

Status Report on the Southern Cape Study Area

Prepared for the Kishugu NPC as part of the study into the Feasibility of Integrating Fire and Alien Vegetation Management Activities in the Western Cape



Zane Erasmus

Phone: 044 8733348
Cell: 082 414 6344
Fax: 0866 846 279
PO Box 1265
George
6530



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A Status Report on the Southern Cape Pilot Study Area

A Report prepared for the *“Pilot Study into the possible Integration of Fire and Alien Vegetation Activities in the Western Cape”*

1. Background

The study to look at ways of integrating alien vegetation clearing operations with veldfire management initiatives commenced in May 2015. Two study areas, one in the Agulhas Plain, and one in the Southern Cape were identified. A series of meetings and interviews were held with stakeholders in each area, primarily to establish the relevant status of both fire and alien management activities within their relevant areas of operation. Particular attention was paid to the various types of planning formats that were applied in each of the areas.

2. Objectives of Report

The overall objective of this report is to record as concisely as possible the findings of a series of field visits and interviews with stakeholders involved in alien vegetation and fire management in the Southern Cape study area, as indicated in Maps 1a and 1b in Appendix 1.

The number of field visits and interviews were restricted to meet budgetary and time constraints but are deemed to give a fair indication of the status of the Southern Cape in terms of the following:

- The form of structured management strategies or plans as utilised by the various stakeholders;
- How these strategies or plans are applied in the field;

- Scale of alien vegetation invasion and level of fire management practised in selected areas; and
- The challenges confronting alien vegetation and fire managers in the study areas.

This study aims to inform the basis upon which a future “workshop” will be held to explore ways that both fire and alien vegetation can be integrated at ground level planning and execution phases. The ultimate objective is to not only manage both fire and alien vegetation cost effectively, but also to increase the job opportunities currently available in this field.

3. Structure of this report

A brief descriptive overview of the study area is provided as a context to the study. The report indicates the procedure followed to collect information, provides a brief overview of the entire study area and then details the findings for each of the four study areas, providing information on management planning in place for each study site, fire and alien invasive vegetation management and challenges for each agency approached.

4. Data Collection Procedure and Protocols

A series of meetings were held at provincial and regional level to advise stakeholders of the study concept and to engender support for the study.

A study area within the Southern Cape regarded as representative of the region was identified during the meetings as the focus area for the study. An attempt was made to adhere to the existing Southern Cape Fire Protection Association Fire Management Unit (FMU) boundaries. These unfortunately do not form a contiguous area or boundary. However, seven FMU's are included in the study Area (see Map 1a and 1b in Appendix 1).

Representative management organisations were chosen in the study area and managers from each were interviewed in a series of field trips held during July and August 2015 to assess the level of planning and the type of management strategies used by each organisation.

While detail of the discussions is captured in Section 7, an example of the range of comments received is provided in Section 5.

5. Perceptions of agents towards the integration of fire and alien vegetation management

The remarks captured below reflect the perceptions that are held in some quarters regarding the integration of fire and alien vegetation management and are included to provide context to this report. Some of these comments originate from discussions held in the Agulhas Plain study area but have relevance for the Southern Cape study area as well:

- The Working for Water's WIMS (Water Information Management System) does not take the role of fire in the local environment into account.
- Extended Public Works Programmes (EPWPs) are focused on eradicating alien plants and do not address the broader environmental concerns closely related to alien vegetation management.
- No provision is made for managing the fuel loads created by clearing operations.
- Alien vegetation clearing operations seem to be focused on areas that are not necessarily priority areas (e.g. catchment areas and along river courses).
- The value of ecosystem services is not taken into account when budgeting for alien clearing operations.
- Contract Working for Water teams should be trained to carry out stack, prescribed and fuel reduction burns. In this way post clearing operations that require a burn can be undertaken without bringing specialist teams in from other areas.

- More money is spent on alien vegetation management than on fire management. This is reflected in the budgets of the different EPWPs. There are more Working for Water teams than there are Working on Fire teams.
- The gains made in the Mountain Catchment Areas that were earlier identified as priority areas has been lost. Some areas previously cleared have been re-infested and now require initial clearing again.
- Some farmers are disillusioned with new Fire Protection Association structures and feel that they do not get enough support to do control burns.
- EPWPs should not be operating in silos. Conservation agencies in particular have a logistical challenge aligning their objectives with several programmes running simultaneously within their areas.
- The Natural Biological Alien (NBAs) units provided by the Working for Water WIMs (Water Information Management System) are out-dated and do not accurately reflect the densities and distributions that exist on the ground.

6. Area Description

6.1. Climate

The climate in the study area is a maritime or oceanic¹ climate. The tall folded Outeniqua Mountains that run east to west and parallel to the coast contribute to the variable and mild climate.

The southern aspects of the mountains have recorded some of the highest rainfalls in South Africa. Most precipitation falls in winter as cold fronts move in from the west. Humid sea-winds originating from the Indian Ocean, only 10 to 15 km from the mountains, can yield rain at any time of the year.

¹ Typical climate of west coast areas at the middle latitudes of most continents, with warm summers and cool winters and a relatively narrow

The northern aspects of the Outeniqua Mountains contrast vastly from the southern aspects, as they are much warmer and drier and form the southern reaches of the Small Karoo, a semi-arid region.

Most significantly, the Southern Cape falls between the winter and summer rainfall regions and is therefore renowned for being a “constant rainfall region”.

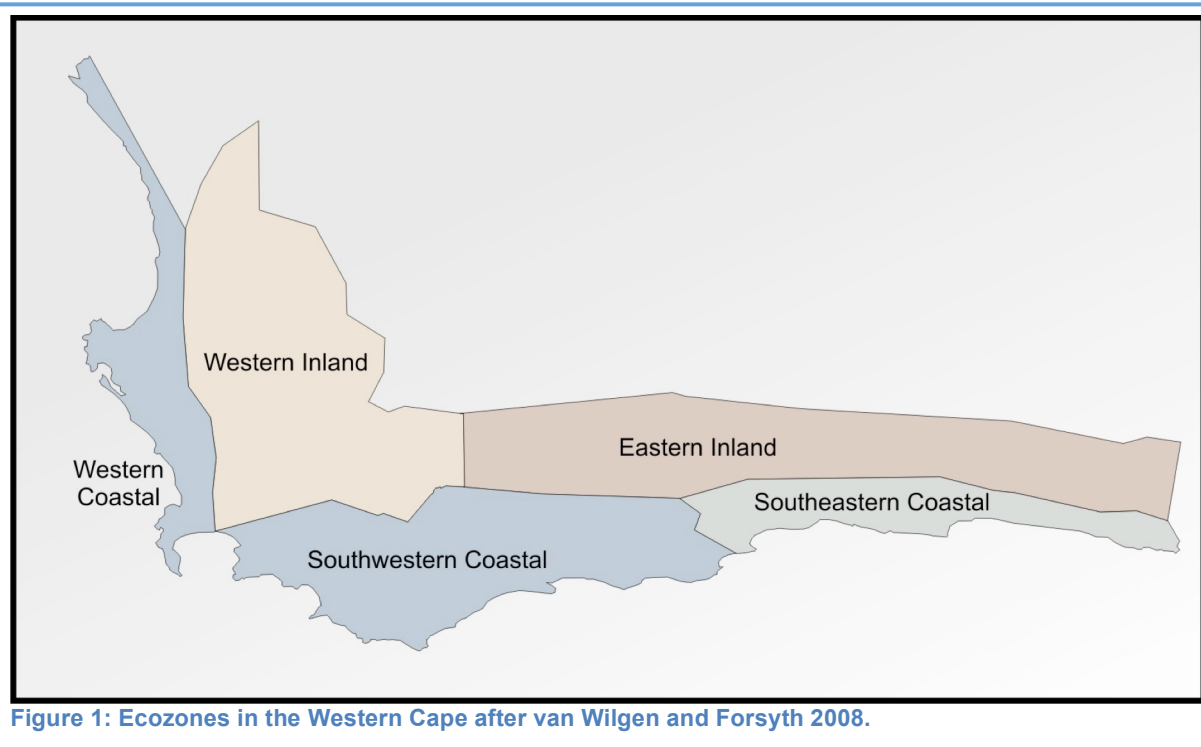
6.2. Fire History

Five fire climate zones, also termed ecozones, have been identified in the Western Cape. Each ecozone has a distinct potential for veldfires that is defined by the regional climate (Figure 1 (van Wilgen BW and Forsyth, 2008)). The Southern Cape falls within the southeastern coastal zone, where there is a potential for veldfires at any time of the year. There are two distinct fire seasons in this region. Lightning in the mountains in summer ignites veldfires, while hot berg wind conditions in winter can rapidly spread wildfires throughout the region (van Wilgen BW and Forsyth, 2008).

The search for records for veldfires in the plateau between the mountains and the sea revealed that information is lacking in this regard and records that do exist are vague, with little detail on area, time and extent of fires. Local Fire Brigades have kept some incident records but this does not include spatial data.

In contrast, there are accumulated records that date back to the 1930's for the mountainous areas, originally under the control of the Department of Forestry. A period of controlled burning and alien vegetation clearing during the years from 1960 to early 1980, was followed by “20 years of catchment management neglect with virtually no fire management and alien plant control done²”.

² T. Kraaij, RM Cowling and BW van Wilgen. Presentation at the Fynbos Forum – July 2012, Cape St Francis. *Fire regimes in the eastern coastal fynbos: History, weather and plant response*.



Recent research has shown an increase in the area burnt in the Southern Cape since 1980 (Kraaij, 2012), which coincided with an increase in fire weather leading to speculation that fire regimes are responding to climate change.

6.3. Vegetation

Maps 3a to 4b in Appendix 1 show the wide distribution of vegetation types in the Southern Cape ranging from Western Strandveld along the coast to Sandstone and Shale Fynbos on the slopes of the tall Outeniqua Mountains. Most of the plateau between the mountains and the coast is developed and very little of the original vegetation remains. The vegetation type under most formal protection is thus Mountain Fynbos in the Outeniqua Mountains where this study has been focused.

Of particular interest within the Outeniqua Mountains is the presence of Afromontane Forest patches and remnants in the ravines and valleys. The fringes of these forests patches, which have already decreased in area from historical times, are susceptible to frequent and intense fires and are prone to invasion by woody alien plant species.

