

# Plantation forestry and invasive pines in the Cape Floristic Region: Towards conflict resolution

## AUTHOR:

Brian W. van Wilgen<sup>1</sup>

## AFFILIATION:

<sup>1</sup>Centre for Invasion Biology,  
Department of Botany and  
Zoology, Stellenbosch University,  
Stellenbosch, South Africa

## CORRESPONDENCE TO:

Brian van Wilgen

## EMAIL:

bvanwilgen@sun.ac.za

## POSTAL ADDRESS:

Centre for Invasion Biology,  
Department of Botany and  
Zoology, Stellenbosch University,  
Private Bag X1, Matieland 7602,  
South Africa

## KEYWORDS:

invasive trees; ecosystem  
services; water resources;  
policymaking; land rehabilitation

## HOW TO CITE:

Van Wilgen BW. Plantation  
forestry and invasive pines  
in the Cape Floristic Region:  
Towards conflict resolution.  
*S Afr J Sci.* 2015;111(7/8), Art.  
#a0114, 2 pages. [http://dx.doi.  
org/10.17159/sajs.2015/a0114](http://dx.doi.org/10.17159/sajs.2015/a0114)

Forests supply important commercial resources in the form of timber for building, furniture and packaging, and pulp for paper products. As human populations grow, the demand for these products is driving substantial growth in plantation forestry. Such plantations are necessary both to meet demand for wood-based products and to protect remaining natural forests from over-exploitation, and they are usually based on fast-growing, alien trees. Globally, forest plantations currently represent 5% of forest cover but they account for 40% of commercial wood and fibre production. As more species of alien trees are introduced and widely planted in novel environments, a proportion become invasive, spreading into adjacent landscapes where they have negative effects on biodiversity and the delivery of ecosystem services.<sup>1</sup> Among commercial forestry species, pines (*Pinus* species) are especially problematic, with at least 19 invasive species in the southern hemisphere, where they cause significant problems.<sup>2</sup> The fact that pine trees can simultaneously be useful and harmful in the same region has led to 'schizophrenia' in policy formulation and conflict between land managers.<sup>3,4</sup>

In South Africa, formal pine plantations cover 660 000 ha, and invasive stands of pine trees occur in a further 2.9 million ha. Pine invasions are clearly linked to pine plantations<sup>5</sup>, and the problems associated with invasive pines are most acutely felt in the fynbos-clad mountain catchments of the Cape Floristic Region (CFR)<sup>6</sup>. Pine-based plantation forestry is an important economic activity in the CFR, providing direct employment and supplying resources to downstream processors. Authorities responsible for conservation in the CFR (notably Cape Nature and South African National Parks) are, however, concerned about the degree of invasion of protected areas and catchments and the ecosystem services that they deliver, setting the scene for potential conflict.

Government's policy responses to the issue have at best been confused. In June 2001, the Cabinet approved the conversion of 44 763 ha of pine plantations in the CFR to other land uses, principally conservation, signalling a policy of retreat from plantation forestry in the CFR. In 2006, the former Department of Water Affairs and Forestry commissioned a study to re-assess the conversion process and its socio-economic impact, and subsequently recommended that 22 402 ha of the plantations be retained and that the remaining 22 361 ha be included in the continuation of the conversion ('exit') strategy.<sup>7</sup> In 2008, Cabinet approved the proposal to retain 22 402 ha, but it was only in 2014 that the Department approached the Industrial Development Corporation (IDC) to advise it on implementation options to replant state forest land. The IDC identified a number of 'key principles' to guide the restructuring and transfer process, namely community empowerment, broad participation, transformation in the sector, and maximising future forest product outputs.

In June 2004, the government also promulgated the *National Environmental Management: Biodiversity Act* (NEM:BA), which among other things makes provision for the management of listed invasive alien species. Government was obliged, in terms of NEM:BA, to publish a national list of invasive species within 2 years. However, and despite many false starts, it was only in 2014 that the Department of Environmental Affairs published new regulations that listed (among others) eight species of pines as invasive aliens. Under these regulations, it is now necessary to obtain a permit to re-forest new areas with listed species, as well as to continue with normal forestry practices in existing plantations. Permits will place obligations on the recipients to ensure that planted pines do not spread to adjacent areas. A great deal of confusion still exists as to how the process of legalising the remaining forestry activities in the CFR will be taken forward.

Given the confusion, and the potential for conflict, it would clearly be beneficial to bring the various stakeholders together to explore ways in which the situation could be addressed in a constructive manner. With this in mind, WWF (South Africa) convened a meeting of diverse players with interests in the management of pine trees in the CFR. The meeting, held in Stellenbosch on 4 May 2015, included representatives from forestry companies, conservation agencies, science councils and universities. The goal was to explore a range of relevant issues and to initiate a dialogue aimed at finding mutually acceptable and sustainable solutions to the problem. Most participants identified the need to develop a common understanding of issues as a key outcome of the meeting.

