PHRAGMITES KARKA

A MONUMENTAL FAILURE IN WEED PEST MANAGEMENT AND CONTROL IN THE MANAWATŪ-WHANGANUI REGION

BARRY SCOTT

Title: Phragmites karka: a monumental failure in weed pest management and control in the Manawatū-Whanganui Region

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Cover Image. Extensive growth of Phragmites karka along the banks of the Makino Stream in Feilding just upstream of the South Street bridge (January 2024). Note the stolons growing across the stream bed (Credit: Awahuri Forest Kitchener Park Collection)

PHRAGMITES KARKA

"The first thing that needs to be said about the biosecurity system is that it is immensely complex."

Simon Upton, Parliamentary Commissioner of Environment

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1. EXECUTIVE SUMMARY

Phragmites karka, or tall reed, is one of the most serious terrestrial weed pests to establish in New Zealand. It is unclear when it was introduced into New Zealand but retrospective identification confirmed it was growing as tall dense stands along the lower reaches of the Whangaehu and Rangitīkei Rivers in the 1980s. Later it was identified at several sites across Auckland. Once established it is very difficult to control as most standard herbicide treatments fail to kill it. It has slowly and silently spread from these early incursion sites to other waterways in the Manawatū – Whanganui region and, more recently, through flooding and storm surges, along the North Island western coast as far south as Kapiti. Nowhere has its impact been more noticeable than in the remnant lowland wetland podocarp forest of Awahuri Forest Kitchener Park (AFKP) near Feilding, where it has invaded following flood events and movement of reed, stolon and rhizome fragments from several heavily infected sites on the Makino Stream in the heart of Feilding. Besides its significant impact on natural ecosystems, it is also having serious economic impacts through blockage of streams and destabilisation of stopbanks. Surprisingly, it is not listed on the Ministry of Primary Industries (MPI) national weed pest register or on the Horizons Regional Council Pest Management Plan, yet its sister species, *Phragmites australis*, is listed as one of the most serious terrestrial weed pest species in New Zealand. While challenging to control, there is a need for a national or regional strategy to control further spread through more comprehensive surveillance, treatment at new detection sites, and through increased public awareness. With a lack of national and regional leadership, the response has been very *ad hoc*. Given the severity of its impact, the AFKP Trust has stepped in to fill this void by initiating research on control methods and organising workshops to raise community awareness. With recent support from the Horizons Biodiversity Fund the AFKP Trust has made significant progress in developing methods for controlling *P. karka* but more research and trials are needed, and urgently. Community groups and individuals have also taken the lead with surveillance, logging new infestations on iNaturalist, and being proactive in removal of this highly invasive weed at accessible sites along the coast. Without more action, *Phragmites karka* will continue to spread throughout the Manawatū-Whanganui region and further afield. Urgent leadership and action are needed.

2. RECOMMENDATIONS

That *Phragmites karka* be added to the national and regional pest registers and be given an impact risk assessment similar to that of *P. australis*.

That MPI, in collaboration with regional territorial authorities, establish a national strategy to control spread of *Phragmites karka* either through a pest management plan or a national pathway management plan.

That Horizons Regional Council take immediate steps to put *P. karka* on a watch list, increase surveillance and treatment of new infestations, and work more closely with community groups and river operators to raise awareness of this very serious weed.

That MPI and Horizons Regional Council provide funding for ongoing research and development into methods to control the growth and spread of *P. karka*.

That Horizons Regional Council initiate some longitudinal studies to better monitor and record spread of this highly invasive weed.

3. DOCUMENT PURPOSE

This document has been prepared as a resource for the Awahuri Forest Kitchener Park Trust and the communities of Manawatū and Whanganui to:

- Provide an account of the early incursions of this weed.
- Describe the biology and taxonomy of this plant.
- Document the submissions made by the community to the agencies responsible for managing weed pest species.
- Document how those agencies responded to those submissions.
- Provide an overview of the national and regional regulatory framework.
- Describe known treatment methods both in New Zealand and overseas.
- Provide an overview of new technologies and methodologies developed by the Awahuri Forest Kitchener Park Trust to control this plant.
- Identify what needs to be done to prevent further spread of *P. karka*.

A RESOURCE FOR AWAHURI FOREST KITCHENER PARK TRUST AND THE COMMUNITIES OF MANAWATŪ AND WHANGANUI

4. BACKGROUND

Phragmites karka, or tall reed, is among the most highly invasive and most difficult to control weed species to become naturalised in New Zealand (*Figure 1*). How it arrived in New Zealand, and when, is not known. It was first formally identified in May 2006 when it was found at the mouth of the Rangitīkei River at Tangimoana[1] and later several kilometres upstream[2]. The second recorded sighting of *P. karka* was at Tahapa Reserve in the Auckland Region in 2011[3], where it was identified as *P. karka* rather than *P. australis*. It was first formally recognised in Awahuri Forest Kitchener Park (AFKP)[4], on the outskirts of Feilding, in October 2020, having previously been mistaken for either bamboo (*Bambusa spp.*) or giant reed (*Arundo donax*).

This serious weed is now found along a 3 km stretch of the lower Whangaehu River, along 7 km of the lower Rangitīkei River, in the Makino Stream from Feilding to the confluence of the Oroua River, and down the Oroua almost to the junction with the Manawatū River. It is also found in the Horowhenua region at a number of sites. In 2021 it was identified at two new sites along the Kāpiti coast, and in 2025 on the edge of the Kaikokopu Stream at Himatangi Beach, presumably being dispersed this far in sea water, following flood events in the rivers further north.

The ability of *P. karka* to establish from small reed and rhizomatous fragments enables it to be spread very easily (*Figure 2*). Once established, it forms an extensive, creeping, underground rhizome system and a huge above-ground monoculture of reeds, that makes it very difficult to control.

Figure 1: Phragmites karka growing on the banks of the Makino Stream upstream of Awahuri Forest Kitchener Park (Credit: Barry Scott)

Figure 2: Excavated rhizome of P. karka with upright stems arising from nodes on the rhizome (Credit: Awahuri Forest Kitchener Park Collection)

5. BIOLOGY OF PHRAGMITES KARKA

Figure 3: Growth habit of mature clumps of Phragmites karka growing at Awahuri Forest Kitchener Park, Feilding (2021), with Vivienne McGlynn in foreground (Credit: Awahuri Forest Kitchener Park Collection)

Phragmites karka is a tall perennial reed-like grass species within the family Poaceae (*Figure 3*)[5]. It is found growing naturally in Australia, Asia, Papua New Guinea and the Pacific Islands and, in contrast to its sister species *P. australis* (earlier known as *P. communis*), it is not deciduous. North America has both *P. australis*, as an introduced species, and *P. karka*, which is native and found along the Gulf of Mexico coast[6]. *Phragmites karka* is an adaptable, invasive and aggressive species that outcompetes native flora for essential resources such as space, moisture and nutrients[7]. Distinctive characteristics include:

- **CULMS:** The above ground culms (stems) are stout, often woody or reed-like, growing to heights of up to four metres. A defining morphological feature is the fringed membranous ligule at the junction between the leaf blade and the sheath (*Figure 4*). The ligule hairs of *P. karka* are much smaller in length (~0.75 mm) to that of *Arundo donax* (~1.5 mm) with which it has sometimes been mistakenly identified[8] (*Figures 5 to 7*). *Arundo donax* also has leaves

arranged in two rows whereas *P. karka* does not. A key distinguishing feature between *P. karka* and *P. australis* is the structure of the floral spikelet[9]. *P. karka* has longer glumes and rhachilla hairs than *P. australis*[10]. The leaves of *P. australis* are bluish green and taper to a point, with large fluffy purplish-brown flowerheads[11]. Other distinguishing features are the 'smooth and shiny' culms of *P. karka* compared to the 'ridged and not shiny' culms of *P. australis*[12], with the former being evergreen and the latter deciduous.

- **STOLONS:** An extensive network of stolons with adventitious roots enables it to grow along the surface of the ground over distances of 4 – 8 metres or more. If any part of the reed breaks off and lands in water or on wet ground, new roots form from growth nodes to establish a new colony of *P. karka*.
- **RHIZOMES:** Although the above ground structures form extensive monocultures, the greatest biomass is in the underground rhizome structure. The rhizomes can be the thickness of an adult wrist and comprised of segmented structures divided into nodes (from which the stems arise) and internodes. Rhizomes can grow up to six metres a year underground, sending up new reeds and forming big clumps. Any part of a rhizome that is broken off containing a growth node can form a new plant as with the above ground stolons and reeds.

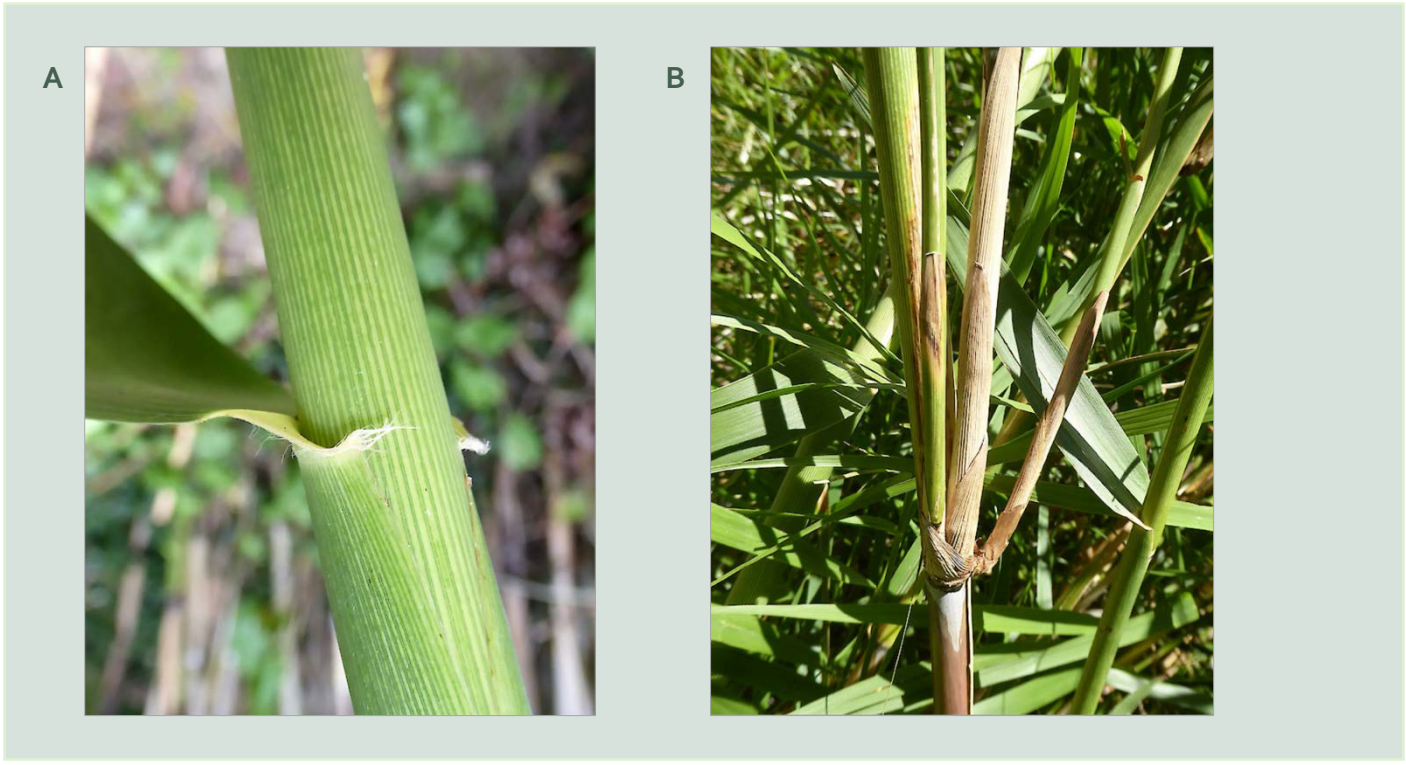


Figure 4: Phragmites karka ligule structure. ***A.*** *Ligule-collar area at top of stem of P. karka, highlighting the short membranous ligule structure;* ***B.*** *Branching culm of P. karka (Credit: Colin Ogle NZPCN 2021)*

During flooding, pieces of rhizomes, stolons, or reeds break off and get carried to a new site downstream and establish new plants and colonies.

