trees		Note that the compartments north of area were originally planted in 1890
Cupressus macrocarpa	Monterey cypress		Part of original plantings.
Cupressus sp	Cypress species		
Ekebergia capenis	Cape ash	Non Peninsula	
Elaeodendron croceum (=Cassine papillosa)	Safronwood	Non Peninsula	May spread into indigenous forests. Note that the identification is most likely *E. croceum* and not *E.zeyheri* (formerly incorrectly known as *Cassine crocea*)
Eucalyptus gomhpocephala	Dune gum		Part of original plantings.
Eucalyptus species			
Grevillea robusta	Silky oak		Throws branches easily and could become a hazard
Kigelaria africana	Wild peach	Peninsula	Only one specimen, probably self sown.
Melaluca sp	Paperbark		
Olea europea ssp *africana*		Peninsula	Probably self sown
Pinus pinea	Stone pine		
Pinus radiata	Montery pine		
Podocarpus falcatus	Outeniqua yellowwood	Non Peninsula	Dense masses of saplings present in the adjoining camphor compartments. Can become a problem in indigenous where it does not naturally occur.
Podocarpus latifolius	Real yellowwwood	Peninsula	
Quercus canarienesis	Algerian oak		

Quercus cerris	Mossy cup oak		
Quercus ilex	Holm oak		
Quercus robur	English oak		Dead branches can become a safety hazard (two successful liability cases)
Quercus spp x2			Two species of oak, identification not confirmed
Quercus suber	Cork oak		
Schinus terebithifolius	Brazilian pepper		Can spread.
Sequoia sempervirens	Redwood		Part of original plantings.
Syncarpia glomulifera	Turpentine tree		Part of original plantings.
Ulmus parivfolia	Chinese elm		Can be invasive

Distinguishing characteristics *Elaeodendron zeheri* (*Cassine crocea*) and *E. croceum* (*C. papillosa*)

Previous name	***Cassine crocea*** Red saffronwood	***Cassine papillosa*** Common saffronwood
Current name	***Elaeodendron zeyheri*** Small leaved saffron	***Elaeodendron croceum*** Forest Saffron
Bark	Whitish -yellowish with reddish markings. Generally smooth with encrustations. Branchlets warty, with prominent brownish lenticels.	Grey smooth with bright orange underbark which shows through in patches. Dotted with prominent brown or black lenticels
Leaves	Usually opposite. Elliptic 3.5-7 x 1-3.5 cm	Opposite to sub-opposite. Oblong to elliptic 5-11 x 2-4 cm
	Hairless, Dark green to pale green above, paler with conspicuous dark net veining below	Thick leathery. Dark green above paler below or grey-green on both surfaces in younger leaves
	Conspicuous net veining	Net veining visible below
	Apex tapering to rounded sometimes notched	Apex tapering to broadly so
	Base broadly tapering	Base tapering
	Margin Very shallow widely spaced teeth or scalloped	Margin hardened with fine often widely spaced teeth which are sharp tipped
	Petiole 2-7mm	Petiole up to 1cm long.
Flowers	Small greenish, in axillary clusters (December -June)	Small whitish or pale green on current years shoots in axils of small bracts that soon fall
Fruit	Fruit Berry-like, narrowly ovoid up to 2cm long maturing to pale yellow	Fruit Berry-like 2.5 cm long ovoid becoming pale lemon-yellow when mature. Often covered with wrinkles and encrustations (papillosa refers to this). Fruit frequently only reach maturity with the next season's flowers

1 Preliminary guidelines for recreational activities

Table 1: Broad site requirements for the different recreational activities.

Activity / Criteria	Dog walking	Mountain biking (adventure)	Mountain biking (leisure)	Mountain biking (kids)	Hiking	Walking	Picnic	Braai	Horse riding	Paint ball
Shade	√√	√	√	√	X	√√	√√	√√	X	√
Variety of shade and open	√	√√	√√	√√	√	X	X	X	√√	√
Gentle slope/gradient	√√	X	√	√√	X	√√	X	X	√	√
Steeper gradient	X	√√	X	X	√	X	X	X	X	√
Soft path surface (sandy)	X	X	X	X	√	X	X	X	√	√
Harder path surface	√	√	√	√√	√	√	√	√	X	√

√√	**Important or prerequisite attribute**
√	**Less important or not prerequisite**
X	**Not appropriate**

Annexure E

Table 2: Comparison of recreational activities regarding competition for specific environments.

