Report No.	20-32
Information Only - No Decision Required	

OLD MAN'S BEARD MANAGEMENT IN THE HORIZONS REGION

1. PURPOSE

1.1. This paper reviews the current programme on old man's beard (OMB) control, provides an assessment of options for its future management within Horizons' Region and seeks Councillors guidance on next steps for this programme.

2. EXECUTIVE SUMMARY

2.1. Old man's beard is our region's worst terrestrial weed and accounts for the Council's single biggest annual spend against a pest plant species. Old man's beard colonises disturbed or open forests, shrub lands, riversides, cliffs, bush tracks, roadsides and hedgerows, and is also in urban areas. Horizons has managed OMB via rules or active management programmes since Regional Councils were established in 1991 and currently spends approximately $650,000, either directly or by supporting community initiatives and site protection. Communities support the reduction of OMB and generally desire more control in places valued for recreation or aesthetic values. Many of our significant biodiversity sites are threatened by OMB with others already lost to smothering, leading to species reduction.

2.2. Horizons has championed biological control of OMB with a goal of reducing vigour and spread, to reduce the dominance it exhibits currently. Multiple insect and disease agents have been trialed but we have not yet achieved any significant impact. The OMB gallmite is currently a focus. Other new-to-New Zealand agents are being investigated and are worth pursuing, however future known options are limited.

2.3. Control typically requires re-visiting historic sites and regular surveillance by ground and/or air of valued sites and large areas of potential habitat to find new plants, which are invariably adult. Control is usually achieved chemically at a cost of up to $1,500/ha. Chemical control can pose a risk to the local ecosystem being protected. Many sites are within One Plan Schedule F rare biodiversity habitat and widespread chemical application is generally unsuitable in these locations.

2.4. Horizons' current approaches of control within sites of high value and areas where OMB is sparse is sound. Horizons' Regional Pest Management Plan includes areas where OMB is actively controlled, the **Active Management Zone** (AMZ) and an area that is not controlled, the **Good Neighbour Process Zone** (GNPZ). Pressure on the AMZ increases as the non-controlled area 'fills-up' and spreads. The current biosecurity programme is 'holding the line' within the AMZ, with 75% of the 2,000 or more sites we manage at Zero levels. However, new sites are being found every year. Horizons' Biodiversity programme, which works across the AMZ and GNPZ is similarly impacted by a large and increasing burden of OMB that compromises the long-term integrity of sites and incurs considerable costs.

2.5. Assessment of the current approach concludes that the Regional Pest Management Plan and biodiversity goals will not be met. Suppression, not eradication of OMB in the AMZ will become more likely. Further, there will be limited biodiversity protection in the priority habitats that Horizons manages, due to control being focused within sites, without buffer control around sites to reduce reinvasion.

3. RECOMMENDATION

That the Committee recommends that Council:

a. receives the information contained in Report No. 20-32.

b. notes the projected outcomes from the current control programme in relation to regional pest management plan and biodiversity protection.

4. FINANCIAL IMPACT

4.1. There is no financial impact of this paper.

5. COMMUNITY ENGAGEMENT

5.1. This item is presented to Council to transparently report the review of OMB control that has recently been completed. Old man's beard control is delivered in partnership with some community groups and is a topic that has been submitted on via the Regional Pest Management Plan process and Long-term Plan/Annual Plan budget process. This item is presented in a public forum.

6. SIGNIFICANT BUSINESS RISK IMPACT

6.1. OMB does not have a significant business impact, but there is a risk that the Regional Pest Management Plan goal of zero level goals within the AMZ will not be met by the goal date of 2037; there is also a risk to our biodiversity site integrity from OMB infestations. This review is to provide an overview of the risk and options in relation to this and seeks Councils guidance on next steps for the programme. There is also a risk Horizons faces via the perception of non-action in the area OMB is not controlled (GNPZ).

7. BACKGROUND

7.1. Old man's beard is known to have been in the Horizons Region from around the 1930s and local lore has it that the Taihape mayor's wife imported it for her floral arrangements. Then it was more likely known by its European nickname, Travellers' Joy, a plant desired for its flowers and fluffy seed heads that were useful in floral art. Since then, terrestrial habitats across New Zealand have undergone widespread transformation and the invasive OMB gained widespread public attention during the late 1980s (Figure 1). This galvanised ongoing action by catchment boards and government organisations to control this pest plant, which has been declared an unwanted organism under the Biosecurity Act 1993, prohibiting its sale, distribution and propagation. OMB's ability to spread freely on the wind, grow quickly, and smother all but the largest trees has seen permanent loss of many indigenous habitats as well as the creation of weed problems in amenity plantings, forestry and river management vegetation.

Figure 1 Bring back Bellamy. The face of old man's beard in the 1980s was TV presenter, botanist and environmental campaigner David Bellamy.

7.2. National spread continues and although some councils have ceased work and many areas managed by others have been left to let nature take its course, there remains a strong desire to keep OMB in check. Management approaches around New Zealand include:

- Exclusion – keep it out of a region;
- Eradication – completely remove it from a region;
- Progressive Containment – remove all plants from large areas where the current population is beatable and push back towards the entrenched infestation;
- Site-led control, where high value biodiversity sites are kept free of OMB and ingress is prevented by control work within a buffer area.

7.3. Alongside direct intervention by chemical or physical control, there has been a long-term search for biological control agents to minimise the effect of OMB in areas too costly or sensitive for usual control methodology to be effective. Horizons has been a lead agency in the search for biological control options, including a current DNA analysis of the New Zealand OMB population to compare to the plant's northern hemisphere home range in hopes of locating any future biological control options.

7.4. This paper provides a review of the current programme and an assessment of options for future management of OMB within Horizons' Region and is part of a staff review of progress on the Regional Pest Management Plan in 2020 to be presented to Council in April-May 2020. Given the significance of the spend on OMB, this item has been completed as a separate piece of work. Information is sourced from, and reference given to, two of the previous management reviews Horizons has recently conducted to ensure the approach and goals of management are best suited to controlling OMB in a regional context. These documents are available for reference: Review of Horizons Regional Council Old Man's Beard (*Clematis vitabla*) Management Strategy, Cam Speedy and Peter Williams, October 2010; Can we keep the lid on old man's beard? Consideration of management options for old man's beard in Horizons' Region, Diederik Meeneken, 2013.

Figure 2 Old man's beard has invaded this stand of kowhai at Moawhango near Whanganui (M.Matthewson).

Why control old man's beard?