6.4. Alien vegetation

Maps 5a and 5b in Appendix 1 give an indication of the spread of alien vegetation throughout the Southern Cape. Pine plantations on the lower southern slopes of the Outeniqua Mountains are a major source of infestation with *Pinus* spp. seeds distributed by wind. Hakea infestations are a major threat because young seedlings blend in easily with fynbos and early detection and mapping is difficult. Neither of these species resprout when they are felled and it should be relatively easily to control them, if the veld is burnt within a year of the parent trees being felled. A prescribed burn will kill seedlings and at the same time remove the fuel load left after clearing operations. This has not happened in many areas and pine and hakea seedlings have re-established and reached maturity in areas previously cleared (personal observation).

Acacia species resprout when they are felled necessitating the use of herbicides. Burning after felling can kill off most of the seedlings, but the vast levels of seed production make constant and expensive follow-up operations essential. Failure to follow-up, and the recurrence of wildfires has led to the increase of *Acacia* dense infestations throughout most of the Southern Cape.

Management neglect in the mountain catchment areas has led to most of the alien vegetation infestation having to revert to the “initial phase” of alien clearing operations³.

³ Pers. Comm. J. Vaas. Area Manager – Department of Environmental Affairs August 2015.

6.5. Agriculture

The year round rainfall and fertile soils of the Southern Cape provide conditions that attract a diverse selection of productive agricultural options. The coastal plateau supports a mix of dairy and vegetable cash crop farming. The moist southern slopes have sustained a forestry industry since the first pine species were planted in the 1880s.

The entire South African hops farming industry is situated in the Southern Cape in the Waboomskraal and Herold valleys in the Outeniqua Mountains. The long summer days and cool winters provide ideal conditions for cultivating this plant essential for brewing beer.

6.6. Socio Economics

The Southern Cape study area includes the local Municipality of George as well as a section of the Eden District Municipality. Demographics have thus been drawn from these two different government structures and are expressed here as an estimated mean.

George has a population of over 200, 000, of which 20% are living in poverty. The unemployment rate of 20% is slightly lower than the rate for the Western Cape, but of concern is the high rate of youth unemployment at 27% (Anon., 2014).

The entire population of the Eden District Municipality is 587, 600, of which only a small percentage would fall within the study area. The unemployment figures for the District are similar to that of the George Municipality at 22%. There is particular concern that there is a negative growth rate in the agriculture and forestry industry with accompanying job losses within this vital sector. Dropout rates for high school are much higher than the norm and may be contributing to the 29% youth unemployment rate (Anon., Socio-Economic Profile Eden District Municipality., 2014).

7. Agencies involved in Fire and Alien Vegetation Management

The management of alien vegetation and fire is a responsibility shared by several organisations throughout the area. Interviews were held with a range of managers from four management areas selected for this study, where alien vegetation and fire are both key responsibilities. An attempt was made to include a cross-section of private and public areas and management agencies.

The four areas chosen are as follows:

- The Waboomskraal Project, managed by a private environmental company and a range of agencies, as well as the landowners in the Waboomskraal FMU;
- The Outeniqua Nature Reserve, managed by CapeNature;
- The Herold FMU, managed by the landowners aided by the Southern Cape Fire Protection Association; and
- The Garden Route Catchment Basin, managed predominantly by the George Municipality but including participation by CapeNature, the National Department of Environment Affairs and Cape MTO.

These agencies are described below. An overview is provided on the status and content of management plans, as well as the funding and resources available to sustain management activities. Information on fire history and alien vegetation levels is restricted to that which was made available at interviews, indicating the working knowledge of current managers. Key challenges faced by each organisation are also provided where relevant.

7.1. The Waboomskraal Project⁴

The Waboomskraal Valley is a productive agricultural zone with extensive farming practices producing predominantly deciduous fruits and hops. The surrounding slopes form an effective catchment basin that feeds the Klip River and provides adequate irrigation for farms in the high rainfall area (1200 mm to 1500 mm per annum). The Klip River is also an important water source for the town of Oudsthoorn 40 km downstream. The slopes and riparian zones in this catchment basin are however heavily infested with pine, hakea and *Acacia* species.

The Outeniqua Nature Reserve borders Waboomskraal Valley along the eastern and northern slopes (see Maps 1b and 2b in Appendix 1 for the locality of Waboomskraal).

A unique “Water Futures Partnership” (WFP) has been initiated in the Waboomskraal and Herold Valleys, incorporating the South African Breweries, The World Wildlife Fund (WWF) – South Africa, and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). The strategic objective of the initiative is to rehabilitate the catchments serving these areas. A series of stewardship agreements set up vehicles for alien clearing operations to improve the hydrological and ecological systems in the area. The role of veldfires is also recognised and it is proposed in the document that adequate structures be established to deal with the risk associated with climate change (Nel, 2012).

The WFP approached the Natural Infrastructure Services (NIS), a private company responsible for environmental work. They are currently appointed as Implementing Agent for Working for Water operations in the Southern Cape region to manage the clearing operations at Waboomskraal.

7.1.1. Management Plans

The NIS have partnered with WWF-South Africa who have forwarded the NBal units obtained from the Working for Waters WIMS. The information contained in the NBals reviewed as part of this study was however out-dated and did not accurately reflect the current densities. In addition the areas were mapped in a 2D format that did not make it possible to calculate slope and areas. In April 2015, Gerrie van Tonder, an independent GIS expert, was commissioned to establish the current levels of invasion in the Waboomskraal area. At the same time he was asked to validate the following:

- Geographic data within the NBals, i.e. elevation and area;
- Area invaded by alien vegetation;

⁴ ZA1572.E, a National Department of Environment Affairs Natural Resource Management Project – the Hops Farms Clearing Project.

- Density of invasion; and
- The walking distance and altitude that workers would have to climb to reach the areas of infestation.

Of note in van Tonder's study is the disconcerting rate of spread of the alien vegetation over a relatively short period of time. Google images taken in 2011 for specific NBals were compared to images taken in 2015 (van Tonder, 2015), showing dramatic increases in areas of infestation.

NIS do not have a specific management plan drafted for the area. The work is however carried on in accordance with a Memorandum of Agreement between WWF-South Africa and NIS, and the information provided on the NBals.

While no specific objectives for conservation management were identified, there is however an overall objective to clear invader plant species in the catchment, and to provide employment and enhance skills development opportunities for previously disadvantaged South Africans.

The project runs for a period of three years, and was started in 2014. Cost estimates in the Nel et al (2012) literature place the total expenditure required for the project at R39 million (this includes a similar Project to be run in Herold).

Funding for the project so far is sourced from the WWF-SABMiller-GIZ partnership, the CSIR and the Department of Science and Technology. Reported expenditure on the Project is currently R2 million (Meiring, 2015).

7.1.2. Resources

The Memorandum of Agreement between NIS and WWF-South Africa includes initial clearing and one year of follow up operations that are funded for 3 years.

Funding

The status of funding supplied by SABMiller-GIZ is not known. Members of the Waboomskraal FMU pay an annual levy to the Southern Cape FPA based on the area of their farm⁵.

⁵ <http://www.scfpa.co.za/userfiles/File/SCFPA%20Memberhip%20fees%202013.pdf>

Staffing

The project is supervised by Christo Strydom from NIS in association with a private contractor Prieur du Plessis. Two contractors, namely Unjani and PSP, are currently employed and a total of 9, 880 working days, or person days, have been recorded since the start of the project (Meiring, 2015).

7.1.3. Fire History

A very large fire spread across the north western regions of the Waboomskraal Valley during 2015 (see Maps 6a and b in Appendix 1). The Fynbos to the east and south surrounding the Waboomskraal FMU is all older than 10 years, with a section in the southeast over 30 years old.

7.1.4. Alien Vegetation

The area is subject to dense infestation by primarily pine species. The NIS are currently in the process of mapping densities and species. A total of 228 hectares has been cleared so far (see Maps 5a and b in Appendix 1).

7.1.5. Level of Fire Management and Alien Vegetation Management Integration

Waboomskraal forms an independent Fire Management Unit (FMU) administrated by the Southern Cape FPA.

FPA staff have compiled the **Waboomskraal FMU Smoke Report Plan** that serves the following purpose:

- Indicates response and actions to wildfire callout;
- Identifies the FMU Warden and FPA members with relevant contact details;
- Contains contact details of responsible fire management authorities;
- Lists requirements for fire-fighting resources and location thereof;
- Illustrates the Incident Command Systems applicable at wildfire events; and
- Provides maps of the FMU and neighbouring boundaries.

In addition to the Smoke Report Plan, FPA staff have also drafted a comprehensive **Strategic Integrated Fire Management Plan for Waboomskraal** that is focused primarily on the protection and prevention aspects of fire management. This strategic plan is updated annually, and establishes the procedures whereby certain aspects of integration can be formalised, namely:

- Planning, policy and execution of fuel reduction burns;

- Awareness and education of fire management principles; and
- Identity of hazards and associated risk reduction.

Other aspects of fire management, such as the following are addressed:

- Construction, locality and type of firebreaks;
- Training requirements for FPA members, farmers and staff;
- Recommendations for essential protective clothing, tools and equipment; and
- Wildfire record keeping.

At this stage the integration between the planning efforts of the Southern Cape FPA and NIS has not been formalised. NIS staff are in the process of planning a burning operation on the northern aspect slopes of the Waboomskraal in an attempt to clear dense stands of pine. Informal discussions have been held around the burning procedure with Working on Fire Commercial.

7.1.6. Key challenges

The following points include the practical and strategic challenges identified by the managers within the area during discussions.

- The terrain is generally inaccessible with very steep slopes. Extreme temperatures are experienced at the height of summer. Snakes, particularly in spring present a risk to the workers. These practicalities are limitations to the effectiveness of firefighting and alien vegetation management operations.
- Roadblocks introduced to control traffic on the R62 for constructions work have restricted access to Waboomskraal. This has impacted on the contract workers and progress on the project has been hampered.
- Co-ordinating activities amongst the many landowners, partners and stakeholders remains a challenge.

7.2. The Outeniqua Nature Reserve

The Outeniqua Nature Reserve, managed by CapeNature is the largest of the land units in the study area spreading for over 38, 000 hectare across the Outeniqua Mountains between the coast and the Klein Karoo to the north.

