The Garden Route in flames: Chapter V - Handling the impact of the wildfires on weed infestation

A book by Dr Neels de Ronde

The following article is the forth in the series of excerpts from a book written by Dr Neels de Ronde, The Garden Route in flames. Dr de Ronde lives in Sedgefield in the Southern Cape, South Africa and has done extensive research in the field of land management and wildfire prevention. Dr de Ronde gave permission to Fire and Rescue International to publish the book in the magazine in separate sections for the benefit of all forestry and wildfire managers, fire protection associations and land owners in order to gain insight and an understanding of the intricacies that form the basis of such extreme fires and how it can be prevented, highlighting effective fuel management and fire prevention measures.

Photograph 14 Picture of effectively-burning of Setaria weeds inside a mature Pinus elliottii stand in Mpumalanga (Photograph taken by unknown photographer).

5.1 History of exotic weeds in the region

Some of the worst weed problem areas in the Garden Route region have been burned over by the Knysna and Outeniqua wildfires. The impact on the degree of weed infestations after the wildfires has as yet not been properly assessed, but I believe serious attempts are being made to combat the weeds after both fires.

The weed problems can basically be divided into two groups, namely:

- Those weeds present in the fynbos covering the Mountains, including in the foothills (such as Hakea, Pines), and
- The weeds present on the lower Garden Route plateau, mainly within the fynbos (Strandveld) growing on the sand dunes (such as Acacia spp., ie A. Cyclops).

The Pine weed problem is related to off-site species planted in the foothills area of the Outeniqua Mountains, which produced an abundance of seed, spreading from there into the mountain fynbos. It will be mainly the fynbos in the Outeniqua Mountains which will be affected by the wildfire experienced there. Firstly, the younger Pine trees will still not be carrying seed-productive cones, which will be killed by this fire and not form anymore seeds in the future. Secondly, the older Pine trees subjected to the fire, will by now have been regenerated in abundance from the seeds shed by the 'mother trees', which most probably survived the fire.

It is thus the last category of 'seeder trees', which should get attention from the 'eradication teams' as soon as possible, as this will not only be the cheapest way of eradication of the weed by means of pulling out the seedlings with a year or two after the 2018 fire. This means that these 'seeders' have to be identified and mapped as a matter of urgency and be eradicated soonest, with follow-up checks on any regeneration left after first treatments.

The weeds growing within the coastal fynbos (Strandveld) were mostly not exposed to the fires, with a few exceptions, such as the Featherbed Nature Reserve, near the Heads, Knysna. However, otherwise fire exposure to serious weed problem areas was a rare event in the Garden Route Strandveld areas during the 2017/18 wildfires. Subsequently, future weed problems can get attention soonest as these are mostly found in relatively restricted areas and should be ▸

- treated by means of a focussed weed eradication program.

Because the Outeniqua Mountain range was almost completely burned out by the 2018 wildfire, the planning team from 'Working for Water' should make use of before and after fire satellite images to map known weed problem areas within this burned over land, so weed eradication programs can be prioritised, budgeted for and systematically get attention.

5.2 Incorporating weed eradication programs in fire prevention plans

The regional fire prevention plan for the Garden Route region should also be used to advantage to attend to weed eradication programs within the main buffer zones of the region. Fire managers responsible for the development and maintenance of the main (regional) buffer zones, should also be aware of weed problem areas within these buffers. The fire managers should consult with Working for Water scientists or Universities, how their prescribed burning programs can best be used to eradicate the weeds successfully and effectively where prescribed fire is applied, for the fire prevention programme discussed earlier in this writing.

Where the main buffers are crossing private property, the eradication of weeds should also receive the necessary attention. Where property owners do not have the capacity to attend to their weed problems properly, assistance from the Provincial or local Governments should be considered to ensure proper (systematic) weed eradication. Legal steps should be considered where private property owners fail to attend to their own weed problems, particularly where such problem areas are falling within the fire prevention buffer zone program.

5.3 Attending to weed problems within Industrial Pine plantations

Where P. radiata still forms the most prominent species used by private timber growers, weeds can develop faster to become a more serious problem as where the ex-Government (Safcol) plantations are growing. This is because in most plantation stands P. radiata is the dominant species on private land.