A wide variety of topics was introduced by speakers from different organisations. Dean Muruven of WWF (South Africa) began by outlining their concerns regarding the conservation of critical water source areas, stating that 50% of the country's water is generated by just 8% of the land,<sup>8</sup> much of it at risk from invasion by pine trees. David Le Maitre of the Council for Scientific and Industrial Research reviewed the impacts of alien trees on the hydrological cycle, pointing out that invasive trees could potentially reduce water run-off in the CFR by 37% (from 6765 to 4271 million m<sup>3</sup>/year)<sup>9</sup> if invasions are allowed to continue unchecked. Dave Richardson, Director of the Centre for Invasion Biology at Stellenbosch University, pointed to the fact that concern about invasions by introduced trees is growing globally, often leading to conflict, and that much research remains to be done before equitable solutions can be found. Matt McConnachie of the Centre for Invasion Biology outlined innovative research that sought to establish the degree to which different sources (including ornamental plantings, windbreaks and plantations) contributed to the invasion problem,<sup>5</sup> estimating that plantations were probably responsible for about half of the current invaded area. Kassie Carstens from Cape Pine stated that new plantings were of different species (*Pinus elliotii*) that did not produce seed in the CFR, and that this may alleviate the problem of invasions, although whether or not this is correct, and to what degree it will help, has yet to be shown. Finally, Fiona Impson from the Plant Protection Research Institute outlined a 10-year research programme that had sought to find a suitable biological control agent that would reduce seed production in *Pinus pinaster*.<sup>10</sup> Although a suitable agent had been identified, concerns have been expressed that it may exacerbate the problems of pitch canker in pines. The agent has not yet been released, and an application for release that would require further public consultation is overdue.

On the practical side, John Scotcher from Forestry South Africa reiterated the forest industry's commitment to sound environmental management, but outlined concerns regarding the new regulations governing alien species under NEM:BA. The regulations would logically replace earlier legislation in terms of the *Conservation of Agricultural Resources Act* (CARA), although it is not clear if this will occur. Currently, plantation forestry in South Africa is licensed under the *National Water Act*, and the *National Water Act* licences are recognised under the CARA regulations. Forestry South Africa has reviewed the new NEM:BA regulations, and identified some uncertainties regarding the 'restricted activities' with which permitted plantations would have to comply (restricted activities include owning, transporting or selling any specimens or derivatives of listed alien species). All forestry operations will have to apply for new permits under NEM:BA to clarify these issues, and until they do so there is uncertainty regarding how they can legally conduct restricted activities.

Steve Germishuizen (representing the Forestry Stewardship Council, FSC) reviewed the processes whereby all major South African plantation forestry operations had been granted certification. FSC certification requires adherence to sound environmental management practices that follow clear principles, taking account of national laws in the country concerned. FSC certification is also necessary for operating in certain markets, and thus although voluntary, is important in terms of trading with forestry products. Principle 10 of the FSC requires explicitly that an applicant for certification 'shall only use alien species when knowledge and/or experience have shown that any invasive impacts can be controlled and effective mitigation measures are in place'<sup>11</sup>. Nonetheless, certification has been granted to South African plantations on the basis of applications that apparently have not adequately dealt with the problem of invasive species.

Susan Steyn from the Department of Agriculture, Forestry and Fisheries (DAFF) outlined the events that had led to a reversal of earlier decisions to exit from forestry in certain parts of the CFR. The process is ongoing, and workshop participants raised some concerns. Firstly, the assessments of the economic viability of forestry as set out in the 2006 report<sup>7</sup> excluded the externalities associated with invasions linked to plantations. They also did not factor in the effects of fires, which are increasing in frequency and will almost certainly impact on the viability of plantation forestry. Secondly, although the authors of the report initially consulted several stakeholders, many from conservation organisations were only consulted for information, and not given the opportunity to review the report before it was finalised. ('...[I]t was not the purpose of this study to engage in wide community consultation, and the stakeholder consultation was predominantly technical in nature...').<sup>7</sup> This statement is not aligned with the principle of broad consultation. There is also a dichotomy of views on how the remaining plantations earmarked for transfer to conservation should be dealt with. Cape Nature, on the one hand, has been reluctant to assume responsibility for these areas without guarantees for the funding needed to rehabilitate them to an acceptable standard. South African National Parks, on the other hand, has accepted responsibility for some of these areas despite having no funding to rehabilitate them. As DAFF also has no funding to manage these areas, it is either stuck with them, or is handing them to an organ of state equally unable to afford their management.