7.2.1. Management Plans

CapeNature is currently in the process of compiling integrated Protected Area Management Plans for all the protected areas that are managed by the entity in terms of the National Environmental Management Protected Areas Act (Act 57 of 2003). Within the Southern Cape area 6 Protected Area plans have been completed. The Outeniqua Nature Reserve plan is scheduled for final compilation during 2017. In order to facilitate the optimisation of annual activities, prior to the formal plan compilation, CapeNature formalises the planning process by means of Fire suppression Plans and Integrated Work Plans for each Protected Area, including Outeniqua Nature Reserve. Two such plans are compiled, one regional, and one drawn up specifically for the Outeniqua Nature Reserve. The Fire Suppression Plans explicitly address wildfire events only. Prescribed responses are detailed for areas that are classified as ecologically sensitive. In other words, all possible measures are taken to extinguish fires in young Fynbos, whilst older veld is allowed to burn if it can do so within specific safety parameters. Details are provided in the plan to activate suitable responses to a wildfire callout (Phalanndwa, 2014). This form of fire management loosely follows the “adaptive fire management response” where burning and suppression operations are adapted as a better understanding of the ecological effects of fire are understood (van Wilgen B. , 2013).

CapeNature, like many other conservation agencies, has entered into partnership agreements with a whole range of independently funded and managed Extended Public Work Programmes (EPWPs), as a way to meet its nature conservation obligations. It is difficult to develop a single Management Plan that can be used to achieve its multiple objectives as each partnership may have slightly different goals. Management staff have developed a system whereby their management and scientific services staff meet annually to review the ecological status of each reserve. Experts in both fire and alien vegetation management, as well as plant and animal ecologists, contribute towards an **Integrated Work Plan**. All priority activities are identified based on the occurrence of fires and the spread of alien vegetation. This is then used to compile an Annual Plan of Operations (APO). Liaison between CapeNature management and the relevant EPWP ensures that the priority work identified is then addressed in the APOs drafted by the EPWPs. CapeNatures APO is entirely dependent on the management structures available to CapeNature, as well as the budgets made available by way of the partnerships with the EPWPs.

The primary objective of the Integrated Work Plan that is drafted annually is to protect the biodiversity of the region and the reserve.

7.2.2. Resources

Funding

The Provincial Government funds CapeNature in terms of the Western Cape Nature Conservation Board Act 15 of 1998. Ring fenced funding for alien vegetation and fire management activities in the Mountain Catchment Areas is assigned via the Integrated Catchment Management Fund.

Staffing

Outeniqua NR has a full complement of management staff which includes a Conservation Manager, Nature Conservator, Project Manager (who manages the WfW and Integrated Catchment Management contractor teams) and a Fire Officer (who manages the WoF team based at Outeniqua Nature Reserve).

The WfW (4) and ICM (3) contract teams are primarily active with Alien Vegetation clearing and other conservation activities such as fire-break, footpath and road maintenance. These teams are appointed for the execution of specific tasks as determined on the Annual Plan of Operation.

The WoF team, which is managed by CapeNature in terms of a partnership agreement with Working on Fire, respond to all wildfires in the area and also construct/maintain fire-breaks, clear Alien Vegetation and other integrated fire management activities.

7.2.3. Fire History

CapeNature manages a comprehensive fire reporting system that includes detailed spatial information. Map 4 (Appendix 1) illustrates the veld age distribution of veld within the areas managed by CapeNature. The cause of 50% of the fires on CapeNature is unknown. At least 25% of the wildfires are ignited by lightning.

7.2.4. Alien Vegetation

Maps 5a and b in Appendix 1 illustrate the extent to which the Outeniqua Nature Reserve has been invaded by alien plant species. Dominant aggressive invader species include hakea, *Pinus* and *Acacia*.

7.2.5. Level of Fire Management and Alien Vegetation Management Integration

Integration between fire and alien vegetation management activities, although not formalised, takes place in the planning process that results in the annual Integrated Work Plan, thereby ensuring that the two activities are regarded in a holistic manner.

7.2.6. Key challenges

Challenges identified by the CapeNature managers during discussions include the fact that large tracts of state land on the southern boundary of the Outeniqua Nature Reserve are not currently managed by any authority. Plantations are not cleared and a high fire hazard has been created. The plantations are also a constant source of invasive plants spread by winds across the mountains.

Budget restraints are also a constant concern for management who struggle to meet their legal obligation in terms of fire and alien vegetation legislation.

7.3. The Herold Fire Management Unit

The Herold FMU lies in a valley on the northern reaches of the Outeniqua Mountain range. Direct access to the FMU across the mountains is via the Montagu Pass that links George with the N9 highway to the north.

The FMU is comprised of a community of 20 farmers, 11 of whom belong to the Southern Cape FPA. The Outeniqua Nature Reserve under the management of CapeNature surrounds almost the entire FMU. The steep slopes surrounding the FMU are heavily infested with alien vegetation.

7.3.1. Management Plans

FPA staff have compiled the ***Herold FMU Smoke Report Plan*** that is updated annually and serves the following purpose:

- Indicates response and actions to wildfire callout;
- Identifies FMU representative (warden) and FPA members and relevant contact details;
- Contains contact details of responsible fire management authorities;
- Lists requirements for fire-fighting resources and location thereof;
- Illustrates the Incident Command Systems applicable at wildfire events; and
- Provides maps of the FMU and neighbouring boundaries.

In addition to the Smoke Report Plan, FPA staff have also drafted a ***Strategic Integrated Fire Management Plan for Herold*** that is focused primarily on the protection and prevention aspects of fire management. This plan is also updated annually and serves the following purpose:

- Awareness and education of integrated fire management principles;
- Construction, locality and type of firebreaks;
- Planning and execution of fuel reduction burns;
- Identity of hazards and associated risk reduction;
- Training requirements for FPA members, farmers and staff;
- Recommendations for essential protective clothing, tools and equipment; and

- Wildfire record keeping.

Although mentioned in the Water Stewardship literature for Waboomskraal, work on the alien vegetation in the Herold area has not yet started (Nel, 2012). NIS will be starting work in the area in the foreseeable future (pers. comm. L. Zondagh).

7.3.2. Resources

Funding

The FMU was formed under the auspices of the Southern Cape FPA. Members pay an annual levy that is based on the area of their farm⁶. This funding is used to meet the costs of running the FPA which is registered as a non-profit company and public benefit organisation.

Staffing

A FMU representative is appointed to co-ordinate activities among the members in Herold (Smit, 2014). Two of the FPA members have a core of trained fighters, namely CapeNature with a team of 11 firefighters and SAB Hops Farm with 10. The rest of the members do not yet have any trained fire-fighters.

Any one of the seven Working on Fire teams assigned to the Southern Cape FPA can be deployed to assist farmers in the case of a wildfire, or as required to carry out any fire protection work. The closest Working on Fire team that can assist the Herold FMU is based in George, 35 km away. The Working on Fire team assigned to Outeniqua Nature Reserve at the Witfontein station may also by arrangement with CapeNature staff, assist the Herold farmers. Working on Fire teams are usually about 25 strong but numbers tend to fluctuate.

Two Extension Officers who have been funded by the FynbosFire Project currently assist the Southern Cape FPA management. This funding is to end in December and it is hoped that the FPA will be able to take over cost of the appointment.

7.3.3. Fire History

The fynbos veld surrounding the FMU is mature with vegetation at least 10 years or older. A large fire started on the hops farm Burns Leigh in May 2005. It spread southwards across the mountains towards George burning a total of 5, 500 ha and destroying pine plantations as well as patches of rare indigenous forest remnants (Anon, 2005).

⁶ <http://www.scfpa.co.za/userfiles/File/SCFPA%20Memberhip%20fees%202013.pdf>

7.3.4. Alien Vegetation

The slopes surrounding the FMU are infested with pine, *Acacia* and hakea species. Most have originated from the farms in the area and spread by fire and the northerly and southerly winds. Some of the densest alien vegetation in the region is found to the north of the Herold FMU.

7.3.5. Level of Fire Management and Alien Vegetation Management Integration

Landowners do what they can with their limited budget but there is very little alien vegetation management taking place in the area at this time. The “Water Futures Partnership” that is operational in Waboomskraal is to be extended to include Herold, but as yet no date or funding has been set aside.

7.3.6. Key challenges

Challenges identified by the Southern Cape FPA staff during discussions include the fact that while they strive to reach a 100% membership of landowners in their area, this has been hampered largely because of absentee landowners. In addition, it has not always been possible to obtain the names and addresses of the landowners from the relevant municipalities.

It is an on-going challenge to develop a strong code of fire management practice amongst the disparate members of the FBA, many of whom do not have a conservation focus and who have differing goals for their properties.

Farmers have to apply to the George Municipality for a permit to burn. The George Fire Brigades Services however are not well equipped or trained for veld firefighting, and the assistance of the Eden District Municipality Fire and Rescue Services is called upon to help with wildfires and controlled burns.

7.4. The Garden Route Dam Catchment Basin (GRDCB)

As the name implies, the Garden Route Dam is fed by a single and clearly defined catchment basin in the Outeniqua Mountains. The catchment basin of 3, 500 hectare is managed by four key landowners, namely CapeNature (41%), the George Municipality (47%), Public Works Department (6%) and the forestry company Cape MTO (6%), the latter which has a contract to manage pine plantations on State Land.

The GRDCB was chosen as a study area for the following reasons:

- The Garden Route Dam has strategic value as it supplies a community exceeding 200, 000 people in the City of George and environs with potable water⁷. This population increases significantly during the summer holiday season creating sporadic water shortages⁸.
- Sections of the catchment basin are heavily infested with alien vegetation.
- The dominant vegetation in the catchment basin is mountain Fynbos that should burn on a cycle of 12 to 14 years. The basin has not been burnt regularly in the past and the majority of the veld age currently exceeds 12 years, some of the veld reportedly being as old as 50 years (Loubser, 2015). Research into mountain catchments indicates that moribund vegetation markedly decreases stream flow (van der Zel, 1975), which is a problem in a strategic water source catchment area.
- The GRDCB lies in quaternary catchment K30D that has been identified as a priority for alien plant control (Forsyth, 2009).
- The GRDCB is a typical example of similar catchment basins that feed numerous water storage dams and towns in the Western Cape, thereby providing an opportunity for lessons learnt here to be extended to other such areas.