In Safcol plantation stands most of the (off site) P. radiata stands have been converted to P. elliottii. The latter has a much faster tree canopy closure rate (at approx. 10 – 12 years of stand age) than the first (only after 15 – 20 years will crown canopies of this species close). This can mainly be attributed to the thinner crown form of the P. radiata species.

Where most of the private P. radiata plantations are situated on the Garden Route plateau, a substantial area was burned over by the Knysna wildfire and these areas will be easier exposed to weeds because of its later crown canopy closure, as explained above. This impact might well be counteracted by dense natural regeneration after the fire. This will suppress any weeds developing there. Where natural regeneration of P. radiata is sparse or absent, weeds can get a 'foothold' and these areas should be included in the weed eradication programme.

The Outeniqua Mountain foothills have a mix of 'exit' plantation blocks, blocks that have been taken out of the 'exit' programme (thus not converted to fynbos) and then the remaining plantation, unaffected by the exit programme, which still fall under Safcol control. I will refrain from pointing finger at this rather chaotic conversion programme but it is a fact that management of this programme failed in many respects. Subsequently, fire was excluded from clear felled stands, and weeds also had a chance to develop unhindered.

The massive control of all the natural regeneration in burned over P. rad. stands, will be a mammoth task during coming years, which I doubt if the local timber companies can handle. However, if they can manage to stay abreast of this programme, such action will also present a perfect opportunity to check and eradicate weeds within the plantations burned over by the two wildfires, which will also be ideal for future fire prevention purposes. This will also be an opportunity to strengthen buffer zones, particularly where national roads are carving through such plantation blocks and such clearing can be applied hand in hand with the removal of burnable material within these buffer zone areas.

I do not know what the status of the 'exit' programme is today but know that a substantial area was burned over by the Outeniqua fire and in these neglected areas, not only will weeds develop in abundance but the affected land will soon present extreme fire hazards again. It is for this reason that I proposed to develop the main buffer zone "B4" (Photographs 9 and 10), to protect the Garden Route plateau from future fire hazards, as well as the added (predicted) extreme fire hazard expected to develop along the foothills, south of the Outeniqua Mountains. I will discuss the creation of this vital buffer zone in detail in following chapters of this writing.

5.4 Streamlining the weed eradication program

This programme is not just the responsibility of the Working for Water section of the Department of Environmental Affairs but ALL landowners and land managers are responsible for the weed control on their properties. Subsequently, weed control will have to be attended to at regional level and here the authorities responsible for the creation and maintenance of the regional fire prevention plan will have to come in to manage weed control within the main regional buffer zones as well as all land treated for fuel reduction programs within the region.

Most weeds, if left uncontrolled, will eventually present an abnormal fire hazard, which has to be avoided at all cost, and will also have to be addressed by the regions' fire managers. Subsequently, I would like to see that satellite images from before and after the fires are used to advantage to map serious weed "hot-spots" on fire prevention maps, and that they are subsequently being treated to eradicate the weeds, with follow-up programmes.

Regional fire prevention planners will also have to identify land without proper management and/or control, and take steps to ensure that such properties are marked as "unmanaged" and that steps are taken to see that weeds are still being managed on such lands in some alternative way. This is particularly necessary if this concerns the weeds affecting the main regional buffer zone maintenance. Legislation will also have to be checked to enforce such measures where possible.