Although flowers were first observed on *P. karka* plants at Tahapa East Reserve[13] in 2011 (*Figure 8*), when analysed by the National Arboretum no viable seeds were detected. In 2022 two single plants were observed to be flowering in Feilding, one by the South Street bridge upstream of AFKP, and another within the park[14]. Most plants appear to reproduce vegetatively rather than by sexual means. The environmental conditions found in New Zealand may not be conducive to promote flowering among what is probably a clonal population. Phragmites flowers are known to produce thousands of viable seeds annually elsewhere[15]. If with climate change conditions in New Zealand modify to allow flowers to seed, control of spread will be unmanageable.

Other methods of spread include mechanical spread by machinery operating in infested river and stream beds but also by people who mistake *P. karka* for bamboo and transplant it. These additional pathways have contributed to further spread of *P. karka* across the Manawatū-Whanganui region, often in areas well removed from waterways[16]. People are unaware that the plant spreading along the stop banks, through estuaries and wetlands is not bamboo but potentially one of the biggest threats to these native ecosystems.

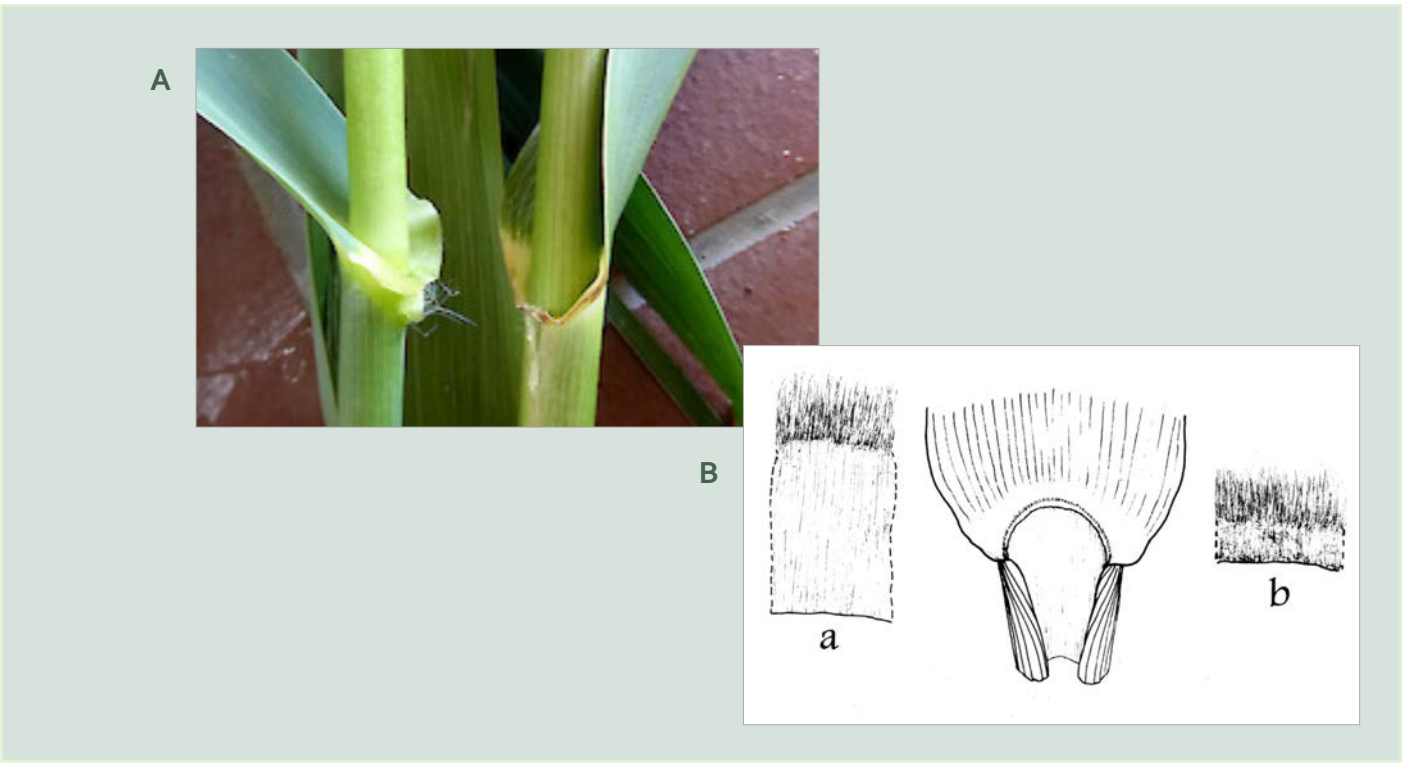


Figure 5: ***A.*** *Ligule-collar area at top of stem of Phragmites karka (right) and Arundo donax (left) (Credit: Colin Ogle NZPCN 2021)* ***B.*** *A comparison of the membranous ligule structure between P. karka and A. donax (Credit: Reproduced from Gardner 2011)*

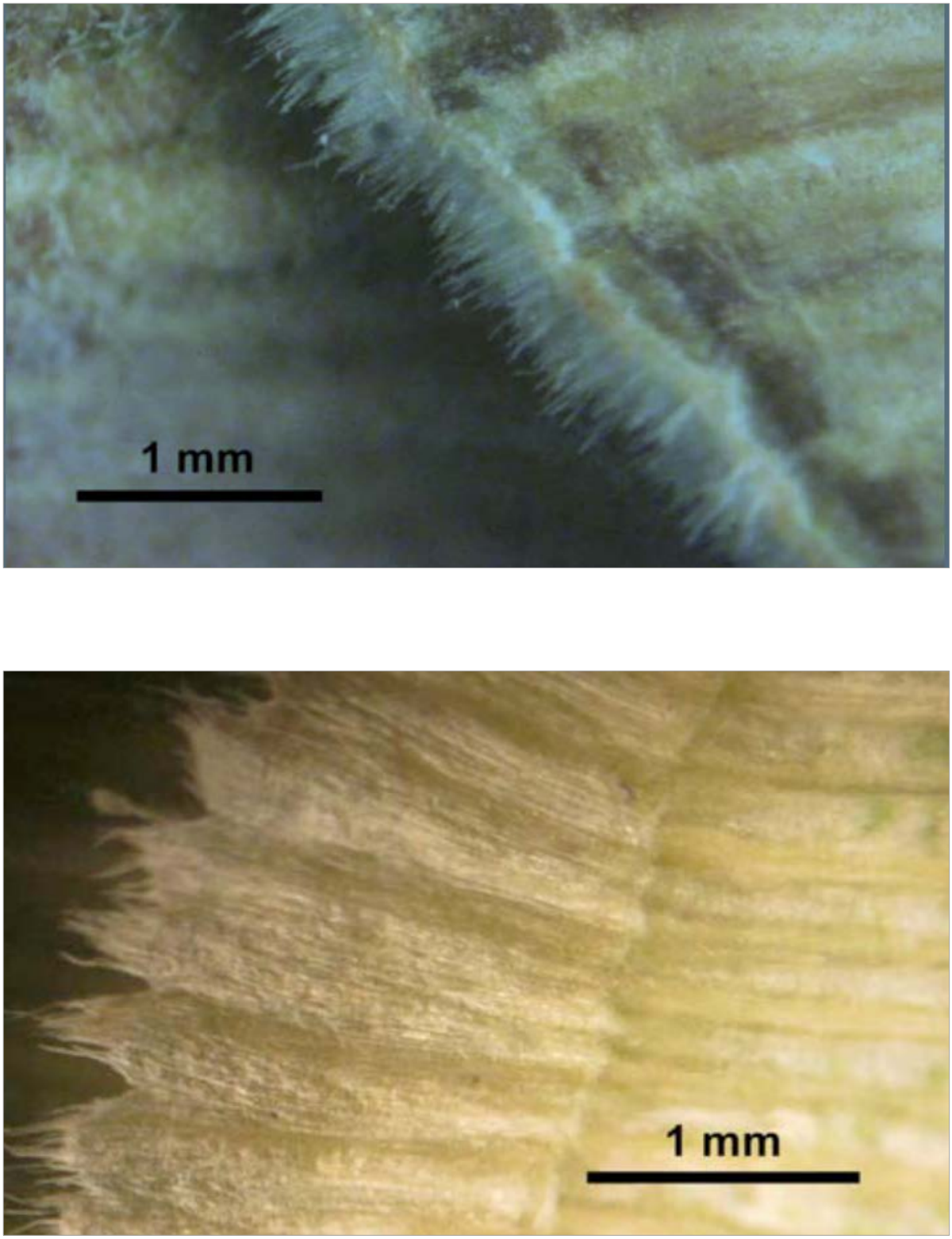


*Figure 6: A comparison of the ligule morphology between P. karka (**A**) and A. donax (**B**) (Credit: Reproduced from Wilcox 2011)*

Figure 7: Arundo donax growing along the banks of the lower Waimata River in Gisborne (Credit: Barry Scott)

Figure 8: Flower head and florets of P. karka growing at Tahapa East Reserve (Credit: Reproduced from Wilcox 2011)

6. *PHRAGMITES KARKA* ALONG THE WHANGAEHU

While visiting Whitiau Scientific Reserve in 1988, Colin Ogle saw a 'bamboo-like' weed growing prolifically along the true left (i.e. the opposite side) of the lower Whangaehu River[17]. At the time he thought it was a bamboo (e.g. *Pseudosasa japonica*) but later realized it was *P. karka*[18]. The infestation there is now very significant and extends up the river for about 3 km[19]. This may well be 'ground zero' for this plant as it has recently been revealed that it was planted there by the Craig family on the banks of the river, close to stock yards, over 50 years ago[20]. The infestation at this site has followed the classic new weed establishment trajectory of a lag phase in which the weed establishes in one place and slowly spreads and then explodes[21], aided by human and mechanical spread. Interestingly, there appears to be a distinct growth 'cut off' zone at this site, with no evidence for *P. karka* growing in the lower reaches of the river, and around the mud flats and dunes close to the outlet of the river[22]. This is surprising given the length of time it has been present at this site. Possible reasons for this growth restriction might be high salinity or water quality (high sediment and/or acidity) at the mouth of the river – the headwaters of the river are in lahar soils high in minerals like arsenic. Furthermore, the plants in the lower reaches now look considerably unhealthy, compared to four years ago[23, 24] (*Figure 9*). A similar lower stream growth restriction has also been observed for *P. karka* growing on the edge of Kaikokopu Stream at Himatangi Beach, with upstream infestations looking considerably more healthy than the infestation closest to the sea[25].

On the true right of the Whangaehu estuary is the 246 hectare Whitiau Scientific Reserve[26] (*Figure 10*). Although small rooted pieces of *P. karka* have been found (and removed) on this side of the river, until recently the reserve was thought to be free of *P. karka*. However, a recent survey by the Department of Conservation (DOC) of the reserve identified two patches of *P. karka* well established on the banks of the true right of the Whangaehu River at the North East boundary[27]. DOC have sought help from the AFKP Trust as to how they might manage these two infestations. This new observation highlights the importance of regular surveillance, especially of high value biodiversity sites such as this one, to prevent this difficult to remove plant becoming established.

Figure 9 (opposite): Comparison of P. karka growing on true left bank of the Whangaehu River May 2021 (A & B) and June 2025 (C) (Credit: Colin Ogle)

Figure 10: View of Whitiau Scientific Reserve (April 2025) looking across the Whangaehu river to the estuary and outlet of the river. Note the heavy infestation of P. karka on the true left of the lower reaches of the river
(Credit: Barry Scott)

7. *PHRAGMITES KARKA* AT TANGIMOANA

Figure 11: Phragmites karka at Tangimoana along the Rangitīkei River berm (Credit: Awahuri Forest Kitchener Park Collection)

P. karka was first formally identified in May 2006 when it was found at the mouth of the Rangitīkei River at Tangimoana[28] and later several kilometres upstream[29] (*Figure 11*). Initially it was identified as *Arundo donax* and later corrected to *P. karka* following communication with Wilcox. How *P. karka* became established on the banks of this river is not known but could well have been planted at a site upstream and spread downstream from there[30] or was spread by machinery that had previously operated at an infested site. Concern about the impact of this weed on the ecology and biodiversity of the estuary triggered the Ellison Reserve Community Group at Tangimoana to take action in 2012.