The Southern Cape experienced a severe drought during the period from 2009 to 2011. At one stage the level of the Garden Route Dam was reduced to less than 10% of its total capacity and was one of the factors leading to the

⁷ http://www.statssa.gov.za/?page_id=993&id=george-municipality

⁸ http://www.george.org.za/file/chapter_2.pdf

introduction of Disaster Management relief measures at the time. The drought coincided with the global recession of 2008, making its impact on the local economy even more severe. In total, R572 million was spent by Government on wide ranging relief activities to alleviate the impact of the drought. Eighty five per cent of this money was spent on improving urban water supply options alone such as boreholes that have been sunk and are ready to be activated if required (Holloway, 2012). Management of water supply to the Garden Route dam on a long term basis however remains a critical factor for water provision in the area and good management in the catchment areas is vital. The volume of the Garden Route Dam is currently augmented by pumping water from the Kaaimans and Malgas Rivers, as well as recycled water from the water treatment plant. The catchments feeding these rivers are also managed by CapeNature.

7.4.1. Management Activity Summary

Map 7 in Appendix 1 illustrates the area that each landowner is responsible for in the catchment basin. There is no joint management plan currently in place for alien vegetation or fire management. CapeNature currently does some management in the area as referred to above.

While fire records are patchy, it is recorded that in 2005 a very hot wildfire burnt the major part of the plantation area, as well as the lower section next to the Saasveld road.

In 2010, R7 million emergency funding was received from the Department of Water Affairs to carry out a series of controlled burns in the GRDCB, specifically to “supplement water supplies”. One burn of roughly 1, 100 ha was completed and a series of firebreaks were constructed. R3 million of the emergency funding was spent on fire management and alien clearing operations in total. The remaining R4 million was returned to the Department in terms of the Division of Revenue Act controlling emergency funding.

Records for the work conducted in the GRDCB are also sketchy. It is claimed that from the mid-eighties up until 2003, very little or no catchment management work in terms of controlled burns or alien vegetation control, took place. Initial clearing operations in the old plantations in the lower reaches of the catchment were effectively carried out in 2011. Operations have however ceased after only two follow-ups and it is evident that the area is again heavily infested, particularly with wattle. Management have submitted proposals to fund a programme to clear the alien vegetation on municipal land (Loubser, 2015).

The George Municipality is no longer an implementing agent for Working for Water teams claiming that the WIMS system is not reliable. The Municipality appoint their own staff when financing is available.

Application has been made and approval has been received to develop a residential and hotel complex along the western banks of the dam.

7.4.2. Limitations to joint management

A key challenge to management of this area is that despite being a local authority and managing land exposed to fire, the George Municipality is not a member of the Southern Cape FPA.

The Eden District Municipality is one of the regions with the highest numbers of “disasters” in South Africa. Within the last eight years, 24 disasters or major incidents were registered in the region. This included incidents ranging from floods to oil spills and agricultural failures. Fire and alien vegetation issues are thus only one of a wide range of risks that authorities have to plan for (Pers. comm. G. Otto, 2015).

8. Limitations to this Study

Trying to establish the status of alien vegetation and fire management integration in the Western Cape is in reality a major undertaking, complicated by the wide range and number of landowners involved. The vast scale of the alien invader plant species infestation, coupled with the increasing relevance of fire management, makes it one of the most critical land management issues confronting landowners and management today. The annual national budget for Working for Water exceeds R1,5 billion⁹ while the budget spend on fire management would most likely match that. The impact and cost of alien vegetation and veldfires on socio economic and biophysical services is inestimable. A topic of this nature merits the consideration of a detailed and long-term study.

Ideally, the collection of fine scale data is required to address the questions posed at the initiation of the study. While adequate data can be sourced to provide high-level findings, the time frame for the study to collect data, analyse them, draft reports and present findings was less than 5 months.

There is a fair amount of institutional sensitivity around the provision of data as a vast investment has been made in the development of exclusive systems over time. Discretion had to be exercised when accessing this information and additional care taken to ensure that records are accurate.

An objective of this study was to provide information on a broad and complex issue and this has been done within the set limitations. Like any study however, this information should be subject to criticism and analysis from a range of stakeholders, and hopefully in this process, some advance will be made in resolving the integration of fire and alien vegetation management in the Western Cape.

⁹ <https://sites.google.com/site/wfwplanning/>

9. Findings

The general description of each management entity is discussed in the foregoing sections. Table 1 below provides a general summary of the findings to help draw comparisons, particularly with respect to the various levels of planning applicable.

Table 1. Summary of findings for management agencies in the study area

	Waboomskraal	Outeniqa NR	Herold FMU	GRDCB
Area	5 889 ha	38, 000 ha	2 032 ha	3, 500 ha
Strategic Plan	Only SCFPA plan	None	None	None
Operational Plan (Prescriptive)	None	Annual Integrated Work Plan	None	None
Fire Management addressed in MP	Yes in SCFPA plan	Adaptive in response to scientific development	SCFPA plan	No
Alien Vegetation management in MP	N/A	Adaptive in response to scientific development	No	Partial. <i>Ad hoc</i> response to drought
Integration of fire and alien vegetation	FPA plans only	Partial, short term.	No	No
Funding Sources	Uncertain	Not stable	Uncertain	Uncertain
Staff resources	1 Project Manager. No on-ground staff	1 Conservation manager, 1 Fire Officer	1 Fire Warden	Proposal made to appoint someone
Working for Water Teams	2 teams of 12 workers	4 teams of 11 workers	None	None
Fire records available	Detailed CapeNature records. SCFPA records not setup yet	Yes – detailed CapeNature Records	CapeNature records. SCFPA records not setup)	CapeNature, lower reaches unclear
Records of alien invasive plant clearing operations	Project 1 year old – records for this	Yes	No	Vague

9.1. Management planning

The most effective way of ensuring that alien vegetation and fire management activities are integrated is by including both activities into an operational plan to cover management activities. In this study, note was taken of the type of plans used by each organisation.

There are many interpretations of what a management plan is. Generally, all plans include guidelines for the management of a specified area for both the long and short term to achieve certain predetermined objectives. A distinction however has been observed in the two study areas forming part of the pilot study (namely Agulhas Plains and the Southern Cape) between plans that are mostly descriptive in format opposed to those that are more prescriptive (or operational). Some organisations have strategic type plans while others had planned management activities at a more practical level. Whilst both plans contain objectives for management, the prescriptive plans tend to focus more on the what, where, how and when certain activities need to take place to achieve the objectives. This practical information can be used to compile fundamental budgets and Annual Plans of Operation, and most importantly will indicate what the consequences are likely to be if certain prescribed activities do not take place. Descriptive plans on the other hand generally only provide a guideline or policies without any detailed activities, with the result that such plans may not be readily implemented.

Public entities, like CapeNature and the South African National Parks, generally have comprehensive planning systems in place covering both the strategic and operational aspects of planning. This is a requirement in terms of the National Environmental Biodiversity Management Act (Section 43). The level and degree to which these plans are applied is beyond the mandate of this study, but it is apparent that accurate APOs have been prepared each year and form part of a robust government controlled financial system.

Private instances on the other hand tend to rely on strategic type planning where the focus is on providing guidelines for management. This is possibly because a strategic plan is drafted when the organisation is first established. A lack of funding, or the fact that there are multiple landowners making up the conservation unit, also makes it difficult to prepare fine detailed operational type plans. Wildfires and alien vegetation infestation however, are obviously not constrained by boundaries and the impacts of both are evident across cadastral units. The ultimate challenge thus is to achieve integration of both these activities on a broad landscape basis. The question remains about whether it is possible to draft an operational plan across a wide geographic region such as the study area.

An issue in the Southern Cape study area is the joint management by multiple authorities and landowners of a single geographic feature, such as for example the Garden Route Dam Catchment Basin. Each organisation has its own policies, budgets and management structures, as well as distinctly different services they render. Their plans and ultimately budgets vary considerably and this can have a detrimental effect on the management of the resource. The challenge in areas like this is to develop adequately funded and integrated joint management plans that ultimately render the intended biophysical objectives - in this case it would be the sustained yield of high quality water to the Garden Route Dam. This objective can only be achieved if the management of fire and alien vegetation is fully integrated across cadastral boundaries.

