



MTO CAPE
ENVIRONMENTAL/SOCIAL
MONITORING PROGRAM
2025 - 2029



MTO | cape

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INTRODUCTION

The development and implementation of a holistic monitoring program is an essential management tool of any well managed business, to mitigate and manage impacts on the environment. Monitoring is essential to determine base-line information, detect possible change after a predetermined period and to monitor and implement adequate management changes, should they be required. Monitoring will ensure that standards are being maintained and that constant improvement is taking place, where needed.

This document is the publically available (free of charge) five year strategic environmental and social monitoring plan for MTO Cape from 2025 – 2029. The document covers environment and social monitoring and does not include the daily monitoring of forestry silviculture or harvesting activities, which are covered by the company's Integrated Management System procedures and policies. Results of monitoring will be updated at least every two years to keep the document current. This is the 2025 update. Stakeholders wishing to receive an electronic or hardcopy version of this document can contact the General Manager (contact details at end of the document).

STRATEGIC MONITORING PROGRAM

Long term, goal-oriented and systematic trend assessment of process is needed as part of a strategic monitoring program. The monitoring of the impact of forestry on the different levels of the ecosystem, landscape and within communities is needed to monitor trends over time. The different levels at which this program is aimed are shown in Table 1. The monitoring programs initiated for each of these levels is shown and discussed further in this document.

Table 1. The strategic ecosystem levels to be monitored as part of this monitoring program.

Level of monitoring	Description	Identified and Implemented Monitoring Programs
Environmental Monitoring		
Biodiversity pattern	Monitoring the extent, intactness, and health of identified ecosystems such as forest, wetlands and fynbos.	• Priority Conservation Areas Identification (High Conservation Value) • Priority Conesevation Areas monitoring
Biodiversity process	Monitoring the potential of the site to function as a biological corridor that will enable the movement of plants and animals over ecological time-scales (e.g. seasonal movement), evolutionary time-scales (population differentiation and diversification) and in response to anticipated anthropogenic climate change.	• Natural Heritage site monitoring • Water Quality monitoring • Erosion monitoring • Weed eradication monitoring
Species Monitoring	The monitoring of identified rare, threatened and endangered species to determine and manage the impacts of forestry on these species over time.	• General Fauna and Flora monitoring. • Fish monitoring • Odonata monitoring • Red Data Species Monitoring.
Landscape scale Monitoring		
Fire Impacts	The monitoring of unplanned or wildfires. Documented records of past fires, which include: number of fires, extent of damage and examination of causes and analysis of trends	• Fire History monitoring
Soil trend/growth monitoring	The long-term monitoring of tree growth as a function of soil sustainability	• Long term growth trend monitoring
Impact of herbicide application	A new program to monitor the impact of herbicides, notably glyphosate on water runoff and underground water sources.	• Trends in herbicide use • Types of herbicides used • Diatom monitoring

		Glyphosate/Herbicide monitoring
	Socio-economic monitoring	
Areas of Special Interest Monitoring	The monitoring of identified cultural and historical sites listed on plantations, to monitor their status over time, and prescribe management actions as necessary.	Areas of Special Interest Program.
Employment, Training and Contractor	Monitoring the long term employment, training and opportunities for contractors provided by the company	Employment, Training and Contractor Monitoring.
Social and Economic development	Monitoring of provision of social economic development opportunities to communities.	Socio-economic development monitoring.
Community Engagement	Monitoring engagement with local communities.	Community engagement monitoring.

The monitoring program is aimed to provide sufficient information to make informed decisions but must also be affordable and general enough to be implemented easily over time. Quantitative and qualitative site monitoring, fixed point photo monitoring and site/habitat/species specific monitoring protocols are all tools that were considered when developing the strategic monitoring program for MTO Cape. Cost, the amount of information obtained, and the practical use of this information were also critical decision-making components.

MONITORING PROJECTS

1. BIODIVERSITY PATTERN

1.1 Priority Conservation Area Identification

1.1.1. Requirement for Monitoring

The High Conservation value process underwent change within the last 10 years, with the focus shifting away from High Conservation Value Forest to a focus on High Conservation Values. MTO Cape has designated these areas of higher conservation value as **Priority Conservation Areas**. The current FSC® standard for South Africa (FSC-STD-ZAF-01-2017 V1-1) Principle 9 (High Conservation values) which came into affect in 2019, states:

The Organization* shall* maintain and/or enhance the High Conservation Values* in the Management Unit* through applying the precautionary approach*. (P9 P&C V4)
Criterion 9.1 "The Organization*, through engagement* with affected stakeholders*, interested stakeholders* and other means and sources, shall* assess and record the presence and status of the following High Conservation Values* in the Management Unit*, proportionate to the scale, intensity and risk* of impacts of management activities, and likelihood of the occurrence of the High Conservation Values*: HCV 1 – Species diversity. Concentrations of biological diversity* including endemic species, and rare*, threatened* or endangered species, that are significant* at global, regional or national levels. HCV 2 – Landscape*-level ecosystems* and mosaics. Intact forest landscapes and large landscape*-level ecosystems* and ecosystem* mosaics that are significant* at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance. HCV 3 – Ecosystems* and habitats*. Rare*, threatened*, or endangered ecosystems*, habitats* or refugia*. HCV 4 – Critical* ecosystem services*. Basic ecosystem services* in critical* situations, including protection* of water catchments and control of erosion of vulnerable soils and slopes.

HCV 5 – Community needs. Sites and resources fundamental for satisfying the basic necessities of local communities* or indigenous peoples* (for livelihoods, health, nutrition, water, etc.), identified through engagement* with these communities or indigenous peoples*.

HCV 6 – Cultural values. Sites, resources, habitats* and landscapes* of global or national cultural, archaeological or historical significance, and/or of critical* cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities* or indigenous peoples*, identified through engagement* with these local communities* or indigenous peoples*. (C9.1 P&C V4 and Motion 2014#7)"

FSC Indicators

9.1.1. An assessment is completed using Best Available Information* that records the location and status of High Conservation Value* Categories 1-6, as defined in Criterion* 9.1; the High Conservation Value Areas* they rely upon, and their condition.

9.1.2 The assessment uses results from culturally appropriate* engagement* with affected* and interested stakeholders* with an interest in the conservation* of the High Conservation Values*.

9.2.1 Threats to High Conservation Values* are identified using Best Available Information*.

9.2.2 Management strategies and actions are developed to maintain and/or enhance the identified High Conservation Values* and to maintain associated High Conservation Value Areas* prior to implementing potentially harmful management activities.

9.2.3 Affected* and interested stakeholders* and experts are engaged in the development of management strategies and actions to maintain and/or enhance the identified High Conservation Values*.

9.3.1 The High Conservation Values* and the High Conservation Value Areas* on which they depend are maintained and/or enhanced, including by implementing the strategies developed.

9.3.2 The strategies and actions prevent damage and avoid risks to High Conservation Values*, even when the scientific information is incomplete or inconclusive, and when the vulnerability and sensitivity of High Conservation Values* are uncertain.

9.3.3 Activities that harm High Conservation Values* cease immediately and actions are taken to restore* and protect the High Conservation Values*.

9.4.1 A program of periodic monitoring* assesses:

- Implementation of strategies.
- The status of High Conservation Values* including High Conservation Value Areas* on which they depend; and

The effectiveness of the management strategies and actions for the protection* of High Conservation Value* to fully maintain and/or enhance the High Conservation Values*.

9.4.2 The monitoring* program includes engagement* with affected* and interested stakeholders* and experts.

9.4.3 The monitoring* program has sufficient scope, detail and frequency to detect changes in High Conservation Values*, relative to the initial assessment and status identified for each High Conservation Value*.

9.4.4 Management strategies and actions are adapted when monitoring* or other new information shows that these strategies and actions are insufficient to ensure the maintenance and/or enhancement of High Conservation Values*.

Plantation forestry areas within MTO were established as plantations a long time ago (30 – >100 years), and transformation of the landscape has already taken place. No new afforestation is planned in the short or medium term that may impact on converting areas of high conservation importance. This significantly decreases risk as all conservation areas which form part of this HCV review are already under conservation management and managed as such.

Current and historical conservation planning of the company, combined with updated information from provincial, site specific and national spatial development tools were however used to identify areas of high conservation values that need to be prioritized within the conservation area per plantation – these areas are identified as **HCV/Priority Conservation Areas** for MTO – areas with high conservation value in the local context. A document entitled, *MTO Cape Process to identify areas of High Conservation value and designate Priority Conservation areas (Version 2, last updated November 2024)* was developed by the company to explain the process of identification in further detail.

1.1.2. Monitoring Protocol

The 2017 Western Cape Biodiversity Spatial Plan (WCBSP) is a spatial tool that forms part of a broader set of national biodiversity planning tools and initiatives that are provided for in national legislation and policy. It comprises the Biodiversity Spatial Plan Map of biodiversity priority areas, accompanied by contextual information and land use guidelines that make the most recent and best quality biodiversity information available for use in land use and development planning, environmental assessment and regulation, and natural resource management. The biodiversity spatial plan provides a map of terrestrial and freshwater areas that are important for conserving biodiversity pattern and ecological processes (Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs)).

The WCBSP is a core component of the Provincial Biodiversity Strategy and Action Plan (PBSAP) of the Western Cape as it is used to spatially prioritize conservation action (such as protected area expansion or investment into ecological infrastructure), or to feed spatial biodiversity priorities into planning and decision-making in a wide range of cross-sectoral planning processes and instruments such as development applications in terms of the National Environmental Management Act (NEMA), the Spatial Planning and Land Use Management Act (SPLUMA), the Western Cape Land Use Planning Act (LUPA), the Provincial Spatial Development Framework and municipal integrated development plans (IDPs), spatial development frameworks (SDFs), land use management schemes and environmental management frameworks (EMFs).

The 2017 WCBSP (available on SANBI website at bgisviewer@sanbi.org) reflects important advances in biodiversity planning over the last few years. Importantly, the WCBSP: (1) provides, for the first time, a singular province-wide assessment; (2) utilizes more recent and accurate land cover data than previous assessments; (3) gives explicit consideration to ecological infrastructure and climate resilience; (4) responds to the need for greater conflict avoidance with urban areas; (5) identifies depleted ecosystem/environmental stocks; and (6) generally incorporates better quality and more up-to-date biodiversity data. The WCBSP is therefore a detailed plan that can be used to review HCV and identify PCA for plantations in the Western Cape.

The Eastern Cape Biodiversity planning outcomes, like the WCBSP was developed by specialists and the South African Biodiversity Institute (SANBI) and was used to review the presence of HCV areas for plantations which fall within the Eastern Cape. The Eastern Cape Biodiversity plan (ECBP), which was completed in 2019 has been uploaded onto the SANBI website and is available at bgisviewer@sanbi.org. To determine Priority areas for MTO the Eastern Cape Biodiversity plan together with the spatial Terrestrial Biodiversity Land Use decision tool summary maps for Kouga and Kou-kamma municipalities (in which the Eastern Cape plantations fall) were also overlaid and reviewed. Within the ECBP areas important for biodiversity pattern and ecological processes are captured, and these are included as Critical Biodiversity Areas (CBAs). Terrestrial and aquatic CBA's have been identified and are included in the SANBI BGIS layers with more detail. These plans identify areas of high biodiversity value and are thus an ideal product to use for the identification of Priority Conservation Areas on MTO property in the Eastern Cape.

During the 2024 update review the HCV6 sites of archaeological and historical importance were reviewed to ensure that any areas that classify as HCV6 are also included in the PCA. The National Heritage Resources Act (No. 25 of 1999) provides a grading system to determine the significance of heritage sites in South Africa. These include:

- Grade 1: Heritage resources with qualities so exceptional that they are of special national significance.
- Grade 2: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region, and

- Grade 3: Other heritage resources worthy of conservation.

Archaeological and historical ASI sites were reviewed against these criteria and the known Western Cape and Eastern Cape provincial Heritage Resource database and sites considered for classification. Specialists in the archaeological field were also contacted. After a discussion with specialists it was concluded that the rock art sites at Garcia, although not registered by SAHRA, would classify as Grade 2 sites due to their regional importance. Discussion with specialists concluded that the Khoisan midden site at Wiltelsbos would be a Grade 3 site (a site inspection is planned for 2025 to confirm this). Other locally important sites of cultural and historical importance would be Grade 3 or not registered. These are still included as part of the Areas of Special interest management and monitoring program and are protected as such (but are not regarded as HCV).

1.1.3. Summary of Results

With the update of Plantation Conservation plans, the PCA for each plantation were identified, using the Bioregional planning tools available (ECBP and WCBP and the through discussion with archaeologist specialists for HCV6). A map showing the locality of plantation and PCA sites is included at the end of this document.

From an assessment of criteria, the following PCA Areas are identified for MTO Cape plantations.

FSC HCV Criterion	Interpretation in the SA FSC standard (2018).	MTO Cape PCA interpretation
<u>HCV 1 – Species diversity.</u> Concentrations of biological diversity* including endemic species, and rare*, threatened* or endangered species, that are significant* at global, regional or national levels.	6.4.1 requires that priority species are identified 6.5.2 requires that conservation zones are prioritized according to conservation value. Areas with high species diversity will be accorded higher conservation value.	Identification of priority conservation units for relevant concentrations of biodiversity is included in regional biodiversity mapping and identification of critical biodiversity areas. Known critical sites were also included where appropriate.
<u>HCV 2 – Landscape-level ecosystems and mosaics.</u> Intact forest landscapes and large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.	No single conservation zone within an FMU is South Africa is large enough to be considered a landscape level ecosystem.	Not applicable as no single conservation zone is large enough to be considered a landscape level ecosystem.
<u>HCV 3 – Ecosystems and habitats.</u> Rare, threatened, or endangered ecosystems, habitats or refugia.	6.4.1, 6.5.1, 6.5.2 These indicators require that habitats/representative ecosystems are all designated as conservation zones and prioritized according to conservation value, guided by systematic conservation planning. Systematic conservation planning takes into account the conservation status of ecosystems, the presence of habitats and refugia, amongst many other data layers.	The Western and Eastern Cape Biodiversity Spatial Plans and National threatened ecosystems map were used to identify Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) to inform the identification of Priority Conservation Areas and units. Prior priority High Conservation Forests have also been included.
<u>HCV 4 – Critical ecosystem services.</u> Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.	The risk assessment in Annex 4 identified the following basic ecosystem services are associated with plantation forestry relevant to HCV 4. Water Quantity, Water Quality, Soil Retention. Any conservation values related to the supply of basic ecosystem services are identified in the following indicators- 6.7: Wetlands and riparian areas are identified as ecosystems associated with delivering quality water. 10.5.1 and 10.5.2 and 10.11.1: Soils sensitive	The Western Cape and Eastern Cape Biodiversity Spatial plans and National threatened ecosystems map were used to identify Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) to inform the identification of Priority Conservation Areas and units, notably wetlands and riparian zones. Critical soils sensitive to erosion do not occur. Soil information is

	to erosion are required to be identified. Soil erosion results in the loss of soil and causes sedimentation of natural water bodies.	included in the Microforest plans of plantation and used to minimize impacts on soils and not included as priority areas.
HCV 5 – Community needs. Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples.	These values are identified through compliance with the following indicators: 4.1.3 and 5.1.1	Not identified as Priority areas, as no known areas fundamental to satisfying basic necessities occur. General values are protected through Forestry industry standards.
HCV 6 – Cultural values. Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples. (C9.1 P&C V4 and Motion 2014#7)"	These values are protected by the implementing 4.7.2	Only archaeological sites are considered of national importance and included as PCA. Historical and other sites are not regarded PCA sites but are included as Areas of Special interest and protected and monitored as part of the monitoring program.

MTO Cape HCV areas as at November 2024. Sites are shown on MTO GIS. The GIS mapping and area of these sites is scheduled for review in 2025.

HCV	Total Hectare	Longmore (Ha)	Witelsbos (Ha)	Lottering (Ha)	Kruisfontein (Ha)	Garcia (Ha)	Jonkershoek (ha)
HCV1	3501.87	3083.19	401.36	0	0	6.68	10.64
HCV2	0	0	0	0	0	0	0
HCV3	3461.66	32.7	736.39	1411.65	765.85	324.56	190.51
HCV4	2963.51	1840.22	503.98	497.03	14.02	38.34	69.92
HCV5	0	0	0	0	0	0	0
HCV6	2	0	0	0	0	2	0
Total	9929.04	4956.11	1641.73	1908.68	779.87	371.58	271.07

A list of PCA areas per plantation, the main HCV aspect for which they were chosen and the monitoring implemented for each site is shown below. A summary of current condition and the management practices for each site are also shown (refer to the Threats and Mitigation strategies table below). Detailed information on condition (weed ratings) and management requirements are available in the Conservation Management plan and on Microforest.

