



FORESTRY SOUTH AFRICA
Registration No: 017-638 NPO

Code of Good Practice for Managing Alien and Invasive Species in the South African Forestry Industry

February 2018

Background and Supporting Documentation

Prepared for Forestry South Africa

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Background

The spread of Alien Invasive Species (AIS) is of worldwide concern. In South Africa, it is claimed that these introduced plant species are causing millions of rands of damage to the economy every year and are the biggest threat to the country's biodiversity. Few countries have attempted to control or eradicate them more in than South Africa.

The [Working for Water \(WfW\) Programme](#), a government initiative of the Department of Environmental Affairs, employs upward of 25,000 people each year in an attempt to eradicate and control these AIS. The objective of the WfW is to reduce the density of established terrestrial AIS through labour intensive, mechanical and chemical control by 22% per annum. The costs and benefits of AIS control has indicated gains in water yields in a number of catchments and the reported recovery of insects, specifically dragonflies, as a result of the reduction in density of wattle.

(www.dwaf.gov.za/wfw/docs/Marais&Wannenburgh,2008.pdf).

By 2005/6, the programme had spent R3.2 billion since its inception in 1995. By extrapolation, this figure is likely to be in the region of R6 billion up until 2017.

Forestry companies and growers spend an estimated R100 million annually in the control of AIS on their land outside the planted area.

Most commercial forest species in South Africa are listed as AIS within regulations published under the National Environmental Management: Biodiversity Act, 2004, (Act No. 10 of 2004), and as weeds within regulations published under the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). Under these Acts, all landowners are legally responsible for controlling the listed AIS and invasive plants and weeds on their own land.

This Code of Good Practice proposes that plantation forest landowners voluntarily assist in the control of AIS on adjoining property or properties in collaboration with neighbours, non-governmental organisations or specific government organisations such as the WfW Extended Public Works Programme.

While not an implementing agent, Forestry South Africa (FSA) encourages its members to:

- i. Control the spread of listed AIS and weeds on their own land as prescribed by law.
- ii. Implement best management actions to control and minimise the spread of AIS.
- iii. Where possible, voluntarily assist neighbours and other landowners in the area with the control of AIS.

The Code of Good Practice describes the scope, legal requirements, voluntary actions and best practices to control the spread of AIS.

1. Scope

The scope of the Code of Good Practice is a formal statement by FSA that promotes:

- i. Legal requirements for the control of the spread of plantation species on member's land.
- ii. Voluntary actions by members for the control of AIS on adjoining land.
- iii. Good land management actions by landowners to control the spread of AIS.

2. Historical context

Globally, both natural and plantation forests make a significant contribution to regional and national economies and provide multiple products and ecosystem services to support livelihoods and biodiversity conservation.

In South Africa, plantation forestry was established in the late 19th century as a timber resource to augment indigenous forest harvesting, firstly in the fynbos surrounding the natural forests in the western and southern regions of the Cape Province and later in the grasslands of the eastern parts of the country. Forestry was seen then as a beneficial land use activity with little to no impact, while government actively encouraged and assisted landowners to establish plantations.

Tree planting was promoted through subsidies and competitions but legislation and policing made it mandatory for some people to plant trees. At that time and into the early 1900s, there were no legal restrictions on where plantations or trees could be established.

The development of mining and the subsequent building of railways caused a significant change in tree planting. Eucalyptus plantations for sleepers and firewood were established and the displacement of wagon transport by the railways rendered the extraction of timber from the indigenous forests unprofitable.

South Africa's most pressing forestry problem after 1910 was its severe shortage of softwood (pine). In response to this demand, afforestation expanded rapidly from the 1920s to 1930s.

However, concerns were expressed by a growing number of individuals and groups over the impacts of afforestation on water resources. In response to these concerns, research on the impacts of plantations on streamflow was initiated in the 1950s by the then Department of Forestry. These findings documented the impacts of forest plantations on water resources which ultimately led to regulations under the Forest Act of 1968. From 1972, permits were required for afforestation and more recently the National Water Act of 1998 (NWA) required that a water use licence be granted before any land may be afforested which is classified as a stream flow reduction activity (SFRA).