7.5. Old man's beard is the worst terrestrial weed in our region. It is named for the attractive mass of fluffy seeds that persist on the plant over winter. It was introduced into New Zealand and we believe into Taihape, as an ornamental before 1922 and was well naturalised by 1935. It is native to Europe, where it achieves minor pest status in forests and vineyards (Mihajlovic *et al*., 1998). However, in Europe it does not form the vigorous thickets with massive stems that damage lowland forest fragments in many parts of New Zealand. It is also regarded as invasive in the Pacific Northwest region of the United States and Canada, and in Maine and Ontario (ISSG 2017).

7.6. Old man's beard colonises disturbed or open forests and forest margins, shrub lands, riversides, cliffs, bush tracks, roadsides, hedgerows and vacant land (Gourlay *et al*., 2000) and is also a troublesome urban weed. It is adventive, i.e. introduced but not fully naturalised, throughout much of NZ, predominantly south of Auckland. Without a national weeds database the best distribution map available is the **Department of Conservation** (DOC) database (Figure 3). The most heavily infested areas in Horizons' Region are the wider Taihape and Turakina Valley high country, the middle and lower stretches of the Rangitīkei and Turakina River corridors, Whanganui urban area, Pahiatua and much of the Tararua District including the Manawatū River corridor. An example of OMB impact on a site in the region is provided in Figure 2. Many other regions are heavily impacted by OMB spreading significantly into and over vulnerable habitat, to the extent that control is deemed not to be feasible and OMB is now ubiquitous in the landscape.

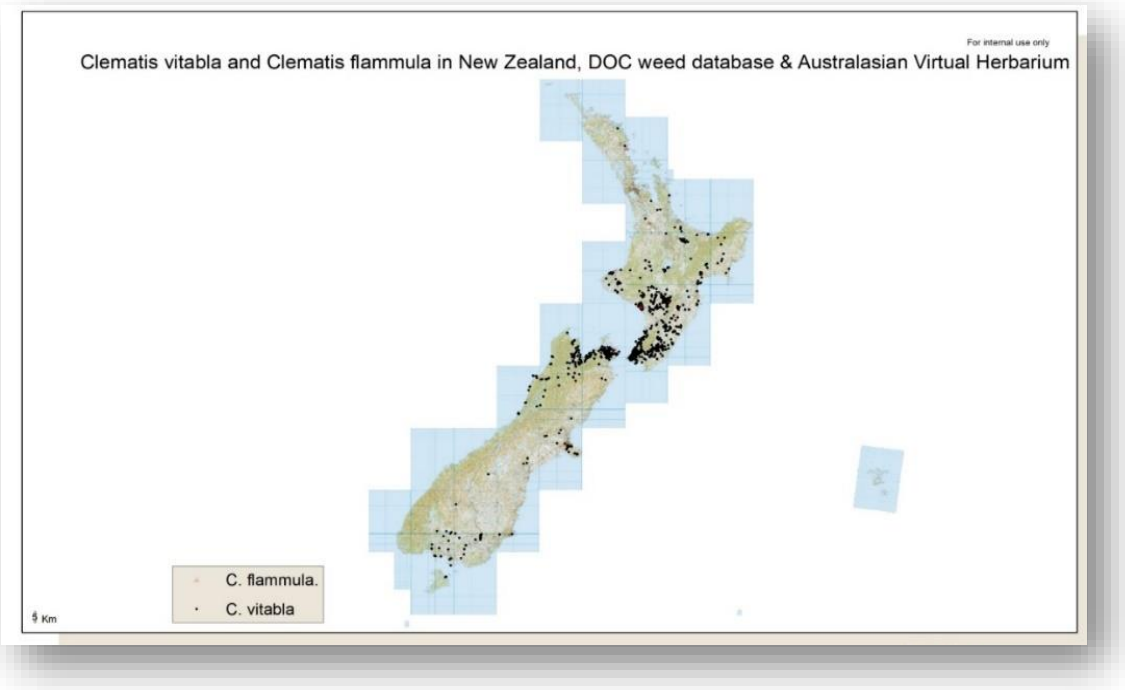

Figure 3 Distribution of old man's beard, 2018.

7.7. Old man's beard can attain a density of 7,000 stems per hectare and a fresh weight increment of 6.3 kilograms per square metre per year. Stems can grow an average of 2.3 metres in one year, producing 20 new nodes. Plants spread both by seed and adventitious roots. West (1992) recorded an average seed fall at one site of 65 seeds per square metre per year, and estimated the life of seed in the soil to be 8-10 years. Seeds are borne on wind or water, but OMB can also spread by stem layering and can establish where garden refuse is dumped.

Old man's beard's impact on biodiversity

7.8. OMB invades forests from the edges or from canopy gaps. The vines can grow more than 20 metres, scrambling over low-growing vegetation or climbing into undergrowth. Vines ascend into the canopy and can climb large-diameter trees if shrubs and smaller trees provide 'stepping stones' to the crown. Vines can smother and collapse the forest canopy, leaving only tall emergent trees. Curtains of OMB create dense shade, killing plants growing beneath and stopping regeneration from seedlings.

7.9. Ogle *et al*. (2000) found there is little regeneration of remnant species, even where the vine has been cleared, likely due to control methodology at the study site and the ingress of other weed species. The study, highlighted graphically in figure 3, showed the number and variety of understorey trees and shrubs at a Central North Island site near Taihape had been severely reduced following infestation with *C. vitalba*, and the authors concluded that already-vulnerable species had been disproportionately affected by OMB. They concluded the presence of OMB had resulted in local extinction of uncommon species. Based on the evidence that *C. vitalba* can significantly degrade tall mixed podocarp forest, it has one of the highest weed rankings in the DOC weed database.

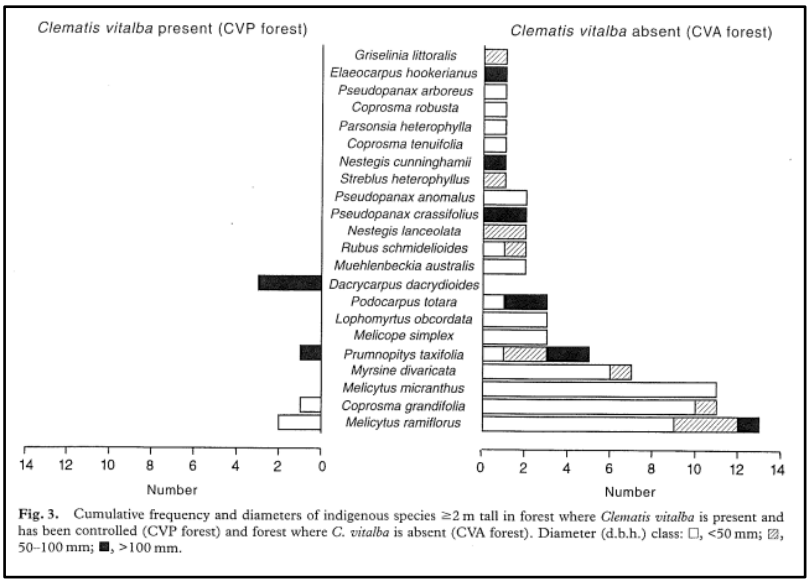

Fig. 3. Cumulative frequency and diameters of indigenous species ≥2 m tall in forest where *Clematis vitalba* is present and has been controlled (CVP forest) and forest where *C. vitalba* is absent (CVA forest). Diameter (d.b.h.) class: □, <50 mm; ▨, 50–100 mm; ■, >100 mm.

