Dr. Peter A.Williams
Landcare Research
Private bag 6
Nelson, New Zealand.
Ph. + 64 3 545 7715 Fax + 64 3 546 8590
Email WilliamsP@Landcareresearch.co.nz

30/03/06

To: Environment Southland

Comments on RPMS (Plants)

Following a meeting with Environment Southland staff I have been asked to present my thoughts on the potential priorities and initiatives ES might take into consideration when preparing its next strategy.

Invasion is a staged process
As clearly set out in the ES document "Review of the regional pest management strategy, issues and options", plant invasions commonly go through a series of stages. These are:

1. The "lag phase" where the plant is in low abundance, often for a long time.
2. The "explosion phase" where the plant rapidly begins to increase in numbers.
3. The "establishment phase" where the plant comes to occupy most of the remaining potential habitat.

This process can be conceived as occurring at any scale, and even more than one scale for the same species, for example, for Southland as a whole, and within one or more subdistricts.

Some implications of the invasion curve
The value of the using the invasion curve as the paradigm for all weeds is that it enables them to be compared. The stage plant is at on the invasion curve also ahs profound implications for the control options and the prioritization of resources.

1. Firstly, it will be possible to exterminate a species from a defined area only when it is very early on the invasion curve. Overseas experience suggests the chances of doing this declines very rapidly when a species occupies more than about 1 ha. There are three critical requirements to achieve extermination.
All stages of the lifecycle must be vulnerable to control, there must be technical methods for killing all stages, and it must be controlled before it reproduces. These are all seldom met for plants, especially because a 100% kill even of visible plants is not achieved, and many have an "invisible phase" in the form of a persistent seed bank.
2. Because there are often many more species in the early invasion stages than it is possible to control, those that are targeted should either be those with a very strong history of weediness elsewhere, or failing that, when they appear to be spreading and having an impact.

3. Because we can “measure” impacts only once a species has spread, most newly spreading species will need to be targeted before their full potential impacts are understood. In many cases it will also not be possible to differentiate them on the bases of economic arguments, despite what the legislation says, because there will be little, if any, data. Thus there will need to be an acceptance of uncertainty in the validity of the control efforts undertaken.
4. For a given level of effort, controlling a plant at the early invasion stages will protect the most people from potential effects because most will not already have it. The same amount of effort directed towards the same number of plants when the species is at a latter stage will benefit primarily those on whose properties the work is undertaken.
5. Only in an unreal world of unlimited resources is it possible to control all species at all stages and there will therefore be opportunity costs for any control efforts taken.

Management implications

1. A clear statement needs to be made of the state of knowledge of the invasion stage of every pest species in RPMS. This should also be specific to a defined area(s).
2. Greater effort in surveillance and better spatial data will need to be collated to achieve this (1).
3. It follows then, that the total area of the RPMS should be clearly divided into a number (2 or more) of areas. All species should be considered within these defined areas and prioritised accordingly. The boundaries of these areas should be based on biophysical factors such as climate/landuse/stated values to be protected/ weed density/ and human population density. The values being potentially protected should be clearly stated and mapped even when they cannot be couched in “economic” terms. This will assist people to understand the different priorities given to the same species in different places.
4. For example, although I was unable in the time available to determine what these areas (3 above) should be within Southland, clearly the area around Te Anau, is the urban centre of potential weed invasions into far Southland and the National Park. This area warrants special attention for surveillance and perhaps specific rules within the RPMS if invasive species are detected there. Similarly, in an effort to protect Stewart Island, particular care should be taken to ensure that species likely to impact on S.Is., are not grown in Bluff.
5. The management objectives for each species should be clearly defined in terms of plant populations and a hierarchy of control objectives, based on the state of the population within the area(s). This is likely to range from *preventing entry* into the area(s) along transport corridors (e.g. roads) or via vectors (gardening), through *extermination, preventing further spread,* and *reducing the extent* of the population.
6. The objectives should be measurable and achievable within the terms of the strategy. It follows that good information will be required on each species to be able to satisfy this requirement and the information will need to be updated regularly within the life of the strategy.

7. Terms like “progressive control” should be avoided as they are descriptive of an approach, not of what will become of the extent and impact of the plant population if the strategy is successful.
8. Only a very limited number of species should be targeted for ‘total control”, assuming this is taken to mean extermination within a defined area. It is extremely unlikely that *any* species would *every* be exterminated if the methods available to the council are only those of occupier control. “Service delivery” should always be available to kill (and closely monitor) the last (?) patches of a species targeted for extermination.
9. Because there have been very few examples of successful “total control” in areas greater than 1 ha, it is suggested species more abundant than this be not included in this category unless large amounts of resources are available.
10. In practical terms however, even without “extermination”, reducing a species to a level where its impacts are minimal remains a desirable and practical objective.
11. The approach of targeting species within the urban area is an excellent one, partly because it involves urban people in weed control. Most new weeds come from urban areas. Urban areas are not only in the main towns but also around rural towns. The latter are especially likely to be the source of new conservation weeds because of their close proximity to conservation land. The case of Te Anau has been mentioned (4, above).
12. Because what is in the final strategy will be “the best solution” with the available resources, it would be useful to describe those objectives which needed to be put aside for lack of resources. Traditionally species have been “dumped” in the “surveillance” category, but in many cases, a little further explanation would be warranted, in part as a “steer” for the next strategy.