Longmore

HCV/PCA	HCV	Hectares	Main Aspect	CBA	Proposed Monitoring	2024 Condition comment	Risk Mitigation practices
Longmore Forest	3	29.31	Forest		Weed monitoring	Good, stable	1,2,3,4,6
Bulk river catchment	4	618.92	Riparian		Weed monitoring, SASS	Medium, stable (some headcuts)	1,2,3,4,5,6
Stinkhout kloof	3	3.39	Forest		Weed monitoring, Forest	Good, stable	1,2,3,4,6
Van Stadens Heritage site	1	1884.46	Biodiversity		Weed monitoring, Heritage site, rare species	Good, stable	1,2,3,4,5,6
Sand River catchment	4	903.66	Riparian		Weed monitoring	Good, stable (some headcuts)	1,2,3,4,5,6

Van Stadens catchment	4	317.64	Riparian	Weed monitoring, SASS	Good, stable (some headcuts)	1,2,3,4,5,6
Hewitts Ghost Frog Geelhoutboom river	1	301.19	Biodiversity	Weed monitoring, HGF main, SASS	Long term conversion, stable	1,2,3,4,6,7
Hewitts Ghost Frog Martins river	1	141.87	Biodiversity	Weed monitoring, HGF occasional, SASS	Long term conversion, stable	1,2,3,4,6,7
Hewitts Ghost Frog Klein river	1	97.61	Biodiversity	Weed monitoring, HGF occasional, SASS	Long term conversion, stable	1,2,3,4,6,7
Hewitts Ghost Frog Diepkloof	1	658.06	Biodiversity	Weed monitoring, HGF occasional, SASS	Long term conversion, stable	1,2,3,4,6,7
Total area		4956.11				

Witelsbos

HCV/PCA	HCV	Hectares	Main CBA Aspect	Proposed Monitoring	2024 Condition comment	Risk Mitigation practices
Indigenous Forest K23	3	6.77	Forest	Weed monitoring	Good, stable	1,2,3,4,6
Indigenous Forest K24 (Klein Witelsbos)	3	93.05	Forest	Forest, Weed monitoring	Good, stable	1,2,3,4,6
Indigenous Forest L86	3	52.48	Forest	Weed monitoring		1,2,3,4,6
Corridor J80	3	136.62	Biodiversity Forest	Weed monitoring	Good, stable	1,2,3,4,5,6
Koomansbos Corridor	3	40.2	Biodiversity Forest	Weed monitoring	Good, stable	1,2,3,4,5,6
Indigenous Forest A33	3	23.88	Forest	Weed monitoring	Good, stable	1,2,3,4,6
Corridor B74	3	4.33	Biodiversity	Weed monitoring	Good, stable	1,2,3,4,5,6
Corridor C74	3	224.20	Biodiversity Forest	Weed monitoring	Good, stable	1,2,3,4,5,6
Indigenous Forest C74	3	11.53	Forest	Weed monitoring	Good, stable	1,2,3,4,6
Corridor C77	3	189.47	Biodiversity Forest Riparian	Weed monitoring	Good, stable	1,2,3,4,5,6
Woodlands Corridor C79	3	137.92	Biodiversity	Weed monitoring	Good, stable	1,2,3,4,5,6
Indigenous Forest M1	3	5.19	Forest	Weed monitoring	Good, stable	1,2,3,4,6
Riparian Zone D35	4	12.19	Riparian	Weed monitoring	Good, stable	1,2,3,4,6
Kareedouwberg	1	401.36	Biodiversity	Weed monitoring, NHS site monitoring	Good, stable	1,2,3,4,5,6
Kromme River rip Zone 1	4	38.95	Riparian	Weed monitoring	Good, stable	1,2,3,4,5,6
Kromme River rip Zone 2	4	187.0	Riparian	Weed monitoring	Good, stable	1,2,3,4,5,6
Kromme River rip Zone 3	4	76.27	Riparian	Weed monitoring	Good, stable	1,2,3,4,5,6
Total area		1641.73				

Lottering

HCV/PCA Name	HCV	Hectares	Main CBA Aspect	Proposed Monitoring	2024 Condition comment	Risk Mitigation practices
Indigenous Forest S68	3	3.81	Forest	Weed monitoring	Good, stable	1,2,3,4,6

SanParks Forest Buffer 1	3	53.33	Forest	Weed monitoring	Good, stable	1,2,3,4,6
SanParks Forest Buffer 2	3	15.18	Forest	Weed monitoring	Weed, stable	1,2,3,4,6
Kleinbos River North	4	57.78	Riparian	Weed monitoring	Weed, stable	1,2,3,4,6
SanParks Forest Buffer 3	3	39.30	Forest	Weed monitoring	Good, stable	1,2,3,4,6
Indigenous Forest D87	3	401.57	Forest	Weed monitoring	Good, stable	1,2,3,4,6
Ratelsbos Forest C48	3	15.55	Forest	Forest, Weed monitoring	Good, stable	1,2,3,4,6
Elandsriver Corridor	3	122.19	Biodiversity	Weed monitoring	Weed, stable	1,2,3,4,5,6
Lottering River Corridor North	4	68.48	Biodiversity	Weed monitoring	Good, stable	1,2,3,4,5,6
Lottering River Corridor South	4	32.59	Biodiversity	Weed monitoring	Good, stable	1,2,3,4,5,6
SanParks Forest Buffer 4	3	2.81	Forest	Weed monitoring	Weed, stable	1,2,3,4,6
Lottering Riparian zone 1	4	15.79	Riparian	Weed monitoring	Good, stable	1,2,3,4,6
Indigenous Forest E50	3	72.31	Forest	Weed, SASS monitoring	Good, stable	1,2,3,4,6
Lottering Riparian Zone 2	4	29.38	Riparian	Weed monitoring	Weed, stable	1,2,3,4,6
Lottering Riparian Zone 3	4	10.47	Riparian	Weed monitoring	Good, stable	1,2,3,4,6
Lottering Riparian zone 4	4	9.23	Riparian	Weed monitoring	Good, stable	1,2,3,4,6
SanParks Rugbos forest Buffer	3	47.98	Forest	Weed monitoring	Weed, stable	1,2,3,4,6
Lottering Riparian Zone 5	4	3.87	Riparian	Weed monitoring	Good, stable	1,2,3,4,6
Bloukrans Gorge	4	166.98	Biodiversity	Weed monitoring	Weed, stable	1,2,3,4,5,6
SanParks Toll Bridge Forest buffer	3	7.78	Forest	Weed monitoring	Good, stable	1,2,3,4,6
SanParks Forest Buffer 5	3	2.62	Forest	Weed monitoring	Weed, stable	1,2,3,4,6
Forest K24 – Klein Witelsbos	3	16.19	Forest	Weed monitoring, forest	Weed, stable	1,2,3,4,6
Lottering Riparian zone 6	4	24.60	Riparian	Weed monitoring	Good, stable	1,2,3,4,6
KB Hek se Bos	3	355.51	Forest	NHS monitoring, Weed, SASS monitoring	Good, stable	1,2,3,4,5,6
KB Sanparks Whiskey Creek Buffer	3	26.69	Forest	Weed monitoring	Good, stable	1,2,3,4,5,6
KB Indigenous Forest N36	3	51.20	Forest	Weed monitoring	Good, stable	1,2,3,4,6
KB Riparian zone 1	4	20.47	Riparian	Weed monitoring	Good, stable	1,2,3,4,5,6
KB Riparian zone 2	4	5.61	Riparian	Weed monitoring	Good, stable	1,2,3,4,5,6
KB Riparian zone 3	4	51.78	Riparian	Weed,SASS monitoring	Good, stable	1,2,3,4,5,6
KB Rondebos Forest	3	1.03	Forest	Forest, Weed monitoring	Good, stable	1,2,3,4,6

Maatjiesfontein Forest Corridor	3	176.60	Forest	Forest, Weed monitoring	Good, stable	1,2,3,4,6
Total area		1908.68				

Kruisfontein

HCV/PCA	HCV	Hectares	Main CBA Aspect	Proposed Monitoring	2024 Condition comment	Risk Mitigation practices
Indigenous Forest A14	3	24.13	Forest	Weed monitoring	Good, stable	1,2,3,4,6
Fynbos Corridor A16	4	14.02	Biodiversity	Weed monitoring	Good, stable	1,2,3,4,5,6
Indigenous Forest A22	3	4.96	Forest	Weed monitoring	Good, stable	1,2,3,4,6
Indigenous Forest B10	3	24.41	Forest	Weed monitoring	Good, stable	1,2,3,4,6
Indigenous Forest C15	3	4.72	Forest	Weed monitoring	Good, stable	1,2,3,4,6
Sand plein fynbos reserve	3	67.60	Biodiversity	Fynbos, Weed monitoring	Good, stable	1,2,3,4,5,6
Indigenous Forest C17	3	7.45	Forest	Weed monitoring	Good, stable	1,2,3,4,6
Indigenous Forest D54	3	19.52	Forest	Weed monitoring	Good, stable	1,2,3,4,6
Indigenous Forest D56	3	7.07	Forest	Weed monitoring	Good, stable	1,2,3,4,6
Indigenous Forest D57	3	19.76	Forest	Weed monitoring	Good, stable	1,2,3,4,6
Indigenous Forest D67	3	40.37	Forest	Weed monitoring	Good, stable	1,2,3,4,6
Indigenous Forest G22 (Noetzie)	3	15.35	Forest	Forest, Weed monitoring	Good, stable	1,2,3,4,6
Block K corridor	3	530.51	Biodiversity	Forests (Klein Gouna), Weed monitoring	Good, stable	1,2,3,4,5,6
Total area		779.87				

Garcia

HCV/PCA	HCV	Hectares	Main CBA Aspect	Proposed Monitoring	2024 Condition comment	Risk Mitigation practices
Indigenous forest patches	3	29.41	Forest	Weed monitoring	Good, stable	1,2,3,4,6
Meulen river catchment	3	295.15	Forest	Forest, SASS Weed monitoring	Good, stable	1,2,3,4,5,6
Koppies river riparian zone	4	38.34	Riparian	SASS, Weed monitoring	Weed infestation	1,2,3,4,5,6
Erica ixanthera habitat	1	6.68	Biodiversity	Rare species, Weed monitoring	Average, weeding required	1,2,3,4,6
Dancing ladies archaeological	6	1.00	Archaeological	Specialist archaeological monitoring 2025	Stable, specialist advice awaited	1,2,3,4,6,8
Cave of hands archaeological	6	1.00	Archeological	Specialist archaeological monitoring 2025	Stable, specialist advice awaited	1,2,3,4,6,8
Total area		371.58				

Jonkershoek

HCV/PCA	HCV	Hectares				
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			Main CBA Aspect	Proposed Monitoring	2024 Condition comment	Risk Mitigation practices
Block 2 Fynbos	3	20.68	Biodiversity	Weed monitoring	Recovering after 2019 fire	1,2,3,4,5,6
Block 1 Fynbos and burnt forest	3	60.48	Biodiversity	Weed monitoring	Recovering after 2019 fire	1,2,3,4,6
Eerste river corridor	4	21.13	Riparian	Weed monitoring	Recovering after 2019 fire	1,2,3,4,5,6
Heuningkloof forest and riparian corridor	3	22.21	Forest	Forest, Weed monitoring	Recovering after 2019 fire	1,2,3,4,6
Indigenous forest M62	3	4.15	Forest	Forest, Weed monitoring	Recovering after 2019 fire	1,2,3,4,6
M67 riparian corridor	4	4.38	Riparian	Weed monitoring	Recovering after 2019 fire	1,2,3,4,6
M68 Forest and riparian corridor	4	33.00	Riparian	Weed monitoring	Recovering after 2019 fire	1,2,3,4,6
Abdolskloof	1	10.64	Biodiversity	Weed monitoring	Recovering after 2019 fire	1,2,3,4,5,6
M77 Riparian corridor	4	11.41	Riparian	Weed monitoring	Recovering after 2019 fire	1,2,3,4,6
Block 3 Fynbos	3	70.36	Biodiversity	Weed monitoring	Recovering after 2019 fire	1,2,3,4,5,6
Indigenous forest C85 (was M85)	3	12.63	Forest	Forest, Weed monitoring	Recovering after 2019 fire	1,2,3,4,6
Total area		271.07				

1.1.4 General Management Recommendations

Below is a review of the impacts that could be faced by HCV/PCA and a summary of how these risks will be managed and minimised.

Mitigation No.	Potential impact	Risk Mitigation and management
1	Fragmentation	PCA areas not to be converted or transformed. Any transformation will need to comply with the implementation of the Environmental Impact Assessment Management procedure (MP). Where improvements are identified to layout, and changes are possible that will lead to significant improvement to layout these will be considered.
2	Illegal activities (poaching, illegal harvesting)	MTO Access control and Security MP. Also refer to the Natural Resource Usage MP and Non Timber Forest products MP.
3	Weed infestation leading to change in habitat	Long term weed control program with monitoring of improvement over time. Prioritisation of PCA areas in planning. Refer to tending and weed control MP and the integrated pest management strategy, and progress per site on Microforest.
4	Roads or flooding leading to erosion	Review of potential erosion aspects through normal monitoring. Control of impacts through improvement in road management or river crossing improvement. Refer to Road maintenance MP. Erosion monitoring for active erosion and rehabilitation if active.
5	Burning rotations leading to transformation	Where possible and required, schedule of burning rotations of PCA areas to comply with prescribed conservation burning rotations as far as possible. Refer to Conservation Management plans and Fire Management plans.
6	Uncontrolled burning leading to damage	Fire protection and protection of areas through integrated fire protection. Refer to the Fire protection plan.
7	Forestry activities on critical species.	Site specific management requirements will be developed for specific sites were needed. Refer to Management plans.
8	Archaeological sites: damage or theft	Protect sites from operations and sites only accessible through control. Management recommendations by specialists and through monitoring.

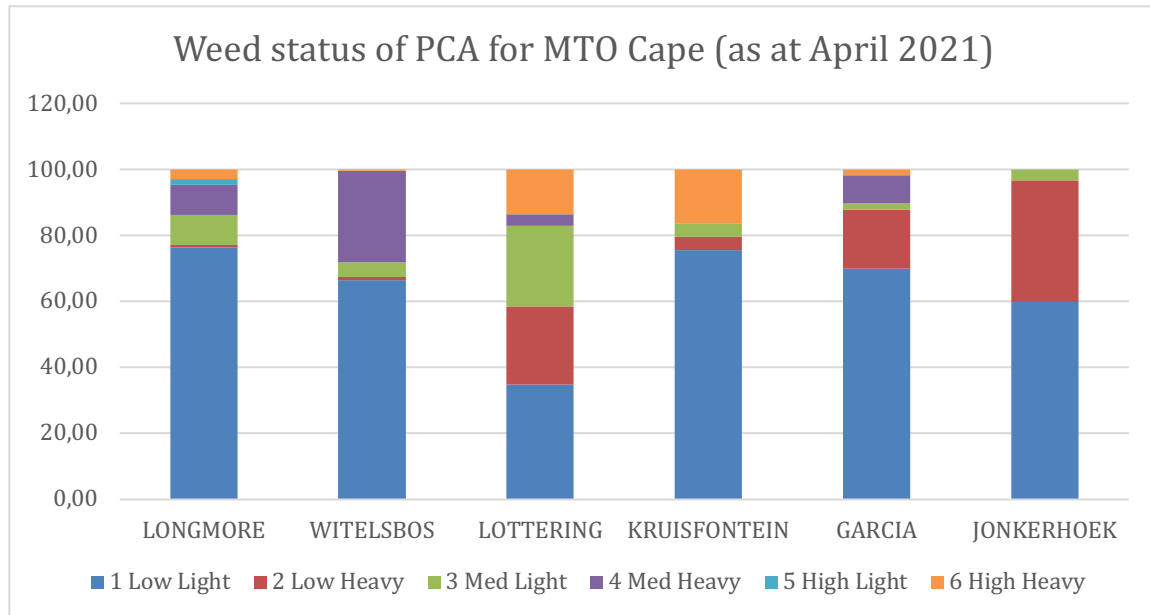
All priority conservation areas are currently scheduled for weed eradication. Fire rotations are in place where areas are managed as part of fire management or for conservation burning. Detailed information is available in the Conservation Management plans.

1.1.5 Monitoring Frequency

A summary of all monitoring per PCA is shown above under Summary of Results.

1.1.6 Summary of Results

Results of this monitoring program are shown under the relevant section in this report. Results of weed monitoring are included in Microforest. Detailed results are available on plantation, but for weeding are summarized here as of April 2021. A detailed review of area is scheduled for 2025 and the PCA weed table will be updated after completion of the review in 2025.



1.1.7 Monitoring Objective and Target

The objective is to track improvement over time ensuring that all PCA areas achieve a 100% weed maintenance level with a focus on their management in 5 years. Erosion control and site-specific monitoring is also available in plantation management plans. Monitoring of the HCV6 sites at Garcia is planned for 2025.

1.2 Priority Conservation forests Monitoring

1.2.1 Requirement for monitoring

For the past 20 years, MTO Cape has monitoring forests that were identified by the company as representative High Conservation value forests (HCVF). All forests managed by MTO Cape are small patches and only parts of larger forests managed by SanParks. Nevertheless, MTO Cape decided to identify HCVF using additional local requirements, as indigenous forest is a key vegetation type, currently protected under national legislation. The criteria used to identify HCVF (Von dem Bussche, 2003) included:

- Large landscape dominating forest representing a well conserved indigenous forest ecosystem.
- Wet to very wet mountain forests bordering onto fynbos areas, which are subject to natural fires.
- Small inland forest surrounded by commercial plantations.
- Dry and very dry scrub forests
- Heavily infested forests with excessive alien vegetation.
- Forests at the ecological extremity of their natural range.

These same forests, as originally identified for monitoring are now identified as Priority Conservation Area Forests, as they represent a critical vegetation type and are therefore included in the Priority Conservation Areas monitoring program. MTO Priority Conservation Areas Forests are selected to detect trends over a long observation period, to assess management operations through monitoring and to keep records of representative small or isolated forests.

The Southern Cape indigenous forests, covering an area of 60 500 ha are the largest in South Africa and occur along the foothills of the coastal mountain range from George in the west to Humansdorp in the east. They represent the most southern extension of the Afromontane Forest belt and stretch along the escarpment and the lowlands along the Indian Ocean coastal belt (Geldenhuys, 1982). The forests occur as large landscape forest areas as well as smaller forest patches interspersing natural fynbos areas, wetlands and commercial plantations. The main forest areas are situated on stateforest land, which are managed by the South African National Parks Board (SANParks). Many indigenous forest patches of varying sizes, composition and status are also interspersed within MTO Cape plantations, and these are currently managed by MTO Cape as part of normal conservation management. All indigenous forests enjoy strict legal protection.

The main monitoring objective for MTO Priority Conservation forests are:

- base-line information (status during time of first assessment),
- to detect possible change after a predetermined period and,
- to plan and implement adequate management activities to ensure correct management of these forests (also to be used as a guideline for other non monitored forest).

Monitoring long-term development and growth of indigenous forest is scientifically implemented at the FVC (French Volume Curve) research areas at Diepwalle (Vermeulen, 1994). In addition, 966 permanent sample plots of 0,04 hectare each have been established in the indigenous forest controlled by SanParks (Vermeulen, 1994). Long-term, goal-orientated and systematic trend assessment of natural processes in the indigenous forest of the Southern Cape is therefore sufficiently attended to. A repetition of this work in the ecologically comparable indigenous forest on land controlled by MTO Cape is therefore not necessary.

The influence of commercial plantations on the indigenous forest, however, needs to be monitored. The main influence of the plantation on the forest is experienced at the contact zones (forest edge or ecotone) and the influence of alien vegetation and the control thereof on the indigenous forest, forms the basis of the MTO Cape monitoring system. Fire can also significantly impact forest.

1.2.2 Monitoring protocol

Priority Conservation Forests are still selected in order to detect trends over a long observation period, to assess management operations through monitoring and to keep records of change over time.

The following information has been documented for each forest:

- | | |
|---|---|
| • Name of the forest, plantation, compartment | • Hydrology |
| • General description | • Fire history |
| • List of tree species according to the National Tree Number List | • Fauna |
| • Regeneration | • Social functions |
| • Ground cover | • Fixed-point photo-monitoring sites |
| • Past utilization | • Other monitoring programs |
| • Present status | • Management proposals |
| • Edge (ecotone) description | • General |
| • Alien vegetation | • Date of forest assessment and name of recorder. |

A fixed-point photo-monitoring program, which creates a comparative, visual documentation of vegetation change, may it be due to natural causes or management induced actions, has been implemented. Photo records as well as documentation of fixed-point photo-monitoring sites are kept at a central office, while the information, relevant to each plantation, is kept at each plantation office.

1.2.3 Summary of Results

A list of all indigenous forests on MTO Cape plantations in the Eastern and Western Cape was compiled during 1996 – 1998. Twenty-one forests were historically chosen, and thirteen still form part of the monitoring (eight have been handed back to the State as part of the exit program). These forests represent a selection of different types of forests and include some unique indigenous forests on MTO Cape property.

In selecting these forests, the objective was to select a wide variety of forests, where different ecological parameters may be significant, and which could necessitate different management actions. The different reasons for selection are given for each forest on the relevant evaluation sheet. The forests were also selected to detect trends over a long observation period, to assess management operations through monitoring and to keep records for small and sometimes even insignificant forests.

Table 3. The current selected and assessed forests (which still occur on MTO Cape property, and under control of the company).