Figure 4 Impact of OMB on native species variety, abundance and age class in comparative reserves near Taihape, one with *C. viatalba* present (CVP), one where it is absent (CVA).

7.10. One of the worst examples of its impact on native biodiversity and transformational change to landscapes is the middle reaches of the Rangitīkei River corridor. Downstream from Mokai, OMB is too dense and growing in too difficult terrain to effectively manage, retain successful control and allow a return to a sustainable native vegetation mix. This is evident in Figure 5, where old man's beard can be seen completely smothering vegetation, likely the locally endemic kowhai (*Sophora godleyi* aka Godley's kowhai, papa kowhai or Rangitīkei kowhai), and turning a once dynamic and diverse mixed-height canopy into blanketed stems and a monoculture of OMB.

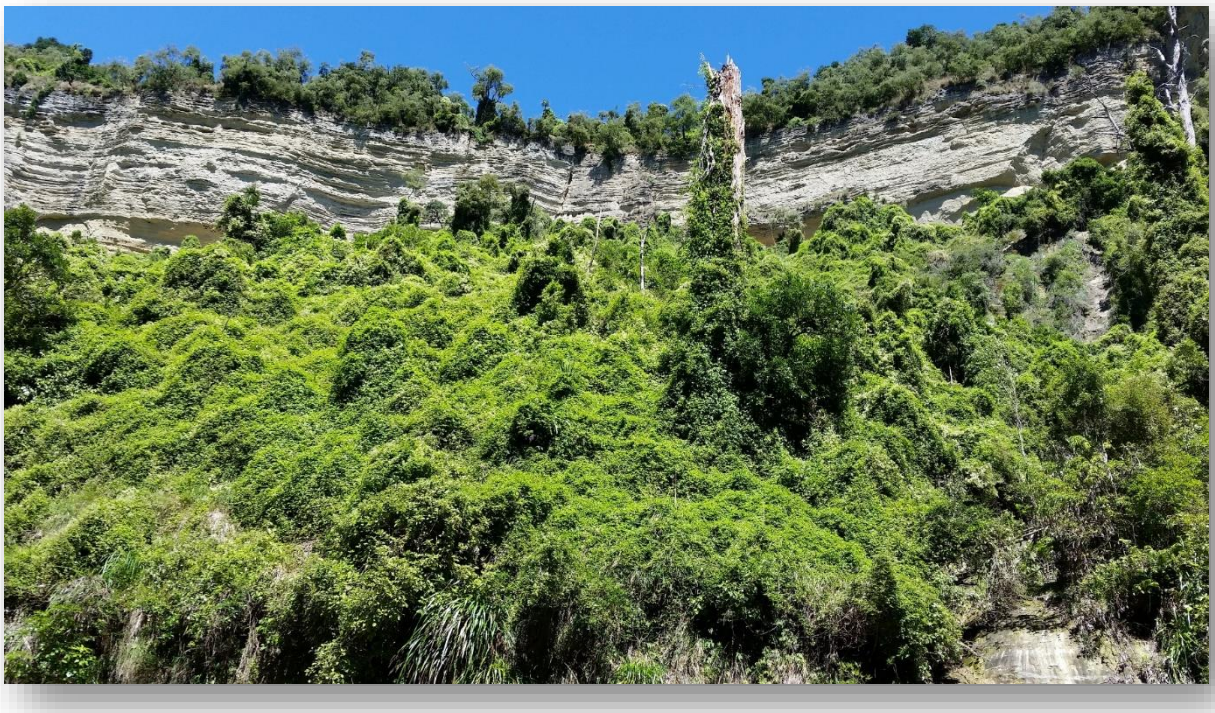

Figure 5 Old man's beard, Rangitīkei River. Old man's beard is in the middle below the cliff, dominating all but the tallest emergent trees (D.Havell, DOC).

Old man's beard's impact on forestry and farm land

7.11. Private landowners incur costs for shelter belt management on farms and orchards, and when restoration work is implemented to restore native habitats.

7.12. Old man's beard vines impede both productivity and operations in production forests (Figure 6) and in areas set aside for retirement or riparian planting. It is controlled in the farmed landscape by a competitive pasture sward and by sheep and cattle browsing. Withdrawal of grazing in areas where OMB is present can result in almost immediate invasion. Livestock are normally excluded during the establishment of new forests, allowing OMB to establish. Following harvest, bare ground and slash provide an ideal nursery environment for OMB seedlings. Forest compartments are occasionally subject to respraying and replanting of a second rotation due to OMB. One Taihape-based farm forester would not replant because OMB affected tree quality.

7.13. Old man's beard also appears to have a tolerance to terbuthylazine, a herbicide used to provide long-term suppression of competing weeds in forests. This allows OMB to establish adjacent to forest seedlings which it can climb and smother, reducing yields. OMB also impedes access for silvicultural work, and the risk to workers felling trees bound up with OMB poses health and safety-related costs at harvest. There is no exotic forest species currently growing in New Zealand that can outgrow OMB, so without effective control forest estate can be significantly impacted with many forests unable to re-establish without chemical control strategies targeting OMB.