5.5 Optimum use of unemployed workers to be employed for weed eradication programs

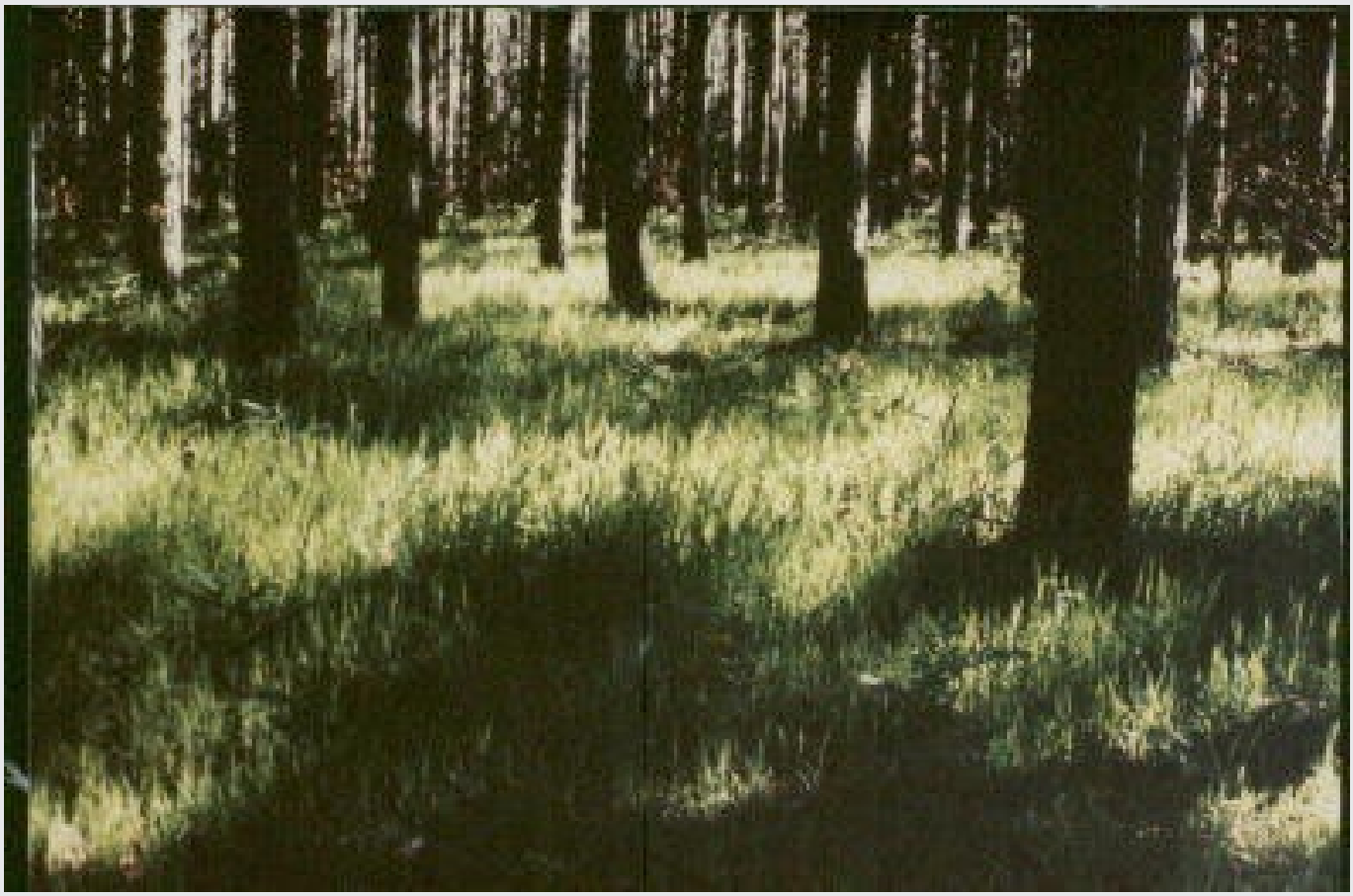
I am of the opinion that the added weed problem in the Garden Route area as a result of both wildfires will require additional manpower to check and get under control. I believe that steps have already been taken to add attention to the eradication of the weeds after both wildfires, and this is appreciated.

All I can comment to this is to ask if any proper mapping and use of remote sensing of the problem has been conducted so far, with attention to the classification of the weeds at this stage, and if scientists have attempted to use this information to extrapolate predicted weed levels in say five and 10 years' time. If this is not the case, the development of such tools is strongly recommended.

Likewise it would be nice if the areas infested by the weeds could be modelled to create fuel models for each, over time (age). I am not in a position anymore to conduct such tasks, although I can make myself available for consultation and training how to conduct such tasks, if and when required, with or without the assistance of remote sensing. Such fuel models could assist greatly in 'tuning up' the region's fuel model database for a range of different purposes, such as (i) fire hazard rating classification adjustments, (ii) updating the regional fuel model sets and (iii) checking specific sections of the regional buffer zones' width specifications, for effectiveness against wildfire threats.