Plantation	Forest Code	Forest Name	Ha	Description
Garcia	Na 006 (A59)	Meulenrivierkloof	22.56	Riverine forest along the Meulenrivier with fynbos transition zones. Photo-monitoring.
Kruisfontein	Na 031 – 032 (K42)	Klein Gouna	95.02	Very dry scrub forest at steep slope towards Knysna River. Photo-monitoring. Damaged in the 2017 fire.
Kruisfontein	Na013 (G22)	Noetzie	1.49	Very small dry kloof forest surrounded by commercial plantations. Control of aliens is scheduled and will be monitored. Damaged in the 2017 fire.
Keurbooms	Na 003 – 004 (A28)	Hek se bos	128.99	Natural Heritage Site. Dry to very dry kloof forest with medium-moist riverine parts on slopes towards Keurboomsrivier. <i>Strelitzia alba</i> colony, is part of the forest and has been monitored in the past.
Keurbooms	Na 019 – 021 (D19)	Matjiesfontein	53.70	Large dry and very dry coastal scrub forest adjoining Wiskey Creek Nature Reserve and Keurboomsrivier Nature Reserve. Photo-monitoring.
Keurbooms	Na 015 (N38)	Rondebos	1.29	Very small dry inland forest patch, completely burnt during forest fire of April 1998. Photo-monitoring.
Lottering	Na 006 (B53)	Ratelbos	15.51	Wet mountain forest. Photo-monitoring to monitor burnt ecotone during fires of 1998 and 1999 and establishment of PSP's. Damaged in the 2018 fire.
Blueliliesbush	Na 003 (A24)	Klein Witelsbos	91.67	Fire-damage in 1996. Photo-monitoring. Damaged in the 2018 fire.
Witelsbos	Na 022 (C79)	Witelsbos	37.61	Dry kloof forest with riverine parts : Photo-monitoring.
Longmore	Na 001 (A38)	Longmore Forest	30.02	Dry to very dry kloof forest. Photo-monitoring.
Longmore	Na 006 (C21)	Stinkhoutkloof	3.42	Moist riverine forest with Keur fringe and a few Stinkwood (<i>Ocotea bullata</i>) trees. Previously badly damaged by fire. Photo-monitoring.

Jonkershoek	Na 012 (M75)	Heuningkloof	34.38	New sites Added 2010. Burnt in 2017. Photo-monitoring.
Jonkershoek	Na 018 (M85)	Burnt Forest	9.2	Added 2010. Burnt in 2009. Burnt in 2017. Photo-monitoring.

Detailed results of the initial monitoring are available in Von dem Bussche (2003), and the follow up photo monitoring and five yearly monitoring results are kept on plantation in the Priority Conservation Forests file.

1.2.4 General Management Recommendations

Scheduled operations are included into the conservation management plans of the plantation and include:

Potential impact	Risk Mitigation and management
Control of alien vegetation	Wattle, blackwood, eucalypt, pine and other alien vegetation notably along the edges of forests. In some cases tall mature Blackwood trees can be harvested and the timber can be utilized. The felling operations have to be acceptable according to environmental conservation principles. All other regrowth to be managed as part of long terms weed plans. Refer to tending and weed control MP and the integrated pest management strategy.
Maintenance of ecotone	It is of importance that during plantation harvesting operations no trees are felled into the forest or damage the ecotone of the forest. The officially prescribed buffer-zones between the forest and the first row of planted commercial trees must also be maintained at all times. It is essential that the buffer-zone is adequate for the establishment and maintenance of ecologically viable ecotones. Indigenous species are allowed to grow back into ecotones.
Uncontrolled burning leading to damage	Fire protection and protection of areas through integrated fire protection. Refer to the Fire protection plan.
Post fire damage recovery	Proactive weed control to ensure recovery of ecotones and forests damaged by fire. Protection of forests from fires during scheduled burning actions in adjoining compartments.
Harvesting	MTO Cape does not harvest indigenous trees.

1.2.5 Monitoring Frequency

Forest processes and dynamics are slow, and therefore responses to change can only be monitored over long time frames and were therefore scheduled every 5 years in the past, and will continue every 3 years in future to monitor the success of alien invasive plant control after impact by wildfires.

Table 5. Priority Conservation Forest monitoring schedule.

Plantation	Forest	2023	2025	2026	2027	2028	2029	2030
Garcia	Meulenrivierkloof	YES		3YR			3YR	
Kruisfontein	Klein Gouna	YES		3YR			3YR	
Kruisfontein	Noetzie	YES		3YR			3YR	
Lottering	Hek se Bos	YES		3YR			3YR	
Lottering	Maatjiesfontein		3YR			3YR		
Lottering	Ratelsbos	YES		3YR			3YR	
Lottering	Rondebos		3YR			3YR		
Witelsbos	Klein Witelsbos	YES		3YR			3YR	
Witelsbos	Witelsbos	YES		3YR			3YR	
Longmore	Longmore Forest	YES		3YR			3YR	
Longmore	Stinkhoutbos	YES		3YR			3YR	
Jonkershoek	Heuningkloof	YES		3YR			3YR	

Jonkershoek	Burnt forest	YES		3YR			3YR	
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Yes = completed three yearly monitoring.

1.2.6 Monitoring Objective and Target

The monitoring objective is to monitor the recovery or condition of these forests over time. The short term target is to ensure that recovery is encouraged through the removal of weeds and protection from future uncontrolled fires. Annual monitoring ensures that management can be provided (such as weeding), should it be noted during monitoring. The long term target is maintenance of these forests in as natural a state as possible.

1.3 Natural Heritage Site Monitoring

1.3.1 Requirement for Monitoring

The South African Natural Heritage Program (not to be confused with the UNESCO Natural Heritage site program) was launched in South Africa in 1984 as a voluntary cooperative venture between the Government (represented by the Department of Environmental Affairs and Tourism at the time), the regional nature conservation agencies, the Worldwide Fund for Nature (WWF) and the private sector through Schneider. The program was aimed to private landowners who would dedicate a tract of land to conservation through registration. This program was discontinued in the 2000's, but still left a legacy of encouraging the protection of important natural sites, and MTO Cape still therefore honors the management of these sites that were registered while the program was still in operation.

MTO Cape, had three historical Natural Heritage sites. These are: Van Stadensberg (No. 211) on Longmore plantation which is an important fynbos mountain habitat, Kareedouwberg (No. 299), of which only the front portion of the Kareedouwberg fynbos mountain still occurs on Witelsbos plantation and Hek se Bos (No. 255), an indigenous forest occurring on the Keurbooms section of Lottering plantation and included as a Priority Conservation Forest.

1.3.2 Monitoring Protocol

To monitor changes over time a photo-monitoring program was initiated for each site from 2015. Monitoring concentrated on the critical components of each site, which warranted their registration initially, and will in future be repeated every five years. Previous monitoring of these sites was repeated in 2017 (Hek se Bos, Kareedouwberg) and 2018 (Van Stadensberg) and 2020 (Hek se Bos, Kareedouwberg, Van Standensberg).

Table 6. NHS monitoring.

NHS	Monitoring requirement
Van Standensberg	Photomonitoring of rare species habitat, and ecotone monitoring.
Kareedouwberg	General alien spread from plantation to adjoining mountain and monitoring of the recovery of the old pine compartment area below the lookout.
Hek se Bos	General overview forest monitoring and ecotone monitoring of the fynbos portion also included in the heritage site.

1.3.3 Summary of Results

Old photographs of these sites are available on file. 2015 monitoring results including photomonitoring can be found in a report by G.v.d Busche (2015). 2018 monitoring results can be found in von dem Busche and du Preez (2018) and 2020 monitoring in Kirkman (2020). Results are summarized here:

NHS	2015 Monitoring summary	2017/2018 Monitoring Summary	2020 Monitoring Summary
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Van Standensberg	The whole area was subject to a hot and intensive veld fire in 2005 and has been subject to regular invader control operations, so that at present hardly any invaders along the plantation border have been observed with the only exception at one site at block Z9. In 2012 controlled block burns commenced in order to obtain different stages of fynbos development of the different management blocks over time. The present policy is to aim at a rotation of 12 – 18 years, however recent fire protection considerations have resulted in a reduction of the rotation to a minimum of 8 years for some blocks. This aspect that will need to be reviewed, with a longer period introduced to apply improved conservation planning.	An accidental veld fire burnt the total area of the NHS during June 2017. The climatic conditions before, during and after the second veld-fire had been extremely dry, so that the present monitoring was postponed to October 2018. Areas which did not burn between the two general veld fires of 2005 and 2017 have re-grown very well and the cover includes Proteaceae seedlings (serotinous species) and re-sprouters, while the area which had experienced accidental or controlled burns in between had generally a reasonable grass cover but definitely reduced Proteaceae re-sprout and no Proteaceae seedlings. This leads to the conclusion that a general rotation of 12 years is ideal for ecological reasons. Areas that burnt at intervals of 5 years and less, have probably experienced a loss of Proteaceae species, which is unfortunate but indicates that short rotations should be avoided for ecological reasons. No invader re-growth has occurred. This is probably the result of diligent weed control in the past and is an indication that intensive and correct removal of invaders, particularly <i>Pinus pinaster</i>, before fires, results in invader free fynbos areas.	Areas which did not burn between the two general veld fires of 2005 and 2017 have re-grown very well and the cover includes Proteaceae seedlings (serotinous species) as well as re-sprouters (<i>Leucodendron</i>, <i>Leucospermum</i>), while areas, which had experienced accidental or controlled burns in between had generally a reasonable grass cover and recovering <i>Leucodendron</i> and <i>Leucospermum</i>, but definitely reduced Proteaceae recovery. This confirms that longer rotations are required (to allow proteas to grow, flower and seed), and veld must be protected at least for 9 - 12 years between fires. The regrowth of proteas should determine the best ecological time to burn. Areas which burnt in intervals of 5 years and less are still not recovering their Protea component, and should still be protected going forward to allow the few plants that remain to flower and set seed to aid with recovery. Invaders have not returned and control efforts have been successful. The clean nature of the site before the fires really assisted with this, and shows that clean areas will greatly reduce costs in the long term.
Kareedouwberg	The few indigenous forests along drainage lines and rivers were badly damaged during the wild-fire of 2005, however well - developed Keur (<i>Virgilia oroboides</i>) buffers have established themselves subsequently. The southern slopes consist mainly of Mountain Fynbos. The whole area, including the adjoining commercial plantation, was burnt during 2005 by a devastating and hot wild-fire but has subsequently recovered. The fynbos is now 10 years old and controlled block burns should be scheduled soon. Most of the fynbos areas above the commercial plantation are at present invaded by pine and control should be investigated. The area west of Clarkson burnt during 2014, while large areas of the northern slopes, at present under the control of DAFF also	Follow – up weed control at all the fynbos areas, along drainage lines and indigenous forests require urgent attention and should be scheduled. Block burn plans should be drawn up in accordance with fire-protection planning for the plantation. Most fynbos areas (except for the north-eastern areas which burnt in 2014) have last burnt during 2005 and are now 12 years old. Fynbos on the south-facing slopes should burn every 12-15 years. <i>NOTE: These areas subsequently burnt in the wildfire event in November 2018. Weed follow up will be scheduled.</i> The remaining indigenous forests along the drainage lines have a high environmental value and must not be endangered during scheduled burns or accidental fires. Proper planning and preparation to protect the forest edge (ecotone) during scheduled prescribed burning operations is required. <i>Note: This</i>	This area was burnt in the October 2018 fire. A firebreak has been recently prepared, and compartment F15d is still not planted (due to be planted early 2021). The fynbos area shows good signs of recovery, with only a very few aliens (wattle) close to the road. Otherwise the area is totally clean and recovering well. Mountain Cedar regrowth was also noted at the site. Good recovery of the fynbos was seen, with King Protea flowering (in unburnt patches), and a good regrowth of fynbos observed. No erosion noted.

	burnt during 2014, nine years after the previous wild-fire. The buffer zone between the NHS and the commercial plantation is well defined. The rehabilitation area below the tower, part of FB06, consists of well - established fynbos elements, however young pine re-growth was observed at many sites and will need to be scheduled for a follow – up operation soon.	<i>forest edge was affected by the November 2018 wildfire.</i> The Rehabilitation area (F32 Se 0028 / Tb) was until a few years ago covered with large <i>Pinus pinaster</i>. Recommendations to control pines and other invasive species and to schedule a controlled burn of the area have not been implemented. Urgent actions are suggested. <i>Note: This area was burnt in the November 2018 wildfire, and weed follow up will be scheduled.</i>	
Hek se Bos	The forest borders onto fynbos and rehabilitation areas (previously commercial plantations) and have now developed towards fynbos and thicket. The ecotones and buffer zones along the forest edges are well developed, however a few large wattle trees are evident along parts of the forest edge. Weed eradication has been scheduled. The mountain fynbos areas, mainly on north/western slopes at the south/western side, has recovered well after the fire of April 1997 and have developed now towards fynbos and thicket. A few pine and wattle invaders are evident however and a dense <i>Eucalyptus</i> has emerged at the N/W corner. These will be addressed. The erosion scars, caused by the flooding in 2007, have stabilized and are well covered with vegetation.	The Erosion scar has stabilised substantially and the forest edge appears in good health with good stands of Blombos (<i>Metalsia muricata</i>) and Keur (<i>Virgilia divaricata</i>) observed between the edge of the road and the forest below in the area previously affected. Control of alien invasive species has been done but a follow – up operation is urgent and needs to be scheduled. Large single pines and eucalypts inside the forest must please be ring-barked and not felled in order not to damage the surrounding vegetation. Follow-up is particularly important above the <i>Strelitzia alba</i> colony. The area which was previously commercially planted, has rehabilitated well and the Fynbos is well established and should be incorporated into controlled burning schedule done as soon as possible but no later than 2020 as the fynbos is now 19 years old. Follow-up weeding should be prioritised. The <i>Strelitzia alba</i> colony is in good condition.	Vegetation has grown extensively since the 2017 photo monitoring, and along the road is now up to 3m high. Significant Keur regrowth was seen. A significant amount of Eucalyptus and black wattle regrowth was however also seen, and follow up weed eradication should be scheduled. For fire protection purposes, a controlled burn could be considered in the old fynbos along the forest buffer (which is now 22 years old). The <i>Strelitzia</i> colony appears to be in good condition. The site is very inaccessible and some large eucalyptus are still visible (e.g. 200m downslope) and not killed. Some young eucalyptus also noted. The site will need to be scheduled for weed control again, in areas that can be reached (especially along road) to keep the invasion of weeds low.

1.3.4 General Management Recommendations

Management of the Natural heritage sites is included in the Conservation plans of the respective plantations. This includes primarily weed eradication and fynbos burning for conservation management, and potential erosion control, should it occur after fires.

1.3.5 Monitoring Frequency

Natural Heritage sites form part of the Priority Conservation areas monitoring. Monitoring of the sites to review general status is to occur every five years. Next monitoring is 2025.

1.3.6 Monitoring Objective and Target

The monitoring objective is to monitor the status of these sites over time. Monitoring ensures that management can be provided (such as weeding), should it be noted during monitoring, and that impacts can be noted over time.

2. BIODIVERSITY PROCESS

2.1 Water Quality Monitoring

2.1.1 Requirement for Monitoring

The conservation and wise use of water are priorities in South Africa. For this reason the maintenance of riparian zones and wetlands is seen as a priority within the South African forestry context. Rivers and riparian zones also form critical habitat and biological corridors within forestry areas and as such should therefore be maintained to improve the overall biodiversity value of a planted area. Detailed monitoring, concentrating on benchmark monitoring and site impact monitoring, to determine change over time, are both important tools used to monitor water quality, and hence, the state of the river system. Many sites identified for water quality monitoring fall within Priority Conservation areas.

Monitoring of stream flow reduction is done at National level in various catchment experiments which have been used to drive forestry policy in South Africa since 1972 towards the mitigation of this impact. Due to the complexity and scientific expertise required, plantation level monitoring is not feasible.

2.1.2 Monitoring Protocol

A water quality monitoring program was initiated for the MTO Cape in 1999. The SASS5 bio monitoring system is used. The monitoring system is essentially a bio-monitoring system of the benthic invertebrates coupled with a habitat assessment and the measurement of certain physical parameters such as temperature, pH, turbidity, dissolved oxygen and conductivity. Selected sites are sampled every three years to monitor baseline conditions. In 2012, fish and dragonfly monitoring were also added to the monitoring programme, and are done periodically, with last fish and dragonfly monitoring in 2023 and 2024. Last SASS5 monitoring occurred in 2024 for selected sites and is scheduled every three years. In 2022, new sites were added to include sites above Stormsrivier village (Witteklip river), and on the Elands river following concerns regarding onsite impacts due to chemical operations. From 2022 diatom monitoring has also been included for selected sites as part of the MTO long term programme (Koekemoer 2022). According to Koekemoer (2022) diatoms have been shown to be reliable indicators of specific water quality problems such as organic pollution, eutrophication, acidification, and metal pollution, as well as for general water quality. Diatom-based water quality indices for riverine ecosystems have been implemented in South Africa since 2004 as there is a measurable relationship between water quality variables such as pH, electrical conductivity, phosphorus and nitrogen, and the structure of diatom communities as reflected by diatom index scores, allowing for inferences to be drawn about water quality. In 2023 two additional SASS5, fish, dragonfly and diatom sites were added for Garcia and three new sites for the Keurboomsriver section of Lottering.

Table 7. SASS5 sampling has been carried out at the following sites on MTO Cape land. Current and future diatom monitoring sites are also shown.

Site No.	Site name	River	System	Plantation	Latitude	Longitude	(m a.s.l)	Diatom site
K60E-01	Heksebos	Keurbooms	Keurbooms	Lottering	-33.93407	23.367025	7	No
K60E-02	Upper Duiwelsgat	Duiwelsgat	Keurbooms	Lottering	-33.90113	23.41961	340	Yes
K60E-03	Lower Duiwelsgat	Duiwelsgat	Keurbooms	Lottering	-33.90893	23.41662	310	No
K60F-03	Swaneberg	Bos	Noetzie	Kruisfontein	-34.03230	23.19548	250	No

K60G-04	Pumphouse	Witels	Noetzie	Kruisfontein	-34.03562	23.16029	210	Yes
K60G-05	Bracken Falls	Witels	Noetzie	Kruisfontein	-34.04607	23.16302	190	Yes
K60G-06	Noetzie	Noetzie	Noetzie	Kruisfontein	-34.05909	23.13253	50	Yes
K80A-01	Grenadier	Lottering	Lotering	Lottering	-33.93299	23.72952	267	No
K80A-02	Elandsbos	Lottering	Lottering	Lottering	-33.96415	23.74512	234	No
K80A-03	Lottering	Lottering	Lottering	Lottering	-33.97261	23.74729	204	No
K80A-06	Lower Lottering	Lottering	Lottering	Lottering	-33.99088	23.73675	1	No
K80B-01	Kleinbos	Kleinbos	Kleinbos	Lottering	-33.96386	23.81587	250	No
K80B-02	Boskor	Kleinbos	Kleinbos	Lottering	-33.96386	23.81998	208	No
K80B-06	Boskorspruit	Boskorspruit	Boskorspruit	Lottering	-33.99796	23.8017	198	No
K80B-03	Blueliliesbush	Sanddrift	Sanddrift	Witelsbos	-33.972	23.97799	260	Yes
K80B-04	Sanddrift	Sanddrift	Sanddrift	Witelsbos	-33.99041	23.97972	220	No
K80B-07	Upper Witteklip	Witteklip	Storms	Lottering	-33.956273	23.868994	254	Yes
K80B-08	Lower Witteklip	Witteklip	Storms	Lottering	-33.964056	23.873274	226	Yes
K80C-01	Upper Elands	Elands	Elands	Witelsbos	-33.975679	24.049828	219	Yes
K80C-02	Wolf sanctuary	Elands	Elands	Witelsbos	-33.980594	24.050105	211	Yes
L90B-01	Upper Klein	Klein	Klein	Longmore	-33.76822	25.0228	450	Yes
L90C-01	Loerie's Drift	Loeriespruit	Loerie	Longmore	-33.81489	25.08950	350	Yes
L90C-02	Emerald Pool	Geelhoutboom	Geelhoutboom	Longmore	-33.79663	25.06504	430	Yes
L90C-04	Geelhoutboom	Geelhoutboom	Geelhoutboom	Longmore	-33.80072	25.05728	410	Yes
L90C-05	Martins Drift	Martins	Martins	Longmore	-33.79358	25.03825	410	Yes
M10A-01	Upper Sand	Sand	Sand	Longmore	-33.75901	25.07253	430	Yes
M10B-02	Bulk u/s Dam	Bulk	Bulk	Longmore	-33.80827	25.15872	330	Yes
M20A-01	Van Stadens	Van Stadens	Van Stadens	Longmore	-33.84787	25.22198	310	Yes
H90B-01	Above Dam	Korente river	Korente river	Garcia	-33.98914	21.15820	324	Yes
H90B-02	Die Glen	Meul river	Meul river	Garcia	-34.01331	21.23164	178	No

2.1.3 Summary of Results

Detailed results of the SASS5 monitoring are provided in the specific site reports provided by Diedericks (Diedericks, Roux and Koekemoer 2012 and Diedericks 2015, Diedericks 2018a, 2018b, Diedericks 2019, Diedericks 2021, Diedericks 2022, Koekemoer 2022, Diedericks 2023, Diedericks 2024). The SASS5 method was applied to generate the appropriate biomonitoring data with ancillary measures of habitat availability generated by the Integrated Habitat Assessment System, (IHAS version 2). A Comprehensive Habitat Integrity Assessment (or Index of Habitat Integrity - IHI) was also applied at each site sampled. For many, sites were chosen to measure specific impacts at a particular site over time. The reasons for change are explained in the detailed reports for each year.