3. Legal requirements for the control of AIS

Two pieces of legislation require the removal of commercial forestry species from areas where they are regarded as unlawful. Unlawful presence of AIS are areas of land owned by a landowner outside the area planted to trees (recognised as the demarcated area under the Conservation of Agricultural Resources Act (CARA regulations)) and outside the planted area permitted as an existing lawful water use for a SFRA (as regulated under the NWA). The legal requirements are included in **Appendix A and B** respectively.

4. Voluntary collaborative actions with neighbours and interested organisations

In the interest of controlling or reducing current infestations outside the forest plantation estate boundary, voluntary information sharing systems and collaboration may be undertaken in conjunction with:

- i. Adjoining landowner/s;
- ii. National, provincial or municipal alien and invasive species control programmes, such as the Working on Fire (WoF) and WfW managed by national government; and/or
- iii. The establishment of small business operations within communities to assist in the control of AIS.

5. Good land management, fire and grazing practices

Good land management practices involve the use of controlled fires (prescribed burning) at regular intervals and/or correct livestock grazing (stocking rates and rotational grazing). Landowners should ensure:

- i. Reduction in density of AIS, such as a controlled fire programme at the correct time of the year (late winter to spring in most areas) and at an intensity that enables hot fires with the prevailing wind to burn off the above ground AIS. (*Please note that any burning operation must be carefully planned and take into consideration factors such as the local fire danger index (FDI) and fuel loads in order to comply with conditions of the National Veld and Forest Fire Act, 1998 (NVFFA, Act No.101 of 1998)*); and
- ii. Grazing practices that are in accordance with accepted grazing intensity and rotational grazing practices.

6. Best practice for control of AIS

i. Management plan

A management plan should have clear objectives, which can be monitored and measured in terms of outcomes/progress. The management plan should be proportional to the scale and density of infestation (**see Appendix C** for further details).

ii. Adopt good practices for habitat restoration/rehabilitation

Specific guidelines for the restoration of sites previously occupied by alien plantations should be adopted. The focus should be on the establishment of an indigenous grass cover to minimise soil erosion and to implement a controlled fire regime which enhances, to some extent, the return of some biodiversity elements and suppresses re-growth of AIS.

Commercially available species such as *Eragrostis curvula* and their various cultivars can be used as soil cover and reduce the potential for excessive soil loss. As an alternative, appropriate grass species can be recommended by pasture scientists.

iii. Implement early detection and response systems

Early detection and initiation of a management response can make a difference between being able to employ offensive strategies (possibly even eradication) or facing the reality of a more expensive defensive strategy (control and many follow-ups).

New invasive species should be targeted with a strategy to achieve four goals:

1. **Prevention** of spread into new areas.
2. **Local eradication** of isolated populations.
3. **Containment** in areas where eradication is not possible.
4. **Actions** to protect assets where containment is no longer an option.

In the future there are likely to be many AIS that can be expected to occur over time. The risk of arrival is likely to be exacerbated by climate change and detection of new AIS is important at the estate level.

The South African National Biodiversity Institute has an [early detection and rapid response team](#) that is structured around the activities of early detection of plant invasions, identification and verification of the invasive plants, risk assessments and response planning and immediate response action.

References

- a. Bennett, B.M and Kruger, K.F. 2015. Forestry and water conservation in South Africa: History, science and policy. World Forestry Series, ANU Press. The Australian National University, Australia. 269pp.
- b. Brundu, G and Richardson, DM. 2016. Planted forests and invasive alien trees in Europe: A code for managing existing and future plantings to mitigate the risk of negative impacts from invasions. *NeoBiota* 30: 5-47 doi: 10.3897/neobiota.30.7015. <http://neobiota.pensoft.net>
- c. Forestry South Africa Environmental Guidelines for Plantation Forestry in South Africa. 2017. (<http://www.forestry.co.za>)
- d. Guidelines for Monitoring, Control and Eradication Plans as Required by Section 76 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) NEMBA for Species Listed as Invasive in Terms of Section 70 of the Act: 2015. Biosecurity: Department of Environmental Affairs, Cape Town.14pp.

