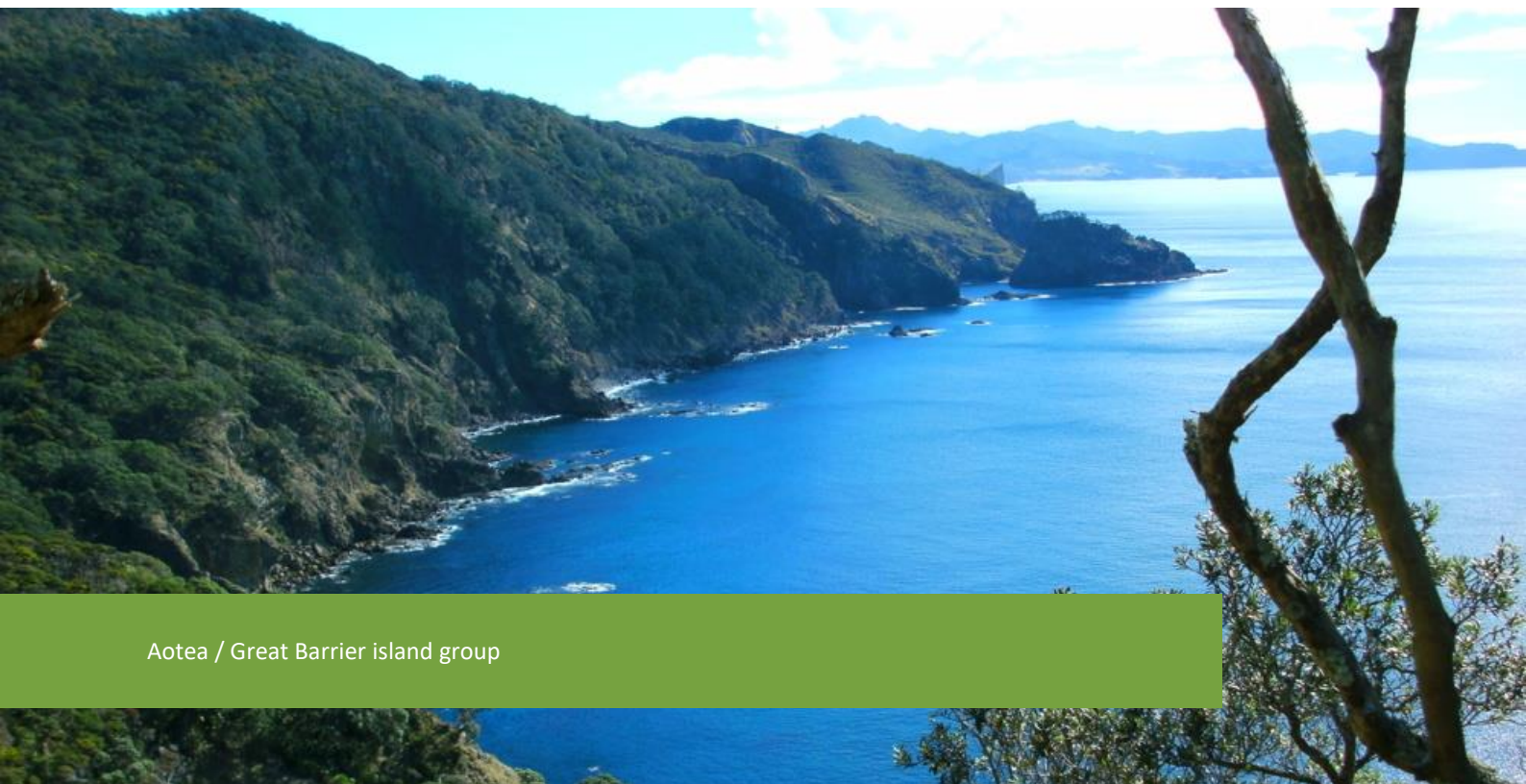


7.2 Aotea / Great Barrier Island Group

E mau tonu ana i ngā moutere o Aotea te rahi o ngā uara kanorau-koiora o te rohe, mai i te noho kāinga mō te tāiko me te pāteke. Hei tohu o te hiranga nui o te āhua taketake tuku iho me te noho ārai o te matawhenua o te kāhui moutere o Aotea, tērā tēnei RPMP te tohi motuhake me te whakanui i a Aotea me ngā motu iti e horapa ana i a ia, ki ētahi momo hōtaka e aro nei ki te whakaiti iho i tō rātou pokea e te tipu orotā, i runga atu i te para huarahi hei aukati, kei uru atu he raru hōu.