Summary of findings for Kruisfontein over time (from Diedericks (2021, 2023)).

Table 3-4. Ecological categories per sampling site per sampling period. The percentage change represents the change between the November 2021 results compared to the 90th percentile of previous results. The "ns" stands for not sampled.

Site	Site Name	SAMPLING DATE											Change (%)
		Sep 1999	Oct 2000	Oct 2001	Oct 2002	Oct 2003	Nov 2004	Oct 2005	Sep 2007	Mar 2012	Oct 2018	Nov 2021	
K60F-03	Swaneberg	C	D	D	ns	ns	D	ns	C	ns	B	ns	↗
K60G-04	Pumphouse	D/E	D	E	D	C/D	D	D	D	ns	C/D	ns	↗
K60G-05	Bracken Falls	C	C	C	C	C	C	ns	C	E	C	C/D	18%↓
K60G-06	Noetzie	B	C	C	ns	ns	C	ns	C/D	C	C	C	10%↘

* Sites significantly impacted by wildfire in June 2017.

Table 4-3. The 2023 SASS5 results and a summary of the different indexes on flow, water quality and habitat responses are presented for the Bracken Falls and Noetzie sites.

Site	Site Name	SASS Results			Various Indices ¹¹			
		SASS Score	No. SASS Families	ASPT	Flow	WQ	Habitat	ALL
K60G-05	Bracken Falls	75 [↗]	11 [↗]	6.8 [↗]	3.0 [↗]	3.8 [↗]	3.6 [↗]	3.5 [↗]
K60G-06	Noetzie	95 [↗]	19 [↗]	5.0 [↗]	2.5 [↗]	3.4 [↗]	2.6 [↗]	2.8 [↗]

Summary of findings for Longmore over time (from Diedericks 2021, 2024).

Table 3-3. Ecological categories per sampling site per sampling period. The percentage change represents the change between the November 2021 results compared to the 90th percentile of previous results.

Site	Stream	SAMPLING DATE												Change (%)
		Oct 2001	Sep 2002	Oct 2003	Nov 2004	Oct 2005	Oct 2006	Sep 2007	Oct 2008	Sep 2010	Oct 2015	Oct 2018	Nov 2021	
L90B-01	Klein	B	B	B	C		C	B/C	B	C	B/C	B	B	3% ↘
L90C-01	Loerie		C	B/C	C	B/C	C	C			B	B	B/C	5% ↘
L90C-02	Geelhoutboom	B	B/C	C	B/C	C		C	C	C	B/C	B	C	10% ↘
L90C-04	Geelhoutboom	C	B/C	B	B	B	C	C	B	B/C	B	B	C	11% ↘
L90C-05	Martin's	B	B	C	C	C		C	B/C	C	C	C	D	33% ↘
M10A-01	Sand							D				B/C	B	22% ↗
M10B-01	Bulk											D	B/C	16% ↗
M20A-01	Van Stadens		B/C	B	A/B	B	E	D/E				B/C	C	19% ↘

Table 4-5. Summary of present ecological state based on the water chemistry and the aquatic macroinvertebrate and diatom communities encountered in October 2024.

Site	Stream	SASS5 - MIRAI		Diatoms	Chemical Water Quality	Overall
		Present	Change			
L90B-01	Klein	A/B	improved	A	natural	A
L90C-01	Loeries	A/B	improved	A	natural	A
L90C-02	Geelhoutboom	B	improved	A	natural	A
L90C-04	Geelhoutboom	B	improved	A	natural	A
L90C-05	Martins	C	deteriorated	A	natural	C
M10A-01	Sand	C	improved	A	natural	A/B
M10B-02	Bulk	B/C	improved	A	natural	A/B
M20B-01	Van Stadens	B/C	deteriorated	A	natural	B/C

Summary of findings for Witelsbos over time (from Diedericks 2022).

Table 4-3. Stream condition based on SASS biomonitoring results for sites on the Sanddrift River on Witelsbos plantation, using MIRAI. Refer to Table 3-1 for condition scale.

Site Code	Site Name	River	Category										Change (from previous surveys)
			1998	1999	2000	2001	2004	2007	2012	2015	2019	2022	
K80B-03	Blueliliesbush	Sanddrift	B	B	B	B	B	B	C	C	B	B/C	→
K80B-04	Sanddrift			D	B/C	B	B	C	C	C	B	B/C	→

* = A = "natural"; B = largely natural; C = moderately modified; D = largely modified; E = seriously modified; F = critically modified

Table 4-7. Stream condition based on SASS biomonitoring results for sites on the Elands River on Lottering plantation using MIRAI.

Site Code	Site Name	River	Oct 2022
K80C-01	Upper Elands	Elands	B
K80B-08	Wolf Sanctuary	Elands	B

* = A = "natural"; B = largely natural; C = moderately modified; D = largely modified; E = seriously modified; F = critically modified

Summary of findings for Lottering over time (from Diedericks 2022, 2023).

Table 4-6. Stream condition based on SASS biomonitoring results for sites on the Lottering River on Lottering plantation, using MIRAI. Refer to Table 3-1 for condition scale.

SITE CODE	SITE NAME	RIVER	CATEGORY*								CHANGE (From previous surveys)
			2002	2003	2004	2005	2008	2015	2019	2022	
K80A-01	Grenadier	Lottering	B	B	B	B	B	C	B	B	→
K80A-02	Elandsbos		B	B	B	B/C	B	C	B	B/C	→
K80A-03	Lottering		B	B	B	B/C	C	B/C	B/C	B	→
K80A-06	Lower Lottering					B/C			A/B	B	→

* = A = "natural"; B = largely natural; C = moderately modified; D = largely modified; E = seriously modified; F = critically modified

Table 4-10. Stream condition based on SASS biomonitoring results for sites on the Kleinbos River and Boskorspruit on Blueliliesbush (Lottering) plantation using MIRAI.

Site code	Site name	River	Category												Change (from previous surveys)
			1998	1999	2000	2001	2004	2007	2008	2010	2012	2015	2019	2022	
K80B-01	Kleinbos	Kleinbos	B	B	B	B	A/B	C	C	B	C	B	B	C	↓
K80B-02	Boskor			C	B/C	C	B	C	C	B/C	C	C	B/C	B/C	↔
K80B-06	Boskorspruit	Boskorspruit						C	C	E	D	C/D	C/D	C/D	↔

* = A = "natural"; B = largely natural; C = moderately modified; D = largely modified; E = seriously modified; F = critically modified

Table 4-14. Stream condition based on SASS biomonitoring results for sites on the Witteklip River on Lottering plantation using MIRAI.

Site Code	Site Name	River	Oct 2022
K80B-07	Upper Witteklip	Witteklip	B
K80B-08	Lower Witteklip	Witteklip	B

* = A = "natural"; B = largely natural; C = moderately modified; D = largely modified; E = seriously modified; F = critically modified

Table 4-2. The 2023 SASS5 results and a summary of the different indexes on flow, water quality and habitat responses are presented for the sites on the Keurbooms River (K60E-01) and Duiwelsgat stream (K60E-02 & K60E-03).

Site	Site Name	SASS Results			Various Indices ¹²			
		SASS Score	No. SASS Families	ASPT	Flow	WQ	Habitat	ALL
K60E-01	Heksebos	142 ^a	21 ^a	6.8 ^a	3.2 ^a	3.6 ^a	3.8 ^a	3.5 ^a
K60E-02	Upper Duiwelsgat	162	22	7.4	3.0	2.6	2.7	2.8
K60E-03	Lower Duiwelsgat	169	23	7.3	3.0	3.8	3.9	3.6

Summary of findings for Garcia (monitoring initiated in 2023) (from Diedericks 2023).

Table 4-2. The 2023 SASS5 results and a summary of the different indexes on flow, water quality and habitat responses are presented for the Above Korinte Dam and Die Glen sites.

Site	Site Name	SASS Results			Various Indices ¹¹			
		SASS Score	No. SASS Families	ASPT	Flow	WQ	Habitat	ALL
H90B-01	Above Dam	134 ^a	17 ^a	7.9 ^a	3.0 ^a	4.2 ^a	4.1 ^a	3.8 ^a
H90B-02	Die Glen	154	19	8.1	3.0	4.2	4.6	3.9

Table 3-1. Description of ecological stream conditions as guidelines for allocation of ecological categories (based on Kleynhans 1996, 1999 & Government Gazette, 30 December 2016, No. 1616, Department of Water and Sanitation).

ECOLOGICAL CATEGORY	GENERIC DESCRIPTION OF ECOLOGICAL CONDITIONS
A	Unmodified/natural, close to natural or close to predevelopment conditions within the natural variability of the system drivers, hydrology, physico-chemical and geomorphology. The habitat template and biological components can be considered close to natural or to pre-development conditions. The resilience of the system has not been compromised.
A/B	The system and its components are in a close to natural condition most of the time. Conditions may rarely and temporarily decrease below the upper boundary of a B category.
B	Largely natural with few modifications. A small change in the attributes of natural habitats and biota may have taken place in terms of frequencies of occurrence and abundance. Ecosystem functions are essentially unchanged.
B/C	Close to largely natural most of the time. Conditions may rarely and temporarily decrease below the upper boundary of a C category.
C	Moderately modified. Loss and change of natural habitat and biota have occurred in terms of frequencies of occurrence and abundance. Basic ecosystem functions are still predominantly unchanged. The resilience of the system to recover from human impacts has not been lost and it is ability to recover to a moderately modified condition following disturbance has been maintained.
C/D	The system is in a close to moderately modified condition most of the time. Conditions may rarely and temporarily decrease below the upper boundary of a D category.
D	Largely modified. A large change or loss of natural habitat, biota and basic ecosystem functions have occurred. The resilience of the system to maintain the category has not been compromised and the ability to deliver ecological goods and services have been maintained.
D/E	The system is in a close to largely modified condition most of the time. Conditions may rarely and temporarily decrease below the upper boundary of an E category. The resilience of the system is often under severe stress and may be lost permanently if adverse impacts continue.
E	Seriously modified. The change in the natural habitat template, biota and basic ecosystem functions are extensive. Only resilient biota may survive, and it is highly likely that invasive and problem (pest) species may dominate. The resilience of the system is severely compromised as is the capacity to provide ecological goods and services. However, geomorphological conditions are largely intact but extensive restoration may be required to improve the system's hydrology and physico-chemical conditions.
F	Critically / Extremely modified. Modifications have reached a critical level and the system has been modified completely with an almost complete change of the natural habitat template, biota, and basic ecosystem functions. Ecological goods and services have largely been lost. This is likely to include severe catchment changes as well as hydrological, physico-chemical, and geomorphological changes. In the worst instances, the basic ecosystem functions have been destroyed and the changes are irreversible. Restoration of the system to a synthetic but sustainable condition acceptable for human purposes and to limit downstream impacts is the only option.

Diatom results

Diatoms information is being collected from 2022 together with SASS5 at selected sites to determine whether glyphosate-based/herbicide applications in commercial tree compartments are indicating changes in the stream community. Results are interpreted according to the Specific Pollution sensitivity Index (SPI) and South African Diatom Index (SADI, Harding and Taylor, 2011) to assess the “health status” of each river pertaining to diatoms. Furthermore, Harding and Taylors (2011) adjusted current SPE and SADI class limit boundaries (*Table 3-2*) was used to determine the Ecological Category per site.

Table 3-2. Interpretation of SPI scores indicating class limit boundaries.

Category (EC)	Class	SPI ⁷ Score
A	High	20 - 18
A/B		18 - 17
B	Good	17 - 15
B/C		15 - 14
C	Moderate	14 - 12
C/D		12 - 10
D	Poor	10 - 8
D/E		8 - 6
E	Bad	6 - 5
E/F		5 - 4
F	Very Poor	<4

A summary of these results is shown below.

Summary of findings for Lottering over time (from Diedericks 2022).

Table 4-8. Diatom results for the two Elands River sites, October 2022.

Site	No. of Species	SPI score	Class	Category	PTV (%)	Valve deformities (%)
K80C-01	14	17.6	High quality	A/B	5.8	0
K80C-02	10	18.1	High quality	A	0	0

Table 4-15. Diatom results for Witteklip control (K80B-07) and impact (K80B-08) sites sampled October 2022.

Site	No species	SPI score	Class	Category	PTV (%)	Valve deformities (%)
K80B-07	11	18	High quality	A	0	0
K80B-08	9	19.7	High quality	A	3	0.3

Table 4-3. The diatom results obtained for the K60E-02 Upper Duiwelsgat site during November 2023 biomonitoring assessment.

Site	Site Name	No of Species	SPI score	Class	Category	PTV (%)	Valve Deformities
K60E-02	Upper Duiwelsgat	21	19.2	High quality	A	3.5	0

Summary of findings for Garcia (monitoring initiated in 2023) (from Diedericks 2023).

Table 4-3. The diatom results obtained for the Above Korinte Dam site during November 2023 biomonitoring assessment.

Site	Site Name	No of Species	SPI score	Class	Category	PTV (%)	Valve Deformities
H90B-01	Above Dam	14	19.8	High quality	A	0.5	0

Summary of findings for Kruisfontein over time (from Diedericks (2023)).

Table 4-5. The diatom results obtained at various sites in the Bietou-Keurbooms and Noetzie Catchments during November 2023 biomonitoring assessment.

Site	Site Name	No of Species	SPI score	Class	Category	PTV (%)	Valve Deformities
K60F-03	Bos stream at Swaneberg	31	19.1	High quality	A	1.3	0
K60G-04	Witels at Pumphouse	18	19.6	High quality	A	0.5	0
K60G-05	Witels us from Bracken Falls	21	19.4	High quality	A	0	0
K60G-06	Noetzie	16	17.2	High quality	A/B	2	0

Summary of findings for Longmore over time (from Diedericks 2024).

Table 4-8. Results of the diatom biomonitoring from seven sites on Longmore Plantation collected 14-16 October 2024.

Site	Site Name	No species	SPI score	% species used in SPI and SADI	Class	Category	PTV (%)	Deformities (%)
L90B-01a	Upper Klein	24	18.5	100	High quality	A	0	0
L90C-01	Loeries Drift	14	19.9	100	High quality	A	0	0
L90C-02	Emerald Pool	15	20	100	High quality	A	0	0
L90C-04	Geelhoutboom	18	20	100	High quality	A	0	0
L90C-05	Martins Drift	19	19.6	100	High quality	A	0	0.8
M10B-02	Barendspas	19	19.7	100	High quality	A	0	0
M20A-01	Van Stadens	15	19.9	100	High quality	A	0	0

2.1.4 General Management Requirements

General management requirements notably include weed eradication and the management of siltation through improved river crossing and road network management. All areas are part of long terms planning for improvement over time. SASS5 results include detailed management recommendations which are adopted when possible.

2.1.5 Monitoring Frequency

SASS5 and diatom Monitoring is scheduled every three years, with the next monitoring scheduled for Witelsbos and Lottering in 2025.

2.1.6 Monitoring Objective and Target

Maintenance of water quality as category B or above. Where lower water quality is found, improvement in management to be done to ensure continual compliance.

2.2 EROSION MONITORING

2.2.1 Requirement for Monitoring

As part of process monitoring, the identification, monitoring and rehabilitation of erosion sites has been initiated. This is a long-term program aimed at improving the ecological status of impacted sites. Eroded and degraded sites are caused because of incorrect management practices, such as road construction, firebreak erosion, burning, etc. All sites need to be identified and rehabilitated over time.

2.2.2 Monitoring Protocol

All sites are recorded as they are identified, either during routine plantation visits, or as reported by forestry staff. All sites are formally photographed and a site record established. A program to re photograph sites on a two to three yearly basis is managed by the plantation staff.

2.2.3 Summary of Results

Individual site records are available at each plantation.

2.2.4 General Management Requirements

When necessary active erosion sites will be scheduled for rehabilitation, either by improving draining impacts, seeding with indigenous seed mixed, or establishments of barriers using logs or gabions.

2.2.5 Monitoring Frequency

Two- or three-year monitoring will be carried out depending on the status of each site (stable or eroding). Monitoring is recorded in the Degraded sites register. Sites that are stable and rehabilitated are removed from the register.

2.2.6 Monitoring Objective and Target

The monitoring objective is to track improvement over time. All degraded sites should be in a status of stable or improvement within two years of sites being identified.

2.3 WEED ERADICATION MONITORING

2.3.1 Requirement for Monitoring

To improve weeding and develop a holistic plan for each plantation, a programme to determine weed intensity and spread was initiated in 2007. The system of identifying the current weed intensity within the conservation areas (with commercial areas later also included) was initiated, to identify the spread of weed through the plantation, and to then use this information to prioritise and schedule clearing activities on a 5 yearly basis. The intensity of spread will be reviewed every two years, and adaptations made to the clearing programme as required. Amongst other, the objective of weed ratings are to assist foresters with the prioritisation and scheduling of weed control activities over the medium term.

2.3.2 Monitoring Protocol

To quantify the amount of weed on the plantations, each conservation and commercial compartment is rated according to the amount (percentage cover) and size of weed (age), and effort needed to remove the weed (slashing, herbicide, chainsaw, cost) at least once in two years. Ratings of 1 have the lowest amount of weed and effort needed, while rating of 6 is the most infested and would cost the largest amount to remove.

Table 8. Classification used to rate the weed infestations per conservation and commercial compartment.