Many attempts were made by this group to have *P. karka* recognised as a weed of both regional and national significance through submissions to Horizons Regional Council (Long Term Plan), Manawatū District Council and Biosecurity New Zealand, but without success[31]. However, they did receive some support from Horizons to mechanically remove it from sections of the estuary and around the boat ramp at Scott's Ferry on the true right of the river, but long term their efforts were in vain. A timeline of those efforts is recorded in Appendix I.

In 2018 Horizons carried out some spray trials at six sites along the Rangitīkei and at one site on the Whangaehu River with the aim of "trialling seven different herbicides and two control techniques … to learn if there is a control solution suitable for these environments" but the results of those trials, and earlier trials carried out in 2015, do not seem to be available[32]. Despite this being the most heavily infested site in New Zealand, there is no mention of the environmental and economic risk of this weed to valued coastal reserves in this region in a coastal reserves management plan[33].

During the preparation of this report I made a visit to Tangimoana with Bessie Nicholls to see the extent and impact of *P. karka* on this very extensive (118 hectare) high ecological value tidal estuary. I was shocked at the degraded state of this ecosystem. Large patches of *P. karka*, pampas and other exotic weeds cover the banks of the river between Tangimoana and the river outlet at the beach. *P. karka* patches were visible on the horizon across the central area of the estuary, upstream, and along the other side of the river. The stark reality of how *P. karka* continues to spread not just at this site but further down the coast was clear to us when we walked along the high tide zone of the beach. Freshly washed up fragments of viable rhizomes and reeds were extensive among the driftwood recently deposited along the beach following flooding from the previous weekend (28-29th June) (*Figure 12*).

While broad scale habitat mapping of the Rangitīkei Estuary was carried out in 2018[34], and the potential biological impact of *P. karka* noted in this report, there has not been any longitudinal study to monitor and measure the extent and spread of *P. karka* across this ecologically important site. One of the recommendations from the 2018 report was to evaluate the potential for spread of *P. karka* and consider removal or containment strategies, but I am not aware of any follow up action to this recommendation.

Figure 12 (opposite): P. karka viable reed and root material among the driftwood at Tangimoana Beach (1st July, 2025) (Credit: Barry Scott)

8. *PHRAGMITES KARKA* IN AUCKLAND

P. karka was first recognised in Auckland by Mike Wilcox at Tahapa Reserve, Meadowbank, Auckland in 2011[35]. The current estimated area of cover is ~500 m^2. Glyphosate was initially trialled as a potential control method but was unsuccessful. Other herbicides were tested from 2012 to 2021 but with little success. Use of Imazapyr in 2021 did lead to a reduction in actively growing stems. In 2014 *P. karka* was found at two sites in Manurewa – Wattle Downs and Coxhead Road. A combination herbicide treatment of imazapyr and amitrole has been used to control spread[36]. In 2018 a member of the public sighted *P. karka* on the Hobson Bay Walkway, but it was mistakenly identified as *Arundo donax*/giant reed, highlighting an issue around surveillance, identification and reporting of this serious weed. A key feature to distinguish these two reed species is the length of the hairs on the membranous ligule, which are ~1.5 mm for *Arundo* and ~0.75 mm for *P. karka*[37]. In 2022, a contractor reported *P. karka* present on Pah Road at Cockle Bay. New sites have since been identified at Kenneth Small Place, Remuera, and College Road, St Johns, in 2023 and 2024. Around this time, metsulfuron was added to the herbicide mix to reduce the growth of this plant. Despite multiple herbicide treatments per year, regrowth has occurred at all sites, highlighting the difficulty in controlling this weed[38].

In 2012 Auckland Regional Council listed *P. karka* as a notifiable weed even though it was not listed on their Regional Pest Management Plan at that time[39,40].

9. *PHRAGMITES KARKA* AT AWAHURI FOREST KITCHENER PARK

Figure 13: Awahuri Forest Kitchener Park showing old podocarp lowland forest and recently planted native plants as part of restoration programme within the Park (Credit: Barry Scott)

Awahuri Forest Kitchener Park (AFKP) is a highly significant (Scenic A reserve) remnant (17 ha) of ancient lowland and wetland native forest on the southern side of the township of Feilding in the Manawatū district (*Figure 13*). The forest floods on a regular basis from overflow of the adjacent Makino Stream. It is DOC land managed by the Manawatū District Council through the AFKP Trust, which was established in 2014.

While a reed-like grass was observed growing in AFKP for several years it was not until October 2020 that the Plant Health and Environment Laboratory at MPI formally identified it as *P. karka*[41] (*Figure 14*). It had previously been mistaken for either bamboo (*Bambusa spp.)* or giant reed (*Arundo donax*). Since this time, the AFKP Trust has been working tirelessly to get regional (Horizons Regional Council) and national (Ministry of Primary Industries) recognition of this plant as a highly invasive and ecologically destructive weed, but without success. A timeline of those efforts is recorded in Appendix I. While its sister species, *P. australis* has been listed within the National Interest Pest Response programme since the 1990s[42], *P. karka* remains almost totally off the radar of regulatory authorities, with no recognised weed pest status.

It is still unclear to the author why this is the case given *P. australis* is listed as one of our most serious terrestrial weeds. One can only conclude that historical oversight or inaction led to this situation and once *P. karka* 'got away' no remedial action was ever taken.

Figure 14: Phragmites karka in Awahuri Forest Kitchener Park (October 2021) (Credit: Barry Scott)

P. karka is now present at many sites from the source, above South Street bridge in mid-Feilding (*Figure 15*), along the banks of the Makino Stream to the AFKP. However, it is still absent from the Mangaone West Stream, a tributary that joins the Makino Stream just upstream of the park. Flood events have exacerbated the rate of spread of this highly invasive weed. Fragments of rhizomes, stolons and reeds are all capable of forming viable plants. Stolons spreading across the river bed are particularly susceptible to breakage; with one in the upper Makino measuring 8.5 metres in length[43]. *P. karka* also impacts on infrastructure beyond the stream. Growth around the source site in Feilding is so vigorous that asphalt and concrete slabs on public and private property have been lifted, and in one case rhizomes have spread across a property, under the house and into the framework of the building! How *P. karka* became established on the banks of the Makino Stream is not known but is likely to have been growing here for at least 40 years. Spread by river-operating machinery is a likely pathway. As with the heavily infested sites on the lower Whangaehu and Rangitīkei Rivers, spread down the Makino Stream has followed the classic new weed establishment trajectory of a lag phase in which the weed has established in one place (upstream of South Street bridge), slowly spread downstream, then exploded once a critical biomass has been reached[44]. The presence of this weed along a waterway has exacerbated spread by flood events when live material can be moved over large distances. The rapid and extensive spread of *P. karka* into AFKP in the last 10 years has been a consequence of the *P. karka* population reaching a 'critical biomass' in the upper Makino Stream, and highlights what happens without early intervention.

Photos taken inside the Makino Stream channel after the February 2004 flood shows clearly identifiable clumps of *P. karka* along the banks. Since then, *P. karka* has spread down the Makino Stream from Feilding, into the Oroua River and almost all the way to Rangiotu, where the Oroua River joins the Manawatū River[45]. More recently, *P. karka* has been identified by community at two sites upstream of the confluence of the Makino and Oroua Rivers[46]. These stands are an additional biological source for spread into the lower Oroua River. The *P. karka* stands at these two sites do not appear to be growing as well as plants in and around AFKP, with the reeds heavily pigmented with anthocyanins, a biochemical signature of stressed plants (*Figure 16*). Removal of these stands should be a high priority to prevent (or at least slow down) spread of *P. karka* along the Oroua River, otherwise we will see a repeat of what has happened on the Makino, Rangitīkei and Whangaehu Rivers. At a minimum, the stolons growing across the gravel flats adjacent to these stands should be removed as they are the highest biological risk material. While *P. karka* is not yet present in the Manawatū River, its presence in the lower reaches of the Oroua River makes it highly likely that without urgent measures to control spread it will make its way to the banks of this river in future flooding events. This then puts at risk further downstream spread to the Foxton estuary, an internationally significant wetland with Ramsar status[47].

Figure 15: Extensive growth of Phragmites karka along the banks of the Makino Stream in Feilding just upstream of the South Street bridge (June 2025) (Credit: Barry Scott)

Figure 16: Culms of P. karka, enriched in anthocyanins, growing on the banks of the Oroua River (June 2025) (Credit: Barry Scott)

10. OTHER SITES

Besides the coastal infestations around the mouths of the Whangaehu and Rangitīkei Rivers, *P. karka* has also been identified at several other sites along the stretch of coast extending from the mouth of the Whangaehu to the Kapiti coast, including three sites in the Kaikokopu stream at Himatangi Beach, around Foxton Beach, and at Waitarere, highlighting how it is slowly spreading along the west coast of the lower North Island through floods and storm surge events that bring it ashore[48, 49]. After the winter floods of 2022 a considerable amount of *P. karka* plant debris was washed ashore at Foxton Beach but a pro-active community group removed and disposed of this material[50]. They also carried out surveillance (and continue to do so) along the coast from Foxton to the mouth of the Rangitīkei River. Along this section of the coast *P. karka* is still present among driftwood immediately south of Tangimoana and at the outlet of Pukepuke Stream, 3 km south of Tangimoana. The current status of *P. karka* between the mouths of the Whangaehu and Rangitīkei Rivers is not known but does appear to be absent along and around the mouth of the Turakina River.

P. karka has also been reported at several coastal sites south of Foxton Beach. A major infestation has been identified around the mouth of the Waiorongomai Stream, between Waikawa Beach and Otaki. Attempts have been made by Greater Wellington Regional Council, in partnership with local iwi, to remove it from this site, including the use of a bulldozer, but to date without success. More recently (January 2025), they have contracted Green by Nature to trial the cut-and-fill method at this site.

P. karka is also at two sites in Springvale Park in Whanganui[51] (*Figure 17*). While Whanganui District Council has been informed that *P. karka* is growing in this park, to date no action has been taken to remove the plants, even though they remain a serious risk to further spread in and around the city through human and/or machine movement.

The spread of *P. karka* to sites away from waterways would strongly suggest that machine or human movement has been responsible. A good example is a patch of *P. karka* that was found in Sanson village at a heavy machinery wash site[52]. Interestingly, there is also an infestation of field horsetail (*Equisetum arvense*) at this same site, a weed that is now very widespread across the Manawatū, with one of the main pathways for this spread being movement of gravel from 'contaminated' river shingle sites to new sites. Significantly more agency led public education and awareness is needed to prevent this happening with *P. karka*.

Figure 17: Phragmites karka in Springvale Park, Whanganui (June 2025) (Credit: Colin Ogle)

11. GIS MAPPING OF *PHRAGMITES KARKA*

Unfortunately, there is no publicly available portal to comprehensively show all known sites of *P. karka* infestation. The best publicly available site is iNaturalist (*Figure 18*). It is thanks to the individual efforts of a few community members inputting data into this citizen science portal that we have a general picture of the distribution of *P. karka* across the Manawatū – Whanganui area and coastal regions further south. But one major limitation to citizen led surveillance is site accessibility. While there is good coverage of the coast, access to infested sites along the banks of the Whangaehu, Rangitīkei, Makino, Oroua and other rivers is difficult as it is frequently through private property. Horizons do operate in-house a GIS based geo-spatial system for numerous pest/invasive weeds but this information is not available to the public, because, they say, of privacy issues. However, filtering of sensitive field information is possible, enabling some information on location of specific invasive species to be shared with the public as is currently the case with surveillance data for the exotic alga, Caulerpa, in coastal waters of the north east of the North Island[53].