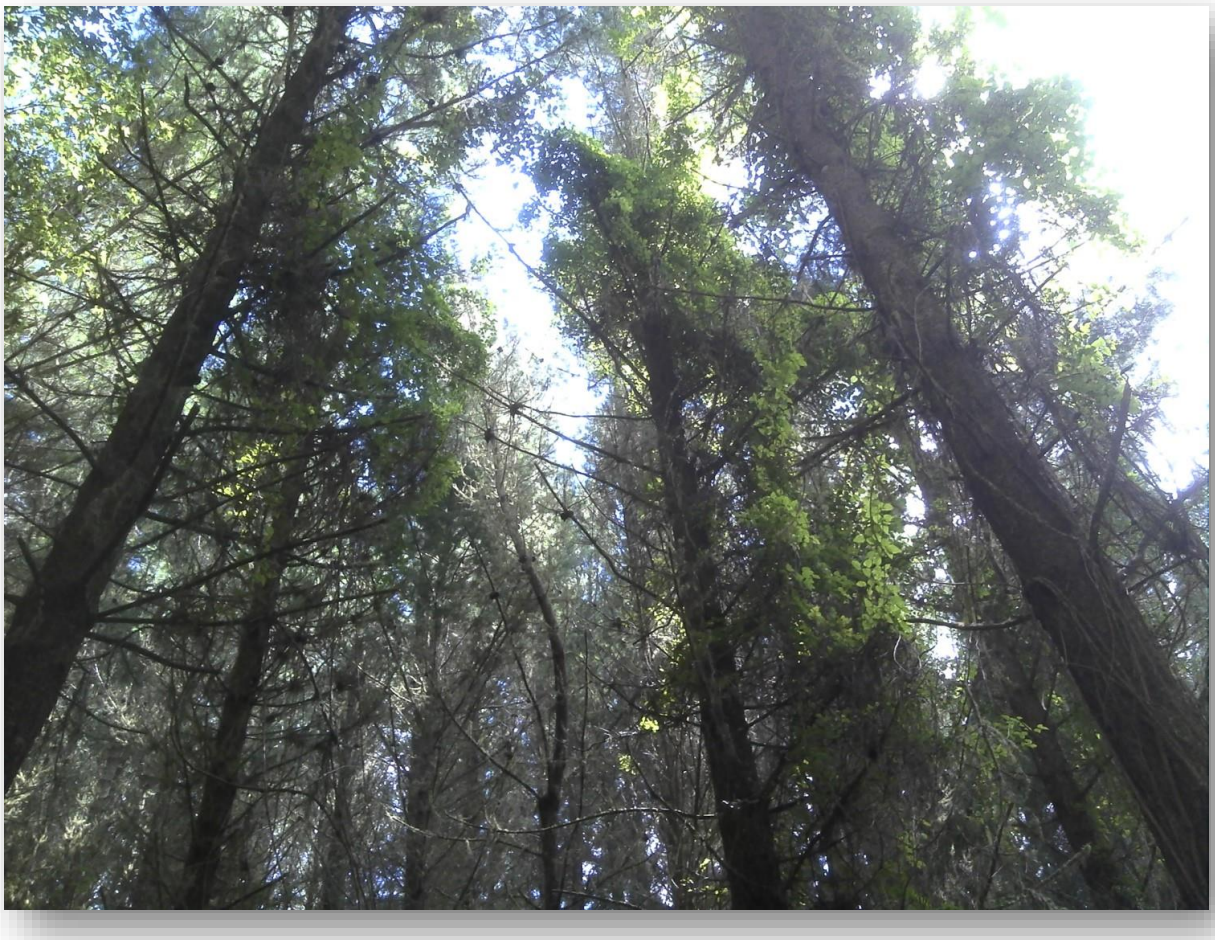

Figure 6 Old man's beard reaching to the crowns of production forestry trees (D. Alker).

Old man's beard control in Horizons' Region

7.14. Horizons has chosen to manage OMB, given the large impact large populations can have on native biodiversity, amenity plantings, forestry and other natural assets. A number of community groups receive either funding or advice when working on infestations not managed by Horizons staff. Since 1996 Horizons has managed OMB via the Biosecurity Act and has included it within Regional Pest Management Strategies (now Plans). Horizons started by placing responsibility on occupiers and this includes regulatory rules. The current Regional Pest Management Plan (the Plan) requires that Horizons manages control programmes within a mapped (Figure 7) Active Management Zone (AMZ, 828,000 ha), and boundary control is enforced via a good neighbour rule within the GNPZ covering all of the region outside the AMZ. Staff currently manage live and historic infestations which cover a total of 3,314 ha. Approximately 16 ha (a measure of the area of occupancy (AOO) or plant cover) of plants (Figure 8), across approximately 2,000 sites of which 75% are at zero-levels (Figure 9). 'Zero levels' is the state where a site is either clear or only presenting seedlings with no risk of spreading.

7.15. Horizons also controls OMB within and around high value biodiversity sites under the Biodiversity programme across the entire region. OMB is a constant threat to the integrity of many of our pristine sites and can be the main determinant of whether a location is added to the programme, in view of the cost and long-term nature of any control, potential collateral damage due to the control operations and the likelihood of reinvasion from nearby seed sources. A typical annual cost of $50,000 is needed to maintain the current level of control but this is well short of the actual sum required to effectively protect our top biodiversity locations.