Rating	% weed cover	Effort needed to remove	Man day and effort required	Description Rating
0	No weed could occur (dam, graded area).			0
1	0-10 %	Young or few small patches in an area and easy to remove	Man days <3. Slashing, spraying.	Low light
2		Older or larger patches, more difficult to remove	Man days <3 or perhaps greater. Slashing, spraying, could include chainsaw	Low heavy
3	11- 50 %	Young or few small patches in an area and easy to remove	Man days 1 to 3. Normally not chainsaw.	Medium light
4		Older or larger patches, more difficult to remove	Man days 1 to 3. Chainsaw could be required.	Medium heavy
5	51 – 100 %	Young or few small patches in an area and easier to remove.	Man days 1 to 3. Normally not chainsaw.	High light
6		Older or larger patches, more difficult to remove	Man days > 3. Chainsaw required.	High heavy

Because it is difficult to include a quantification of the weeds species into a rating system, the actual species found within the compartment was merely added as a comment and did not influence the rating system.

2.3.3 Summary of Results

Individual site records are available at each plantation and on Microforest and GIS. A summary of the changes in total weed ratings for the company from 2008 is however shown below.

Figure 1. Summary of percentage weed for conservation areas 2008 – 2024.

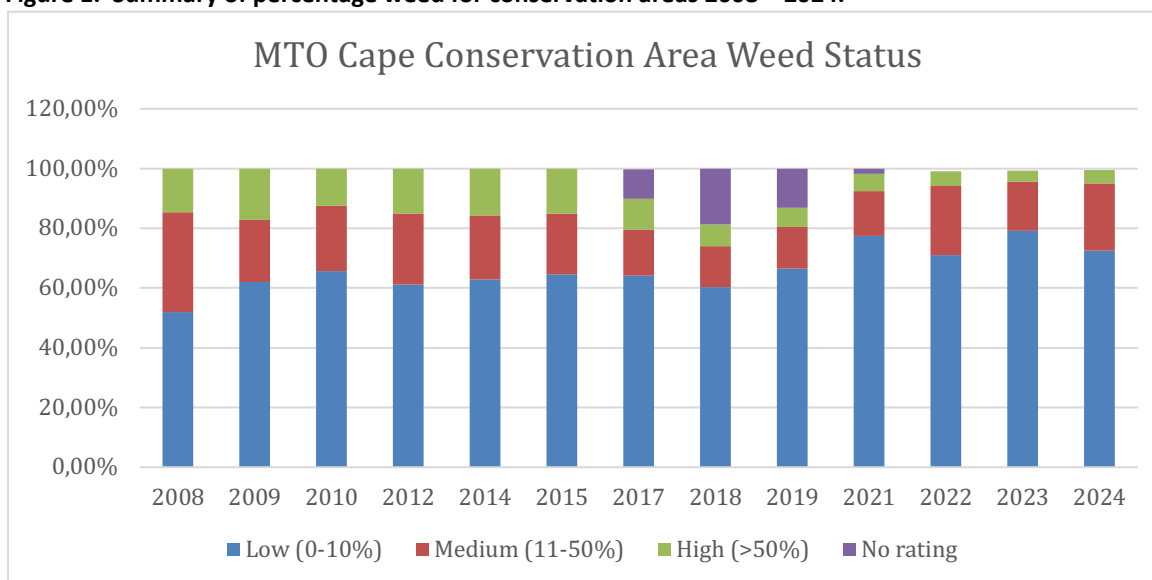


Table 9. MTO Cape Plantations: Weed rating progress in hectares 2008-2024.

Weed Rating	Low (0-10%)	Medium (11-50%)	High (>50%)
2008	52,03%	33,25%	14,72%
2009	61,99%	20,90%	17,11%
2010	65,67%	21,86%	12,45%
2012	61,23%	23,81%	14,96%

2014	62,87%	21,53%	15,60%
2015	64,66%	20,21%	15,13%
2017	64,13%	15,50%	10,22%
2018	60,24%	13,75%	7,23%
2019	66,60%	13,80%	6,38%
2021	77,48%	15,02%	5,78%
2022	71,04%	23,09%	5,06%
2023	79.12%	16.58%	3.70%
2024	72.61%	22.46%	4.49%

1.3.4 General Management Recommendations

A conservation action plan has been developed for each plantation, which shows the requirements for weeding for all conservation areas. These plans are edited annually as changes are needed. All actions scheduled and completed work is recorded on Microforest. Weed eradication will continue annually to decrease the weed density over time. The aim is to decrease all weeds to a maintenance phase on the plantations. MTO Cape is also committed to the reduction in the use of chemicals and is implementing an intergrated pest management approach. Various methods to achieve chemical use reduction whilst at the same time ensuring that weeds are reduced are being reviewed and included in the company procedures.

2.3.5 Monitoring Frequency

Weed Monitoring is carried out every two years. From 2019 the specific weed ratings of all priority conservation areas will also be reported to track improvement in weed ratings in these priority sites. Chemical use is monitored annually, and results are shown in this report.

2.5.6 Monitoring Objective and Target

The objective is to actively control weed infestations with the ultimate goal of achieving maintenance phase for all areas. The Target for the next 5 years is to achieve 75% maintenance for all conservation areas, 80% for PCA areas and maintain commercial areas above 75%.

3. SPECIES MONITORING

3.1 General fauna monitoring and the identification of Red data species

3.1.1 Requirement for Monitoring

Vertebrates have been relatively well documented in South Africa (www.sanbi.org). In total 243 mammals are found in South Africa, of which 17 are threatened species. Of the more than 800 bird species, 26 are threatened and 5 are declared as endangered. 370 reptiles and amphibians are known to occur in the region, of which 21 are threatened and 6 are endangered. 220 freshwater fishes occur, of which 21 are threatened.

A baseline database has been developed for all vertebrates (birds, mammals, reptiles, amphibians and fish) known to occur on MTO Cape plantations. This information was obtained by reviewing the South African National Biodiversity Institute (SANBI) databases and various species lists (see references in the tables below).

Baseline data is important when management decisions are taken, and when changes to the planted area are contemplated. General fauna monitoring should be seen as a long-term record keeping action, and the database will be expanded as more information becomes available.

Red Data species are those species that are known to be rare or threatened with extinction according to IUCN criteria. Species listed in the Red Data List are placed in categories that reflect the scarcity of the species. Species may be classified as Critically Endangered (CE), Endangered (E), Vulnerable (VU) and Near Threatened (NT). The identification of red data species is a priority, as where located, these species might require additional management and protection to ensure their survival, if their survival could be impacted by forestry. Using known literature for South Africa (www.sanbi.org) and the IUCN Red list (www.iucnredlist.org) a list of potential Red Data Species has been compiled.

3.1.2 Monitoring Protocol

From the 2025 IUCN Red List (www.iucnredlist.org) (downloaded February 2025) and South African red lists (www.sanbi.org) (2025 review update) (South African Biodiversity Institute (SANBI) websites), the following Species of Special Interest, possibly occur on MTO Cape plantation, and are also shown in terms of their threatened or protected species status (TOPS) or CITES (Convention on International Trade in Endangered Species) status. All known and existing sight record data are linked to this. The Threatened or Protected species regulations (Notice 388 of 2013, GG 16 April 2013, No. 36375) governs the protection of red data species in South Africa, while CITES, protects species internationally.

CITES I include all species threatened with extinction, which are or may be affected by trade. Trade in specimens of these species must be subject to particularly strict regulation in order not to endanger further their survival and must only be authorized in exceptional circumstances. Cites II include all species which although not necessarily now threatened with extinction may become so unless trade in specimens of these species is subject to strict regulation to avoid utilization incompatible with their survival.

From this list, all Red Data Species either positively identified, or potentially known to occur on MTO Cape plantations has been drawn up. Eleven fish species (5 positively identified), fourteen frog species (1 positively identified), sixteen mammal species (4 positively identified), three reptile species (1 positively identified) and twenty five bird species (14 positively identified) and 1 butterfly species (positively identified) were identified during this review. A formal review of the list will occur every two years.

Table 10. Red Data listed mammal species that could occur on MTO Cape property.

Common name	Scientific name	2025 IUCN status	2025 Red listing	TOPS 2013	CITES 2025	Jponkershoek	Garcia	Kruisfontein	Tsitsikamma	Longmore
Fynbos Golden mole	<i>Amblysomus corriae</i>	NT	NT	None	None	X	X	X	X	
Duthie's Golden mole	<i>Chlorotalpa duthiae</i>	VU	VU	None	None			X	X	X
Grey rhebok	<i>Pelea capreolus</i>	NT	NT	None	None	X	X	X	X	X
Blue duiker	<i>Philantomba monticola</i>	LC	VU					YES	YES	YES
Mountain reedbuck	<i>Redunca fulvorufula</i>	EN	EN					X	X	X
Cape clawless otter	<i>Aonyx capensis</i>	NT	NT	Protected	Type II listed	X	X	X	X	YES
Black footed cat	<i>Felis nigripes</i>	VU	VU	Protected	Type I listed	X				X
Serval	<i>Leptailurus serval</i>	LC	NT	Protected	Type II listed				X	X
Leopard	<i>Panthera pardus</i>	VU	VU	Protected	Type I listed	X	YES	X	YES	YES
African striped weasel	<i>Poecilogale albinucha</i>	LC	NT	None	None	X	X	X		X
Southern African hedgehog	<i>Atelerix frontalis</i>	LC	NT	None	None					X

Long tailed forest shrew	<i>Myosorex longicaudatus</i>	EN	EN	None	None		X	X	X	
African marsh rat	<i>Dasmys incomtus</i>	LC	VU	None	None	X	X	X	X	X
Spectacled dormouse	<i>Graphiurus ocularis</i>	LC	NT	None	None			X	X	X
White tailed rat	<i>Mystromys albicaudatus</i>	VU	VU	None	None	X		X		
Elephant	<i>Loxodonta africana</i>	EN	LC	Protected	Type II listed			YES		

Positively identified species are shown as YES, species not yet identified, but which could potentially occur is shown as X.

Mammal references:

- Smithers, H.N. 2009. Stuart, C. & Stuart, T
- Friedman, Y & Yolan, B. 2006.
- IUCN red list: www.iucnredlist.org. Verified February 2025.
- SA Red list: 2016 Red list of mammals of South Africa, Lesotho and Swaziland.
- TOPS 2007: Threatened or Protected species regulations: Notice 388 of 2013, GG 16 April 2013, No. 36375.
- SANBI: <http://speciesstatus.sanbi.org/>. verified January 2025.

Table 11. Red Data listed bird species that could occur on MTO Cape property.

Common name	Scientific name	SA Regional status 2025	2025 IUCN status	TOPS 2013	CITES 2025	Jonkershoek	Garcia	Kruisfontein	Tsitsikamma	Longmore
Cape Cormorant	<i>Phalacrocorax capensis</i>	EN	EN	VU	No			X	X	
Whitebacked night heron	<i>Gorsachius leuconotus</i>	VU	LC	No	No			X	X	X
Black Stork	<i>Ciconia nigra</i>	VU	LC	No	Type II	X	X	X	X	X
African finfoot	<i>Podica senegalensis</i>	VU	LC	No	No		X	X	X	X
Yellow-billed Stork	<i>Mycteria ibis</i>	EN	LC	No	No			X	X	X
Cape Vulture	<i>Gyps coprotheres</i>	EN	VU	VU	Type II	X	YES			
Black Harrier	<i>Circus maurus</i>	EN	EN	No	No	X	YES	X	X	X
African marsh harrier	<i>Circus ranivorus</i>	EN	LC	No	No	X	YES	X	X	YES
African Crowned Eagle	<i>Stephanoaetus coronatus</i>	VU	NT	No	Type II	X	X	X	YES	YES
Martial Eagle	<i>Polemaetus bellicosus</i>	EN	EN	No	No	X	X	X	X	YES
Verreaux's Eagle	<i>Aquila verreauxii</i>	VU	LC	No	No	X	YES	X	YES	X
Lanner Falcon	<i>Falco biarmicus</i>	VU	LC	No	No	X	YES	X	X	YES
Striped Flufftail	<i>Sarothrura affinis</i>	VU	LC	No	No	X		X	X	X
Blue Crane	<i>Anthropoides paradiseus</i>	NT	VU	VU	Type II	X	YES	X	YES	YES
Ludwig's Bustard	<i>Neotis ludwigii</i>	EN	EN	No	Type II		YES			
Denham's Bustard	<i>Neotis denhami</i>	VU	NT	VU	No		YES	X	YES	YES
Kori bustard	<i>Ardeotis kori</i>	NT	NT	Protected	Type II		X	X	X	X
Karoo korhaan	<i>Eupodotis vigorsii</i>	NT	LC	No	No		X			
Black rumped button quail	<i>Turnix nanus</i>	VU	CL	No	No		X	X	X	X
Fynbos buttonquail	<i>Turnix hottentottus</i>	EN	LC	No	No	X	X	X	X	X
Half-collared Kingfisher	<i>Alcedo semitorquata</i>	NT	LC	No	No	X	X	X	YES	X
Secretarybird	<i>Sagittarius serpentarius</i>	VU	EN	No	Type II	X	YES	X	YES	YES
Cape rockjumper	<i>Chaetops frenatus</i>	NT	NT	No	No		X			

Knysna Warbler	<i>Bradypterus sylvaticus</i>	VU	VU	No	No	X	YES	X	X	X
Knysna woodpecker	<i>Campethera notata</i>	NT	N5	No	No		YES	X	YES	X

Positively identified species are shown as YES, species not yet identified, but which could potentially occur is shown as X.

Bird references:

- Sinclair, I. & Ryan, P. 2010 SA Red data book birds (www.sanbi.org)
- 2015 Checklist. The 2015 Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland. Birdlife South Africa
- IUCN red list: www.iucnredlist.org verified February 2025
- SANBI: <http://speciesstatus.sanbi.org/>. verified January 2025.
- TOPS 2007: Threatened or Protected species regulations: Notice 388 of 2013, GG 16 April 2013, No. 36375.

Table 12. Red Data listed reptile species that could occur on MTO Cape property.

Common name	Scientific name	2025 IUCN status	2025 SA status	TOPS 2013	CITES 2025	Jonkershoek	Garcia	Kruisfontein	Tsitsikamma	Longmore
Oelofsen's girdled lizard	<i>Cordylus oelofseni</i>	LC	LC	No	Type II listing	X				
Cape Dwarf chameleon	<i>Bradypodion pumilum</i>	NT	NT	No	Type II listing	YES				
Elandsberg dwarf chameleon	<i>Bradypodion taeniabronchum</i>	LC	LC	No	Type II listing				YES	YES

Positively identified species are shown as YES, species not yet identified, but which could potentially occur is shown as X.

Reptile references:

- Branch, B. 1990, 1998.
- IUCN red list: www.iucnredlist.org. Verified February 2025.
- SANBI: <http://speciesstatus.sanbi.org/>. verified January 2025.
- Bates et al. 2014: Atlas and Red list of the Reptiles of SA, Lesotho and Swaziland.

Table 13. Red Data listed amphibian species that could occur on MTO Cape property.

Common name	Scientific name	2025 IUCN status	2025 SA status	Jonkershoek	Garcia	Kruisfontein	Tsitsikamma	Longmore
Cape rain frog	<i>Breviceps gibbosus</i>	NT	NT	X				
Hewitt's Ghost frog	<i>Heleophryne hewitti</i>	EN	EN					YES
Knysna leaf folding frog	<i>Afrixalus knysnae</i>	EN	EN			X	X	
Montane marsh frog	<i>Poyntonina paludicola</i>	NT	NT	X				
Landdroskop Moss frog	<i>Arthroleptella landdrosia</i>	NT	NT	YES				

Positively identified species are shown as YES, species not yet identified, but which could potentially occur are shown as X.

Amphibian references:

- Du Preez, L. & Carruthers, V. 2009.
- Minter et. al. 2004
- IUCN red list: www.iucnredlist.org. Verified February 2025
- SANBI: <http://speciesstatus.sanbi.org/>. verified January 2025.
- Measey, G.J. 2011. Ensuring a future for South African frogs: a strategy for conservation research. SANBI biodiversity Series 11.

Table 14. Red Data listed fish species that could occur on MTO Cape property.

Common name	Scientific name	2025 IUCN status	2025 SA status	Jonkershoek	Garcia	Kruisfontein	Tsitsikamma	Longmore
Berg-Breede river whitefish	<i>Pseudobarbus capensis</i>	EN	EN	X				

Eastern Cape redbfin	<i>Pseudobarbus afer</i>	EN	EN					YES
Gamtoos River ridefin	<i>Pseudobarbus swartzi</i>	VU	VU					YES
Small scale redbfin	<i>Pseudobarbus asper</i>	VU	VU		X	X	X	X
Barrydale redbfin	<i>Pseudobarbus burchelli</i>	CR	CR		X			
Berg River redbfin	<i>Pseudobarbus burgi</i>	EN	EN	X				
Slender redbfin	<i>Pseudobarbus cf. tenuis</i> 'Keurbooms'	Not listed	EN				X	X
Cape Galaxia	<i>Galaxias zebratus</i>	DD	DD			YES		
Cape Kurper	<i>Sandelia capensis</i>	DD	DD		YES			
African longfin eel	<i>Anguilla mossambica</i>	NT	NT		X			
Goukou Zebra	<i>Galaxias sp. Nov. goukou</i>	VU	VU		YES			

Positively identified species are shown as YES, species not yet identified, but which could potentially occur are shown as X.

Fish references:

- ☐ Skelton, P.H. 1987.
- ☐ IUCN red list: www.iucnredlist.org. verified February 2025.
- ☐ SANBI: <http://speciesstatus.sanbi.org/>. verified January 2025.

Table 15. Red Data listed butterfly species that could occur on MTO Cape property.

Common name	Scientific name	IUCN status 2025	SA SANBI status 2025	Tsitsikamma
Tsitsikamma Pale Copper	<i>Aloeides pallida juno</i>	Not listed	EN	Yes Witelsbos

☐ SANBI: <http://speciesstatus.sanbi.org/>. verified February 2025.

3.1.3 Management Requirements

Most of the red data species identified are difficult to monitor and detect, and therefore only presence and sightings are recorded for most of these species on the plantation. One frog (Hewitt's Ghost Frog) and two fish species (*Pseudobarbus afer* and *P. swartzi*) were chosen for monitoring, because they could potentially be impacted by forestry activities. The monitoring of these species is discussed below.

To protect fauna, the following general mitigation measures have been identified and where needed incorporated into procedures and planning:

1. Priority Conservation Areas, Natural Heritage sites, indigenous forests, natural fynbos and rocky outcrops will be conserved to create corridors for the movement of animals.
2. Wetland areas will be maintained and protected.
3. Roads and river crossings will be correctly managed, to prevent soil erosion.
4. Procedures will be implemented to minimize impacts on conservation areas by forestry activities such as harvesting, silviculture and road maintenance.
5. Planning will priorities the provision of interconnection of bio-corridors along rivers that will permit fauna to connect to breeding sites and allow flora dispersal and will provide set aside conservation areas managed for protection of natural fauna and flora.