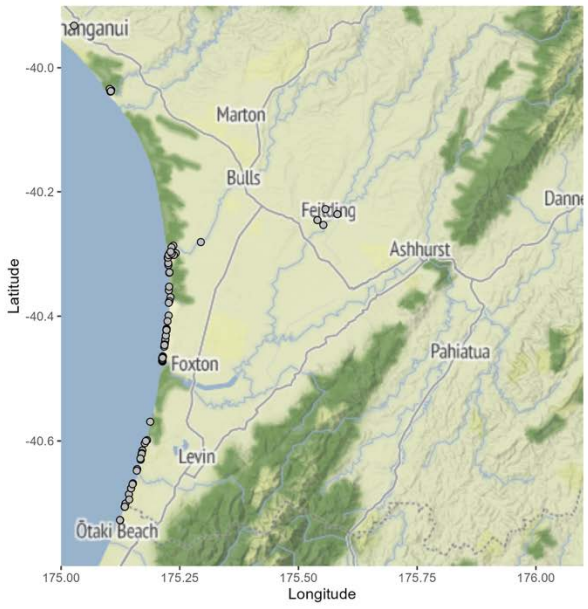
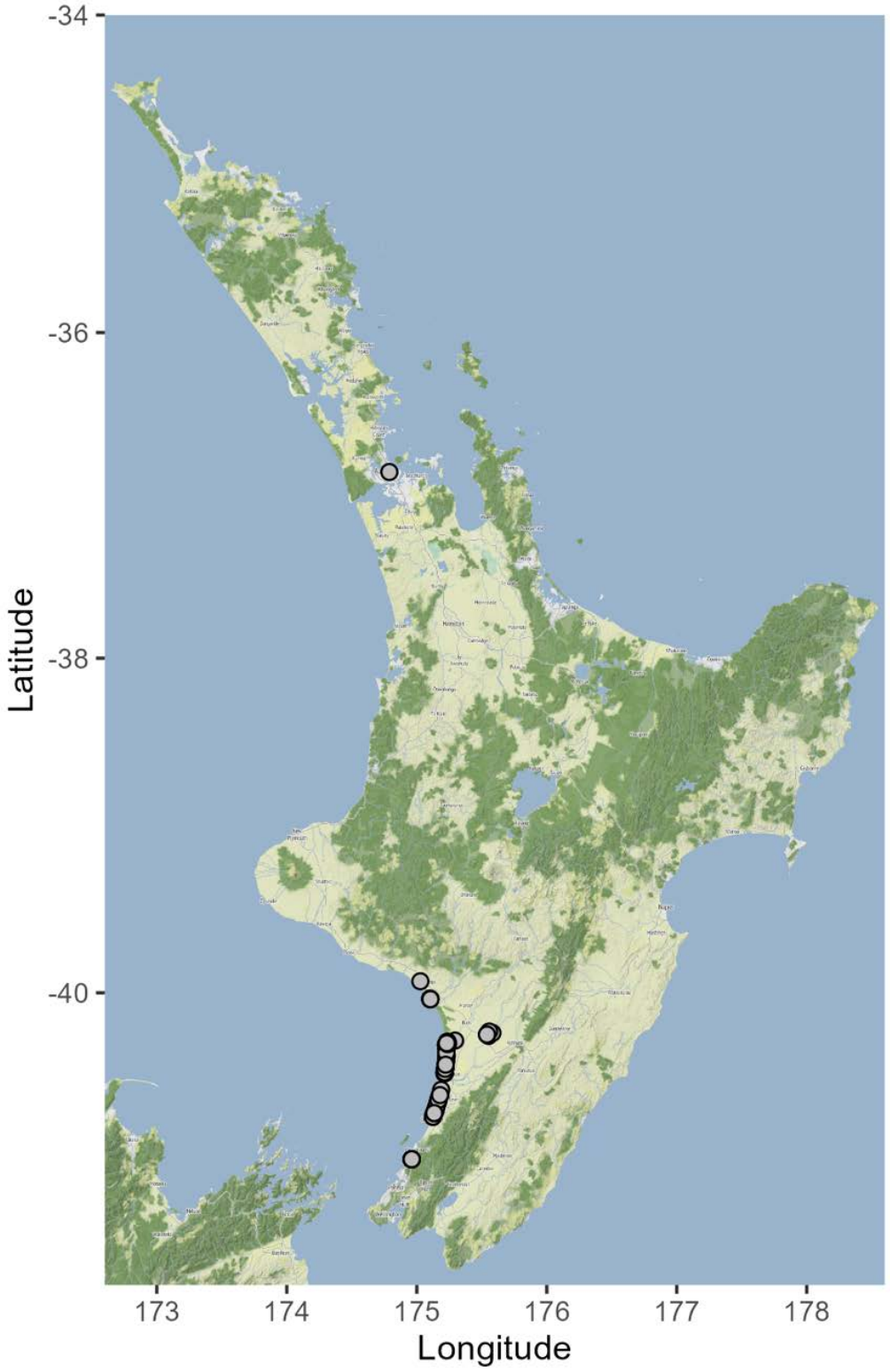


Figure 18 (above and opposite): Mapping of P. karka sites across the North Island using iNaturalist entries (Credit: Sara Burgess, Greenhood Data)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12. WEED STATUS OF *PHRAGMITES* AND AGENCY RESPONSE

12.1. Ministry of Primary Industries (MPI)

The key act for regulation of pest management in New Zealand is the Biosecurity Act 1993[54]. Sections 12A and 12B of this Act set out responsibilities for pest management at the national and regional levels, respectively. The process for declaring an organism a pest at either level is outlined in the *National Policy Direction for Pest Management*[55]. Under this framework there is a requirement for a clear cost-benefit analysis in making the case for listing a species as a pest either regionally or nationally. Feasibility of control is one of the considerations in deciding whether to declare an organism an Unwanted Organism under the Biosecurity Act 1993[56,57].

Phragmites being an "Unwanted Organism" (MPI's national classification for *Phragmites* eradication) and *Phragmites karka* specifically not being a "registered weed" in certain regional or national pest management plans (as articulated by the AFKP Trust) is a critical policy nuance that creates a significant gap in New Zealand's biosecurity response. The term "Unwanted Organism" primarily prohibits certain activities and mandates reporting. However, a "registered weed" status, typically formalized within a Regional Pest Management Plan (RPMP) or a National Pest Management Plan (NPMP), often triggers more direct and consistent obligations for landowners/occupiers, and crucially, dedicated funding streams and explicit control responsibilities for regional or national authorities. *P. australis* is one of nine harmful weeds managed by the National Interest Pest Response (NIPR) programme[58,59] because they "could cause serious harm to New Zealand's environment and economy if they are allowed to spread." However, there have been no additions to this list for many years despite the incursion of many new exotic weeds into New Zealand. In the National Institute for Water and Atmospheric Research (NIWA) *Freshwater Invasive Species of New Zealand* (2020) report[60], the biosecurity risk of *P. australis* is described as: "New Zealand's worst potential aquatic weed species. AWRAM score: 75 (1st worst aquatic weed)." Remarkably, there is no mention of *P. karka* in this report, despite NIWA's knowledge of its widespread distribution in the river catchments of the Whanganui and Manawatū district[61]. *P. australis* is also listed on the National Pest Plant Accord (NPPA) list but not *P. karka*[62].

This seems a serious anomaly given the similarities between these plants and the purpose of the list being the regulation of nursery plant species through the prevention of sale, distribution and propagation of pest plants within New Zealand. The NPPA is a cooperative agreement between:

- The Ministry for Primary Industries (MPI)
- New Zealand Plant Producers Incorporated (NZPPI)
- Unitary and regional councils
- Department of Conservation (DOC)

While some pest management plans are developed nationally most are developed by regional councils and pest management agencies under the framework of the MPI developed *National Policy Direction for Pest Management*[63]. This policy sets out requirements for developing pest management plans and programmes under the Biosecurity Act 1993, and has 6 sections:

- Setting objectives
- Programme description
- Analysing benefits and costs
- Proposed allocation of costs
- Good neighbour rules
- Timing of an inconsistency determination

12.2. Horizons Regional Council

Under the Biosecurity Act 1993 regional councils are required to develop pest management plans for their region. Management of natural resources, including support for biodiversity and biosecurity within the Manawatū-Whanganui region, which covers 10 Territorial Local Authorities, is managed by Horizons Regional Council. The Horizons *Regional Pest Management Plan 2017-2037*[64], strategically interfaces with the *Long-Term Plan (LTP), Annual Plan, The One Plan*, the *National Biosecurity Strategy*, and the *National Biodiversity Strategy*. The current plan contains a list of 55 pest plant species (Section 2.1.2), of which *P. australis* is included but not *P. karka*. Discussions with Horizons[65] revealed that *P. karka* was considered for inclusion in the RPMP (2017-2037) but in the end was excluded because it did not meet the threshold required under the criteria laid out in the MPI *National Policy Direction for Pest Management*[66]. This decision was probably not helped by the absence of a national policy direction on native ecosystem weeds by MPI.

The Horizons *Regional Pest Management Plan* structure for managing these pests is comprised of four programmes:

- Exclusion programme – a programme to prevent establishment of certain species.
- Eradication programme.
- Progressive containment programme (rolling back).
- Sustained control programme.

P. australis is one of the 11 plant species included within the *Exclusion Programme*, highlighting how serious this plant species is considered both regionally and nationally.

While the Horizons *Regional Pest Management Plan* (RPMP) is a 20 year plan (2017-2037) there is discretion for the Council to add additional plant species to the plan during this time although this is potentially costly as public consultation is required to comply with the Biosecurity Act 1993 and The Local Government Act 2002. However, there is the opportunity for Horizons, and for MPI, to raise public awareness of particular pest species through their communication networks but to date this has not been done by either agency. Even in the most recent Horizons State of the Environment report, there is no mention of Phragmites[67], yet the adverse effects of this species on natural ecosystems in the region are considerably greater than many of the plant species listed in the RPMP. Auckland Council was the first to include *P. karka* in their regional pest management plan[68]. The risk assessment of *P. karka* carried out during the review process determined that this species posed a significant risk. In line with this plan, Auckland Council has a programme of raising public awareness[69]. Although *P. karka* is not included in the Greater Wellington

Regional Council pest management plan[70], it is listed in their Operational Report for 2021-2022[71], together with three other species, as a species of interest and has been placed under a control programme. This flexibility for Councils to update or modify plans is highlighted by the Bay of Plenty Council who recently carried out a partial review of its Regional Pest Management Plan to include exotic caulerpa and some other emerging pest species[72,73].

The Auckland *Regional Pest Management Plan* also has a management structure of four categories including: (i) Exclusion, (ii) Eradication, (iii) Progressive Containment and (iv) Site Led[74]. *P. karka* is listed within the Eradication category so there is commitment to controlling at all sites. With *P. australis* there are differences in how this serious weed is being managed in New Zealand. Manawatū-Whanganui, Northland and Tasman run an Exclusion programme; Wellington and West Coast an Organism of Interest programme; and Canterbury and Hawkes Bay an Eradication programme[75]. The fact that *P. australis* has only ever been found in Canterbury (at two sites in Christchurch), Hawkes Bay (one site) and Tasman (one site) since initial detection in the 1990s highlights how eradication can be effective when there is early intervention.

In an important development, Department of Conservation have recently added *Phragmites karka* to their list of environmental weeds in New Zealand[76]. In compiling this list, they considered 759 candidate species for inclusion but then narrowed this down to 386 species on the basis of whether they were fully naturalised in New Zealand and whether they had more than a minor impact on natural ecosystems. This is the first time that a government agency has publicly recognised the potential serious impact of *P. karka* on New Zealand's highly valued native ecosystems.

13. ENVIRONMENTAL, ECONOMIC, SOCIAL & CULTURAL IMPACTS OF *PHRAGMITES KARKA*

The unchecked ongoing spread of *P. karka* along the waterways of the Manawatū – Whanganui catchment, over a period of many years, has had a significant impact on several valued ecosystems including the estuaries at the mouth of the Whangaehu and Rangitīkei Rivers and the remnant semi-wetland podocarp forest at Awahuri Forest Kitchener Park, which is classified as a Scenic A Reserve (*Figure 19*). The AFKP Trust has among the best documented records of the environmental impact of *P. karka* infestation in New Zealand. The dense growth of this reed currently impedes access to waterways in AFKP. The unsightly proliferation of *P. karka* within a native forest reserve (see *Figure 14* for an example at AFKP) spoils the natural aesthetics, detracting from public enjoyment of the regenerating forest landscape. In other locations where *P. karka* has established large stands, if left untouched, will overtime impede fishing and boating access for local communities[77]. Work has already been undertaken at Scott's Ferry around the boat ramp. For Māori, a profound cultural impact of *P. karka* invasion is its potential to diminish the mauri (life-giving force) of freshwater and impact the habitat of taonga species such as tuna/long-fin eel.