Aotea / Great Barrier island group has retained some of the region's highest biodiversity values, including being home to threatened species such as the tāiko / black petrel and pāteke / brown teal. In recognition of Aotea / Great Barrier island group's outstanding natural heritage and defensible geography, this RPMP gives special recognition to Aotea / Great Barrier and the surrounding smaller islands in this group, through a range of programmes targeting low incidence pest plants for control, as well as managing pathways to prevent new incursions.

In addition to those species identified below in section 7.2, Hauraki Gulf-wide programmes may also be used specifically to protect Aotea / Great Barrier. For instance under section 7.1.2.1, bringing a rat to Aotea / Great Barrier is not allowed, and Council may undertake an incursion response if Norway rats are detected on Aotea / Great Barrier. Similarly, region-wide pest plant eradication programmes (such as old man's beard) apply equally on Aotea / Great Barrier as they do elsewhere in the region. Council may also undertake incursion responses on Aotea / Great Barrier



Aotea / Great Barrier island group

for additional species outside of this Regional Pest Management Plan if deemed appropriate.

7.2.1 Te noho wātea o te kararehe orotā / Exclusion pest animals

These exclusion pest animals are potential pests which are not known to be established in the Aotea / Great Barrier island group. These pest animals all have the potential to establish on Aotea / Great Barrier island group and are capable of causing adverse effects to the island's environmental, economic, human health, social or cultural values. Early intervention to manage pathways and respond in the event of incursions is a cost effective approach to prevent or minimise future costs of these pests within the high ecological value island group.

7.2.1.1 Bearded dragon (*Amphibolurus barbatus* syn. *Pogona barbata*)

Also known as: coastal or eastern bearded dragon

Bearded dragons are grey-brown reptiles, between 55-58cm long and throats covered with distinctive spiny scales which can be raised to form a black "beard". As opportunistic omnivores, bearded dragons are likely to prey on native invertebrates and compete for food and resources with native lizards and birds. There is added potential for disease transmission to native reptiles (e.g. adenovirus infections, skin conditions). Bites to humans may cause prolonged swelling and bleeding with the risk of disease transmission to humans.



Objective: over the duration of the plan Auckland Council will exclude bearded dragons (*Pogona barbata*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, human health, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: "exclusion" which means to prevent the establishment of bearded dragons on the Aotea / Great Barrier island group.

Rules:

7.2.1.1.1 No person shall move or allow to be moved any bearded dragon to Great Barrier island group.

7.2.1.1.2 No person shall breed bearded dragons on Great Barrier island group.

7.2.1.1.3 No person shall distribute or release (or cause to be released or distributed), any bearded dragon on Great Barrier island group.

The purpose of rules 7.2.1.1.1 and 7.2.1.1.3 is to specify the circumstances in which the pest may be communicated, released, or otherwise spread.

The purpose of rule 7.2.1.1.2 is to regulate activities that may affect measures taken to implement the plan.

A breach of these rules is an offence under s154N(19) of the Biosecurity Act.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the sale, breeding, distribution and exhibition of the pest animal.
Education and advice	Provide information and advice on responsible pet ownership as well as identification and impacts of the pest animal.
Requirement to act	Pet owners to ensure secure containment and prevent breeding.

7.2.1.2 Blue-tongued skink: common (*Tiliqua scincoides*) and blotched (*T. nigrolutea*)

Blue-tongued skinks are lizards up to 40-70cm long with distinctive blue tongues. They can either have dark bands around the body (common) or are mostly black with varying amounts of light brown, grey, yellow or orange blotches (blotched). They are likely to prey on native invertebrates, smaller lizards, birds and their eggs, and may compete with native species for food and other resources. There is further potential for disease and parasite transmission to other reptiles.