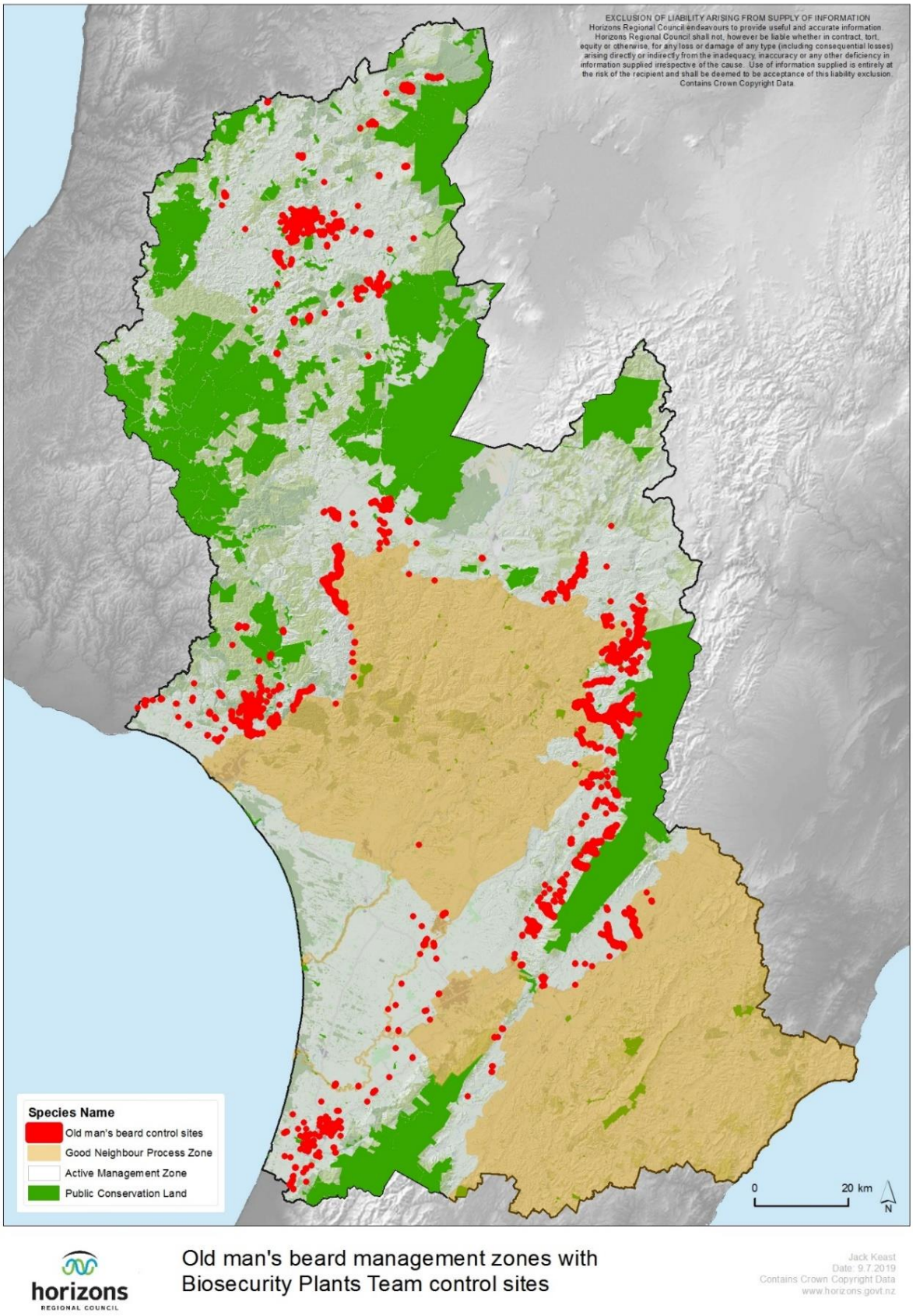

Figure 7 Old man's beard management zones and Biosecurity plant control site distribution. Please note this excludes the work by the biodiversity team.

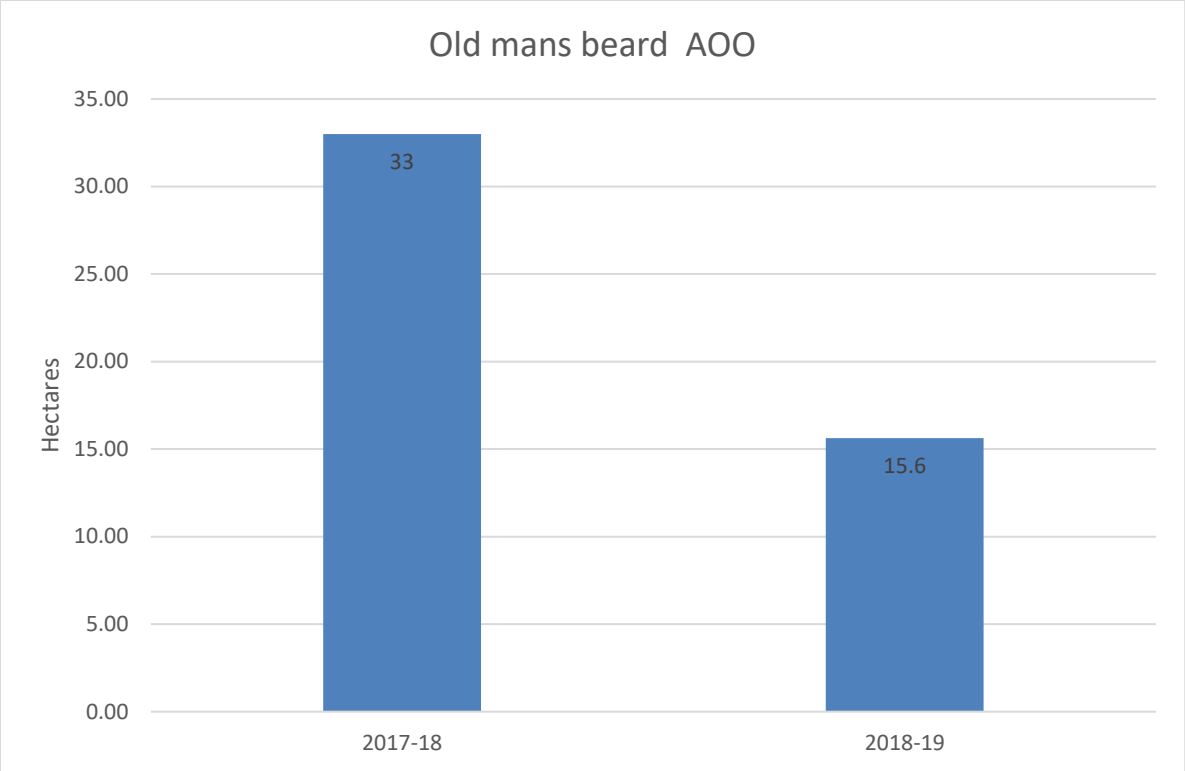

Figure 8 Old man's beard Area of Occupancy measure; accumulated plant cover within AMZ (known). (Data source: WEEDS2.0).