In the last five years *P. karka* has been reported by individuals and communities through iNaturalist at many new sites as far north as Whanganui and south as far as the Kapiti coast[78]. In fact, iNaturalist is probably the most useful database for surveillance information. Despite a recommendation by the Parliamentary Commissioner of Environment that Biosecurity New Zealand needed to develop online[79], real-time portals to record, and make publicly available surveillance data on all exotic plants in New Zealand, this and the other key recommendations he made in that report have not been enacted[80]. The main mechanism for further spread along the already infested waterways and at new coastal sites is likely to be a consequence of flooding events, where both above ground (stolon and reed) and below ground (rhizome) fragments/pieces are spread, settle and sprout from growth nodes to give rise to new clumps and patches of this weed (*Figure 12*).

P. karka is also being spread by both inadvertent (e.g. by vehicles and machinery) and deliberate (removal and planting often under the mistaken identification that it is bamboo) human activity to new sites away from waterways.

Figure 19: Old podocarp lowland forest at Awahuri Forest Kitchener Park (June 2025) (Credit: Barry Scott)

It is also increasingly clear that *P. karka* is having a major economic impact. The blockage of river flow and the potential destabilisation of stop banks from the extensive root growth is of serious concern to the Horizons river engineer team who are very interested in developing new methods and technologies for mitigating those risks. In collaboration with the AFKP Trust, work is being carried out to develop new and improved methods for managing *P. karka* in the Makino Stream in and around Feilding (*Figure 20*). The goal is to keep the Makino Stream channel open by removing reeds in the stream bed and on the lower parts of the stream banks. However, a full economic analysis from an organisation such as the New Zealand Institute of Economic Research is needed to estimate what those economic costs are to New Zealand, scoping scenarios from 'doing nothing', which is very much the current situation, through to a more active management approach using various interventions. While AFKP Trust has pushed for such an analysis to be done, none of the government or regional agencies have been prepared to fund it. AFKP was in discussion with NZIER to do an economic analysis but funding was not available to either party. A cost/benefit study is required to officially list pest plants so such a study would benefit all regions.

Figure 20: Removal of P. karka reeds along the Makino Stream above the Awahuri Forest Kitchener Park (Credit: Awahuri Forest Kitchener Park Collection)

14. DEVELOPMENT OF METHODS TO CONTROL *PHRAGMITES KARKA*

Apart from the spray trials carried out by Horizons on the Rangitīkei and Whangaehu River banks in 2015 and 2018 (see above), very little work has been done, until recently, to find suitable methods for controlling or killing *P. karka*. Out of concern over the rapid expansion of *P. karka* infestations within the Awahuri Forest Kitchener Park, and the impact this would have on the protection and restoration of this significant podocarp remnant forest, the AFKP Trust decided that it had to do something to try and find methods that might be suitable for controlling this highly invasive reed grass. Under the guidance of the AFKP Trust, *Recreational Services* (now *Green by Nature*) who carry out the park maintenance, set up a number of small plot trials in the spring of 2021 across the park to trial two main methods[81]. The first, based on work carried out in North America[82], was to mow or cut the Phragmites in the spring then cover the stubble with a plastic cover to prevent regrowth. After cutting back, *P. karka* regrows as a spike directly from the rhizome below the ground or as a shoot from the remaining above ground stem (*Figure 21*). Initial trials showed that a single layer of plastic was inadequate as the spikes from below the ground were able to punch through the plastic and continue to grow. Outside the edges of the plastic, both spikes and shoots emerged as the *P. karka* re-established. New plot trials were then set up with a layer of cardboard over the mulch followed by three to four layers of plastic. No spikes emerged through the multi-layers but there was a lifting (or ballooning) effect of the covers in both plots. This method did suppress the growth of *P. karka* significantly but the reeds still grew and once released, after being covered for 18 months, greened up within a week or two. This method was deemed to be too labour intensive to pursue further.

The second general method trialled was the use of herbicide. Five different herbicides were trialled using different application methods including:

- Glyphosate[83], which is a broad spectrum, relatively environment safe herbicide. Foliar treatments proved to be ineffective and the 'cut-and-fill' treatment[84] was compromised by flooding .
- Triclopyr[85] is used to control woody or semi-woody plants and broadleaf weeds in grass turf. Trials with this spray produced some interesting results including killing the growing tip without killing the remainder of the stem, and suppression of spike production on nearby untreated plants. Cutting and filling of stems was ineffective. This herbicide can have severe

impacts on non-target native species with tītoki (*Alectryon excelsus*) being particularly sensitive. For these reasons further trials with this herbicide were discontinued.

- Picloram[86] application to mature and new regrowth cut stems achieved poor results. This herbicide is highly phytotoxic and is easily absorbed by roots and foliage, and persists in the soil so was also abandoned as a method.
- Metsulfuron-methyl[87] applied by the 'cut-and-fill' method, even at high concentrations, was ineffective.
- Haloxyfop[88] is a selective herbicide for the control of grass species. Foliar application suppressed regrowth from cut stems but was less effective on mature stems. However, application by the 'cut-and-fill' method proved reasonably effective, even impacting on adjacent untreated spikes suggesting it was translocated into the rhizome.

Figure 21: Phragmites karka shoots from a cut stem (A) and an emerging spike (B) at Awahuri Forest Kitchener Park (Credit: Awahuri Forest Kitchener Park Collection)

Further trials were carried out by varying the time of the year the stems were cut back and when they were treated with herbicide. This preliminary work paved the way for a grant application to the Horizons Regional Council Kanorau Koiora Taketake/Indigenous Biodiversity Community fund to pursue some of the more promising leads and to test effectiveness of scaling up these methods. In 2022 the Awahuri Forest Kitchener Park Trust applied and were successful in getting two-year (July 2022 to June 2024) funding to progress the *P. karka* treatment trials and to disseminate widely their findings[89,90]. Specifically, they were funded to:

- Validate and continue the small plot trial methods carried out by Recreational Services over the spring/summer of 2021/2022 at AFKP to manage *Phragmites karka*.
- To take the more successful small plot trial methods and scale up at various sites at AFKP and the adjacent Makino stream and to assess their effectiveness, practicality and cost if deployed across other sites within the Manawatū/Whanganui region.

Contract Manager for this project was AFKP Trust Chair, Bessie Nicholls (*Figure 22*). The work was contracted to *Green by Nature* (formerly *Recreational Services*) led by Aaron Madden (*Figure 23*), with much of the work force provided by the Ngā Kaitiaki o Ngāti Kauwhata's Mana Taiao team. Scientific oversight of the project was provided by the Ministry of Primary Industries, from Dr Andrea McCormick for the first 18 months, then by Callum McLean and Jasmine Hessell for the remainder of the contract. A report on the work carried out as part of this grant is available from the Awahuri Forest Kitchener Park Trust web site[91].

Figure 22: Awahuri Forest Kitchener Park Trust Chair Bessie Nicholls who has been the driving force in coordinating the battle against P. karka in the Manawatu (Credit: Adele Rycroft, Stuff)

Figure 23: Aaron Madden (Green by Nature) explaining work being carried out in Awahuri Forest Kitchener Park to Phragmites workshop attendees (March 2024) (Credit: Adele Rycroft, Stuff)

While haloxyfop emerged as the most promising herbicide to use for this second phase of work, an assessment of the herbicide methods used by Auckland Council over a 12-year period was first undertaken. The main herbicides they use for foliar spraying is imazapyr and amitrole which are applied to the regrowth following cutting. Multiple applications of these two herbicides are required to keep the *P. karka* in check but despite regular treatment over a long time period, growth of the rhizomes persist as does emergence of stems and aerial foliage. The lack of effectiveness of these two herbicides, combined with their toxicity to non-target species, ruled both out for consideration in AFKP. In addition, the 8 sites being treated in Auckland are in parks away from both waterways and in areas with no native forest remnants.

Initial trials at AFKP were set up at 11 sites (*Figure 24*) across the park using a range of different concentrations of haloxyfop and the 'cut-and-fill' method of application (*Figure 25*). This involves cutting the stems with mechanical secateurs just above the internode to leave a cylinder of stem into which the herbicide can be added using a drench gun combined with tracker dye so the worker can distinguish which plants have been treated and which are untreated (*Figure 26 & Figure 27*). Stems were first cut across the plot, the debris removed, then herbicide applied to cut stems starting from the inside of the plot working to the outside to avoid user contact with the treated stems. For some plots the first cut was particularly challenging given the height and density of the stands (*Figure 28 & Figure 29*). Two plots, A and E, that were

treated three times, showed very little re-growth after the final treatment. Regrowth of shoots from cut stems that remained on the ground required follow up treatment (*Figure 30*). While some of the lower concentrations of haloxyfop were ineffective, the higher concentrations were very effective. In one trial, where a single injection of 20% haloxyfop was used, all treated stems within high density clumps were dead within 7 months (*Figure 31*). Some regrowth occurred in patches of lower density reeds. The exact mechanism remains to be determined. Recent results at plot E have shown that up to three of the nodes on the rhizome below the treated stem are killed but nodes beyond that are still viable, presumably due to a lack of translocation of the herbicide to these more distant growth sites[92]. This is a very important observation worthy of follow up to better understand the plant physiological conditions that favour translocation of the herbicide to the root system and its effectiveness. Following these trials, this methodology was scaled up and trialled along sections of the Makino Stream and Rangitīkei River following approval from the Horizons Compliance Team (*Figure 32*). Although very labour intensive this method proved to be the most effective method trialled so far for treating *P. karka* in New Zealand.

Figure 24: Aerial photo of AFKP showing the location of the 11 trial plots (Credit: Awahuri Forest Kitchener Park Collection)

A

B

*Figure 25: Cut-and-fill with drench (**A**) and cut-and-fill by injection (**B**) (Credit: Awahuri Forest Kitchener Park Collection)*

Figure 26: Darius Hoani tackling the stems with electric secateurs (Credit: Adele Rycroft, Stuff)

Figure 27 (opposite): Injection of herbicide with tracker dye into cut stems of P. karka . Credit: Adele Rycroft, Stuff)

Figure 28: Jahkaya Ngahere cutting P. karka stems in plot E (Credit: Awahuri Forest Kitchener Park Collection)

Figure 29: Darius Hoani and George Metuamate dwarfed by the massive stand of Phragmites karka in plot G (Credit: Adele Rycroft, Stuff)

Figure 30: Regrowth of stems two months after treatment at Mulch and Spray plot (see Figure 24) (Credit: Adele Rycroft, Stuff)

Figure 31: Haloxyfop effectiveness was greater on high density stems compared to low density stems at site J. Images taken 7 months after a single treatment (Credit: Awahuri Forest Kitchener Park Collection)

Figure 32: Cut-and-fill treatment of an area of P. karka on the banks of the Makino Stream above Awahuri Forest Kitchener Park (Credit: Awahuri Forest Kitchener Park Collection)

Innovation and information capture have been two key practices by AFKP Trust to advance this project. An example of the first has been 'on the job' development of new innovations to solve bottlenecks, such as the stem diameter limitation in delivering herbicide from a drench gun (see below). An example of the second is the capture of key field observations made by team members that might improve the effectiveness of the treatment e.g., newly emerging stems were found to be much more susceptible to a foliar application of haloxyfop than more mature stems. These field observations are so important in finding efficient and effective methods to treat this recalcitrant weed pest (*Figure 33*).

As discussed above, one limitation of the drench gun application was the difficulty of treating very narrow stems. To overcome this problem stems were mechanically cut immediately above the internode and a vaccination needle-based system used to inject the herbicide into the hollow stem below (*Figure 25*). While needle resistance was initially an issue, different gauge needles were trialled to overcome this problem. Results to date using this alternative method are very promising.