Version 8 | February 2018 | J Scotcher (jscotcher@forestlore.co.za)

Supporting Documentation

Appendix A

Conservation of Agricultural Resources Act

The Conservation of Agricultural Resource Act, 1983 (Act No. 43 of 1983) (CARA) focuses on soil health through the reduction of human-induced soil erosion, but also regulates weeds and invader plants that pose a threat to the natural resources on the land.

The Act allows for the prohibition of the spreading of weeds and regulations published under the CARA in March 2001 declared certain plants as weeds and invader plants and grouped them into three categories that reflected their threat to the conservation of the natural agricultural resources and vegetation. Note that the regulations came into effect in March 2001 and are likely to be replaced by the National Environmental Management: Biodiversity Act: Alien and Invasive Species Regulations.

Category 1 plants may not occur on any land or inland water surface and a land user is lawfully required to control any category 1 plant by means specified in the regulations. Effectively, no person may establish plant, maintain, multiply, propagate, import, sell, or acquire any propagating material of any category 1 plant. Species that fall into this category are *Acacia implexa*, *A. longifolia*, *A. paraloxa*, *A. pynantha*, *A. dealbata* and *Eucalyptus lehmannia*. However, none of these species are commercial forestry species.

Category 2 plants may not occur on any land or inland water surface other than a demarcated area. The Act allows for an area in respect of which a water use licence for stream flow reduction activities has been issued in terms of the NWA, to be deemed to be a demarcated area. By implication, this includes all existing SFRA lawful water users.

Commercial forestry species are included as Category 2 species in the regulations and therefore need to be controlled when outside the demarcated area. Control is only lawfully required on the landowner's property.

Species included in this category include *A. cyclops*, *A. dealbata*, *A. decurrens*, *A. mearnsii*, *A. melanoxyton*, *A. saligna*, *Eucalyptus camaldulensis*, *E. cladocalyx*, *E. diversiflora*, *E. grandis*, *E. paniculata*, *E. sideroxyton*, *E. lehmanni*, *Pinus canariensis*, *P. elliotti*, *P. halepensis*, *P. patula*, *P. pinaster*, *P. radiata*, *P. roxburghii*, and *P. taeda*.

Category 3 plants shall not occur on any land or inland water surface other than in a biological reserve. No commercial forestry species are included in Category 3 plants.

Further, the Act allows for the demarcation of an area for the occurrence, establishment and maintenance of a Category 2 plant if:

- a. The category 2 plants in the area are cultivated under controlled circumstances.
- b. The land user has been authorised to use water in terms of the NWA.
- c. The Category 2 plants or products of Category 2 plants in the area are demonstrated to primarily serve a commercial purpose, use as a woodlot, shelter belt, building material, animal fodder, soil stabilisation, medicinal or other beneficial function.
- d. All reasonable steps are taken to curtail the spreading of propagating material of the category 2 plants outside the demarcated areas.

In addition and unless authorised in terms of the NWA, no land use shall allow Category 2 plants to occur within 30 metres of the 1:50 year flood line of a river, spring, natural channel in which water flows regularly, or intermittently, lake, dam or wetland. Note that this does not apply to plantations, but only to trees outside the demarcated area/planted forest.

Note that should a forester wish to establish a woodlot for on-farm use, but not for commercial use, this is permitted in terms of the regulations but must be applied for through the local provincial agricultural affairs office. If authorised, the woodlot will be regarded as a demarcated area.

The regulations specify the methods of control, which include:

- a) Uprooting, felling, cutting or burning.
- b) Treatment with a herbicide (weed killer in the regulations) that is registered for use in connection with such plants in accordance with the directions for the use of such herbicide (weed killer in the regulations).
- c) Biological control carried out in accordance with the stipulations of the Agricultural Pests Act, 1983 (Act No. 36 of 1983), the Environment Conservation Act, 1989 (Act No. 73 of 1989) and any other applicable legislation.
- d) Any other method of treatment recognised by the executive officer that has as its object the control of plants concerned.
- e) A combination of one or more of the methods prescribed in paragraphs a), c) and d), save that biological control reserves and areas where biological control agents are effective shall not be disturbed by other control methods to the extent that the agents are destroyed or become ineffective.