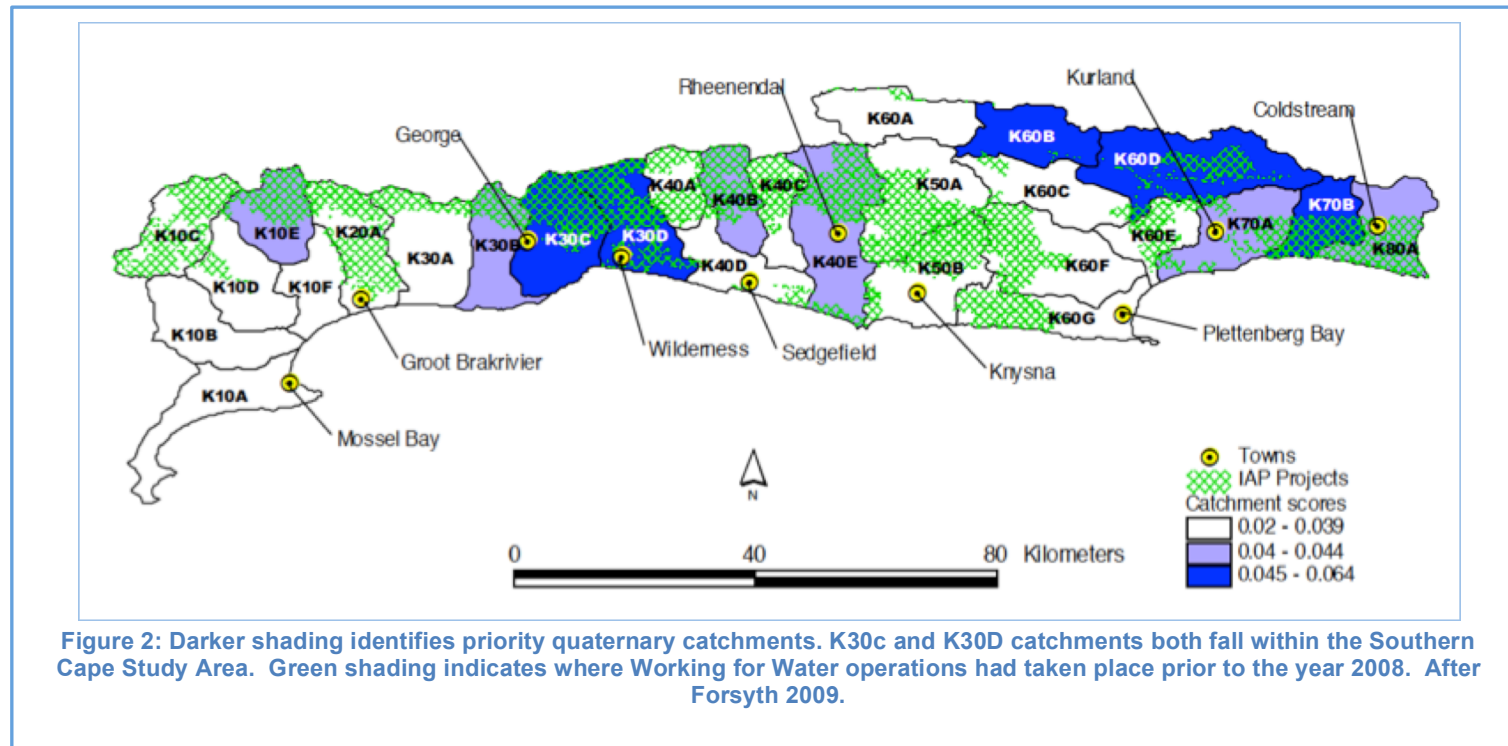
9.2. Resources

Forsyth (2009) determined in his research that the quaternary catchments K30C and K30D that make up the Southern Cape were priority areas for clearing alien invasive plant species (see Figure 2). When looking at the 2009/2010 budget spend for Working for Water however, it was apparent that R17 million was spent on study area catchments K50A, K70C, K40C, K10C, and K20A, while a little more than R1 million was spent on the priority catchment K30C. The other priority catchment K30D, in the Outeniqua received no funding for the year (Forsyth, 2009). This situation was meant to have been addressed subsequent to the publication of Forsyth's (2009) research. However, judging by the comments recorded earlier in Section 4 and findings of the current resources deployed in the mountain catchment area, it would seem as though little has changed.

The Agulhas Plain Study Area has a total of 33 Working for Water teams active in the four areas assessed, while in the Southern Cape Study Area only trace six teams involved in clearing operations could be traced. There is one Working on Fire team based at the Outeniqua Nature Reserves office at Witfontein, and another team assigned to the Southern Cape Fire Protection Association and based with the Eden District Municipality Fire and Rescue Services in George.

If alien vegetation and fire management operations were completely integrated on a regional scale it would entail a complex system of firebreaks and multiple prescribed burns closely coordinated with the alien vegetation clearing operations. This may result in effective management of fire and alien vegetation clearing with a positive consequence, as the number of job opportunities in the region would increase dramatically. This may in turn address the levels of unemployment referred to in Section 5.6.

The challenge thus is to accurately establish the number of job opportunities that could be created by fully integrating fire and alien vegetation activities. In addition sustainable funding has to be sourced to maintain this initiative.



9.3. Heeding the legislation

All invasive plant species are controlled by regulations contained within the National Environmental Management Biodiversity Act 10 of 2004 (NEMBA). The most recent regulations published in the Government Gazette on the 1 October 2014 lists four different categories of alien and invasive plant species that have to be managed, controlled or eradicated from areas where they may impact on the natural environment. Of particular interest is the Section 73 paragraph (2) of NEMBA that reads as follows:

73. Duty of care relating to listed invasive species.

(2) A person who is the owner of land on which a listed invasive species occurs must:

- Notify any relevant competent authority, in writing, of the listed invasive species occurring on that land;
- Take steps to control and eradicate the listed invasive species and to prevent it from spreading; and
- Take all the required steps to prevent or minimise harm to biodiversity.

This has a direct bearing on all private landowners who have alien vegetation on their properties. There are numerous properties in the study area where dense infestations border the Waboomskraal, Outeniqua Nature Reserve and Herold FMU, and where no effort has been made by the private landowners to control the aggressive invasion on their properties. The investment in time and money made by the conservation agencies in clearing alien vegetation is thus largely wasted as such actions are ineffectual in isolation.

In an attempt to address this in other areas, the City of Cape Town's Invasive Species Unit and the Department of Environmental Affairs have, as an example approached owners of heavily infested properties that border on the Table Mountain National Park to inform them of their legal obligations and assist planning to clear their properties. The campaign initially involves engaging with the owners and providing information emphasising the negative impact of alien vegetation, particularly with respect to the dangers of runaway fires. Landowners are required to submit a survey of the alien vegetation present on their properties, and to submit a plan on how they intend to clear the alien vegetation.

This law is not only applicable to private landowners and the following section 76 of NEMBA reproduced here is directed at all State Authorities:

76. Invasive species control plans of organs of state:

- (1) The management authority of a protected area preparing a management plan for the area in terms of the Protected Areas Act must incorporate into the management plan an invasive species control and eradication strategy;
- (2) All organs of state in all spheres of government must prepare an invasive species monitoring, control and eradication plan for land under their control, as part of their environmental plans in accordance with section 11 of the National Environmental Management Act. The invasive species monitoring, control and eradication plans of municipalities must be part of their Integrated Development Plans.

All organs of state have a year from October 2015, in terms of the legislation quoted above, in which to draw up their plans. This legislation has particular bearing on the State owned land bordering the Outeniqua Nature Reserve and in the Garden Route Dam Catchment Basin.

The guidelines for these regulations are currently being drafted and a point has been made that fire be integrated into the plans¹⁰.

9.4. Managing the Biomass

The burning of slash, litter and stacks subsequent to clearing operations will always have an element of risk. Fuels associated with alien vegetation create high intensity fires and safe burning operations are expensive. Research into alternative methods of utilising the biomass created after clearing operations is currently underway.

Post clearing biomass, particularly the woody component, has a significant potential for reuse as raw material in a wide range of fields. A study undertaken by the United Nations Environment Program (UNEP)¹¹ states that the total available biomass of invasive plants in 2004 was estimated to meet the annual requirements for all of South Africa's pulp, paper, and board mills. There are other opportunities for use of resultant biomass from alien vegetation, including conversion to energy from projects such as the production of biofuels, charcoal and biochar. The CSIR undertook to determine the volumes of alien vegetation biomass standing on the Agulhas Plain and the conversion of this to energy. In the 2011 biomass-to-energy study (IAP2ENERGY), the CSIR determined that a purely economic model of converting to biomass to energy was not feasible. However, the range of options mentioned above will all be considered with the project concluding in March 2016¹². Partnerships involving government, farmers and conservation agencies would however be required to develop an effective business model (Stafford, W. 2011).

Other options for using biomass include the Working for Water's Value-Added Industries Programme whereby wood is made available for processing, such as for building materials, indoor and outdoor furniture, screens and blinds, wooden toys

¹⁰ Pers. Comm. Dr Ian MacDonald. Environmental Consultant

¹¹ http://www.unep.org/training/programmes/Instructor%20Version/Part_3/readings/WfW_case.pdf

¹² <http://www.flowervalley.org.za/category/agulhas-biodiversity-initiative/>

furniture and fencing and even coffins¹³ and wood-sheet boards for insulation, all creating jobs, especially in rural areas¹⁴. There is thus a vast market for cleared alien vegetation which can increase local economies, provide jobs and opportunities for employment beyond the jobs created by the clearing operations and therefore promote social upliftment on a wider scale.

10. Conclusions

It is evident that the management of alien vegetation and fire in the various areas does not follow a standard norm. There are vast variations in approach, primarily influenced by the establishments' objectives, their access to resources and also by the level of planning exercised.

While there are many common challenges, some of the limitations and challenges faced by the organisations vary considerably, again partly because objectives and planning levels vary. Formal organisations tend to adopt prescriptive plans ranging from broad to annual spatial plans, while private organisations tend more towards *ad hoc* plans as resources or needs vary. Of concern in the Southern Cape study area is that funding and staff shortages are a challenge to all four of the organisations observed.

While it has been difficult to set up appointments with staff in some organisations, there has been a great deal of support from most for the agents in the study area. There is an underlying sense that everyone feels there is “another way of doing things” that may be more effective.

While this study is limited in scope by resources and time and thus provides only a high level overview, but some early observations warranting examination would include:

- There is an outstanding opportunity to develop sustainable and integrated work in all spheres of environmental management. If alien vegetation management is to be fully integrated with fire management, then a large number of controlled burns have to be undertaken. This would require that well equipped and trained teams of fire-fighters will have to be deployed in the region to conduct this

¹³Working for Water. Partnership to Build 'Eco-Friendly Coffins' Wins R1m World Bank Award.6 June 2005. <http://www.dwaf.gov.za/Docs>

¹⁴ Working for Water. Secondary Industries. [www.dwaf.gov.za/wfw/Secondary Ind/](http://www.dwaf.gov.za/wfw/Secondary%20Ind/)

work. Alien clearing operations in the priority catchment areas needs to be intensified to recover gains lost and to secure water supplies in the region.

- The influence of the FPAs has grown and is recognised by most landowners, but there is still a vast amount of work that can be done to extend that influence.
- Fire management is practiced to some extent by all landusers, but has invariably **NOT** included the management of alien vegetation, and particularly in an integrated manner. Many managers recognise this fact as a problem but are incapable of integrating operations due to the segregated nature of funding, or the extended public works programmes that are active within their areas of interest.
- Some managers have expressed the need to explore the management of fire and alien vegetation on a regional basis as opposed to the current chequered and isolated manner where cadastral boundaries generally confine planning and operations to specific areas, ignoring the regional nature of the functioning and patterns of processes in the area.
- There is an opportunity for an approach whereby highly ecologically sensitive or specific water production areas may need to be identified as focus areas. This approach takes the approach recommended by Forsyth (2009) in his study to prioritise catchments for invasive alien control a step further in the goal of integrated management.