Given how labour intensive the 'cut-and-fill' method is, trials were carried out across four sites by mechanical mulching of large patches followed up by haloxyfop foliar spraying of the regrowth (*Figure 34 to Figure 36*). However, this method proved to be ineffective and was abandoned after 7 spray treatments in a 12-month period. While some reduction in regrowth was observed this appeared to be a seasonal effect rather than a direct effect of the treatment[93].

Figure 33: Fighting the good fight, from left, Horizons river engineer and officer Cameron Reid, Green by Nature biodiversity project manager Aaron Madden, with Darius Hoani and George Metuamate from Ngā Kaitiaki O Ngāti Kauwhata (Credit: Adele Rycroft, Stuff)

Chemical controls present significant challenges and risks. A major environmental concern is the potential for unintended consequences: a large amount of decaying dead plant material following herbicide application can depress oxygen levels in water, leading to fish kills in ponds or small lakes. Furthermore, the excessive or improper use of synthetic herbicides can lead to the development of weed resistance and the accumulation of pesticide residues in the environment. The experience of the Awahuri Forest Kitchener Park Trust, where a "mulch and spray" method proved ineffective after seven cycles, leading to a strategic shift to "cut and inject", underscores the critical need for adaptive management and specific research to optimize chemical control strategies.

Figure 34: Approximate boundaries of the four areas used for the mulch and spray trials (Credit: Awahuri Forest Kitchener Park Collection)

Figure 35: Excavator with mulching head showing areas cut and mulched in AFKP (Credit: Awahuri Forest Kitchener Park Collection)

Figure 36: Haloxyfop foliar spraying of regrowth following mulching. A. Plot immediately after 6th spraying (4th November, 2024). B. Plot immediately before 7th spraying (7th December, 2024) (Credit: Awahuri Forest Kitchener Park Collection)

A key issue with any removal work is disposal of the *P. karka* plant material in a way that prevents regrowth. While removal from site and deep ground burial at the Bonny Glen waste site near Feilding has proved to be effective, it is expensive. Composting the material was also considered but the local companies were reluctant to accept material for fear of it being spread further. At present AFKP Trust is transporting waste plant material to an open site adjacent to the park and burning it. Maybe it could be used as cattle fodder either as a mulch or silage. Further work on finding cost effective ways of disposing this weed without the risk of regrowth is required.

Further research trials, supported by funding from the AFKP Trust, and further control management work, supported by a one year grant from the Kanorau Koiora Taketake/Indigenous Biodiversity Community fund, were carried out in the 2024/2025 financial year. Details on this more recent work can be found in the annual report, prepared by Green by Nature for the Awahuri Forest Kitchener Park Trust[94].

15. PUBLIC AWARENESS

A key control measure in helping reduce the spread of any serious weed is public awareness of the problem. Although both the Ministry of Primary Industries and Horizons Regional Council have strong public awareness warnings about *Phragmites australis*[95], neither has any online or hard copy information for the public on the threat of *P. karka*. This may well be linked to the fact that *P. karka* is still not listed nationally on the MPI register for pests and diseases list[96] or regionally on the Horizons Regional Council Pest Management Plan[97]. There is an urgent need for these two agencies to provide more information about this serious plant pest to the public as has been done by the Department of Conservation[98], some councils (Auckland and Greater Wellington Councils)[99,100,101] and some community groups (Environment Network Manawatu and Awahuri Forest Kitchener Park Trust)[102,103]. Awahuri Forest Kitchener Park Trust, in particular, has been very proactive in getting the message out to the public[104]. This inaction at National and Regional level is exactly the problem the Parliamentary Commissioner of Environment highlighted in '*Space Invaders'* where neither a national pest management plan or a national pathway management plan has ever been prepared for a terrestrial exotic plant[105]. The failed national and regional response to the threat of *Phragmites karka* is exactly why such plans are needed.

AFKP Trust has also taken the lead in bringing both agencies and communities together to share information on this weed and raise public awareness. In March 2024, the AFKP Trust with support from NZ Landcare Trust, held a workshop in Feilding on '*Phragmites karka* – a challenge for everyone'. 63 people from the Manawatū/Whanganui, Taranaki, Auckland and Wellington regions attended this event, which was comprised of presentations as well as a site visit to the AFKP. At the end of the day, everyone came together to share their views on the best way forward. Agencies represented at this symposium included regional and local councils, MPI, Landcare Research, Ngāti Kauwhata, Department of Conservation, community groups and the construction/infrastructure industry. Immediately following this symposium, several regional councils and community organisations reported *P. karka* in their region, highlighting the value of increased community knowledge and awareness. However, addressing most of the recommendations was left to the AFKP Trust. Once again, the Trust applied for *P. karka* to be listed as a weed pest species but without success. Still to be actioned is getting more information out to the likes of river shingle and waterway maintenance businesses and encouraging them to adopt practices that limit spread of the weed. This should not be the job of a small community trust whose mandate is caring for AFKP reserve.

16. CONCLUSION

It seems extraordinary that *Phragmites karka* has been present in New Zealand for 40 years or more yet is still not recognised as a weed of national significance by Biosecurity New Zealand (Ministry of Primary Industries) or of regional significance by Horizons Regional Council, the body responsible for biodiversity and biosecurity within the region most affected (Manawatū-Whanganui). Paradoxically, its sister species, *Phragmites australis*, is one of nine species managed through the National Interest Pest Response (NIPR) programme and is included on all the national and many of the regional pest plant registers, including the Horizons Regional Council Pest Management Plan 2017-2037. The environmental impact of *Phragmites karka* is very clear. It is choking many of the waterways, has spread to estuaries and reserves and is now spreading unaided along the western coastline of the lower North Island, and through human activity, to many sites away from waterways. It is also has the potential to have a serious economic impact through the destabilisation of flood banks and accompanying increase in flood risk, as well as through the blocking of water channels. However, a comprehensive economic analysis of this highly invasive weed has yet to be carried out. The level of inaction and indifference by the agencies charged with protecting our valued natural and modified ecosystems is damning.

While some councils like Auckland Council have recognised the seriousness of this weed and included it in their Regional Pest Management Plan it is the Awahuri Forest Kitchener Park Trust that has stepped into the breach to provide the needed leadership on *Phragmites karka* in the Manawatū-Whanganui region and further afield. The trigger for their involvement was the spread by flooding events of *P. karka* from the upper Makino Stream into Awahuri Forest Kitchener Park. Historical surveillance by Horizons showed that *P. karka* was on the edge of the park in 2015. By 2020 there were huge areas of *P. karka* along the edges of the Makino Stream and in open flooded areas within the park. Awahuri Forest Kitchener Park is one of the most significant remaining wetland lowland podocarp native remnants in the Manawatū so 'doing nothing' was not considered an option. In the absence of any known effective management treatment, the Trust initiated trials within the park to try and identify ways of eliminating or at least controlling its spread. Following those initial trials two of the most promising methods for control were advanced for further study in a grant proposal to the Horizons Biodiversity Fund in 2022. This grant was successful and has enabled the Trust, working closely with their contractor, Green by Nature, and the local mana whenua, Ngāti Kauwhata, to significantly advance methods for controlling this weed. While one very effective method, the so called 'cut-and-fill' method, is proving to be very effective, it is very labour intensive. A

further smaller grant from the Horizons Biodiversity Fund in 2024 has enabled the Trust to test advance technologies and methods for controlling this weed but long term funding is required to develop methods at scale.

While eradication of this well-established weed will now be very difficult, it is imperative that the silent ongoing spread is halted. There is too much at stake, as highlighted by the impact already on Awahuri Forest Kitchener Park and the Rangitīkei Estuary. Halting the spread can be achieved through multiple combined actions. Intensive surveillance is among the most crucial, with that information available in real time through a Community Viewer, as has recently been established for the monitoring of exotic caulerpa around the Hauraki Gulf, Bay of Islands and further afield[106]. Establishment of a GIS based system like this was a key recommendation for better tracking terrestrial exotic weeds in New Zealand by the Parliamentary Commissioner of Environment but is still to be enacted by MPI. At present, surveillance is principally being carried out by the community with new sites being recorded through the citizen science project, iNaturalist. While drones will be helpful in carrying out this surveillance, foot surveillance will be critical to find new, recently established plants, which at an early stage of development will be much easier to mechanically remove or treat with herbicide. Once a new site is identified, then a strategy needs to be developed for prompt removal either mechanically or by such methods as the newly developed 'cut-and-fill' method. In parallel, it is essential that research continues to find better methods for killing or managing this difficult to treat plant pest. While one might expect that research to be done by a University or by a Crown Research Institute, the AFKP Trust has shown that significant advances can be achieved by a community trust by carrying out trials on infested sites, building on the careful observations in the field, and developing new and innovative methods to overcome the problems encountered in scaling up. However, it is clear there needs to be better collaboration between agencies, universities, research organisations and community groups to find new methods for treating this insidious weed pest. Enhancing community awareness is also paramount. It is an indictment on the key agencies that *P. karka* is still not listed as a significant weed pest on the national plant pest registers and is also not formally recognised by the regional council most affected by this weed. While resources may be limited for managing what is now a well-established naturalised weed, it is inexcusable that there is not at least some public awareness programme to educate the public to stop such practices as collecting and spreading, what many think is bamboo or some other reed plant. Auckland Council is to the fore in putting *P. karka* on its *Regional Pest Management Plan* and in having a very active programme of public awareness. Education of contractors involved in moving river shingle from infested sites should also be a high priority, otherwise *P. karka* will be spread far and wide as has already happened through inadequate controls on spread of gravel contaminated with field horsetail. Similarly, education is required for companies operating on infested river banks where there is potential for fragments of *P. karka* to become attached to machinery and moved to new sites.

P. karka Infestation of our waterways, wetland reserves and coastal ecosystems will continue unless more urgent action is taken. It is an indictment on the agencies responsible that a community trust has stepped up and led the way forward in developing new methods for treating this weed and providing the necessary leadership to raise public awareness of the problem. It is critical that MPI broadens the *Phragmites* eradication programme to cover *P. karka*; not just *P. australis*. The inconsistent formal recognition of *P. karka* as a "registered weed" across all regional management plans, limits eradication funding and fragments national response efforts. The time to act is now not when Regional Pest Management Plans are up for review, which can be in 10 years' time.

17. ACKNOWLEDGEMENTS

First and foremost I would like to thank Bessie Nicholls, Chair of the Awahuri Forest Kitchener Park Trust who first drew my attention to *P. karka* and the impact it was having on the AFKP and who has kept me apprised of all things Phragmites since 2020. She has worked tirelessly to raise awareness of the threat of *P. karka* to our valued native ecosystems, obtained grants and initiated trials within AFKP, and been persistent in asking questions of agencies. I would also like to thank the following for sharing expertise, information and results on what is known about *P. karka* both in New Zealand and overseas including: Kelly Wootton (Auckland Council), Colin Ogle (former Department of Conservation), Aaron Madden (Biodiversity Project Manager for *Green by Nature*), Cameron Reid (Horizons Regional Council Engineering Officer), Tania Bramley (NZ Landcare Trust), The Auckland Botanical Society, and Arnim Littek (Foxton community). Thanks to Adele Rycroft (Stuff) for providing images at Awahuri Forest Kitchener Park. Also, my daughter Sara Burgess (Greenhood Data) for preparing maps of *P. karka* distribution in the North Island and Manawatū. I would also like to thank Craig Davey (Horizons Regional Council) and Cath Duthie (Ministry of Primary Industries) for providing answers to my many questions. Finally, very special thanks to Vicky Forgie and Colin Ogle for providing independent reviews of this report.

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19. APPENDIX

TIMELINES OF COMMUNITY ENGAGEMENT WITH REGIONAL AND NATIONAL AGENCIES

2006

- *Phragmites karka* was first collected and identified as *P. australis* in May 2006 at the mouth of the Rangitīkei river at Tangimoana by Colin Ogle. This was the first herbarium voucher specimen collected in New Zealand. Bill Sykes (Manaaki Whenua – Landcare Research) identified the specimen. Neither Bill Sykes nor Colin Ogle considered the possibility that it might be something other than *P. australis*, as that was the only *Phragmites* recorded in NZ at that time. https://scd.landcareresearch.co.nz/Specimen/CHR%20585551%20A
- Later in 2006, Paul Champion (National Institute for Water and Atmospheric Research (NIWA)) found that *Phragmites* was growing several kilometres upstream of Tangimoana. His initial identification was *Arundo donax* but the report was later amended to *Phragmites australis.*

2010

- Ellison Reserve Community Group at Tangimoana established.