From a practical perspective, it is clear that only herbicides that are registered for the control of the weeds or AIS plants can be used lawfully. Use of herbicides NOT registered for control may NOT be used.

Appendix B

National Environmental Management: Biodiversity Act: Alien and Invasive Species Regulations

The regulations were published on 1 August 2014, came into effect on 1 October 2014 and were subsequently amended in July 2016. The regulations have four categories of Listed Invasive Species and no person may carry out a restricted activity involving a specimen of a Listed Invasive Species without a permit, except where exempted from doing so.

Plantations fall into this exemption category which means a plantation which existed when the Notice came in effect (1 October 2014) is exempted from requiring a permit for any restricted activity in terms of the Act or the Alien and Invasive Species Regulations, 2014, if such plantation is authorised in terms of section 22(1) (a) or (b) of the National Water Act. This means that any water use authorised under a water use licence or if that water use is permissible as a continuation of an existing lawful use.

A restricted activity as defined in the Act means:

- I. *Importing into the Republic, including introducing from the sea, any specimen of an alien or listed invasive species;*
- II. *Having in possession or exercising physical control over any specimen of an alien or listed invasive species;*
- III. *Growing, breeding or in any way propagating any specimen of an alien or listed invasive species, or causing it to multiply;*
- IV. *Conveying, moving or otherwise trans-locating any specimen of an alien or listed invasive species;*
- V. *Selling, or otherwise trading in, buying, receiving, giving, donating, or accepting or disposing of any specimen of an alien or listed invasive species; and*
- VI. *Any other prescribed activity which involves a specimen of an alien or listed invasive species.*

In addition to what is defined in the Act, the regulations of 1 August 2014 define further restricted activities as being:

- a) *Spreading or allowing the spread of, any specimen of a listed invasive species.*
- b) *Releasing any specimen of a listed invasive species.*
- c) *Transfer or release of a listed invasive freshwater species.*
- d) *Discharging of or disposing into any waterway or the ocean, water from an aquarium.*
- e) *Catch and release of a specimen of a listed invasive freshwater fish.*
- f) *Introduction of a specimen of an alien or listed invasive species to offshore islands.*
- g) *Release of a specimen of a listed invasive freshwater fish species.*

Note that:

(1) *A specimen means any living or dead animal, plant or other organism; a seed, egg, gamete or propagule or part of any animal, plant or other organism capable of propagation or reproduction or in any way transferring genetic traits; any derivative of any animal, plant or other organism; or any goods which contain a derivative of an animal, plant or organism; or from an accompanying document, from the packaging or mark or label, or from any other indications, appear to be or contain a derivative of an animal, plant or other organism.*

(2) *A derivative in relation to an animal, plant or other organism, means any part, tissue or extract, of an animal, plant or other organism whether fresh, preserved, or processed and includes any chemical compound derived from such part, tissue or extract.*

(3) *As a general exemption "all dead specimens of any listed species are exempted from requiring a Permit for any restricted activity" (this is important as far as transporting of harvested timber).*

1. The main contents of the regulations and the list

1. The Alien and Invasive Species Regulations, 2014, published on 1 August 2014 in GG No. 37885 R 598 and the Alien and Invasive Species Lists published on 1 August 2014 in GG No. 37886 R 599 came into effect on 1 October 2014. They were amended in July 2016.
2. The regulations have four categories of AIS and the list of commercial forestry species is included in all categories, depending on the species and the geographic location. In most cases, all plantation species are exempted from the regulations provided the species occur within the authorised area (permit, water use licence, existing lawful water use).