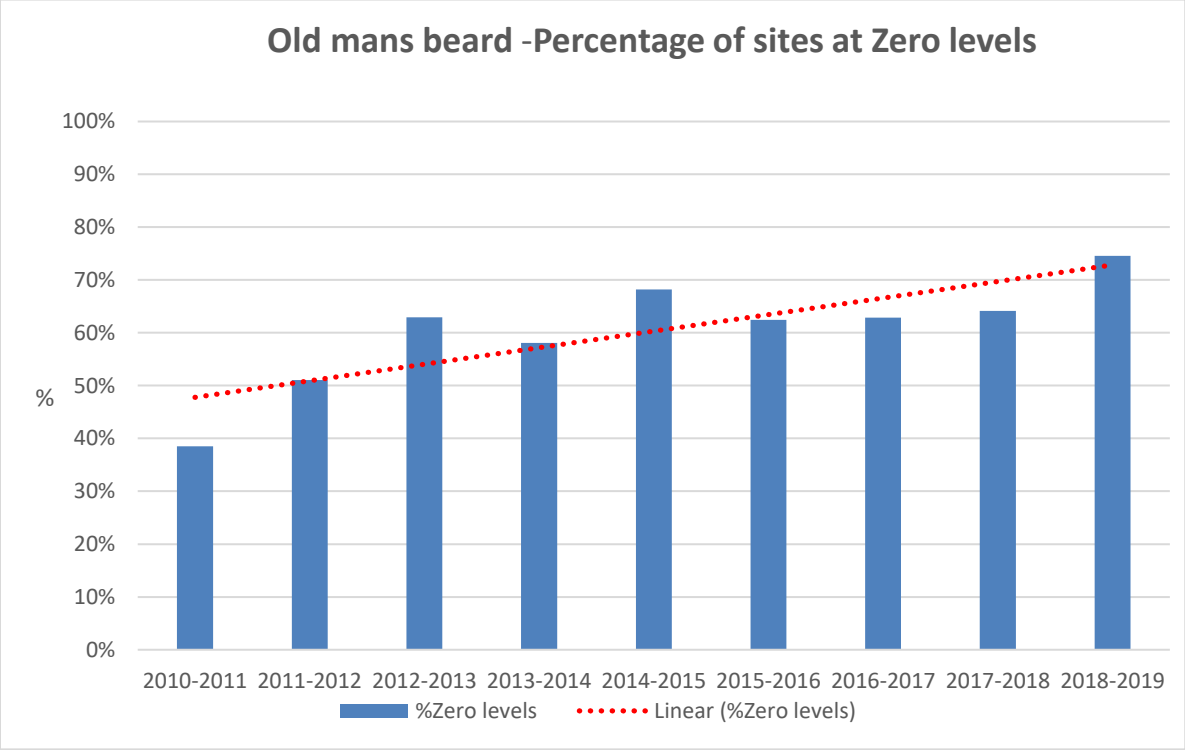

Figure 9 Old man's beard site status tracking. (Data source: WEEDS2.0)

7.16. The current Horizons expenditure against OMB is approximately $700,000 annually. The total spend within Horizons can be difficult to accurately sum as a number of teams undertake control operations against OMB as part of various control programmes. However, an approximate split of costs follows:

- External spend on contractors to undertake spraying and surveillance $330,000. Split across Biosecurity Plants, Biodiversity and River Management groups.
- Support of Rangitīkei Environment Group (REG) $110,000 through the biodiversity budget.
- Internal staff time on control (including project management) $230,000. Split across Biosecurity Plants, Biodiversity and River Management.
- Investment in biological control programmes – from DNA analysis of the national population to importing agents and purchasing populations to release $40,000, funded from Biosecurity Plants.

7.17. Control occurs across the Biosecurity Plants, Biodiversity and River Management teams. It is also a consideration and cost in the Freshwater team's riparian planting as well as retirement planting through the Land team's **Sustainable Land-use Initiative** (SLUI) programme.

7.18. Overall data from our WEEDS2.0 database (Figures 8-9) show that where we do manage sites, we are winning by reducing biomass and preventing seed dispersal, and that we are on track for eradication of these sites at some point in the future. The current 75 percent of sites at Zero levels includes historic and recent discoveries. Eighty-eight percent of sites with more than three years management are at Zero levels. The map in Figure 7 is skewed to the data collected by the Biosecurity pest plant team and misses the very heavy infestations within the GNPZ. It is noted that there are challenges in pooling all of the data for OMB control by the various teams within Horizons.

Partner organisations

7.19. **Territorial local authorities** (TLAs) such as Whanganui, Rangitīkei and Palmerston North councils also fund OMB control, as does the **Department of Conservation** (DOC), KiwiRail and many landowners.

7.20. Territorial local authorities focus control of OMB within local parks and reserves and may support public groups in these initiatives. Old man's beard within road corridors inside the AMZ is now TLAs' responsibility. Most of the TLAs' urban areas, except for Levin, Taumarunui and Ohakune, are within GNPZs. The TLAs are meeting their obligations under the Regional Pest Management Plan (RPMP) and Palmerston North City Council works in a collaborative cost-share initiative with the Horizons Weedbusters programme to control OMB in the city's green belts.

7.21. DOC is represented by a number of area offices within the region and has a substantial land area in the region. DOC and Horizons endeavour to align work programmes to achieve the results deemed best for the region but budget constraints and prioritisation differences have meant this ideal is not always achieved. DOC is under constant fiscal pressure for species-led weed programmes, as well as an expectation from the public and partner organisations to do more against OMB. The newly presented funding opportunity of the government's International Visitors Levy was the impetus for a recent assessment of expanded control scenarios and during 2019 DOC priced four scenarios for OMB management within the Rangitīkei and Manawatū districts:

Year one costs of the four scenarios are:

- Eradication across the Rangitīkei and Manawatū districts $4.4 million;
- Zero-density in all PCLs within Manawatū district $2.1 million;
- Retain the conservation values of DOC land (suppression of current infestation), and Zero density in high-value conservation areas, $518,000; and
- Seek removal of OMB from the Ruahine Forest Park and install a 1.5 km buffer, $463,000.

7.22. The costs were based on DOC and Horizons staff current distribution knowledge in 2019 and on actual current spend against the infestation types present in the target area. Given the current weed burden and the nature of many infestations, the areas for control were understandably large and also dependant on the ultimate goal sought. At the time of writing Horizons is not aware of any decision having been made on the success of this bid.

7.23. KiwiRail has the same requirements as TLAs to manage pest plants under the Regional Pest Management Plan. Old man's beard is not heavily infesting the rail corridor within the AMZ and given the access issues for working within the corridor, staff are reporting any sites discovered directly to the certified contractor for KiwiRail. KiwiRail has in the past undertaken work within the work area of the Rangitīkei Environment Group (REG) to support their local goals.

Non-governmental organisations

7.24. Old man's beard creates management problems and costs to gardeners as well as stewards of reserves and is a great disappointment to those who see what is happening within the GNPZ where a single species is altering the vista and ultimately the essence of once diverse and unique local habitat and landscapes. Community groups are well represented among those against OMB. The Rangitīkei Environment Group is a well-structured group supported by approximately $110,000 annually from Horizons via a Rangitīkei District resident targeted rate as well as assistance with planning by Horizons and Rangitīkei District Council. This group has long been an advocate and manager of OMB control operations across District Council and private land. Initially focussed on Taihape scenic reserves, the group tackles OMB infestations across a range of sites in the Rangitīkei District.

7.25. Forest & Bird is a well-informed and active group championing the control of OMB through the maintenance of many reserves along with QE2Trust registered owners of similar blocks. Groups at Mangaweka, Whanganui, Pongaroa and elsewhere have formed over the years to tackle OMB in parks or within wild areas. However, most disband without achieving their desired outcome generally due to pitching too big a vision and not having the support or funds to allow success and/or prevent the gains made from clearing the plant being lost due to spread from nearby infestations that have not been controlled.

Figure 10 Whanganui old man's beard warriors attacking vines in the suburb of Aramoho (N.Gallagher).

Current management of old man's beard by Horizons.

7.26. Management of OMB can take many forms, depending on the desired outcome and the outcome which is achievable given specific factors. A successful control outcome is dependent on factors such as the abundance of OMB, ability to find individuals prior to seeding/spread, tool availability to control an invaded habitat, control of re-invasion factors, the cost of control and impact of control operations on habitat.