2011

- *Phragmites* collected by Michael Wilcox at Tahapa East Reserve, Meadowbank Auckland, was identified by Rhys Gardner at the Auckland Museum as *Phragmites karka.* https://www.aucklandmuseum.com/collection/object/706908

2012

- Submission from 'Tāwhirihoe Habitat Restoration' group at Tangimoana (Hilary Robson) to Manawatū District Council Draft Long Term Plan 2012 – 2022 (8th May 2012).
- Correspondence from Paul Champion (NIWA) with Ellison Reserve Community Group (Hilary Robson) suggesting possibility of biocontrol methods for *P. karka* (6th August 2012).

2013

- Post graduate fish specialist, Stella McQueen recommends Ellison Reserve Community Group not to use 'Roundup' near waterways during the inanga spawning and migration season due to synergistic effects of the herbicide on a parasite of galaxiids.

2014

- Manawatū District Council establishes the Awahuri Forest Kitchener Park Trust to protect, preserve, maintain and develop this forest for educational purposes and for all people to enjoy (July 2024).

2015

- Surveillance by Horizons Regional Council shows that *P. karka* had spread down the Makino River to the edge of Awahuri Forest Kitchener Park; had spread over several kilometres of the lower Rangitīkei River; and at several sites away from waterways as far south as Waikawa Beach.

2016

- Submission from Ellison Reserve Community Group (Hilary Robson) to Biosecurity New Zealand expressing concern about the spread of P. karka into the Tangimoana estuary. Reply from Amin Pathan (MPI) to inform the group their letter had been referred to the Plants group at Horizons Regional Council.

2018

- Submission from Ellison Reserve Community Group to Horizons in April 2018 on Horizons Long Term Plan (2018-2028)[1].

[1] Hilary Robson correspondence with Bessie Nicholls.

- Report to Horizons Regional Council (2018). Biosecurity Activity – Plants. Under section 2.7.2 of this report, Council was informed of *Phragmites karka* spray trials at six sites on the banks of the Rangitīkei River and one on the Whangaehu River with the aim of "trialling seven different herbicides and two control techniques … to learn if there is a control solution suitable for these environments"[2].

2020

July - October

- In response to concern about the spread of the tall bamboo-like reed grass within Awahuri Forest Kitchener Park the AFKP Trust set out to have the weed identified. Despite requests to Manawatū District Council, Horizons Regional Council (Pest Plant team), Massey University, Manaaki Whenua – LandCare Research, and Department of Conservation, no assistance was forthcoming. Eventually, a visitor to the park identified it as *Phragmites*, having seen it in Europe.
- Circulation of this finding to a wider group within the Manawatū-Whanganui region led to the AFKP Trust connecting with Colin Ogle (former Wildlife Service and DOC), who had collected it at Tangimoana in 2006 (see above), who then apprised them of the work of the Ellison Reserve Community Group and his publications and posts on iNaturalist.
- AFKP Trust members accompanied a Massey University field trip to the dunes at Tangimoana to see the *Phragmites karka* growing there. Discussions from this field trip led to the AFKP Trust connecting with NZ Landcare Trust.
- AFKP Trust became aware that *P. karka* was listed on the Auckland Council website as a serious weed pest. When first identified in 2011 it was not listed in the Regional Plant Pest Management Plan (RPMP) (2007-2012), but because all known sites of *P. karka* infestation were on Auckland Council land, control measures were started in 2012 to stop the spread of this highly invasive plant species. In 2020, *P. karka* was added to their RPMP (2020-2030), but was not added to the National Pest Plant Accord (NPPA) or other Ministry for Primary Industries (MPI) plant pest registers. In contrast, the sister species, *P. australis* was listed on

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the MPI plant pest register and the NPPA list as an Unwanted Organism, as well as one of nine harmful weeds managed by the National Interest Pest Response (NIPR) programme.

October

- AFKP Trust sends photos of the reed plant to MPI biosecurity who immediately send staff to collect samples, initially thinking it was *P. australis*. A close examination by the Plant Health and Environment Laboratory at MPI confirmed it was *P. karka* and not P. australis.

November

- AFKP Trust sought help from MPI on how to manage the *P. karka* infestation but no assistance was forthcoming as it was not a listed weed species. A request for help from Massey University was also declined because the Trust could not find funds to pay for the work.
- Auckland Council shared with the AFKP Trust, herbicide methodology they were using to control *P. karka* at 8 sites across Auckland but noted that even with spraying multiple times a year since 2012 they had not eradicated it. Unlike the situation in AFKP, all sites were away from waterways, so could be treated with a range of herbicides.
- Horizons Regional Council shared mapping information they had carried out in 2015 along the Rangitīkei River and Makino Stream. That data showed that the infestation had just reached the AFKP boundary in 2015. Although the AFKP Trust was formed in July 2014 no communication on the threat of this weed species to the Forest Park was shared with the Trust in 2015.
- Horizons Regional Council brought Paul Champion from NIWA to the AFKP to advise on treatment methods but his advice was to use methods being used by Auckland Council, which were quite unsuitable for plants alongside the stream and besides it was already known to be a rather ineffective method.
- Without further support from Horizons Regional Council, NIWA or any other government organisation, the Trust embarked on its own research to build up its knowledge base about the biology of this plant and potential methods to control it.
- The Trust set up some experiments on small plots of *P. karka* within AFKP to learn how it grows and how it might be controlled. Placement of reeds on wet sand showed that shoots sprouted from nodes within 8 days, highlighting how easy it was for the fragments of the plant to sprout and grow, and then spread.
- NIWA published a report on aquatic weed species of risk to New Zealand, which described the biosecurity risk of *P. australis* as one of "New Zealand's worst potential aquatic weed

species." Remarkably, there was no mention of *P. karka* in this report despite NIWA being aware of its presence on the lower Rangitīkei river banks since 2006[3].

- The Trust ramped up efforts to control/manage this serious weed by:
    - Asking MPI to add *P. karka* to the NPPA register but no action was taken.
    - The Trust, in partnership with the NZ Landcare Trust, arranged a meeting with Manawatū District Council and Horizons Regional Council to develop a regional strategy for managing *P. karka* by increasing public awareness, increasing surveillance and to have this species recognized as a weed of regional significance. While the outcomes from this meeting fell considerably short of what the Trust was seeking, Horizons did agree to carry out further foot and aerial surveillance downstream of the park where they found *P. karka* within the Oroua River catchment.
    - Discussions by the Trust with Horizons' river engineer revealed that as part of their annual stream maintenance cycle in the Makino Stream, they were cutting the *P. karka* and leaving the debris within and on the banks of the stream; a practice that was resulting in further spread of this weed. There was little interest from the engineer in changing their practice despite the obvious consequences. It was clear this practice was spreading *P. karka* more rapidly than would have occurred otherwise from natural methods such as flooding.

2021

January – June

- Visit by Colin Ogle to Awahuri Forest / Kitchener Park to see *P. karka* with Bessie Nicholls (January 2021).
- Faced with inaction and indifference by staff from Horizons Regional Council, the Trust arranged for a meeting with the elected members of Horizons Regional Council to make them aware of the threat this weed posed for the river catchments of the Manawatū – Whanganui region.
- The Trust had further discussions with MPI on the taxonomic anomaly of having *P. australis* as one of nine plant pest species on the NIPR programme, yet not recognizing *P. karka* on

3 Champion PD (2006). Rangitīkei River Phragmites (*Phragmites australis*) investigation. NIWA Client Report: HAM2006-236. Hamilton, New Zealand: National Institute of Water and Atmospheric Research.

any of their registers, despite the now clear evidence that it was having major economic and environmental impacts.

- The Trust submitted a request to MPI to *have P. karka* added to the NIPR weed list but this was rejected.
- The Trust made the decision to keep working on this issue:
    - Despite having funding of $40ok over 3 years for restoration of the AFKP, work on the Phragmites infested sites were excluded from the $181k MPI funding component (from the MPI Billion Dollar Tree Fund).
    - The Trust undertook work on how to get recognition of *P. karka* within the Horizons Regional Pest Management Plan, but they refused to consider any changes until the mid-term review scheduled for 2027.
    - A review of international literature found that there were many reports and research papers on *P. australis* but little on *P. karka*. One method the Trust considered was laser radiation treatment but to date a safe and effective delivery method is still to be developed. Research is underway and AgResearch have developed an AI-driven weed identification tool (Map and Zap®), for mapping and laser-zapping early growth-stage weeds, reducing the need for chemical herbicides[4].
    - In April 2021 the Trust applied for funding from the Horizons contestable Biodiversity Fund to test the feasibility of mechanical removal of a small patch of *P. karka* from the park and disposal at Bonny Glen, but were unsuccessful.
    - The Trust made a submission[5] to the Horizons Long Term Plan (2021-2031)[6] requesting that *P. karka* be listed as a weed in the Regional Pest Management Plan. A similar submission was made by Environment Network Manawatu. To quote from the submission "In the overall context of the pest plant section of the consultation process there is still no commitment or avenue to review *Phragmites karka* let alone putting some actions around it from a biodiversity management perspective. Horizons Regional Council meeting notes from the weed team for March 2021 referred to *Phragmites karka* having a "containment strategy". What does this mean? Is this just the *status quo* – to contain it in the rivers to keep the channels open and flowing and ignore the rest?" No response was received to this and other questions raised.

[4] https://www.agresearch.co.nz/products-and-services/map-and-zap/

[5] Awahuri Forest Kitchener Park Trust submission to the Horizons Long-Term Plan 2021-2031.

[6] Horizons Regional Council Long-Term Plan 2021-2031. https://www.horizons.govt.nz/HRC/media/Media/Publication/Long-term-Plan-2021-31.pdf?ext=.pdf

- AFKP Trust visit to Whangaehu river mouth with Colin Ogle in autumn where stressed plants of *P. karka* with rust-like spots on the leaves were observed[7].
- Environment Network Manawatū posts information on *Phragmites karka* to help raise public awareness of this serious weed on 1st June 2021[8].

July – December

- The AFKP Trust contracted an external biodiversity specialist to carry out surveillance for *P. karka* along the Makino Stream, upstream of the park, to identify the source of the weed and extent of infestation along this section of the river. The original source was identified at a site about halfway through Feilding township. Disturbingly, infestations of *P. karka* were also identified on private properties adjacent to the stream. While private property owners are responsible for controlling weeds on their properties it was clear the infestations had come from the stream, which is the responsibility of regional and local councils, who are legally obliged to be a 'good neighbour'.
- The AFKP Trust commenced management trials in the park using various treatments across 19 small plots that were away from the Makino Stream and internal forest waterways. Waterways are controlled by Horizons and where restrictions on use of herbicides apply.
- In November 2021 the Parliamentary Commissioner for the Environment released his report on plant pest management in New Zealand, called *Space Invaders*[9]. In this report he highlighted the problems with existing weed data information systems singling out the lack of available information on *P. karka*, despite its relatively widespread distribution in the Manawatū.
- Results of 10 plot trials set up at AFKP by *Recreational Services* are shared[10]. The 'drip' method is reported as promising even though it is slow and labour intensive. The trials with tarpaulins over cut Phragmites was temporarily halted to allow reeds to regrow, so they could then be recut and covered with multiple layers of tarpaulins, then left over summer to generate maximum heat underneath the tarpaulins
- Follow up trip by AFKP Trust to Whangaehu river mouth to observe *P. karka*[11].

[7] Email from Bessie Nicolls 4 Nov 2022.

[8] Noxious weed *Phragmites karka* / common reed found in the Manawatu, 1st June 2021. https://www.enm.org.nz/news-1/news/noxious-weed-phragmites-karka-common-reed-found-manawatu

[9] Parliamentary Commissioner of Environment (Nov 2021). *Space Invaders*: A review of how New Zealand manages weeds that threaten native ecosystems. https://pce.parliament.nz/publications/space-invaders-managing-weeds-that-threaten-native-ecosystems/

[10] Email from Bessie Nicholls, 23rd March 2022.