2. Exemptions

- ✓ *Eucalyptus camaldulensis*, *E. cladocalyx*, *E. conferruminata (E. lehmanni)*, *E. diversicolor*, *E. grandis*, *E. tereticornis* and hybrids, varieties and selections of these species are **exempted** from the requirement to obtain a permit for **existing plantations**.
- ✓ *Acacia decurrens*, *A. mearnsii* and *A. melanoxylon* species are **exempted** from the requirement to obtain a permit for an **existing plantation**. All other *Acacia* species are included as a **Category 3** species and are subject to certain conditions.
- ✓ *Pinus patula*, *P. roxburghii*, and *P. taeda* and hybrids, varieties and selections are **exempted** from the requirement to obtain a permit for **existing plantations**.
- ✓ *P. elliotti* is exempted from the regulations but only for existing plantations of sterile specimens. Therefore, any fertile specimens of *P.elliotti* will require a permit for a restricted activity. *P. canariensis* is a **Category 3** species and must be **removed from riparian areas**.
- ✓ *P. halepensis* is listed as a **Category 3 species** in the **Eastern Cape, Free State and Western Cape** and must be **removed from riverine areas**
- ✓ All **dead specimens** of listed alien and invasive species are **exempted** from requiring a permit. This is important when it comes to the transport and movement of harvested timber.
- ✓ **All plantations** in the **Western Cape using *Pinus pinaster* and *P. radiata*** and hybrids, varieties and selections as of 1 October 2104, have to **apply for a permit** to carry out a restricted activity. However, there is **no need to carry out a risk assessment** (amended July 2016).
- ✓ NOTE that **the exemption from the requirements to obtain a permit apply only to existing plantations**. This is very important since it means that any new applications for afforestation after 1 October 2014 using the species contained in the Alien and Invasive Species List will require a permit for a restricted activity and must be accompanied by a risk assessment.

3. Other conditions

1. Any declared protected area within a forestry estate will be required to prepare an Invasive Species Monitoring, Control and Eradication Plan according to guidelines recently developed. The plans are required to be prepared by management authorities of protected areas and organs of state.
2. Permits issued for new plantations after 1 October 2014 are not transferable.
3. When a commercial forestry plantation is sold which contains areas planted under the authorisation of a permit (may only be a small part of the entire plantation), then the new owner must apply for a new permit, but only for that area of land to which the permit applies.
4. Permits are issued for five years but can be extended for a period exceeding five years if in terms of an integrated permit and the other law to which the permit relates provides for a longer period or where recommended by a risk assessment. Since a water use licence is issued for 40 years, it is logical that a permit for a restricted activity involving an alien and invasive plant should be issued for the same period. It is likely that following discussion with

the DEA and FSA, the length of a permit will be aligned with the duration of a SFRA water use licence and will also be freely transferable. Note that while the DWS requires a review of a water use licence only at the time periods stipulated for that purpose, they may amend any condition of the licence other than the period. This means that the licence period of 40 years for a stream flow reduction activity may not be amended in terms of the National Water Act (section 48(1) and (2)).

5. The permit holder is required to take all necessary steps to prevent the escape and spread of the species outside the area for which the permit is issued. This is a duplication of what is contained in CARA regulations and conditions included in the water use licence in terms of the National Water Act.
6. Any person may request a directive to be issued to another person where that person has failed to meet his/her duty of care relating to AIS. This has ramifications as it opens the possibility of a stakeholder or any other party to request a directive to be issued to any other person for failing to take steps to prevent harm to biodiversity in carrying out a restricted activity involving an alien or invasive species.

4. Categories of Listed Alien and Invasive Species

Category 1a Listed Invasive Species (LIS) (the strictest category)

- (1) **Category 1a LIS:** any person in control of a Category 1a LIS **must immediately** take steps to **combat or eradicate** the species by means of methods appropriate for the species and the environment in which it occurs, with due consideration for the environment (see sections 75 (1), (2) and (3) of the Act).
- (2) Such person must also allow an official from the department to enter onto land to monitor, assist with or implement the combating or eradication of the LIS.
- (3) If an Invasive Species Management Programme has been developed in terms of the Act, a person must combat or control the LIS in accordance with the programme.

Category 1b Listed Invasive Species

- (1) **Category 1b LIS:** any person in control of a Category 1b LIS must **control** that species by means of **methods appropriate for the species** and the environment in which it occurs, with due consideration for the environment (see sections 75(1), (2) and (3) of the Act).
- (2) Such person must also allow an official from the department to enter onto land to monitor, assist with or implement the combating or eradication of the LIS.
- (3) If an Invasive Species Management Programme has been developed in terms of the Act, a person must combat or control the LIS in accordance with the programme.