7.27. Old man's beard is abundant and well distributed in the region (Figure 9), hence the current approach of working back towards the entrenched infestations from the scattered, less established areas. Finding OMB prior to flowering and the subsequent risk of seeding requires both ground and aerial surveillance due to a dispersal range from known parent sites of potentially many kilometres. Once it is found, successfully treating OMB typically requires ground access as what may be seen from the air is usually only a fraction of the individual plants at a site. This poses problems in dense bush with light-well invasion, such as along river cliffs, roadsides and other challenging access environments. Mature vines have been known to re-grow after herbicide application and herbicide use is not without potentially significant risk of collateral damage to desirable vegetation. The cost of aerial surveillance and the time resource for staff to ground-truth or de-limit infestations is currently a limiting factor in Horizons' distribution knowledge and influences a required prioritisation of treatment to certain zones within the AMZ on an annually modified rotation.

7.28. To support best practice control and management of OMB, Horizons is sponsoring ($25,000) 'Improving Management of Old Man's Beard' for a PhD study at the School of Agriculture and Environment, Massey University. The Doctoral student is looking at novel methodology of OMB control and broadly assessing best techniques in riparian areas along with targeted application of stem-absorbed herbicides.

7.29. Horizons' current management programmes:

a) Progressive containment via control to Zero levels and sustained control.

i. Rules - Used to enforce control of the isolated infestations below a threshold size (1,000 square metres) within the GNPZ (RPMP rule 5.14.5) and immediate impact of OMB on a landowner's valued habitat by addressing neighbouring boundary ingress (20 m boundary) via a Good Neighbour Rule (GNR), (RPMP rules 5.14.4 and 5.14.6).

ii. Satellite model – As mentioned in Meeneken (2013), the use of the biosecurity industry standard approach of managing small infestations before they increase and pushing back to the large or entrenched gnarly and expensive sites was the core criteria used when forming our AMZ. This programme is undertaken by the biosecurity plants team.

b) Site led – put forward by Speedy and Williams (2010) (Pg 5, 1a) as the likely best spend of limited resources is the identification and prioritisation of high-value sites and working within and nearby to 'weed' OMB from the habitat and aim to prevent most plants able to spread to the site from seeding. The Biodiversity site-led programme takes this approach at a local level at some sites and, given the regional distribution, our current AMZ is drawn to effect this type of approach around significant areas such as the DOC estate.

Another approach to site-led management is where other values in addition to the highest regional biodiversity prioritisation identifies areas with high community influence or use but are presently degraded by OMB. Our region has a number of sites with high profile and significant OMB burdens including Te Āpiti/Manawatū Gorge, Rangitīkei River cliffs at Mangaweka, Matipo Park at Whanganui, Pongaroa, Mowhango River and Makuri Gorge. These types of sites have yet to be explored as viable options for either Horizons managed programmes or fully supported community projects as the opportunity cost of the current funding model tends to favour working across thousands of hectares to prevent these very situations replicating elsewhere.

Horizons' largest site led programme is at Te Āpiti Manawatū Gorge which has a budget of $70,000 this year (including control of banana passionfruit).

c) Community group support – OMB is a plant despised by many people for all the reasons described above. The challenge with community group effort is multi layered. The selection of areas by community groups to focus on can create challenges, especially within the GNPZ where long-term reduction and then maintenance of the cleared asset comes at great cost – not only in herbicide and contractor time but also in volunteer hours. Working against a pest like OMB within an area with a large seed source nearby that can provide for reinfestation requires a long term control effort, albeit at a reduced input after the initial control. Long-term commitment is needed for groups to become successful and the REG is the longest-standing community group receiving funding via Horizons for OMB control.

d) Management of vectors is another industry standard and OMB is able to spread by both natural and human assisted means (vectors). By far the majority of spread is by wind and water; however, other spread can occur on a very low level but with far reaching consequence as survey and subsequent early discovery is not targeted for this type of pathway.

i. We have discovered OMB spread by contamination of potted plant media when shifted from an infested urban location to a holiday home location.

ii. Machinery and equipment may also be a vector, with OMB arriving in the middle of forests isolated by large distances from known OMB sites.

iii. Road and rail corridors appear to be dispersal pathways with sites spread by traffic either receiving seed or seed blowing along the roadside, or in seed contaminated road building materials.

e) Neighbouring councils' OMB programmes have the potential to impact on our success. Each regional council casts its rules or funds programmes depending on the regional priority OMB commands. There is a wide variance of OMB control on our boundaries, however, with a significant GNPZ within our region the level of regional boundary pressure is no worse than our internal infestations against our AMZ boundaries.

i. Greater Wellington Regional Council has in recent times stopped area-wide OMB control on our southern boundary and this is potentially the boundary where most pressure will come from as we have AMZ across the Tararua and Horowhenua district boundaries. An increase in OMB, particularly at Otaki, has been noted.

ii. Taranaki Regional Council has a rule requiring most landowners to remove all OMB from their properties so our western boundary has lower risk.

iii. Waikato Regional Council has active programmes against OMB and is also considered lower risk.

iv. Hawkes Bay Regional Council (HBRC) targets OMB control to a buffer zone along the DOC estate of the Ruahine and Kaweka range, and north of SH5. Below SH5 the southern area adjacent to our north-eastern boundary more or less lines up with our GNPZ, and the buffer zone more or less lines up with our own AMZ. The Hawkes Bay boundary is also considered lower risk.

f) To our knowledge biological control has long been supported by Horizons as there are many areas infested with OMB that are not suitable for conventional or current interventionist control techniques. Biocontrol would complement existing control methods used to mitigate the negative impacts of this weed because biocontrol agents will persist once established, offering the potential to:

i. suppress OMB plants in areas where control is not possible, reducing the accumulation of damaging biomass

ii. suppress regrowth after treatment, potentially reducing the frequency of chemical or mechanical weed control

iii. reduce seed and shoot production, in turn reducing the rate of spread and reinvasion.

7.30. Biological control of OMB has not been attempted elsewhere in the world and Horizons as Champion, along with the rest of the **New Zealand Biocontrol Collective** (NZBC), has funded host testing and introductions of all known and suitable bioagents. Horizons is part of the NZBC consortium of interested agencies which, over the past 14 years, has contracted Landcare Research to investigate, test and introduce a variety of agents to target the most troublesome pest plants in the country. The consortium meets annually to agree on target pest species and to prioritise expenditure. This collective approach means projects can be advanced at a faster rate than relying on a council 'to go it alone'.

7.31. Horizons is currently funding the last tranche of DNA sampling from a coordinated New Zealand-wide and northern hemisphere host range collection of OMB plant material to ascertain any as-yet-undiscovered pathogens from the most likely matching home range sources of the New Zealand OMB population cohort.