3.1.4 Monitoring Frequency

A photographic identification key of red data species was developed for staff and contractors and last updated in 2018 (This is scheduled for update in 2025). This is used to identify the location and presence of red data species on the property, where their location is not already known. Maintenance of the General Fauna Monitoring database and red data species list will be continuous. An initial fish monitoring programme was initiated in 2019 for *Pseudobarbus afer* and *P. swartzi* at Longmore and is discussed in more detail below. The monitoring of the priority fauna species, Hewitt's Ghost frog, is also discussed below.

3.1.5 Monitoring Objective and Target

The monitoring objective is to update the species databases over time, with the added objective of identifying new and unknown species and species of interest. As this is an ongoing program, there is no end target. The photo record of red data species will be updated in 2025.

3.2 Hewitts Ghost Frog monitoring

3.2.1 Requirement for Monitoring

The Hewitt's Ghost Frog (*Heleophryne hewitti*), discovered in 1988, is regarded as endangered. Except for one other locality, the entire distribution of this species falls within the Longmore plantation. The species occurs in four river systems on the plantation, the Geelhoutboom, Martins, Klein and Diepkloof rivers. To ensure the survival of this species, a herpetologist, M. Burger, completed a year study on the distribution and requirements of this species in 2000, and since then ongoing research and management actions have occurred over time.

3.2.2 Monitoring Protocol

A management plan has been developed for Hewitts Ghost frog (Kirkman 2017), and details of the monitoring protocol can be found in this document. The first study occurred from 1999 – 2000, and involved a specialist survey (Burger 2000), to determine the exact locality of the species on the plantation, as well as to provide initial management and monitoring information for the species. This work resulted in a finding that the frog occurred in only four rivers on Longmore, and that only portions of the river were of importance (Klein river 57.38km; Martins river 23.44km; Geelhoutboom 23.457km, Diepkloof 33.85km) which resulted in a length of 138.14km of river which is of importance to this species.

Resulting from the first study, a second study, to continue to monitor the water quality in the priority rivers was also initiated, and water quality monitoring has taken place from 2001 on a three year basis.

After a one-year period of testing various methods to monitor Hewitt's Ghost frog, a tadpole monitoring programme was initiated during 2003, which continued until 2009. This programme concentrated on monitoring tadpoles within notably the Geelhoutboom, Martin and Klein systems. A MSc study was produced (De Beer, 2009) which describes the habitat preferences of the species and recommends rehabilitation actions for the river. Since 2010 periodic specialist surveys continued. To update the status of the species, a repeat tadpole monitoring programme was again initiated in 2015 – 2018 and repeated in the 2021/2022 breeding season. In 2024 M. de Beer has again taken up monitoring of the species, which will occur over the breeding season (November to March).

3.2.3 Monitoring Results

The Burger (2000) and De Beer (2009) reports made valuable recommendations on the management of the rivers for the protection of the species. The report recommended that harvesting along these rivers should follow a stratified harvesting and clearing program and that the thinning process of ring-barking along the rivers should be spread over three years, to allow light to penetrate the riparian zone slowly.

During the last few years the survival of the species has been challenged severely, as a result of major fires and floods. The 2005 fire devastated all the identified habitat of the species. This was followed by flooding at the end of 2005, and again in 2006 and 2007, severely affecting rehabilitation of the frogs' habitat and effecting tadpole survival. Detailed monitoring results are available in Kirkman (2017) and in summary reports of Opperman (2018, 2021, 2023).

3.2.4 Management Requirements

Detailed management requirements are available in Kirkman (2017). Management concentrates on improving the in-stream habitat, removal of trees from the riparian buffers, and improvement of the river crossings and

roads adjoining Hewitts habitat. During 2013 two river crossings on the Geelhoutboom river were closed and continued clearing of weeds in the riparian zones is occurring. Because clearing must be staggered over a long time period to prevent impacts on the species, it will take some time to complete all the actions necessary. Harvesting along adjoining rivers has been scheduled to minimize impacts over time, and only occurs after proper planning to minimize impacts.

3.2.5 Monitoring Frequency

SASS5 monitoring is scheduled every three years. Formal tadpole monitoring will continue from November until March from 2024 to monitor the ongoing status of the species. The herpetologist of the PE Museum and other specialists conduct periodic surveys and access is granted when requested.

1.2.6 Monitoring Objective and Target

The monitoring objective is to monitor population numbers over the long term to inform management decision making. As this is an ongoing program, there is no end target.

3.3 Fish monitoring

3.3.1 Requirement for Monitoring

Fish are good indicators of long-term effects and broad habitat conditions, and changes in the available habitat conditions (Karr et al. 1986). This is because fish are “top of the food chain”, relatively long-lived and mostly highly mobile. Assemblages include a range of species that represent a variety of trophic levels (omnivores, herbivores, insectivores, planktivores, piscivores). They tend to integrate effects of lower trophic levels; thus fish assemblage structure is reflective of integrated environmental health. In 2018 an unknown population of *P. afer* was discovered in the Bulk river at Longmore plantation during SASS5 monitoring. It was suspected that this was a new or unknown population, and therefore a specialist survey was completed for this site in January 2019. Periodic fish monitoring has also occurred from 2019 as part of SASS5 monitoring where fish could be present in the system (Garcia, Kruisfontein and Longmore). Water in the Tsisikamma mostly too acidic to maintain fish populations.

3.3.2 Monitoring Protocol

In 2018 the new population of redbfin minnow (*Pseudobarbus* sp.) was recorded by Diedericks (2018a) in the Bulk river system during SASS5 monitoring (site M10B-02). Redfin minnow are not known from this system, and for this reason a survey to determine the presence and location of the various Redfin minnow *Pseudobarbus* species (or sub-species) within selected sites within the three major river systems draining the Longmore Plantation occurred in January 2019. Fish species present at chosen sites in the selected rivers were reviewed and in addition to visual observations of fish in the shallow, clear- water streams, fish were captured by means of a 3m long minnow seine net with 3mm mesh size. Tissue samples for later DNA analyses were taken from a representative sample of the fish captured.

As part of SASS5 monitoring at Garcia, Kruisfontein and Longmore electro-fishing is also carried out if time allowed to determine species presence-absence. Fish typically reflect long term changes in ecological conditions. The average age of different fish species is dependent on various environmental factors and range in streams and rivers from 2.5 (Skelton 2003) to >100 years (Lackmann et al. 2023). Fish was not part of the terms of reference but was included because recent studies (Wishart et al. 2006; Chakona et al. 2013) indicated genetic differences in species previously considered morphologically the same species. The limited distribution of these species within the south and south-western Cape Mountain streams categorises most species as critically endangered, endangered, vulnerable, and data deficient (IUCN 2017) (Diedericks 2023).

3.3.3 Monitoring Results

For Longmore results from the snap-shot survey indicated that the Berg, Klein and the Bulk rivers represent important sanctuaries for the narrow range endemic redfins, *P. swartzi* and *P. afer*, which are listed in the IUCN list of threatened species as endangered (Bok and Chakona 2019). Further surveys will be required to determine the need to construct instream barriers to prevent the upstream movement of alien fish species present in the mainstem of the Gamtoos and Swartkops river systems to protect the indigenous fish in the upper reaches of streams within the MTO Plantations. The authors suggested that as the isolated populations of redfins within the MTO streams could be vulnerable to genetic problems such as inbreeding depression, ongoing monitoring of the genetic fitness of these populations may be necessary to ensure their long-term survival. They also concluded that although no fish were captured at five of the ten sites sampled, it is possible that further surveys in other reaches of these streams may be more successful.

During SASS5 surveys at Garcia, Diedericks (2023) found two fish species, Cape Kurper (*Sandelia capensis*) (data deficient) and Cape Galaxias (*Galaxias sp. nov. goukou*) (vulnerable). Genetics studies have resulted in the Cape Galaxias (*Galaxias zebratus*) species splitting into several new species, mainly linked to its distribution across systems in the southwestern Cape (Wishart et al. 2006; Chakona et al. 2013). Based on previous records, it is likely that the species in the Goukou system is *Galaxias sp. nov. "goukou"* (Chakona et al. 2013). The abundance of fish was greater at the Die Glen site in the Meulrivier (H90B-02) than at the Korinte River (H90B-01).

Electro fishing was only carried out at Kruisfontein in 2023 at the Bracken Falls (K60G-04) and Noetzie (K60G-06) sites. Access to the instream habitat at the other two sites (Swaneberg and Pumphouse) with an electro-fisher was inaccessible due to dense vegetative growth covering the river and substrates. The Cape Galaxiiformes: Galaxiidae: *Galaxia sp.* (Cape Galaxias) (data deficient) was encountered at the Swaneberg, Pumphouse, and Bracken Falls sites. After two electro-fishing surveys, no fish has yet been encountered at the Noetzie site (K60G-06). This could suggest that their distribution in the Noetzie system is restricted to above the Bracken Falls, which requires confirmation.

3.3.4 Management Requirements

The 2019 survey of the *P. afer* and *P. swartzi* at Longmore suggested further monitoring of the genetic fitness of the species and a review to determine if sufficient barriers exist to keep out alien fish species. It is important to ensure fish continues to maintain healthy populations in the stream systems of the south-western Cape. Gathering information on the distribution of *Pseudobarbus* and *Galaxias sp.* within systems and determine their ecological requirements is therefore important to support informed decision making on the management of freshwater resources in the region. Increased water demands, population growth, and climate change are all potential threats to the future of this genus within the Cape Folded Mountains freshwater systems.

Continued weeding and correct conservation management of the river systems is of importance and will continue.

3.3.5 Monitoring Frequency

Fish will be periodically monitored with SASS5 monitoring, or potentially through specialist research in future if funding is available.

3.3.6 Monitoring Objective and Target

The monitoring objective is to update the species databases over time, with the added objective of identifying new and unknown species and species of interest. As this is an ongoing program, there is no end target.

3.4 Dragonfly monitoring

3.4.1 Requirement for Monitoring

Odonata or dragon- and damselflies reflect conditions in waterbodies as larvae, and the riparian and terrestrial habitat conditions as adults (Corbet 2004; McPeck 2010; Samways & Simaika 2016). The opportunity to start building up a database of adult Odonata together with larvae at SASS5 monitoring sites meant that these have been recorded periodically since 2019.

3.4.2 Monitoring Protocol

Weather conditions strongly affect activeness of adult dragonflies (Odonata: Anisoptera). Environmental conditions are therefore measured at each site to reflect potential high or low diversity and abundance of adults encountered.

Adult Odonata were either identified on the wing with 10 x 40 binoculars, while most species present were caught with a dragonfly sweep net and then identified in-hand. Approximately an hour is spent walking along the river-stream and riparian zone. Adult species abundance (number of individuals per species) is estimated using individuals observed. Species abundance (number of individuals per taxon) is estimated using abundance categories 1 - 5 as follows (Chessman 2003).

Odonata larvae were sampled at selected sites in oxbows, pans, seeps, and more. This is to determine whether the adults were present and identified a specific water body as suitable for oviposition. The species and their abundances recorded at each sampling location are summarised to determine dominant habitat and environmental preferences based on the community composition. This information serves as a baseline for present habitat conditions and presents a template against which future monitoring can be compared.

3.4.3 Monitoring Results

Monitoring results are included in SASS5 monitoring surveys from 2019. Detailed results will not be provided here but in 2023 a total of 6 species were recorded for Garcia, 22 species are recorded for Lottering (21 at Keurbooms river) and 13 species recorded at Kruisfontein.

3.4.4 Management Requirements

This monitoring is an additional step as part of SASS5 monitoring, and for now no additional management requirements are proposed.

3.5.5 Monitoring Frequency

Monitoring frequency corresponds with SASS5 monitoring and will be completed when weather and logistics allow.

3.4.6 Monitoring Objective and Target

The monitoring objective is to update the species databases over time, with the added objective of identifying new and unknown species and species of interest. As this is an ongoing program, there is no end target.

3.5 GENERAL FLORA MONITORING AND IDENTIFICATION OF RED DATA SPECIES

3.5.1 Requirement for Monitoring

More than 20 300 species of flowering plants occur in South Africa. One of the six most significant concentrations of plants in the world is the Cape Floral Kingdom, with its distinctive fynbos vegetation, in the south-west Cape. Most of South Africa's 2 000 threatened plants are found in fynbos (www.sanbi.org).

Due to the large extent of MTO Cape plantations, and the huge number of species, a systematic program to identify and record all flora found on MTO Cape plantations will be almost impossible. Species lists can however be built up through the knowledge of specialists, field surveys and ad hoc records. General flora monitoring should be seen as a long-term action, with databases updated over time to obtain more information on the floral diversity of conservation areas as it becomes available. The identification of rare, threatened and endangered or Red Data species is however a priority, as where located, these species will need additional management and protection to ensure their survival. For MTO Cape, specialist surveys over time have already identified several red data flora species, and these will be managed when their location is known. As new species are identified, they will be added to the management list for rare species.

3.5.2 Monitoring Protocol

The concept of Red Data books was introduced in the mid 1960s by Sir Peter Scott and adopted by the South African Ecosystems Programmes of the CSIR in the 1970s. A preliminary Red Data Book on Plants was published in 1980 (Hall *et al* 1980). In 1996, the Red Data list of Southern African Plants (Hilton Taylor 1996) was published and in 2009 the *Red List of South African Plants* by Raimondo *et. al* 2009. Since then the South African National Botanical Institute (SANBI) (www.sanbi.org) maintains a detailed list of plants of South Africa, and their status under the Threatened species program.

Known species from species lists have been compared, and a list of rare species drawn up. A database, listing all known general flora species has also been developed for the company as a baseline document and with specialist input at Longmore (Ellie Goosens) and with information from I-Naturalist sightings (Jonkershoek – downloaded December 2024). In 2024 a project was initiated to record all Red data flora on the GIS database to allow for improved identification of locality. This project will be completed in 2025.

3.5.3 Monitoring Results

Identified Red Data species are listed below. The IUCN categories were used and status is therefore also shown according to these categories. Two newly described species and two critically endangered, twelve endangered species, sixteen vulnerable species, six rare and seventeen near threatened species have been identified.

Table 16. The Red list categories used to describe a species' conservation status.

Conservation Category	Abbrev.	Description
Critically endangered (IUCN)	CR	A species facing an extremely high risk of extinction in the wild, in the immediate future.
Endangered (IUCN)	EN	A species in danger of extinction and whose survival is unlikely if the threats to the species' survival remain. Numbers of individuals may be reduced to a critical level or habitats may be reduced or altered drastically.
Vulnerable (IUCN)	VU	Species that are close to endangered, but whose numbers are declining through over exploitation and loss or alteration of habitat in the medium-term future.
Conservation dependent (IUCN)	LRcd	Lower Risk – conservation dependent. Species not belonging to the categories of Critically endangered, endangered, or vulnerable, but that are the focus of a specific conservation programme, without which the species would qualify for one of the threatened categories within five years.
Near threatened (IUCN)	LRnt	Lower Risk –near threatened. Species which do not qualify as conservation dependent, but which are close to qualifying as Vulnerable.

Least Concern (IUCN)	LRLc	Lower risk – least concern. Species that do not qualify as conservation threatened or near threatened.
Near Threatened (IUCN)	NT	Do not qualify for categories of threat, but are sufficiently close enough to qualify that they may become in danger of extinction in future.
Critically Rare (SA)	CR	Known to occur at a single site, but not exposed to any known direct or plausible potential threat (does not qualify for IUCN criteria)
Rare (SA)	R	Not exposed to any known direct or plausible potential threat and does not qualify for IUCN criteria, but is still very localized according to Raimondo et al. 2009 criteria.

Table 17. Identified Rare, threatened and endangered flora species on MTO Cape plantations.

Species	Status	Location
<i>Afroaster laevigatus</i>	EN	Longmore
<i>Agathosma hirta</i>	NT	Longmore
<i>Agathosma stenopetala</i>	VU	Longmore
<i>Argyrobium trifoliatum</i>	EN	Longmore
<i>Aspalanthus araneosa</i>	VU	Jonkershoek
<i>Aspalanthus lanceicarpa</i>	R	Longmore
<i>Arthroptella landrossia</i>	NT	Jonkershoek
<i>Babiana villosula</i>	EN	Jonkershoek
<i>Centella longifolia</i>	R	Longmore
<i>Cliffortia phillipsii</i>	VU	Jonkershoek
<i>Cullumia cirsioides</i>	VU	Longmore
<i>Cussonia gamtoensis</i>	VU	Longmore
<i>Cyclopia genistoides</i>	NT	Jonkershoek
<i>Cyclopia longifolia</i>	CR	Longmore
<i>Cyclopia maculata</i>	NT	Jonkershoek
<i>Encephalartos longifolius</i>	NT	Longmore
<i>Erica grandiflora ssp. perfoliosa</i>	VU	Jonkershoek
<i>Erica inconstans</i>	VU	Longmore
<i>Erica pseudotetragonia</i>	New species	Longmore
<i>Erica saggitata</i>	EN	Longmore
<i>Erica ixanthera</i>	VU	Garcia
<i>Euryops ursinoides</i>	VU	Longmore (Van Stadensberg NHS)
<i>Geschollia globuligera</i>	EN	Longmore
<i>Gladiolus geardii</i>	R	Longmore
<i>Gladiolus sempervirens</i>	R	Witelsbos (Kromme River NHS area now managed by SanParks)
<i>Indigofera grisophylla</i>	EN	Longmore
<i>Indigofera hispida</i>	NT	Longmore
<i>Lampranthus umbraticola sp. nov</i>	New species	
<i>Leucodendron orientale</i>	EN	Longmore (Van Stadensberg NHS)
<i>Leucodendron gueinzii</i>	EN	Jonkershoek
<i>Leucodendron sessile</i>	EN	Jonkershoek
<i>Leucodendron spissifolium ssp. phillipsii</i>	NT	Longmore
<i>Leucodendron connicum</i>	NT	Longmore
<i>Leucospermum conocarpodendron ssp. viridum</i>	NT	Jonkershoek
<i>Leucospermum lineare</i>	NT	Jonkershoek
<i>Leucospermum oleifolium</i>	NT	Jonkershoek
<i>Leucospermum reflexum</i>	NT	Jonkershoek
<i>Moraia versicolor</i>	VU	Jonkershoek
<i>Orthochilus litoralis</i>	EN	Jonkershoek
<i>Ortholobium heterosepalum</i>	R	Longmore
<i>Paranomus reflexus</i>	EN	Longmore (Van Stadensberg NHS)
<i>Pelea capreolus</i>	NT	Jonkershoek
<i>Podalyria burchellii</i>	NT	Longmore
<i>Podocarpus henkelii</i>	EN	Jonkershoek
<i>Podranea ricasoliana</i>	VU	Jonkershoek
<i>Protea acaulus</i>	NT	Jonkershoek
<i>Protea burchellii</i>	VU	Jonkershoek
<i>Protea grandiceps</i>	NT	Jonkershoek
<i>Psoralea gigantea</i>	NT	Jonkershoek
<i>Psoralea gueinzii</i>	VU	Jonkershoek

<i>Psoralea kougaensis</i>	R	Longmore
<i>Psoralea rotundifolia</i>	VU	Jonkershoek
<i>Senecio hirtifolius</i>	CR	Longmore
<i>Serruria kraussii</i>	VU	Jonkershoek
<i>Skatophytum tripolium</i>	VU	Jonkershoek

3.5.4 Management Requirements

Where the locality of identified red data species is known, the habitat of the species is protected. This includes weed eradication and where possible, burning for conservation management. The new GIS layer being developed, and due for completion in 2025 will aid in the easy identification of areas that need improved or sensitive management. Management will include protection of plants during chemical operations, and harvesting where relevant.