5.6 Fighting indigenous and exotic weeds

Examples of how controlled backfires can be applied to fight weed species can be found on Photographs 4 and 14. Where dense Kystervaring (Gleichenia polypodioides) has developed inside Pine stands, a high intensity backfire can be used for this purpose, as is illustrated on these photographs. Likewise, Setaria spread can also be checked with high intensity backfires, to keep crowns safe from scorch (Photograph 14) but this weed is fortunately not a problem weed along the Garden Route. Where Acacia spp (such as A. Cyclops) have infested the ▸



Photograph 15: A Pinus pinaster stand in the Tsitsikamma where a controlled fire was applied one year earlier. Note the abundance of palatable grass development from a seed source triggered by the 'ash-bed effect' caused by the prescribed fire applied. Another aspect was that patches of Gleichenia polypodioides fern weed within this stand, where also eradicated by the fire (Photograph by C de Ronde)

Helicopter rescue: First performed by the US Army Air Forces in April 1944 during World War II in Burma

Second Lieutenant Carter Harman, United States Army Air Corps. (US Army)

21 April 1944: The first military helicopter combat rescue began with Lieutenant Carter Harman, US 1st Air Commando Group, being ordered to proceed from Lalaghat, India with his Vought-Sikorsky YR-4B, 43-28247, 965kms to Taro in northern Burma during World War II.

Technical Sergeant Ed "Murphy" Hladovcak, pilot of a Stinson L-1A Vigilant liaison airplane, had crashed in the jungle behind Japanese lines while transporting three wounded British soldiers. Lieutenant Harman was assigned to attempt to rescue the four men. It would be a marathon operation.

It took Harman and his Sikorsky 24 hours to arrive at Taro. After a brief rest and dip in the river to cool off, he continued for another 202kms to an airstrip in the jungle called 'Aberdeen', which was well behind the enemy lines. It was from here that Sgt Hladovcak had been operating, flying out wounded soldiers. From Aberdeen, Harman was led to the location of the downed men by another liaison airplane. The survivors were surrounded by Japanese soldiers who had found the crashed airplane and were trying to locate the four men.

Because of the high heat, elevation and humidity, which increased the density altitude, the YR-4B's air-cooled engine was unable to produce its full rated power. Also, the helicopter's rotor blades were not as effective as they would have been at lower density altitudes.

Harman planned to lift one of the survivors out of the clearing in the jungle and fly a short distance to a sand bank where other L-1 or L-5 liaison airplanes could pick them up and fly them back to Aberdeen. He would repeat the operation until all four men had been rescued. However, it took the rest of the day to airlift just the first two wounded and very sick soldiers.

Distinguished Flying Cross

On the second flight, the helicopter's engine was overheating and on landing it seized and could not be restarted. Sergeant

land inside Strandveld fynbos, the species will dominate this fynbos shrub and will eventually suppress the fynbos until this vegetation completely disappears (see Photograph on front page).

Some indigenous forest edges were established during the 19th Century, with Acacia melanoxylon (Blackwood) but during the 20th Century most of this timber of the species was felled and its timber exploited, with this valuable timber being sold at yearly-held auctions. However, these operations have left a significant slash loading on the forest edges in question, disturbing not only these sensitive interfaces but also creating a fuel bed through which forest edges were exposed to serious fire damage.

Such exposed or damaged forest edges need to be protected on the non-forest side of these forests, by means of keeping a strip of about 20 to 50m free from available fuel, to give these forest edges a chance to recover from the natural seedbeds. Such exposed and sensitive edges should also be kept free from Acacia regenerated weed, by pulling such regenerated trees out as they come up and develop from the forest floor there.

A unique area infested with mainly Acacia mearnsii is situated in the Maalgate area, within the depressions created there by the rivers. The history of this infestation dates back to when the species was established for the trees' bark production to be used for the tannin process to prepare leather used for the shoe factory there during the late 19th Century/ early 20th Century. The seeds from these Acacia trees then spread into the rivers, where these developed the "Acacia jungles" now found in the area along the river banks. Felling of trees for firewood by farmers in the area, assisted in further spread of this exotic weed within the Maalgate area.