	Dog walking	Mountain biking (adventure)	Mountain biking (leisure)	Mountain biking (kids)	Hiking	Walking	Picnic	Braai	Horse riding		
Mountain biking (adventure)	√									**Compete for environment**	
Mountain biking (leisure)	**X**	**X**								√	**None**
Mountain biking (kids)	**X**	**X**	**O**							**X**	**Some degree**
Hiking	√	**O**	**X**	√						**O**	**Mostly same**
Walking	**O**	√	**X**	**X**	**X**						
Picnic	**X**	√	**X**	**O**	√	**O**					
Braai	**X**	√	**X**	**O**	√	**O**	**O**				
Horse riding	**X**	√	**O**	**X**	**X**	**X**	**X**	**X**			

Table 3: Comparison of conflicts between recreational activities.

	Dog walking	Mountain biking (adventure)	Mountain biking (leisure)	Mountain biking (kids)	Hiking	Walking	Picnic	Braai	Horse riding	
Mountain biking (adventure)	√									**Conflict between activities**
Mountain biking (leisure)	**O**	√								√ **Low**
Mountain biking (kids)	**O**	**O**	√							X **Medium**
Hiking	**X**	**O**	**X**	**O**						√ **High**
Walking	√	**O**	**X**	**O**	√					
Picnic	**O**	**O**	**X**	**X**	√	√				
Braai	**O**	**O**	**X**	**X**	**O**	**O**	**X**			
Horse riding	**O**	**O**	**O**	**O**	**X**	**O**	**O**	**O**		

1 Rehabilitation of freshwater systems

The Source-To-Sea, Management and Rehabilitation Action Plan for the Prinskasteel and Keisers River were compiled for the Table Mountain Fund and WWF. The report deals in detail with guidelines and actions to rehabilitate and manage the Prinskasteel and Keysers Rivers. SANParks support this initiative and is committed to the implementation of the proposals. Following a summary of the main issues dealt with in the report.

1.1 Alien Clearing

- Invasive alien vegetation species found in the study area are well known and methods for their control are well established. Table 2 in the Source to Sea Report provides a comprehensive, but by no means exhaustive list of alien plant species found in the Keysers River / Prinskasteel Rivers system.
- Areas with sparse or new infestations should be targeted first.
- An alien-clearing program is only as effective as its follow up. The area should be divided up into management blocks and a record kept of cleared sections.
- In many riverine streams the basic 30m-setback line has not been adhered to for commercial trees. These set back lines must be applied as part of the reduction in alien vegetation.

1.1.1 Slash Removal

- In a number of places, large quantities of slash from the commercial timber industry have been accumulating. This poses a fire risk in terms of increasing the intensity of the fires as they move across the site. High intensity fires tend to create heat scars, germinate alien vegetation and promote erosion and thereby pose an obvious threat to Afro-montane forest restoration.
- Slash need to be reduced by either physical removal or in some cases the possibility of wood extraction for further commercial purposes could be investigated.
- Burning of smaller slash loads could also be an option worth looking into.

1.1.2 Erosion

- Erosion needs to be addressed in the short term, as the continued loss of topsoil and ground cover, as well as the separation of riparian areas from the water table by ongoing down cutting of river channels threaten future rehabilitation options.
- Erosion can be controlled with a combination of vegetation, hard structures (such as gabions, reno mattresses etc), bio-engineering products (such as eco-sleeves) and geo-textiles.
- Debris material such as rocks, excess slash and logs, could also be used as infill material in erosion control measures, although these would not be recommended in stream course rehabilitation.

1.1.3 Wetland habitat creation

- Opportunities exist along the Prinskasteel river system for the creation of habitats that have disappeared or have been rendered inactive through alien vegetation, forestry activities and wetland drainage.
- Wetland habitats create important breeding sites for amphibian species and provide refuge for species in flood events and are generally protected from pollution events in the main river.
- Such habitat creation opportunities exist in the wetland transitional and lower reaches of the Prinskasteel / Keysers River. Here the well-drained nature of the sandy substrate allows for lateral movement of the water.
- Wetland restoration in this area would also facilitate the re-establishment of Sand plain Fynbos vegetation; one of the more endangered vegetation types in the fynbos biome.

1.1.4 Riparian habitat rehabilitation

- The existing afro-montane remnant in the upper forest / mountain stream zone should be protected and re-established in the short term by:
  - ongoing removal of recolonising alien vegetation
  - additional planting of appropriate afro-montane pioneer tree species
  - broadening the forest band through additional planting so as to establish a large enough forest component to survive the next fire event
  - reduction of the fuel load by removing excess dead material before the next fire event.
- The rehabilitation of riverine bank vegetation needs to be linked to the removal of alien vegetation in riverine corridors. The following guidelines will help with the re-establishment of riverine vegetation:
  - Off stream pockets and wet seepage areas are needed to promote and protect the growth of wetland plants.
  - In areas that will burn, it is important to restore reseeding species along with resprouters, so as to have a balanced post fire community.
  - Seeds for the site should be sown as soon as possible after a fire and replanting has taken place.