JJ Harrison

Objective: over the duration of the plan Auckland Council will exclude blue-tongued skinks (*Tiliqua scincoides* and *Tiliqua nigrolutea*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “exclusion” which means to prevent the establishment of blue-tongued skinks on the Aotea / Great Barrier island group.

Rules:

7.2.1.2.1 No person shall move or allow to be moved any blue-tongued skinks to Great Barrier island group.

7.2.1.2.2 No person shall breed blue-tongued skinks on Great Barrier island group.

7.2.1.2.3 No person shall distribute or release (or cause to be released or distributed), any blue-tongued skinks on Great Barrier island group.

The purpose of rules 7.2.1.2.1 and 7.2.1.2.3 is to specify the circumstances in which the pest may be communicated, released, or otherwise spread.

The purpose of rule 7.2.1.2.2 is to regulate activities that may affect measures taken to implement the plan.

A breach of these rules is an offence under s154N(19) of the Biosecurity Act.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the sale, breeding, distribution and exhibition of the pest animal.
Education and advice	Provide information and advice on responsible pet ownership as well as identification and impacts of the pest animal.
Requirement to act	Pet owners to ensure secure containment and prevent breeding.

7.2.1.3 **Brown bullhead catfish (*Ameiurus nebulosus* syn. *Ictalurus nebulosus*)**

Brown bullhead catfish are scaleless dark brown to olive green fish which are most easily distinguished by eight whiskery barbels around the mouth. Adults can grow up to 250-500mm long. They are opportunistic generalist feeders, which have been documented eating common bullies as well as a wide range of invertebrates including kōura. Their presence in wai māori / freshwater bodies can contribute to poor water clarity by extensive consumption of zooplankton, thereby exacerbating algal blooms. Bottom feeding can also cause the re-suspension of sediment and up-rooting of submerged aquatic plants. These impacts can contribute to lakes ‘flipping’ to an alternative stable state devoid of vegetation, with turbid water dominated by phytoplankton.



Stephen Moore

Objective: over the duration of the plan Auckland Council will exclude brown bullhead catfish (*Ameiurus nebulosus*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, human health, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “exclusion” which means to prevent the establishment of brown bullhead catfish on the Aotea / Great Barrier island group.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the sale, breeding, distribution and exhibition of the pest animal.
Education and advice	Provide information and advice on responsible fishing as well as identification, impacts and control of the pest animal.

7.2.1.4 Canadian goose (*Branta canadensis*)

Canadian geese are large (4.5-5.5kg) light brown birds with black heads and white chinstraps. They can be very aggressive towards other wildlife; potential impacts on co-occurring bird species can include displacement from territories and mortality. Goose grazing on pastures can be at levels of appreciable economic impact but tend to be concentrated heavily on farms with the most suitable habitat. Canadian geese pose a high risk of bird strike at airports due to their substantial body size. Faecal contamination of water bodies, pasture and crops with pathogens such as *Salmonella* and *Escherichia coli*, including antibiotic-resistant strains, may pose a risk to human health.



Objective: over the duration of the plan Auckland Council will exclude Canadian geese (*Branta canadensis*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “exclusion” which means to prevent the establishment of Canadian geese on the Aotea / Great Barrier island group.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the sale, breeding, distribution and exhibition of the pest animal.
Education and advice	Provide information and advice on identification, impacts and control of the pest animal.

7.2.1.5 Eastern rosella (*Platycercus eximius*)

Eastern rosellas are brightly coloured parakeets approximately 30cm long and 90-120g in weight, with red heads, white cheeks and mostly yellow-green bodies. They are seed predators, consuming seeds from a range of native plants including harakeke, tōtara and pōhutukawa, and nectar from pūriri and other native plants. They are also implicated as a reservoir for transmission of Beak and Feather Disease Virus to native parrot species, which is likely to pose a higher risk as rosellas increase in range and population density.



Objective: over the duration of the plan Auckland Council will exclude eastern rosellas (*Platycercus eximius*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “exclusion” which means to prevent the establishment of eastern rosellas on the Aotea / Great Barrier island group.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the release of the pest animal outside of containment.
Education and advice	Provide information and advice on responsible pet ownership as well as identification and impacts of the pest animal.