Category 2 Listed Invasive Species

- (1) **Category 2 LIS:** require a **permit** to carry out a **restricted activity** within an area specified in the Notice or an area specified in the permit, as the case may be.
- (2) **No person** may carry out a **restricted activity** in respect of a Category 2 LIS **without a permit**.
- (3) **A landowner** on whose land a **Category 2 LIS** occurs or person in possession of a permit must **ensure that the specimens** of the species **do not spread** outside of the land or area specified in the notice or permit.
- (4) If an Invasive Species Management Programme has been developed, a person must control the LIS in accordance with such a programme.

- (5) Unless otherwise specified in the Notice, any species listed as a Category 2 LIS that occurs outside the specified area (see (1) above), must be considered to be a Category 1b LIS and must be controlled as such.
- (6) **Notwithstanding the specific exemptions relating to existing plantations** in respect of LIS published in Notice 599 of 1 August 2014, **any person** or organ of state must ensure that the specimen of such LIS **do not spread outside of the land over which they have control**.

Category 3 Listed Invasive Species

- (1) **Category 3 LIS:** which are subject to **exemptions** (section 72(3) of the Act) and prohibitions (section 71A of the Act), as specified in the Notice.
- (2) Any **Category 3 LIS** that occurs in **riparian areas** must be considered a **Category 1b LIS** and **managed as such**.
- (3) If an Invasive Species Management Programme has been developed, a person must control the LIS in accordance with such a programme.

For a full list of all Listed Alien and Invasive Species, visit the Department of Environmental Affairs website www.environment.gov.za.

Appendix C

Implementation of a Management Plan

A management plan is a prerequisite for a professionally managed AIS operation. The plan should cover the following points:

- i. Clear illustration of the **extent of infestation**. This can be quantified using a five-point scale: high infestation (50-100% of the target area); medium infestation (20-49% of the target area) low (10-19% of the target area) and maintenance phase (less than 5%).
- ii. **Monitoring** should be done annually to determine the extent of the infestation following the initial control.
- iii. Calculation of the **area** that can be treated annually within the limitations of available resources (labour, transport, finances and other relevant matters).
- iv. Calculation of the **costs** of the control operations which should include transport of labour, direct labour costs, costs of herbicides, any training that may be necessary, personal protective equipment, purchase and maintenance of equipment (knapsack sprayers, etc.). Should there be any form of co-operative agreement between adjoining landowners, or landowners in a catchment, there should be agreement as to how these costs can be shared in a way that is fair and equitable and is proportional to the scale and intensity of the infestation.
- v. **Timing** – depending on the species to be controlled and other work-related priorities, it is important to use the best opportunities that will result in a successful operation. For example, treating bramble with herbicides will achieve a better kill rate during late summer or early autumn when the plant is trans-locating above ground nutrients (and thus the herbicides) in the leaves into the roots. Note that in some cases, it may be necessary to allow for more than one control operation in the growing season due to the vigorous growth of certain species.
- vi. **Catchment approach** – in areas of high biodiversity and conservation importance, foresters should initiate control measure at the top of a catchment and work downstream to improve the success rate. This approach is also particularly effective in co-operation with landowners in the catchment.

An AIS control programme consists of **three phases**:

- i. An **initial control** is the first attempt to control an invasive species infestation. This may be a dense population of the target species, or simply a few scattered plants. Depending on the type of AIS, this may involve obtaining access with the use of chainsaws, brush cutters, fire or slashing. Initial controls are seldom 100% effective, especially in dense infestations.
- ii. A **follow-up control** is the second attempt to control an invasive species. Access is normally easier than in the initial control and allows for the easy application of herbicides. If a follow-up is not completed timeously (normally the next growing season), the site can rapidly revert to its original infested state. Follow up operations should be completed before implementing an initial control in another area.
- iii. **Maintenance control** is reached when the follow-up control phase can be completed using the formula of one labour unit per hectare per day.

Training for staff or employees specifically involved in AIS control is necessary to ensure an effective and focussed work force. Relevant experts or trained foresters can be used.