11. Acknowledgments

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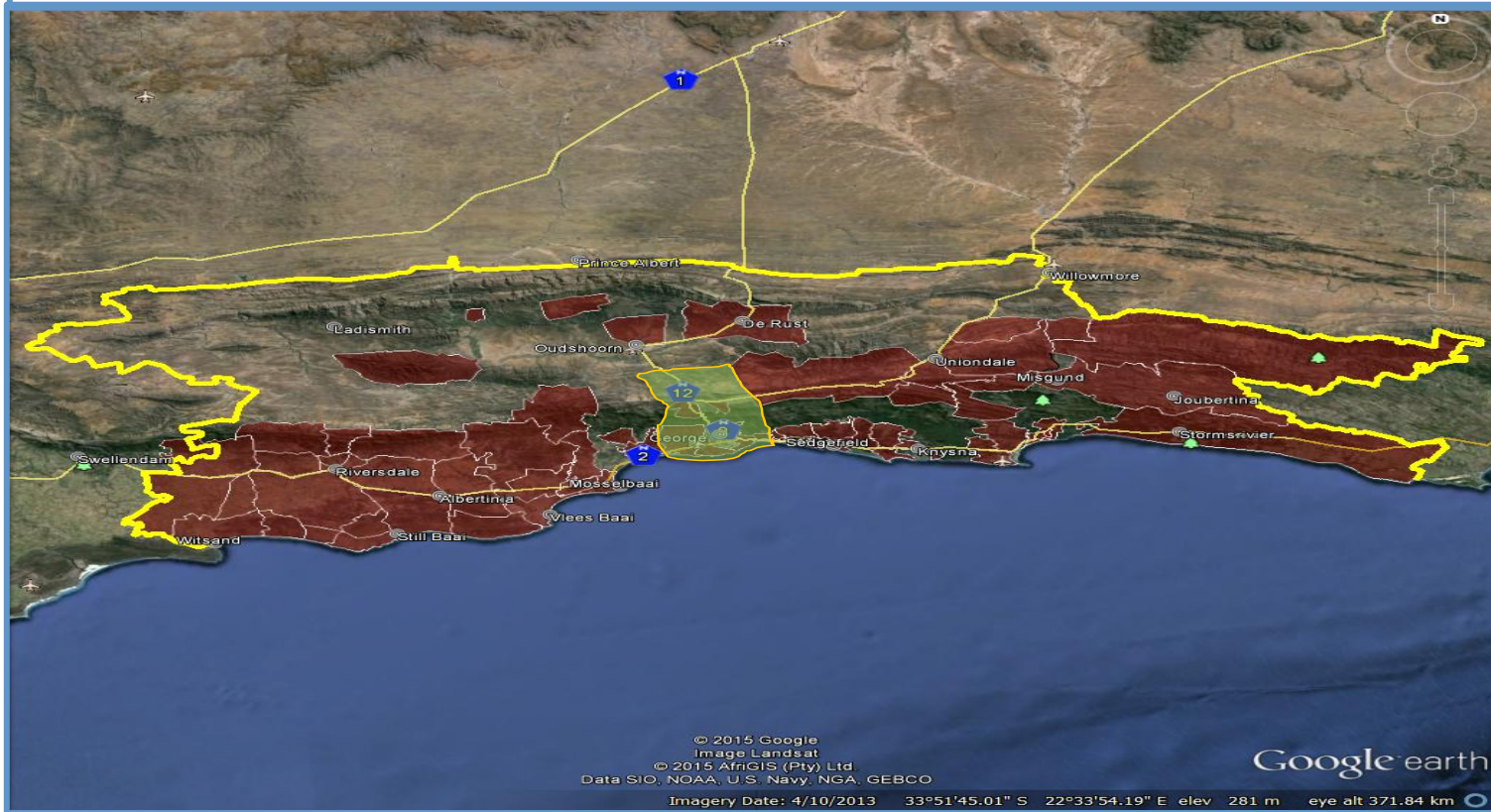
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13. Appendix 1

Maps provided here are in a low resolution to facilitate e-mailing and printing. Higher definition copies are available on request and will be available at the workshops planned for November 2015.

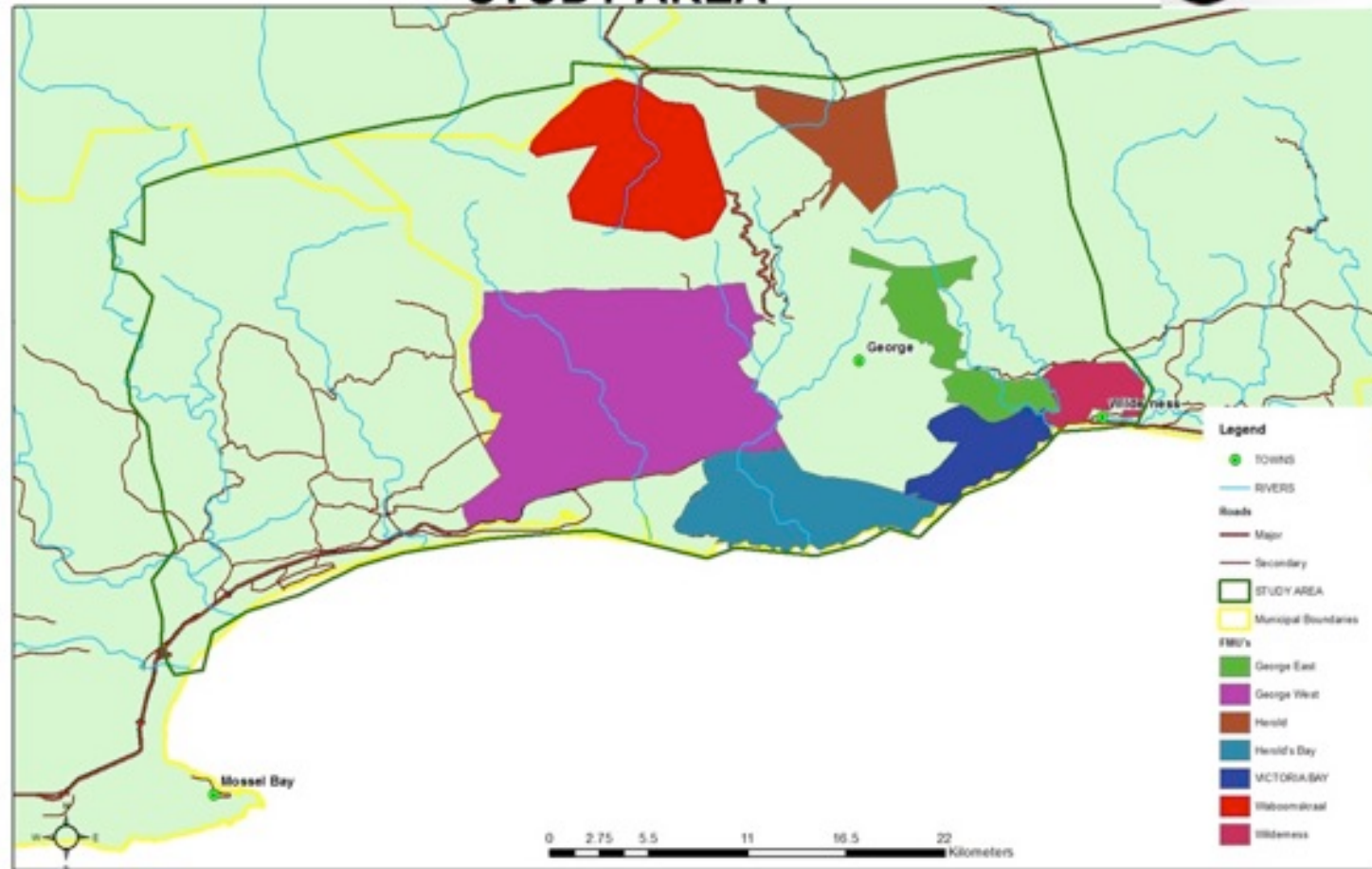
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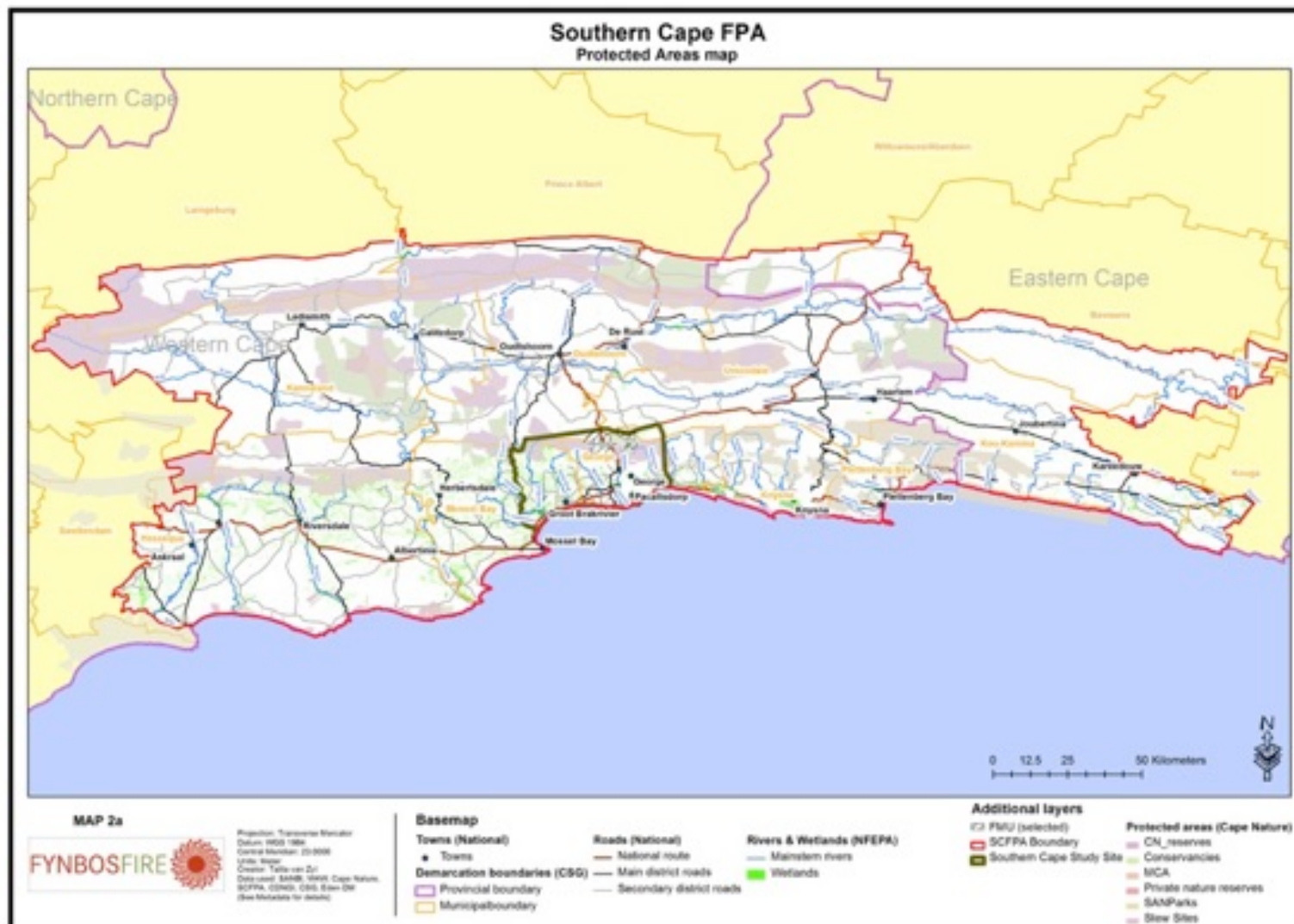