7.2.1.6 Eastern water dragon (*Intellagama lesueurii* syn. *Physignathus lesueurii lesueurii*)

Eastern water dragons are large lizards with brownish-grey bodies and black stripes along the ridge of the back, tail and limbs. Males are up to 1kg in weight and 80-90cm long. Females are shorter and lighter. They are likely to prey on a wide range of small terrestrial, freshwater and inter-tidal fauna, including insects, crabs, molluscs and crustaceans, and may impact upon native plants via herbivory. There is further potential to spread diseases such as Salmonella to native reptiles.



Margaret Stanley

Objective: over the duration of the plan Auckland Council will exclude eastern water dragons (*Intellagama lesueurii*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, human health, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “exclusion” which means to prevent the establishment of eastern water dragons on the Aotea / Great Barrier island group.

Rules:

7.2.1.6.1 No person shall move or allow to be moved any eastern water dragon to Great Barrier island group.

7.2.1.6.2 No person shall breed eastern water dragons on Great Barrier island group.

7.2.1.6.3 No person shall distribute or release (or cause to be released or distributed), any eastern water dragon on Great Barrier island group.

The purpose of rules 7.2.1.6.1 and 7.2.1.6.3 is to specify the circumstances in which the pest may be communicated, released, or otherwise spread.

The purpose of rule 7.2.1.6.2 is to regulate activities that may affect measures taken to implement the plan.

A breach of these rules is an offence under s154N(19) of the Biosecurity Act.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the sale, breeding, distribution and exhibition of the pest animal.
Education and advice	Provide information and advice on responsible pet ownership as well as identification and impacts of the pest animal.
Requirement to act	Pet owners to ensure secure containment and prevent breeding.

7.2.1.7 Galah (*Eolophus roseicapillus*)

Galahs are colourful parrots weighing up to 325g, with white crowns, grey wings and pink chests. They are ground feeding granivores, but will also eat buds, flowers, berries and insect larvae. They may compete with native hole-nesting birds for nest cavities and act as reservoirs or vectors of wildlife diseases and human pathogens. Galahs are a major pest of grain crops in Australia. The impact on grain crops is likely to worsen if galah populations increase in Tāmaki Makaurau / Auckland.



Objective: over the duration of the plan Auckland Council will exclude galahs (*Eolophus roseicapillus*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “exclusion” which means to prevent the establishment of galahs on the Aotea / Great Barrier island group.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the release of the pest animal outside of containment.
Education and advice	Provide information and advice on responsible pet ownership as well as identification and impacts of the pest animal.

7.2.1.8 **Gambusia (*Gambusia affinis*)**

Gambusia are small (3.5-6cm), silver fish which occupy shallow margins of still or slow moving water bodies including lakes, wetlands, ponds and streams. Gambusia prey on zooplankton, eggs and larvae of fish, and a diverse range of aquatic and terrestrial macroinvertebrates. This can induce avoidance behaviours such as changes in habitat use in a range of native fish and crustaceans. Their presence in wai māori / freshwater bodies can contribute to poor water clarity by altering patterns of nutrient cycling via the consumption of zooplankton, subsequently exacerbating algal blooms.



Stephen Moore

Objective: over the duration of the plan Auckland Council will exclude gambusia (*Gambusia affinis*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “exclusion” which means to prevent the establishment of gambusia on the Aotea / Great Barrier island group.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the sale, breeding, distribution and exhibition of the pest animal.
Education and advice	Provide information and advice on responsible fishing as well as identification, impacts and control of the pest animal.

7.2.1.9 Pest goldfish (*Carassius auratus*)

Pest goldfish are small-medium sized (100-400g) fish which may vary in colour, from red-gold, bronze-black through to olive-green. Pest goldfish are generalist feeders consuming aquatic plants, algae, insects, crustaceans, small fish and fish eggs; potentially competing with native fish for resources. The predation of zooplankton, uprooting of aquatic plants and re-suspension of nutrients and sediments into the water column may contribute to reduced water clarity and algal blooms in invaded wai māori / freshwater ecosystems.