3.5.5 Monitoring Frequency

Management of General Flora Monitoring database: ongoing. Formal review of species is to occur every two years, including notably a review of i-Naturalist sightings. Monitoring records per site to be developed where possible per species locality at Longmore.

4. LANDSCAPE SCALE MONITORING

4.1 FIRE IMPACTS

4.1.1 Requirement for Monitoring

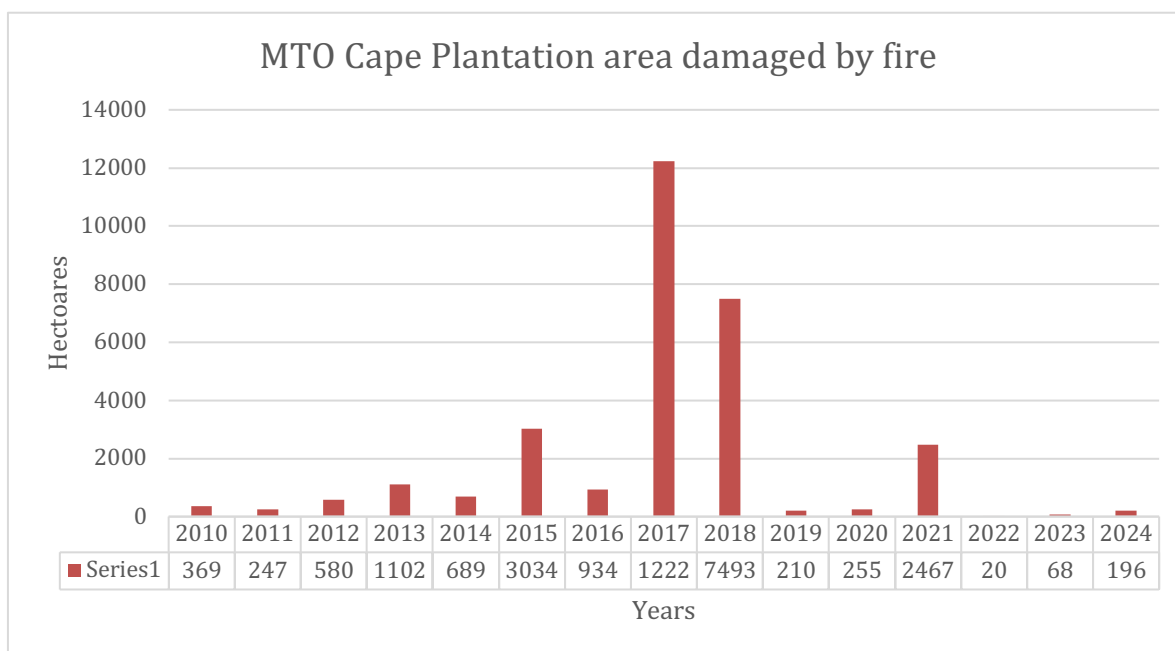
Fire is the biggest threat faced by forestry, and the company has a significant program to proactively prevent and combat fire, especially accelerated after the 2017 and 2018 fires. Fire events are tracked in detail, with lessons learnt and monitoring of causes of fire and proactive protection measures forming an important part of continual improvement.

4.1.2 Monitoring Protocol

A summary of fire impacts, which includes number of fires, extent of damage, and examination of causes and analysis of trends therefore forms part of the monitoring protocol from 2020.

4.1.3 Summary of Results

Year	Number of fires	Plantation area damaged (Ha)	(%)of Total planted area	MTO Cape commercial area (ha)
2015	145	3035	5%	62969
2016	152	934	2%	57786
2017	198	12225	23%	52609
2018	91	7493	16%	47766
2019	43	210	0.50%	42244
2020	94	255	0.75%	34185
2021	97	2467	7.22%	34131
2022	80	19.71	0.058%	34077
2023	104	67.95	0.20%	33982
2024	142	196.25	0.58%	33789



The above figure depicts the annual number of reported fires and the planted area affected by the fires for MTO Cape. Significant fire damage was reported in 2017 and 2018, when the region was effected by severe fire events, impacting neighbouring property and towns as well. Most of these fires did not originate on MTO property. Since 2017 the company has worked on increasing fire protection measures, and the lowest amount of fires and areas impacted was reported in 2022 - 2024 since 2015. Between 2022 – 2024, through intergrated fire management, only 284 hectares was damaged.

4.1.4 General Management Recommendations

Management of fire protection is included in the Fire protection plans of MTO Cape. The company has adopted a rigorous intergrated fire management approach since 2020 to minimize fire impacts.

4.1.5 Monitoring Frequency

Reporting will occur on an annual basis.

4.1.6 Monitoring Objective and Target

The monitoring objective is to track areas damaged by fire over time. The target of the company is to have no plantation areas destroyed by fire over time.

4.2 SOIL TREND/GROWTH MONITORING

4.2.1 Requirement for Monitoring

The monitoring of soil viability is difficult, and can be impacted by a number of variables, making accurate monitoring complex. This monitoring reporting is a new initiative from 2020 and will attempt to track average Site Index values over time as a proxy for soil monitoring, with comparison every five years.

4.2.2 Monitoring Protocol

Determining site quality on a compartment by compartment basis, or on small units is considered as too complex and costly. There are many variables that affect the final growth and production of a compartment, if long term change is to be determined. Tracking per species was therefore completed for *P. elliotti*, *P. elliotti caribea* and *P. radiata*, the predominantly grown species.

At MTO Cape, there is a focus on site-species matching and as part of this process the determining of Site Index values are an important measurable to guide the forest silviculture strategy.

Table 21. Site Index Values MTO Cape, as changes have occurred from 2015 to 2020.

Species and Year	Sum of Area (ha)		Weighted SI (Site Index)	
	2015	2020	2015	2020
Year				
<i>P. elliotti</i>	20946.1	21786.06	22.22	22.30
<i>P. elliotti caribea</i>	1967	3034.09	22.47	23.98
<i>P. radiata</i>	8117.57	6963.22	25.32	25.78
Grand Total	31030.67	31783.37	23.05	23.22

4.2.3 Summary of Results

When comparing Site Index Values over the past five years, the Site Index for all species increased. It is important to note the significant improvement includes areas of *P. elliotti caribea*, which has shown the largest increase, and is replacing undesirable species such as *P. pinaster*. *P. radiata* areas are also being decreased, in favour of other species.

4.2.4 General Management Recommendations

Silviculture management will continue to look at Site Index values as an indication of risk to forest yield over the longer term.

4.2.5 Monitoring Frequency

Analysis will occur every five years, with monitoring scheduled for 2025.

4.2.6 Monitoring Objective and Target

The monitoring objective is to track improvement over time. The target is to show continued improvement as a result of improved silviculture.

4.3 IMPACT OF HERBICIDE APPLICATION

4.2.1 Requirement for Monitoring

A new program to monitor the impact of herbicides, on water runoff and underground water sources was implemented from 2023 to objectively monitor restricted herbicides, notably glyphosate, after stakeholder concerns regarding off site impacts in the Tsitsikamma. This monitoring compliments monitoring of volumes of herbicide used and SASS5 monitoring on water quality which have been in place for several years.

4.2.2 Monitoring Protocol

Trends in herbicide use

MTO has tracked the use of herbicides since 1997. Detailed records of volume of chemicals use are kept per compartment for each plantation.

Types of herbicides used

MTO will record the list of active ingredients of herbicides used annually and include detail on the volume per active ingredient used as part of this monitoring going forward.

Diatom Monitoring

From 2022 MTO has expanded the SASS5 water quality monitoring program to include diatom monitoring of specific sites where either stakeholders have reported a concern regarding the impacts of chemicals or where downstream users could occur. This monitoring is described under 2.1 (Water Quality monitoring).

Glyphosate/Herbicide monitoring

To obtain objective information on the potential impacts of glyphosate on groundwater, a scientific based specialist managed monitoring program, to review the impact of chemicals on groundwater and water runoff, was initiated in 2023. One site in the Tsitsikamma at Witelsbos and one site at Kruisfontein near Knysna were developed in 2023, with additional sites planned in future. Water quality was determined before and after spraying using groundwater monitoring protocols, which took slope angle, geology, streams, rivers and plant growth, as well as the herbicide used and downstream receptors into consideration.

4.2.3 Summary of Results

Trends in herbicide use

MTO maintains a monitoring system on the use of chemicals. Below is a summary of chemical use per hectare and a breakdown of number of hectares treated and litres of total chemicals used over time.

Figure 3. Chemical used (litres per hectare) for MTO Cape sustainable (commercial and conservation areas).

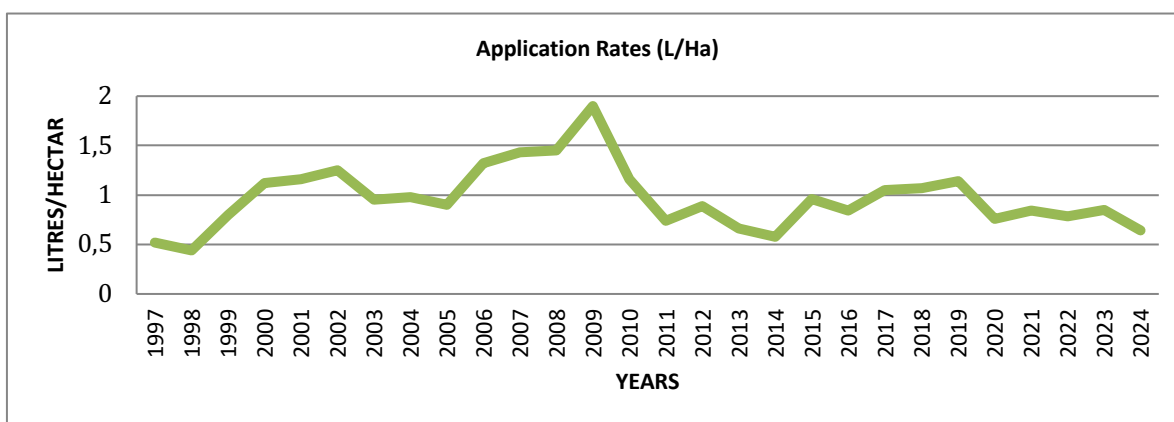


Figure 4. Litres of chemicals used for MTO Cape sustainable (commercial and conservation areas).

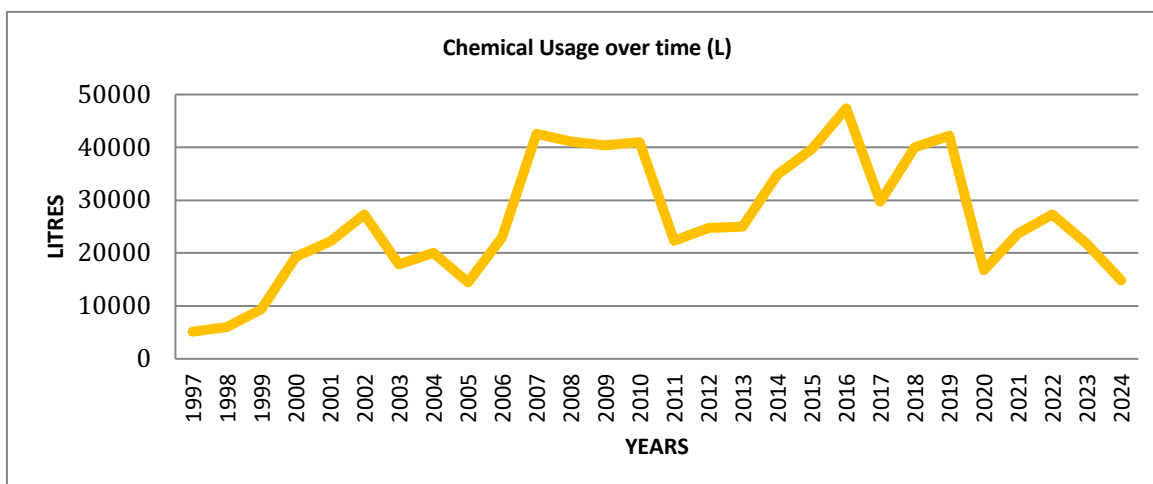
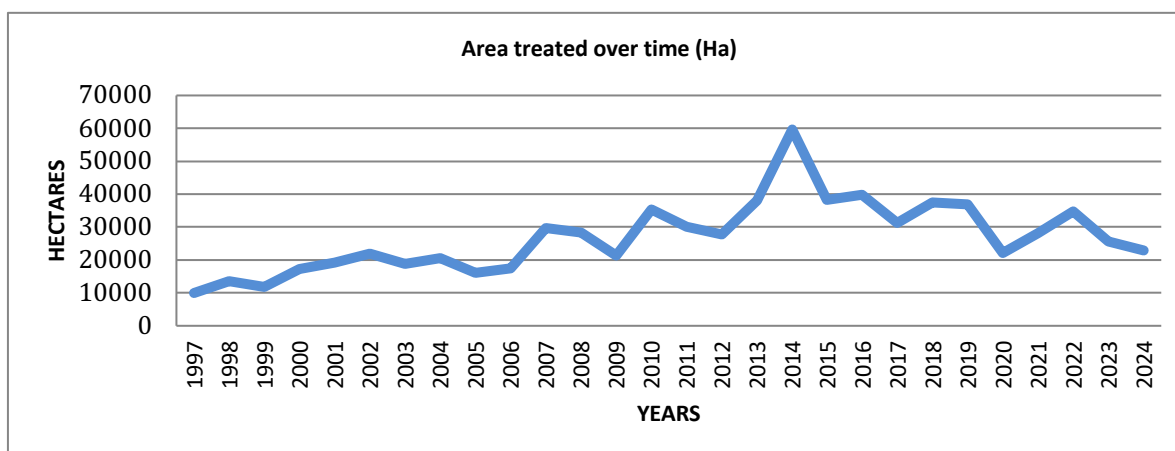


Figure 5. Hectares treated sustainable (commercial and conservation areas).



Types of herbicides used

Year	Active ingredient	Application (ha)	Litres used	Average L/ha
2022	Triclopyr butoxyethyl ester	12179	7103	1,47
	Glyphosate ammonium salt	12675	19741	1,56
	Fluroxypyr methylheptyl ester	3935	130	0.03
	Metsulfuron methyl	4498	213	0,05
	Imazypyr isoproylammonium salt	776	40	0.05
2023	Triclopyr butoxyethyl ester	5514	4147	0.74
	Glyphosate ammonium salt	9898	16215	1.64
	Fluroxypyr methylheptyl ester	3500	737	0.21
	Metsulfuron methyl	4122	310	0.08
	Imazypyr isoproylammonium salt	930	20	0.02
	Clethodium	639	308	0.48
2024	Triclopyr butoxyethyl ester	7331	2336	0.32
	Glyphosate ammonium salt	8113	10848	1.33
	Fluroxypyr methylheptyl ester	3262	1025	0.31
	Metsulfuron methyl	3013	191	0.06
	Imazypyr isoproylammonium salt	0	0	0
	Clethodium	1189	380	0.32

Diatom Monitoring

This monitoring is described under 2.1 (Water Quality monitoring).

Glyphosate/Herbicide monitoring

Both soil and water samples were taken from each block and submitted to the SANAS accredited FDA Laboratory in Pretoria for analysis of glyphosate, AMPA (aminomethylphosphonic acid, the breakdownchemical of Glyphosate) and Triclopyr.

The results for the Witelsbos sample only identified one soil sample with a positive glyphosate and AMPA presence above the lower detection level (LDL) used by the laboratory. The US EPA (Region III – Philadelphia) prescribe a glyphosate Maximum Contaminant Level (MCL) for glyphosate in soil, where ingestion is the possible pathway, as follows: industrial site = 200000 mg/kg and residential = 7800 mg/kg (7800000 ug/kg). The concentration found (420 ug/kg) at Witelsbos was of low significance in comparison. None of the water samples displayed the presence of glyphosate or AMPA above the laboratory lower detection levels (LDL's).

At Kruisfontein very low concentrations of glyphosate and AMPA presented in the pre-spray water sample. There was heavy rain 2 days after the herbicide spray event with 103 mm falling in the 2-week period before the post-spray sampling occurred. This rain may have 'washed' some of the herbicide from the plants. Follow-up samples were taken of water and soil. Only AMPA presented at an unconfirmed concentration of 7.6 ug/kg in one soil sample, which is below the method lower detection level of <50 ug/kg. The concentration is considered insignificant and does not pose a threat to the environment.

Key deductions from the literature research, which are supported by much of the in-field research papers, plus the findings of this recent work are that glyphosate adsorbs strongly to soil, residues are expected to be immobile in soil, glyphosate is readily degraded by soil microbes to AMPA, glyphosate and AMPA are not likely to move to ground water due to their strong adsorptive characteristics. If glyphosate reaches surface water, it would not be broken down readily by water or sunlight.

4.2.4 General Management Recommendations

MTO is a member of the Timber Industry Pesticide Working group (TIPWG). TIPWG has rated the risks of each herbicide and has developed an Allowed Product list to which MTO prescribes (www.tipwg.co.za).

MTO currently reviews the impact of herbicides using a risk-based approach per compartment.

1. No Highly Restricted (HR) chemical are used by MTO
2. Restricted (R) chemicals are only be used where they are used responsibly and taking health and safety, social and environmental risks into consideration. Where possible the company will strive to find alternatives or minimize use.
3. No new Restricted chemical will be purchased without prior identification of risks and approval by the Planning Manager after review.
- 4.

Additional mitigation measures are implemented through compartment specific review. The outcomes of the glyphosate/herbicide monitoring program will also be fed into decision making.

4.2.5 Monitoring Frequency

Trends in herbicide use: Annual collection of data.

Types of herbicides used: Annual collection of data.

Diatom monitoring: Incorporated into the SASS5 water quality monitoring as per schedule shown.

Glyphosate/Herbicide monitoring: Initiated with 2 sites in 2023 (1 Kruisfontein, 1 Tsitsikamma). Review to increase no. of sites in 2024.

4.2.6 Monitoring objectives and targets

The objectives of the Integrated Pest Management program for MTO Cape are:

- List all identified alien and invasive or damaging pests currently known and identify new or emerging species.
- Provide plantation management with various strategies that combine different pest control measures, applicable at varying frequencies and degrees depending on the stage of an actual or potential infestation. As conditions change, control measures can be applied to meet the increased or decreased pest hazard, while always maintaining an appropriate level of base protection.
- Encourage and promote the development and adoption of environmentally friendly non-chemical methods of pest control management and strive to reduce the use of chemical pesticides where possible.
- Understand the economic, environmental, and social costs associated with the pest, disease or weeds, and understand the economic, environmental and social costs of control.

- Continuously strive to improve IPM to be an essential part of the management planning, with primary reliance on prevention through best silvicultural practices and biological control methods rather than chemical pesticides and monitor results to adapt as necessary.
- If chemicals are used, proper equipment and training shall be provided to minimize health and environmental risks.
- As a long-term objective, find alternatives to the use of glyphosate for control where possible, or minimize its use through strict control and minimization of impacts on workers and develop a process to notify stakeholders where relevant.

The objective of this monitoring is to track the volume, active ingredient and impact of herbicides used. The objective of glyphosate monitoring is to determine if there is any residual impact on water quality because of herbicide application.