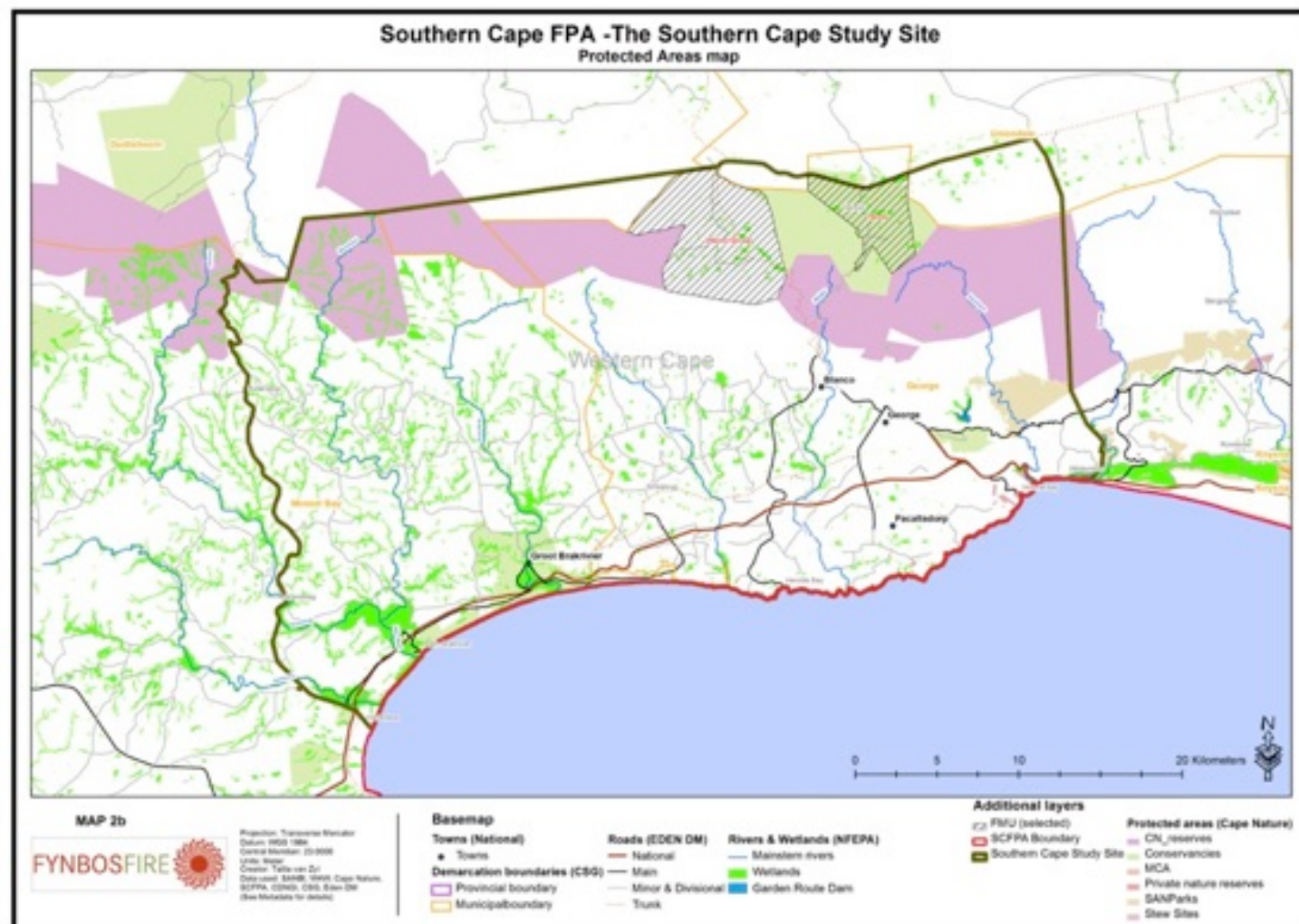
Map 1a

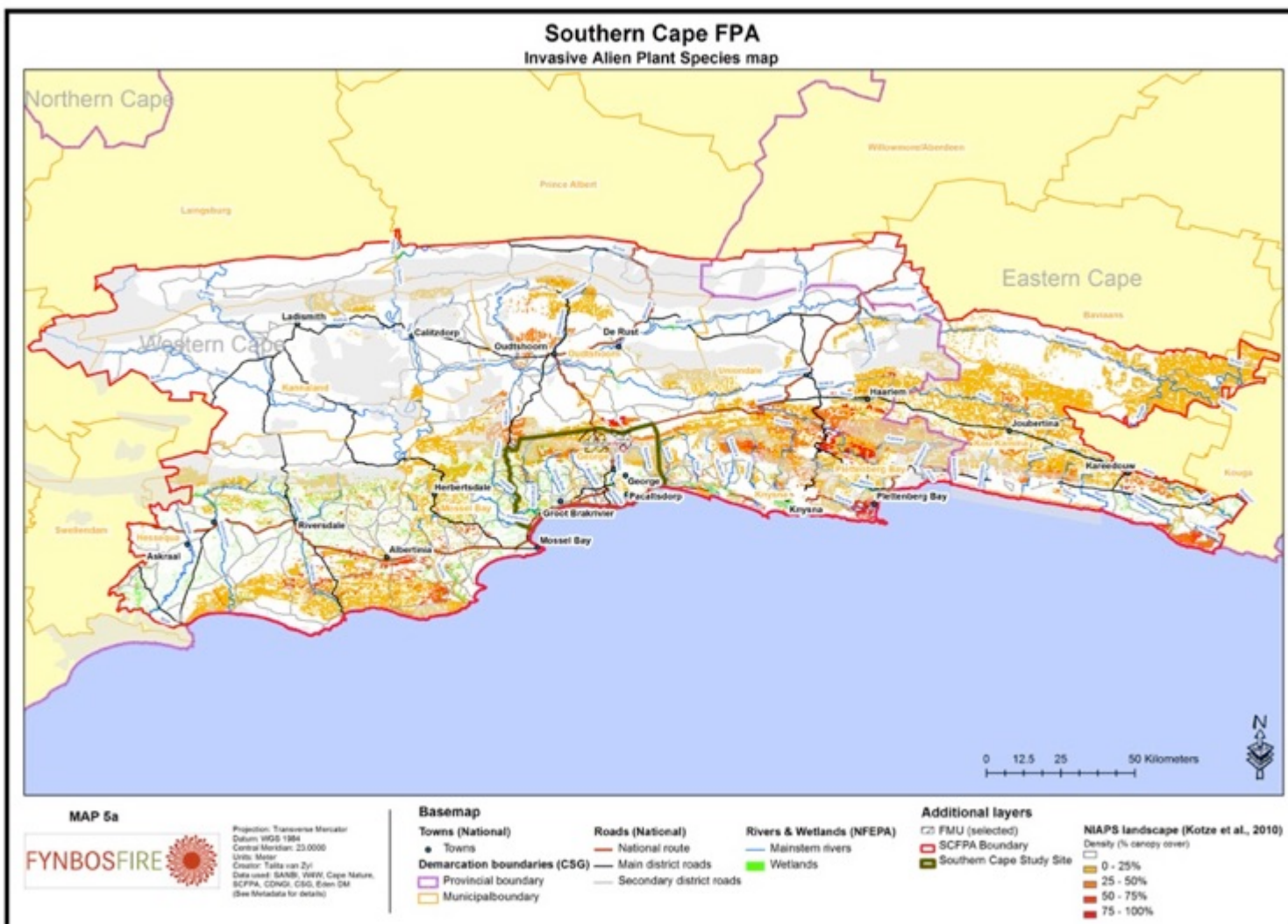
The Southern Cape Fire Protection Association with the study area highlighted in yellow. <http://www.scfpa.co.za>