7.32. Two of the last un-tested OMB agents were recently re-introduced or planned for release shortly – gall mite (Horizons region, yet to be released) and a second attempt at the OMB sawfly (Canterbury, 12/2018). Both are from Serbia and field assessments will ascertain establishment and the hoped-for damage to effect suppression and ultimately balance OMB with desirable vegetation. The sawfly establishment and inter-generational increase was discovered at the Canterbury introduction site in the summer of 2019.

Figure 11 Laboratory raised OMB seedling showing stunting after addition of gall-forming mites (Landcare Research).

Questions for future management of OMB

7.33. In this section we explore various options available for Horizons management of OMB and whether there are alternatives to remaining with the status quo or what increasing expenditure in these will deliver.

Is the current biosecurity work programme effective?

7.34. Both recent assessments of Horizons approach to OMB management (Speedy, C., Williams, P. (2010); and Meeneken, D. (2013)) have corroborated the control investment against OMB using the Progressive containment model. As we mature the approach adopted with the Regional Pest Plant Management Strategy 2007, and refine this with the Regional Pest Management Plan 2017, reporting from our site tracking database shows a reduction in plant population and a steady increase in the proportion of sites which are at our target of Zero levels. Site accumulation occurs due to historic spread from previously undiscovered AMZ sites and the GNPZ. This has implications of costs unlikely to reduce in the short to medium term as the need for regular surveillance, historic site visitation and seed bank expiration control remains for up to 15 years from the last seeding event. As more of the GNPZ area is infested, this will put increasing pressure on the maintained border of the AMZ. Speedy and Williams (2010) (pg 9 Recommendation 14) offered a nominal figure of $500,000 per annum as an increase to better enable the 'line' to be held. This recommendation was taken on board in part with incremental funding increases over the intervening years ($70,000 in Horizons 2019-20 Annual Plan) and by adjusting the AMZ from what it was when the report was written to one more aligned with areas more easily defendable and aligned to protecting the most vulnerable habitats – effectively a cost reduction and site-led model applied to the region.

7.35. Options for the future:

a) Status quo and continue through till RPMP expiration as planned, while acknowledging suppression rather than 100% Zero levels being the most likely outcome.

b) Reduce AMZ to large buffers around identified prioritised sites of significance.

c) Increase expenditure and staff numbers to enable full surveillance of current AMZ on a two-yearly basis, and enable de-limiting and control operations at all sites annually.

Does the community feel the current programme is delivering?

7.36. With any Progressive containment programme, large infestations unmanaged for good reasons are highly visible and unfortunately an apparent indicator to the general public of programme failure, as opposed to the large area (880,000 ha) of well controlled and protected land. Encouraging acceptance of Horizons' approach through interpretation information is a challenge and one that staff need to address continually. The nature of a Progressive Containment approach means someone's valued area may become infested due to the better spend across large hectares elsewhere. Feedback from the community is generally about wanting more done at specific sites of high local importance. People often agree with preventing spread into new areas but would dearly like more action in their 'special place'.

7.37. Options for the future:

a) Re-prioritise current Rangitīkei district community support to target discrete 'high-value' biodiversity locations under a site-led model, and include a full management plan for all threats to values.

b) Provide funding and support to more groups via community-led/owned groups from the same pool as OMB is currently funded from. The potential implication if this is reprioritised spending within the programme is a reduction of service in the current programme. Typically, OMB control costs approximately $2,000 per ha for a mature infestation, reducing to about $40 per hectare at year six with maintenance costs continuing for many years.

Is further expenditure in biological control justifiable?

7.38. The current investment in biological control is significant at approximately $40,000 per year and there has been no benefit delivered to date. Two new agents potentially able to deliver a reduction in plant biomass are yet to be fully realised and with no regional establishment we are a number of years away from a comfortable reliance on heavy OMB infestations being 'managed' by biocontrol agents. Horizons has prepared for the next generation of research by sponsoring ($78,000) the DNA analysis of New Zealand and northern hemisphere OMB populations to enable best efforts to locate any further agents if the last known agents prove to be sub-optimal. Typically, investment in even moderately successful biological control programmes have cost:benefit ratios of 1:14. Biological control offers the best long-term solution to reducing the impact of old man's beard.

7.39. Options for the future:

a) Expand the biological expenditure once agents have proven establishment, to encourage distribution to the full GNPZ as soon as practicable.

b) Press on with the search for novel agents in the northern hemisphere.

If the spend towards OMB is increased what can be delivered?

7.40. The Annual Plan for the 2019-20 financial year allocated $70,000 more towards investment in OMB management. This, with other adjustments within the budget, has increased the external spend against OMB since 2017-18 by approximately $100,000. Current external expenditure within the Pest Plant programme is in the order of $240,000.

a) Spending more within the current programme delivers a more robust earlier detection function and would allow for a more frequent return period at sites requiring control.

Outcome: The AMZ (excluding Crown land) is more than likely returned to an OMB-free state.

Cost: To be assessed. A current risk is contractor availability for the specialist work required in sensitive habitats. The approach would require an increase in aerial surveillance, ground surveillance and control resource necessitating at least one more staff member, with ~$200-350,000 estimated to cover a staff member and increased external contractor costs or development of in-house capacity to deliver control.

b) Spending more on biological control in the short term to expedite the assessment of any available options.

Outcome: Potential for enduring reduction of OMB impact.

Cost: Initial overseas assessment of most likely matching host locations for New Zealand's OMB cohort is estimated to be in the order of $100,000.

c) Spending more on OMB by increasing the support of biodiversity priority sites, by enhancing buffering required through more funds to the Biodiversity team.

Outcome: Overall better protection of regionally important significant habitat.

Cost: Yet to be fully estimated with Biodiversity team but estimated to be in the order of $150,000 for external contractor costs or development of internal capacity to deliver the work, both surveillance and control.

d) Spending more on OMB by increasing the support of community led/valued projects.

Outcome: The AMZ goal of Zero levels will likely not be achieved in all areas, with suppression containing most infestations and only a low level of population persisting. The community has the opportunity to tackle high visibility and valued areas to support community goals of OMB removal.

Cost: Increased spend at approximately $2,000 per ha plus staff time to either manage or process applications, sign off management approaches, and monitor and audit outworking of plans.

8. COMMENT

8.1. This item provides Council with an update on progress on OMB control in the region including current and forecast progress against the Regional Pest Plan goals. Overall it concludes that the current progamme is not on track to deliver on the Regional Pest Plan goals and provides limited biodiversity protection. Councillor guidance on next steps for this programme is sought.

9. SIGNIFICANCE

9.1. This is not a significant decision according to the Council's Policy on Significance and Engagement.

10. REFERENCES

Meeneken, D. (2013) Can we keep the lid on old man's beard? Consideration of management options for old man's beard in Horizons Region, Horizons internal report.

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ANNEXES

There are no attachments for this report.