[11] Email from Bessie Nicholls 4th November, 2022.

2022

January – June 2022

- *P. karka* Infestation in AFKP explodes after December 2021 floods[12].
- Patches of *P. karka* observed at Foxton Beach[13].
- *P. karka* observed on banks of Oroua river close to Rangiotu[14].
- Athol Sanson reports *P. karka* flowering in Feilding by the South Street bridge across the Makino Stream[15]. AFKP gardener reports single *P. karka* plant flowering at Park[16].
- In April 2022 the Trust applied for funding from the Horizons Biodiversity Fund to scale up some of the more promising control methods that had emerged from the Trust funded trials carried out in 2021. The most promising of these methods was treatment with Haloxyfop by cutting the reed just below the internode and filling the stem below with herbicide – the so called 'snip-and-drip' method. This grant application was successful receiving $80k over two years (July 2022 to June 2024). The results of this work were published in a 2024 R&D report by the Trust[17].
- NZ Landcare Trust (Tania Bramley) organizes online hui on Phragmites (13 April 2022).

July – December 2022

- Work on the scale up trials began in July 2022.
    - *Recreational Service Ltd* (now *Green by Nature*) were contracted to lead the project.
    - Andrea McCormick, Senior Adviser, Pest Management Strategy and Planning, MPI, was appointed as scientific advisor for the project
    - Ngāti Kauwhata were contracted to carry out the work in the park under the supervision of Aaron Madden (*Green by Nature*).
- NZ Landcare Trust invited AFKP Trust to present at an online regional pest plant hui on the management of Phragmites.

[12] Email from Bessie Nicholls, 23rd March, 2022.

[13] Email from Bessie Nicholls, 23rd March 2022.

[14] Email from Bessie Nicholls, 23rd March 2022.

[15] Email from Bessie Nicholls, 8 April, 2022.

[16] Email from Bessie Nicholls, 8 April, 2022.

[17] Awahuri Forest Kitchener Park Trust. Report for Horizons Indigenous Biodiversity Community Grants (2024). *Phragmites karka* scale up trials 2022 to June 2024. https://awahuri-forest-kitchener-park.nz/phragmites

- AFKP Trust established a working relationship with new Horizons engineers who were now starting to understand the risks Phragmites posed to the integrity of riverbanks and stop banks. They had begun to see Phragmites choking waterways not just in the Makino River but across the region. As a result of this partnership river bank clearing methods were changed to reduce/minimize fragmentation and spread of Phragmites downstream. An application to use the 'snip-and-drip' method of treatment on plants along the river channels was approved by the compliance group within Horizons with the condition that Horizons have oversight of the work.
- AFKP Trust relationships with the Plant Pest Team at Horizons remained strained with no acceptance of responsibility for managing this weed pest, provision of support, or any action that might raise public awareness of the seriousness of the problem.
- Several significant flood events occurred over the period from late 2021 to mid-2022 resulting in further spread of *P. karka* reed and rhizome fragments downstream and the development of new infestation sites, including several on the dunes and inlets from the mouth of the Whangaehu to past Waitarere. One volunteer (Armin Littek), started surveillance and removal of any material found around the Foxton estuary to protect this ecologically significant site. He is also removing sea spurge (*Euphorbia paralias*), another highly invasive plant that is spreading along our coastlines.
- During this period AFKP Trust established a network of individual and organizational supporters across the region who provided both support and increased surveillance capacity. Several public presentations were delivered by the Trust.
- Contract for Phragmites trials now signed off with report on pretrial work and work plan as part of Horizons contract prepared by *Green by Nature*[18].

2023

- R&D work at the Park continued with trials using different equipment, delivery methods, combination and concentration of herbicides and varying time of application, plant material disposal etc[19].
- Horizons river engineer team provides funding of $50k for the Trust to extend its growth suppression methods to the channels of the Makino Stream upstream of the park to keep

[18] Email from Bessie Nicholls, 6th December, 2022.

[19] Awahuri Forest Kitchener Park Trust. Report for Horizons Indigenous Biodiversity Community Grants (2024). *Phragmites karka* scale up trials 2022 to June 2024. https://awahuri-forest-kitchener-park.nz/phragmites

the stream and banks clear to reduce the risk of stopbank integrity being lost, and consequential flooding of Feilding.

- Disposal methods:
    - Attempts to persuade composting organisations/companies to test if Phragmites would be broken down were unsuccessful as they first wanted proof of concept.
    - Chipping on site was trialled and found to be effective if done immediately but machinery access to some sites proved difficult.
    - The Trust imposed restrictions on movement of any soil or river shingle from infected areas within the park to uninfected areas such as the new wetland area.
    - The trust decided to dispose of all cut material by burning at a designated burn pile site within the wetland.
- Horizons forwarded to the Trust a complaint from a Feilding householder that *P. karka* had invaded their property and was lifting-up and breaking concrete paths (23rd March). Upon investigation *P. karka* was found to be growing under the house! Neither Manawatū District Council nor Horizons offered to do anything saying the responsibility lay with the homeowner and they should use their insurance to deal with the infestation. Both Councils ignored their 'Good Neighbour' responsibilities. Eventually, the Trust working with the river engineers were given approval by Horizons management to try and manage this infestation.
- In October 2023 MPI signalled that Callum McLean would take over the role of science advisor from Andrea McCormick.

2024

January – June 2024

- Kathryn Ryan (Nine to Noon) speaks with Simon Upton (PCE) and Angela Brandt (Manaaki Whenua)[20]. *Concern NZ is not on top of spread of exotic weeds*. Interviewees express frustration at the rate of progress to enact a national action plan for managing invasive weed species and failure of agencies to heed advice and recommendations in PCE's *Space Invaders*

[20] Kathryn Ryan with Simon Upton and Angela Brandt on RNZ Nine to Noon. Concern New Zealand is not on top of spread of exotic weeds. 13 Feb 2024. https://www.rnz.co.nz/national/programmes/ninetonoon/audio/2018925835/concern-nz-is-not-on-top-of-spread-of-exotic-weeds

Report (2021) and report from AgResearch warning of sleeper weed Chilean needle grass could become a billion-dollar problem for agriculture unless a control plan is put in place urgently.

- Confirmation from AFKP Trust of two best methods for treating *P. karka* are 'snip-and-drip' with haloxyflop and the other more conventional method of 'cut-and-spray' of regrowth. While the latter is a similar method to that used by Auckland Council, AFKP have found haloxyfop to be the most promising for use in the AFKP whereas Auckland Council, have to date, preferred to use a combination of imazapyr and amitrole[21].
- In preparation for the next round of consultation on the Horizons Long Term Plan (2024-2034), the Trust initiated a public awareness campaign. Two media outlets published stories on the threat *P. karka* posed to the region waterways and biodiversity[22].
- In March 2024 Andrea McCormick took on a new role within MPI and was replaced by Callum McLean from the NIPR team. Input from MPI dropped off considerably following this change of staff.
- In March 2024 the Trust with support from NZ Landcare Trust held a workshop in Feilding on 'Phragmites karka – a challenge for everyone'. 63 people from the Manawatū/Whanganui, Taranaki, Auckland and Wellington regions attended this event. Agencies represented at this symposium included regional and local councils, MPI, Manaaki Whenua-Landcare Research, Ngāti Kawhatu, Department of Conservation, community groups and the construction/infrastructure industry. Tania Bramley from NZ Landcare Trust facilitated the workshop. The programme comprised presentations from:
    - Bessie Nicholls (AFKP Trust): Geography and spread of *Phragmites karka* in the lower west side of the North Island.
    - Aaron Madden (Green by Nature): Identification of *Phragmites karka.*
    - Kelly Wootton (Auckland Council): The Auckland Story.
    - Aaron Madden (Green by Nature): *Phragmites karka* control trials.
    - Cameron Reid (Horizons, River Engineer Group): Urban to rural.
    - Bessie Nicholls (AFKP Trust): *Phragmites karka* a problem for all.

  Following the presentations a field trip was made to Awahuri Forest Kitchener Park to see the impact of *Phragmites karka* on the park and to look at some of the field trials[23]. The day ended with a round table discussion on 'What now?".
- The value of the workshop in raising public awareness was highlighted by:

[21] Email from Bessie Nicholls, 14th Feb 2024

[22] Matthew Dallas (Stuff). Manawatu Standard 27th March 2024. Invasive giant grass a 'horror story' with deep roots. Feb 17, 2024. https://www.stuff.co.nz/nz-news/350180596/invasive-giant-grass-horror-story-deep-roots

[23] Matthew Dallas. Manawatu Standard 27th March 2024. United front gathers against 'triffid' grass. https://www.stuff.co.nz/environment/350225382/united-front-gathers-against-triffid-grass

- Armed with the tools for identification, representatives from Whanganui confirmed that an infestation of *P. karka* was present in Springvale Park in Whanganui and had been there since the mid 1990s.
- Greater Wellington posted a weed alert on its website and contacted *Green by Nature* to assist with managing two infestations in the northern part of their region.
- Taranaki Regional Council confirmed that an e-DNA signature for *Phragmites* was present in a data set from one of their waterways.
- Horowhenua District Council asked the Trust to examine an infestation blocking a stream and taking over a lagoon in their region.

- The AFKP Trust approached Dr Bill Kye Black from the New Zealand Institute of Economic Research on the feasibility of an economic impact assessment of *P. karka* but a request to MPI to assist with funding such a report was declined.
- In April 2024 the Trust made a submission on the Horizons Long Term Plan (2024-2034) seeking action on this serious weed and further funding of $60k per year for two years to continue the management trials at the Park. Council advised the Trust to apply for funding from the Horizons Biodiversity Fund for the year 2024 to 2025. An application was made with $35k for one year granted.
- In June 2024 a report on the Biodiversity Fund grant was submitted to Horizons[24]. This report was also circulated to MPI. The response from Jon Roygard from Horizons was "Thanks Bessie. Very interesting read". The response from Callum McLean at MPI was "Great write up! I'll circulate it" internally. No further feedback was provided from either organisation despite three further requests.
- Given the disappointing response from both Horizons and MPI, the Trust decided to release the R&D report on their website.

July – December 2024

- With reduced funding available for trials within the AKFP, work was scaled back. While there has been success with some of the herbicide treatments a key challenge that remains is finding effective conditions for uptake of herbicide into the rhizomes.
- Work with the Horizons River Engineers team on keeping the Makino River channels open continues.

[24] Awahuri Forest Kitchener Park Trust. Report for Horizons Indigenous Biodiversity Community Grants (2024). *Phragmites karka* scale up trials 2022 to June 2024. https://awahuri-forest-kitchener-park.nz/phragmites

- In September, Department of Conservation (DOC) added *Phragmites karka* to their list of 383 environmental weeds in New Zealand.
- In November the Trust submitted a proposal to the DOC community fund for support over three years to control *P. karka* at three highly sensitive sites including:
    - Awahuri Forest Kitchener Park from infestation from the Makino Stream.
    - Tangimoana estuary from infestation from the Rangitīkei River.
    - The Manawatū – Whanganui coastal dunes, estuaries and inlets, and in particular the Foxton estuary. This work is in collaboration with several coastal communities and organisations.

2025

January – June 2025

- In April the Trust was informed that its application to the DOC community fund was unsuccessful, despite making the earlier announced short list.
- DOC report finding two clumps of *P. karka* on the banks of the Whangaehu river within Whitiau Scientific Reserve[25].
- April May AFKP Trust applied for further funding for June 2025 to July 2026 under Horizons contestable funding. Awarded $45k of the $87k asked for. Contracts are being prepared at point of writing.
- AFKP Trust visit Tangimoana and Scotts Ferry area of the Rangitīkei river with three Horizons' river engineers to assess the impact of *P. karka* on the lower reaches of this river and its potential contribution to flood risk and infrastructure damage (26th March).
- AFKP Trust (Bessie Nicholls) invited to present at the New Zealand Biosecurity Institute NETS2025 conference at Palmerston North (23-25 July).

[25] James Stuteley communication with Colin Ogle. https://inaturalist.nz/observations/276749685