Workshop participants spent time discussing possible courses of action for taking this initiative forward. One suggestion was that a collaborative management initiative, involving foresters and conservation agencies, should be implemented on a small scale, which, if successful, could lead to the derivation of useful lessons and wider implementation. Another proposition was for forest companies to lease land from the state, and a portion of the lease fees to be used to control invasions in adjacent protected areas or catchments. This was seen as an attractive proposal, although the ability of these funds to make a meaningful impact would have to be assessed. Finally, it was suggested that the problem deserved a thorough, participative, scientific assessment, as was done when the South African government was faced with the development of an acceptable policy for managing elephants.<sup>12</sup> Such assessments are

the product of a process that translates existing scientific information into a form usable by policymakers. Assessments have three critical success factors: (1) legitimacy (the stakeholders have to accept that the process is well founded), (2) saliency (it must be relevant to an expressed need) and (3) credibility (it must be conducted by experts, to the highest standards).

Assessments are characterised by an extensive, transparent review process by both experts and stakeholders. An assessment requires the authors to provide their own expert judgements when the data are sparse or equivocal (as long as these judgements are clearly identified as opinions), but puts checks and balances in place to ensure that all reasonable viewpoints are fairly reflected. Assessments include an explicit evaluation of the uncertainties on key issues, either quantitatively in terms of probability ranges (e.g. 'near certain' is >95% confidence of being true), or qualitatively (such as 'established', 'established but incomplete', 'competing explanations' or 'speculative').

For an assessment of the holistic management of pines in the CFR to take place, it would have to be endorsed by government, to provide the necessary legitimacy. While it is still too early to predict whether this will happen, this meeting has started a process which will hopefully lead to the development of policies based on sound scientific understanding. The apparent willingness to collaborate by all who attended this meeting gives hope that this development will come about.

## References

1. Richardson DM, Hui C, Nuñez MA, Pauchard A. Tree invasions: Patterns, processes, challenges and opportunities. *Biol Invasions*. 2014;16(3):473–481. <http://dx.doi.org/10.1007/s10530-013-0606-9>
2. Richardson DM. Forestry trees as invasive aliens. *Conserv Biol*. 1998;12:18–26. <http://dx.doi.org/10.1046/j.1523-1739.1998.96392.x>
3. Dickie IA, Bennet BM, Burrows LE, Nuñez MA, Peltzer DA, Porté A, et al. Conflicting values: Ecosystem services and invasive tree management. *Biol Invasions*. 2014;16:705–719. <http://dx.doi.org/10.1007/s10530-013-0609-6>
4. Van Wilgen BW, Richardson DM. Challenges and trade-offs in the management of invasive alien trees. *Biol Invasions*. 2014;16:721–734. <http://dx.doi.org/10.1007/s10530-013-0615-8>
5. McConnachie MM, Van Wilgen BW, Richardson DM, Ferraro PJ, Forsyth T. Estimating the effect of plantations on pine invasions in protected areas: A case study from South Africa. *J Appl Ecol*. 2015;52(1):110–118. <http://dx.doi.org/10.1111/1365-2664.12366>
6. Van Wilgen BW, Richardson DM. Three centuries of managing introduced conifers in South Africa: Benefits, impacts, changing perceptions and conflict resolution. *J Environ Manage*. 2012;106:56–68. <http://dx.doi.org/10.1016/j.jenvman.2012.03.052>
7. VECON Consortium. Cape conversion process. Review of the original recommendations and decisions taken about phasing out plantation forestry and state forest land in the southern and western Cape and recommendations on a decision to reverse the withdrawal strategy. Pretoria: Department of Water Affairs and Forestry; 2006 [unpublished report].
8. Colvin C, Nobula S, Imelda Haines I, Nel JL, Le Maitre DC, Smith J. An introduction to South Africa's water source areas. Cape Town: WWF (South Africa); 2013.
9. Van Wilgen BW, Reyers B, Le Maitre DC, Richardson DM, Schonegevel L. A biome-scale assessment of the impact of invasive alien plants on ecosystem services in South Africa. *J Environ Manage*. 2008;89:336–349. <http://dx.doi.org/10.1016/j.jenvman.2007.06.015>
10. Hoffmann JH, Moran VC, Van Wilgen BW. Prospects for biological control of invasive *Pinus* species (Pinaceae) in South Africa. *Afr Entomol*. 2011;19:393–401. <http://dx.doi.org/10.4001/003.019.0209>
11. Forestry Stewardship Council. FSC principles and criteria for forest stewardship. Bonn: Forestry Stewardship Council; 2014.
12. Scholes RJ, Mennel KG. Elephant management: A scientific assessment for South Africa. Johannesburg: Wits University Press; 2008.