The target is that glyphosate monitoring shows no impact on water quality downstream which could be harmful to human health. Targets will be revised further after results are available in 2023.

5. SOCIO-ECONOMIC MONITORING

5.1 AREAS OF SPECIAL INTEREST MONITORING

5.1.1 Requirement for Monitoring

MTO Cape's commitment to people and communities includes a commitment to the management of the artefacts of the cultural and historical past and areas of outstanding natural importance. For this reason MTO Cape recognizes certain places and objects as Areas of Special Interest (ASI). These include specific sites of cultural, historical or archaeological significance such as graves and rock painting sites and sites of natural importance, such as waterfalls. These ASI require specific and sensitive management and this is prescribed in the management records for each site. Monitoring of these sites is important to detect changes over time, and to assist with monitoring the impacts on these sites, such as weed infestation. Management includes general maintenance and the establishment of buffers around sites to prevent potential impacts that may damage the site, and the removal of alien vegetation. Where required and relevant, management is planned in consultation with local communities.

4.1.2 Monitoring Protocol

To ensure that management is effective, all sites are monitored on a two to three year rotation and photographed. A standardised database with site information and monitoring photographic has been developed and is available on the plantation.

4.1.3 Summary of Results

Forty sites are recorded as ASI, and they are listed below. All sites are scheduled for monitoring on a two to three yearly rotation and for site specific management.

Table 18. ASI sites on MTO Cape.

Code	Plant	Site Name
266005	Jonkershoek	Jonkershoek Farmhouse
266006	Jonkershoek	Spookhuis
266007	Jonkershoek	Jonkershoek Muslim grave
266008	Jonkershoek	Office Store
266009	Jonkershoek	Jonkershoek Graveyard
242001	Garcia	Cave of hands - Rock Painting A57
312002	Garcia	Cave of Hands
312003	Garcia	Earth Crust Fault
322001	Kruisfontein	Brakenhill Falls
322002	Kruisfontein	Big Tree
322003	Kruisfontein	Bell
333001	Lottering	Blaaukranz Pass
333002	Lottering	Oakhurst
333003	Lottering	Whitcher Graveyard
333004	Lottering	Puntjesbos Graveyard
333005	Lottering	Die Rye Graveyard
331004	Lottering	Goesa Graveyard

334006	Lottering	Dynamite store – Q15
331001	Witelsbos	Foresters Time book
331002	Witelsbos	Foresters Diary
334001	Witelsbos	Graves Block D10b
334002	Witelsbos	Damant se Kamp
334003	Witelsbos	Graves Block H51
334004	Witelsbos	Spoorbek se Pad
334005	Witelsbos	Old Forestry Office
334007	Witelsbos	Grave – Compartment D5
334008	Witelsbos	Graves H45 and H47
334009	Witelsbos	Stormsriver Pass
334010	Witelsbos	Graves – L52a

334011	Witelsbos	Graveyard –L11a
334012	Witelsbos	Anker memorial plaque
334013	Witelsbos	Dynamite store – L89
334014	Witelsbos	Khoisan midden
332001	Longmore	Upper Van Stadens Fort and Dam
332003	Longmore	Cemetery Loeriecamp
332004	Longmore	Cemetery Longmore Houses
332005	Longmore	Cemetery Otterford
332006	Longmore	Cemetery Longmore Village
332007	Longmore	Shepard's Hut
332008	Longmore	Cemetery – Otterford East

4.1.4 Management Requirements

All ASI's are scheduled for weeding where required. Buildings receive maintenance as required, while archaeological site are protected and closed to the public. All ASI's are shown on maps and protected from impacts during harvesting or other activities that may impact on them.

4.1.5 Monitoring Frequency

Each site to be photographed and monitored every two to three years.

4.1.6 Monitoring Objective and Target

The objective of monitoring is to formally visit each site and record site status notably the need for any management intervention, such as weed control. Regular monitoring will ensure that the target of keeping sites clean and well maintained will be achieved.

6.1 EMPLOYMENT, TRAINING AND CONTRACTOR

6.1.1 Requirement for Monitoring

MTO Cape employs 628 people directly and at least 603 people indirectly, through forestry contracting positions. All staff receive employment contracts, while contracts are signed with all service providers employed to assist with harvesting and silvicultural operations. Staff is notably employed from the local area, and the company strives to provide jobs in the local economy, either directly or indirectly through contractors and downstream processing.

6.1.2 Monitoring Protocol

A summary of employment, training and contractor employment will monitor the impact of employment over time. This is a new monitoring initiative from 2019.

6.1.3 Summary of Results

Current number of employees, and contractor employees is shown below. Number have decreased from 2019 due to completion of the Exit process. A summary of the type of ongoing training provided by MTO is also shown below.

Table 19. Employment numbers and traing provided by MTO Cape.

MTO Cape employment summary					
	2019	2021	2022	2023	2024
No. of Employees	781	628	667	811	865
Men	625	515	532	652	691

Women	156	113	135	159	174
No. of Contractors (forestry)	27	19	19	10	9
No. of Contractor workers (forestry)	780	603	650	467	394
No. own employees trained	1431 Learners/ 2632 Mandays	1153 Learners/ 1808 Mandays	1990 Learners/ 3309 Mandays	2565 Learners/ 4815 Mandays	2200 Learners/ 3855 Mandays
No. of contractor employees trained	1172 Learners/ 1910 Mandays	1690 Learners/ 2418 Mandays	1277 Learners/ 1711 Mandays	1099 Learners/ 1577 Mandays	1744 Learners/ 3117 Mandays
List of type of courses provided					
Agricultural Tractor handling : Basics; Alcotest 6820 Training; Basic Fire Suppression: Buildings; Basic Safety For Workers; Board Edger Operator; BOP - Moulder Training; Brushcutter : Re-Certification; Brushcutter Operator :Basics; Chainsaw Mechanic : Basics; Chainsaw Mechanic Evaluation; Chainsaw Operator : Basics; Chainsaw Operator : Re-Certification; Chairing of a disciplinary hearing; Chemical Store Handling (unit standard 116065); Chipper / Shredder Operator: Basic; Chokerman : Basic; Chokerman : Refresher; Communicate at work; Communicate using a two-way radio system; Competency : Tractor Agriculture; Competency - L.D.V. (4 X 4); Competency : Backactor and loader; Competency : F1 C/Balanced lift truck (3000kg); Competency : Fire tanker Hino 5000 lt; Competency : Fire tanker 10 ton 6X4 Mercedes; Competency : Fire tanker 10 ton Nissan' Competency : Fire tanker 5 ton 4X4 Mercedes; Competency : Fire tanker Unimog; Competency : Front End Loader (Bucket); Competency : Grader; Competency : LDV (4x4); Competency : Light vehicle Code B; Competency : Overhead crane Sawmill; Competency : Samag 20; Competency : Samel 50; Competency : Skidder – Cable; Competency : Tipper -10 Ton; Competency : Tipper 5 Ton; Competency : Tipper Truck up to 7000kg; Competency : Truck req C1 license; Competency: Fork Lift F2 Counterbalanced lift truck (7000kg); Competency: Almoniet Finger Jointer; Competency: Bakkie Sakkie; Competency: Bobcat Loader; Competency: Code B Mini Bus; Competency: Isuzu (New) 4000 LT; Competency: Isuzu 4000LT; Competency: Tipper 7 Ton; Competency: UD Bulk Tanker; Contract law for business and non-lawyers; Counterbalanced Lift Truck Code F2; Counter-Balanced lift Truck Forklift F2(5 Ton); Crew Boss: Appreciation; Crosscut Saw Operator Training; Defensive Driving Techniques; Demonstrate understanding of HIV/AIDs and its implications; Driver Evaluation; Environmental Awareness; F1 - Counterbalanced lift truck 3000kg; Fire Fighting in Buildings; Fire Lookout : Basics; Fire Tanker Hino 5000 lt; Fire tanker operating 10 ton 6x4 Mercedes; Fire tanker operating 5 ton 4x4 Mercedes; Fire tanker operating Unimog; First Aid - Level 1; First Aid -Level 1 & 2; Front End Loader Handling :Refresher; Health And Safety Representative; Herbicide Applicator Course; Herbicide Applicator Refresher; Interpret and use information texts; ISO 45001 Internal Auditor; Job Observation Workshop; Log Recorder: Basic; Logrecorder :Re-Certification; Logscaling in poles/saw logs: Basics; Logscaling in Sawlogs & Poles: Re-Certification; Manage individual and team performance; Manage Personal Finance; Management of Herbicide Store; Managing Employment Relations; Map Reading; Marking for Thinning : Basic; Marking For Thinnings :Refresher; Moderation; NKV Multi Rip Saw Operato; Operate in a team; Opticut Operator Training; Overhead Crane C30; Planer & Moulder Maintenance and Operation; Pole Pruning; Prescribed Burning Course; Recovery saw operator training; Safe Working Procedures; Safety Induction Course; Safety Program Store Personnel; SAMTRAC; Side Loader Lift Truck 5000kgs; Silviculture Planning Phase 1; Site Preparation; Specialised Tree Felling Techniques; Stacker Operator; Storeman : Evaluation; Storeman :Basics; Three Wheel Loader : F11/FZ; Three wheeler loader : Basics; Three Wheeler loader Refresher; Three Wheeler Loader with Forks; Time Management; Truck, bus requiring C1 license; Twin Band Saw Operator; Two Way Radio Communication; Understand the nature and importance of conservation; Unimog : Basics; Wild Fire Suppression : Basic; Wild Fire Suppression : Refresher; Wild Fire Suppression: Crew boss; Wild Fire Suppression: Proto team; Wild Fire Suppression: Prototeam Refresher; Working at Heights					

6.1.4 General Management Recommendations

Personnel management is addressed via the systematic analysis of all critical aspects to provide the necessary procedures and control systems. Orderly and well-managed personnel administration systems provide a basis for sound relations.

6.1.5 Monitoring Frequency

Reporting will occur on an annual basis.

6.1.6 Monitoring Objective and Target

The monitoring objective is to report on employment and training over time. The employment targets of the company are relevant.

6.2 SOCIAL AND ECONOMIC DEVELOPMENT

6.2.1 Requirement for Monitoring

The MTO Group social and economic development programme currently aims at uplifting and improving the relationship with local communities living in and around forest operations. MTO Cape has a good relationship with most of the communities on its borders and gives aid to communities regularly when it is

requested. Community Liaison forums have been established in order to facilitate good neighbour relations and encourage ongoing dialogue.

Social and economic development intends to provide effective social development engagement to ensure that social development projects are sustainable. Social investment should build capacity and derive mutual and/or symbiotic benefit to MTO and to stakeholders. Measuring assistance and reach over time is the start of a improved monitoring program for the company.

6.2.2 Monitoring Protocol

A list of social and economic donations and spend is maintained to monitor donations over time.

6.2.3 Summary of Results

Table 20. Assistance rendered during 2021 - 2024.

Area of Assistance	Examples of types of assistance	No. of people reached and summary of annual assistance.			
		2021	2022	2023	2024
Education	ICT Skills training to school management teams and Grade 4 - 7 learners.	All Eight Tsitsikamma primary schools	120 teachers; 640 learners directly impacted; 2952 learners indirectly impacted; 53 unemployed youth impacting 265 families; 43 SMT's.	Two Schools in Tsitsikamma and communities of Nompumelelo village and Stormsriver	254 Unemployed youth 27 SMMEs
Food security	Food gardens in schools, creches, clinics and backyards.	2500 people benefitted	3250 beneficiaries (650 gardens)	3000 (600 gardens)	4385 (877 gardens)
Donations	Homeless shelter support, soccer kit donations, transporting learners to educational camps	Native Roots Shelter (Plettenberg bay). Longmore soccer club. Tsitsikamma Ward 5 learners	Aftercare centre cleanup, impacting 45 learners.	Plettenberg bay destitute members of the community. 12 members in agriculture. 11 members for Beading. 105 children	5 people / members of the Co-operative
Enterprise & Supplier Development	Assist young entrepreneur starting a charcoal manufacturing business. Business development support to young entrepreneur – Agri business and to women owned sewing business Ferns picking permit Supply and integrate Quickbooks payroll system software into the existing financial management system and providing relevant training.	1 SMME, 5 employees 1 SMME, 3 employees 5 people 1 Cooperative of 8 individuals 15 contractors	3 x Supplier Development SMME's (Silviculture, Harvesting, Transport) - 30 people. 2 x Enterprise development - entrepreneurs supported with infrastructure development.	10 suppliers 8 suppliers	12 suppliers

Skills Development	Skills development programme for unemployed youth.	15 people	None	25 people	80 people
Community	Non-timber forest products (firewood, droppers, poles, mushrooms) Servicing DAFF villages (Water supply & sewage)	All communities bordering the plantations. Longmore, Die Blaar and Koomansbos communities.	All communities bordering the plantations. Longmore, Die Blaar and Koomansbos communities.	All communities bordering the plantations. Longmore, Die Blaar and Koomansbos communities.	All communities bordering the plantations. Longmore, Die Blaar and Koomansbos communities.

6.2.4 General Management Recommendations

An improved system to prioritize projects and monitor the sustainability of donations was initiated in 2020.

6.2.5 Monitoring Frequency

Reporting will occur on an annual basis.

6.2.6 Monitoring Objective and Target

The objective of MTO's socio-economic development program is to utilize available resources to facilitate the improvement of the lives of identified stakeholders.

The stakeholder relations department manages the expenditure on socio-economic initiatives with the purpose of promoting the achievement of this objective.

6.3 COMMUNITY ENGAGEMENT

6.3.1 Requirement for Monitoring

MTO Group has a dedicated Stakeholder Relations team, managing all aspects related to social development. Stakeholder registers are maintained, and regular meetings held with interested and affected communities. Formal community engagements are held with key communities adjoining plantations. An up-to-date record of all grievances is maintained.

6.3.2 Monitoring Protocol

A summary of community engagements is maintained by the company for comparison over time.

6.3.3 Summary of Results

MTO Cape has established liaison forums where continuous and structured engagement process on issues material both to MTO and its stakeholders take place quarterly.

NUMBER OF COMMUNITY ENGAGEMENTS			
Year	2022	2023	2024
Tsitsikamma	3	6	10
Longmore	1	3	6
No. Formal grievances received	1 (Tsitsikamma Witelsbos)	0	0

6.3.4 General Management Recommendations

Continuous response to stakeholder engagement aspects.

6.3.5 Monitoring Frequency

Reporting will occur on an annual basis.

6.3.6 Monitoring Objective and Target

MTO's objectives for monitoring community engagement is to:

- ❑ observe and track dialog between the company and its stakeholders with the aim of developing mutually respectful relationships through the company's actions and attention to stakeholder matters;
- ❑ measure the effectiveness of the community engagement;
- ❑ promote the consideration of the views and interests of participating stakeholders during decision making, with the goal of reducing unnecessary and/or potentially negative stakeholder impacts;
- ❑ promoting transparency; and
- ❑ building a relationship of trust between the company and its stakeholders.

MTO's target is to effectively engage with community members on matters in a manner that results in expedient resolution thereof and without any formal grievances arising from these matters being raised against the company.

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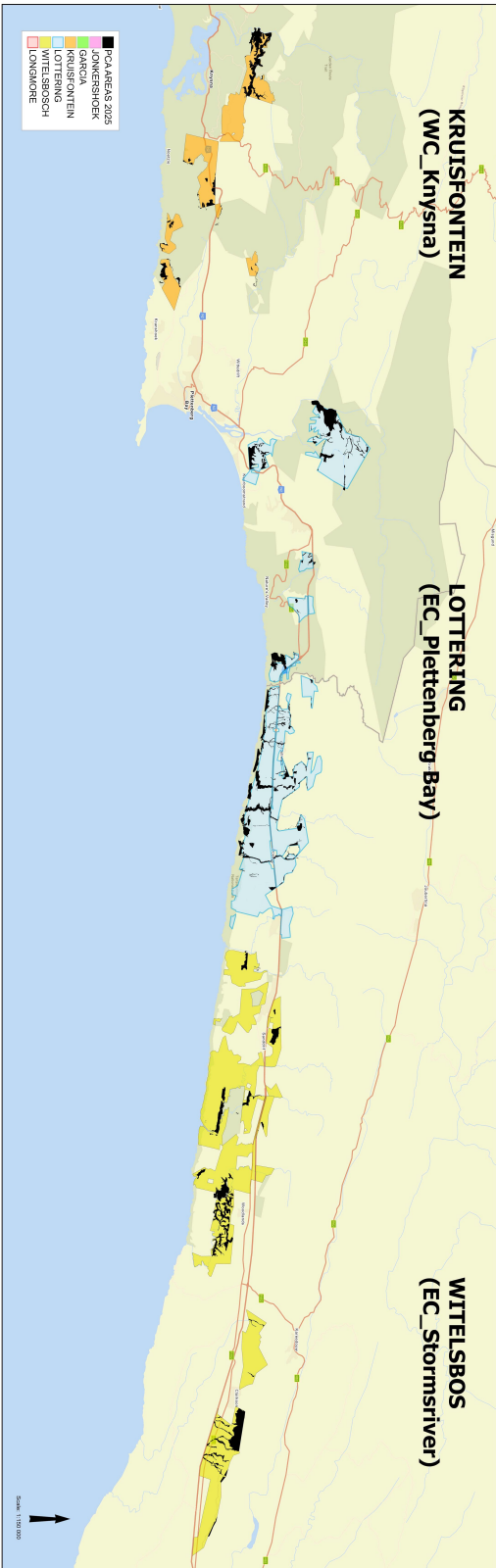
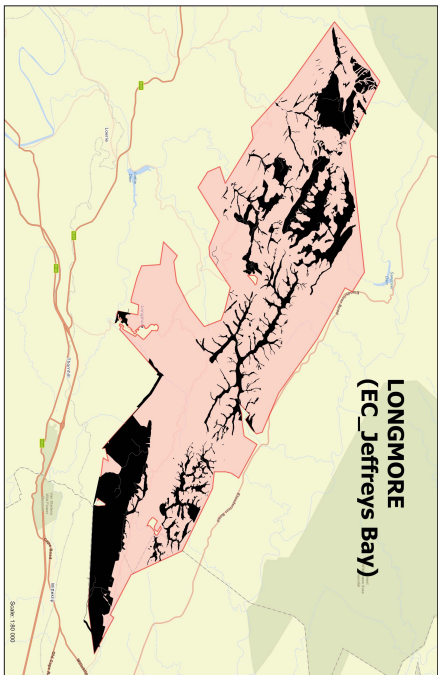
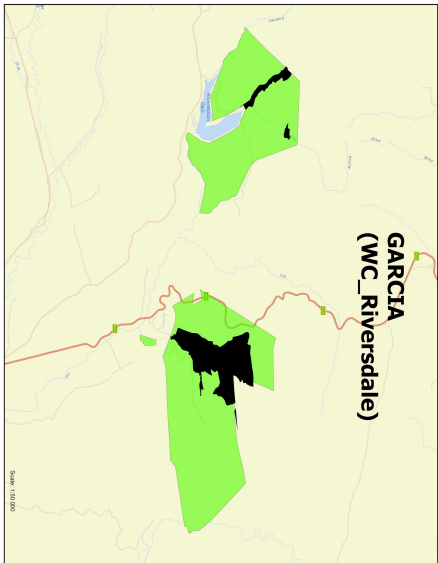
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MTO Cape Plantations - PCA Areas

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