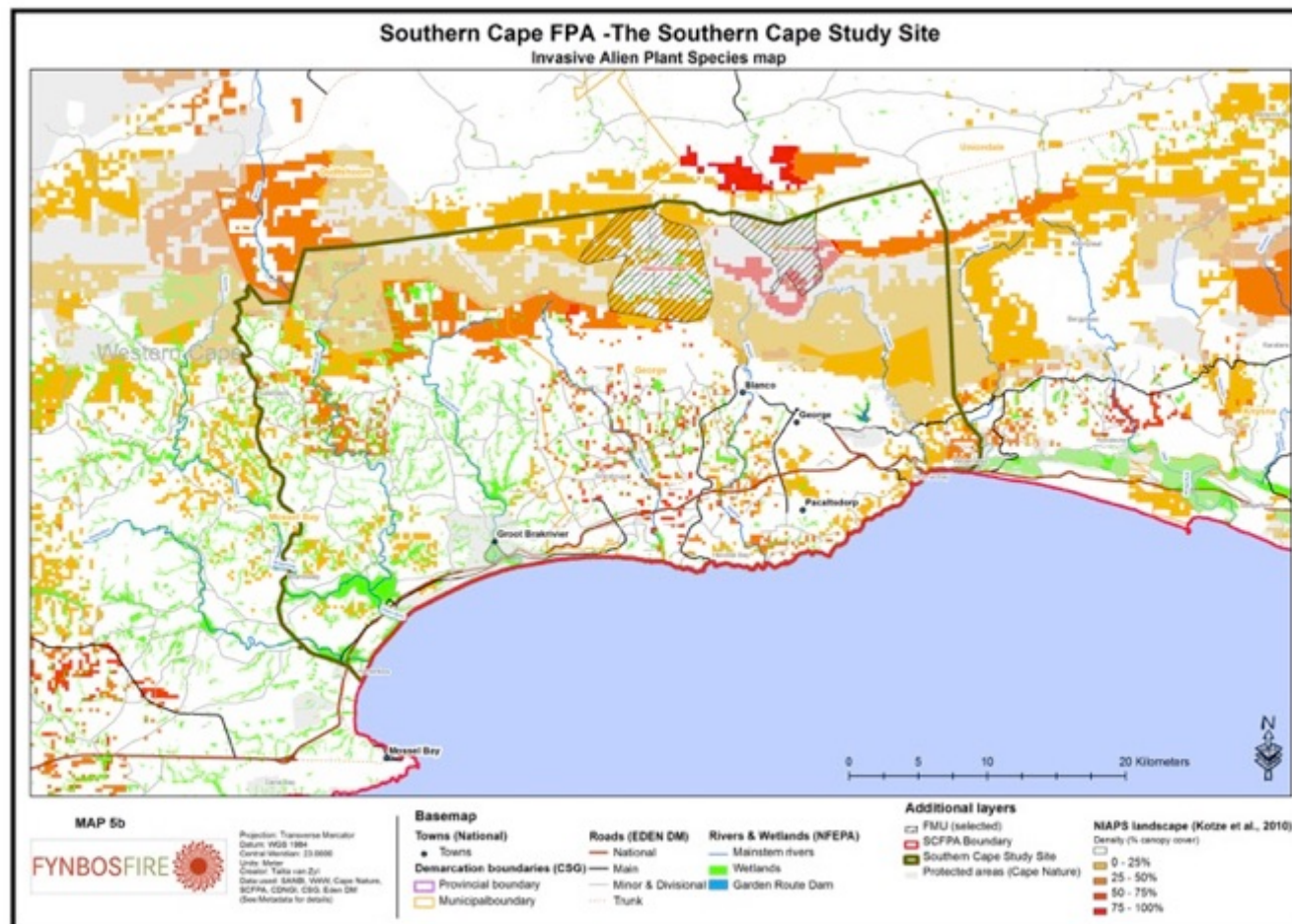
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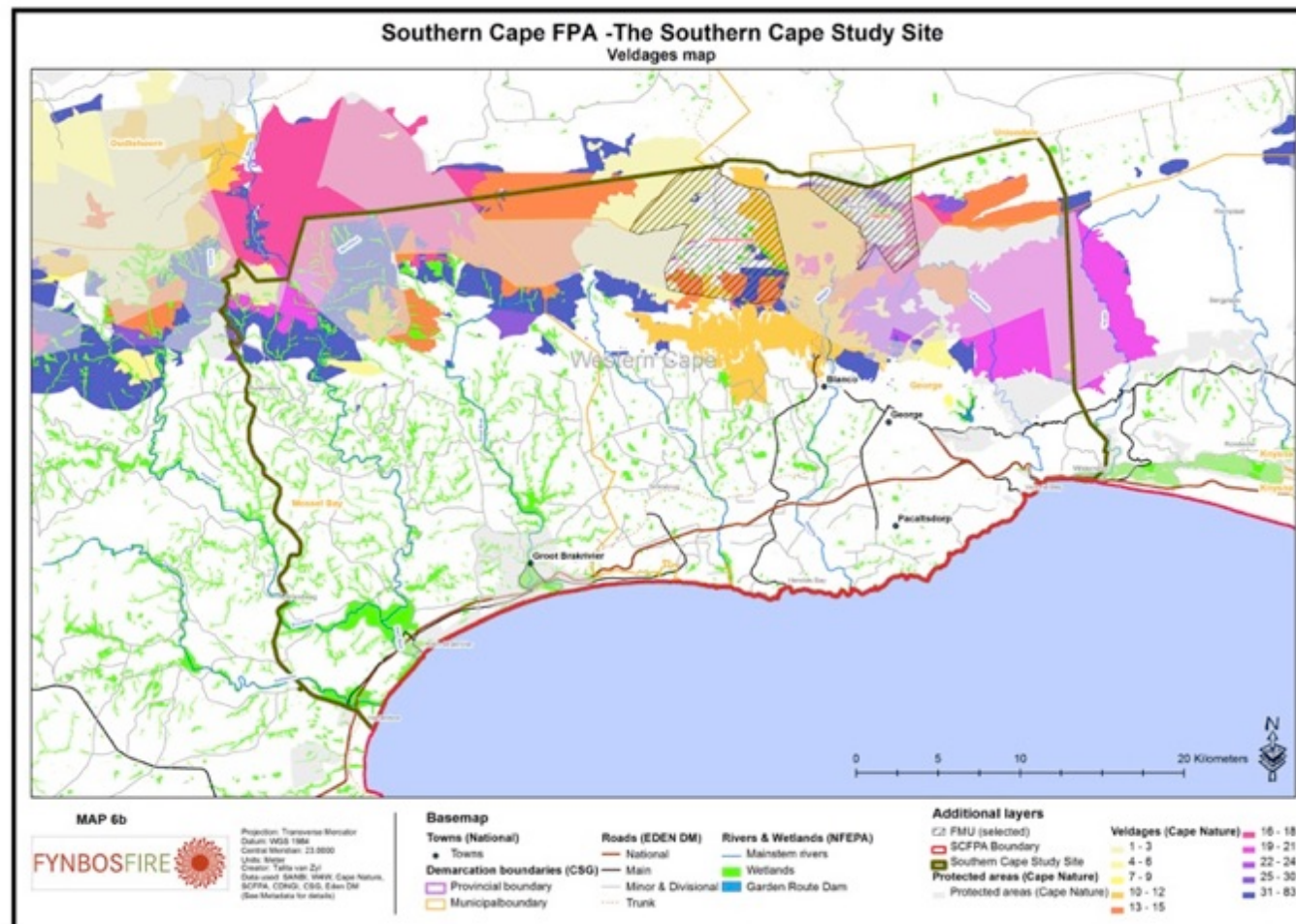




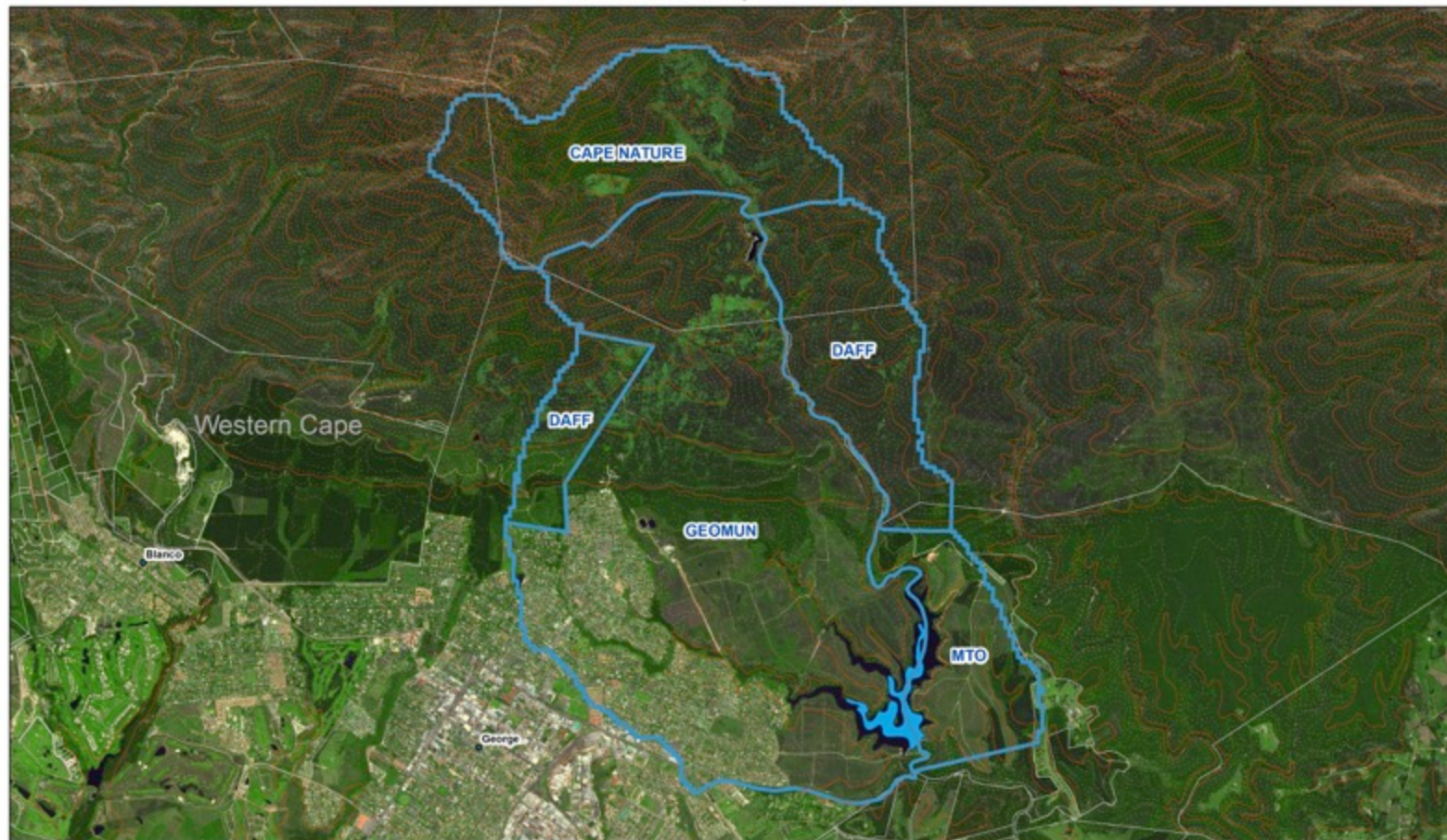




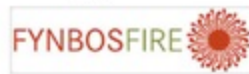




Southern Cape FPA -The Southern Cape Study Site Garden Route Dam, Catchment area



MAP



Projection: Transverse Mercator
Datum: WGS 1984
Central Meridian: 23.0000
Units: Meter
Creator: Tjallingii van Zijl
Data used: CDNSI, CSQ, NPEPA,
SPOTS(2008)
(See Metadata for details)

Basemap

Towns (National)

- Towns
- <all other values>

class

- Major
- Minor

Quinary_CatchmentGeorge

- Farm_Portion_name
- Garden Route Dam