Objective: over the duration of the plan Auckland Council will exclude pest goldfish¹ (*Carassius auratus*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “exclusion” which means to prevent the establishment of goldfish on the Aotea / Great Barrier island group.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the sale, distribution, breeding and release of the pest animal outside of containment.
Education and advice	Provide information and advice on responsible pet ownership as well as identification and impacts of the pest animal.
Requirement to act	Pet owners required to effectively contain goldfish.

¹ A pest goldfish means any goldfish that is not:

- a) held in effective containment on private land; or
- b) otherwise constrained in an enclosed water body on private land.

7.2.1.10 Indian ring-necked parakeet (*Psittacula krameri*)

Indian ring-necked parakeets are green parrots (38-42cm long) with a red band (males) or an indistinct emerald band (females) encircling their necks. They are highly aggressive to other species, including native birds and small mammals such as bats, and have the potential to competitively exclude other cavity-nesting species through eviction, early occupancy and successful defence of cavities. They pose further risk to native parrots as potential vectors of disease, including Beak and Feather Disease Virus. Overseas, Indian ring-necked parakeets are considered primary production pests and can cause economically significant damage to grain crops such as maize and may also attack fruit in orchards such as citrus, guava and grapes.



Objective: over the duration of the plan Auckland Council will exclude Indian ring-necked parakeets (*Psittacula krameri*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “exclusion” which means to prevent the establishment of Indian ring-necked parakeets on the Aotea / Great Barrier island group.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the release of the pest animal outside of containment.
Education and advice	Provide information and advice on responsible pet ownership as well as identification, impacts and control of the pest animal.

7.2.1.11 Koi carp (*Cyprinus carpio*)

Koi carp are an ornamental strain of common carp measuring up to 700mm long, variable in colour but can be distinguished by the presence of a pair of barbels. Koi carp can negatively impact submerged aquatic plant communities via plant uprooting and reduced light penetration, and alter invertebrate communities via predation and habitat modification. Waterfowl, native fish and kōura are also at risk from increased water turbidity, due to koi carp stirring sediment when feeding, and resource competition. Invasion may contribute to lakes ‘flipping’ to an alternative stable state devoid of vegetation, with turbid water dominated by phytoplankton.



Stephen Moore

Objective: over the duration of the plan Auckland Council will exclude koi carp (*Cyprinus carpio*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “exclusion” which means to prevent the establishment of koi carp on the Aotea / Great Barrier island group.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the sale, breeding, distribution and exhibition of the pest animal.
Education and advice	Provide information and advice on responsible fishing as well as identification, impacts and control of the pest animal.

7.2.1.12 Monk parakeet (*Myiopsitta monachus*)

Also known as: Quaker parrots

Monk parakeets are medium sized greenish-grey parrots weighing between 90-120g. They will feed on vegetables, orchard fruit, and grain crops (e.g. maize and sunflower seeds) resulting in substantial crop losses and control efforts overseas. Native birds may be at risk via competition for food and disease transmission, and native vegetation may be impacted via feeding damage and herbivory. Monk parakeets will build chambered nests that may exceed 1000kg; nesting on power line poles, satellite dishes and other utility structures resulting in power outages, fires, and considerable time and money spent removing nests and repairing damage.



Murray Foubister

Objective: over the duration of the plan Auckland Council will exclude monk parakeets (*Myiopsitta monachus*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “exclusion” which means to prevent the establishment of monk parakeets on the Aotea / Great Barrier island group.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the release of the pest animal outside of containment.
Education and advice	Provide information and advice on responsible pet ownership as well as identification, impacts and control of the pest animal.

7.2.1.13 Perch (*Perca fluviatilis*)

Perch are olive green-grey fish (< 1kg) with six or more dark vertical bands across their sides. They can contribute to poor water clarity via the consumption of zooplankton, thereby exacerbating algal blooms. Feeding habits can also cause the re-suspension of sediment and up-rooting of submerged aquatic plants. Combined effects of zooplankton feeding and bottom feeding habits can contribute to lakes 'flipping' to an alternative stable state devoid of vegetation, with turbid water dominated by phytoplankton. Perch presence has been associated with reduced abundance of common bullies, and impacts are likely on other native fish such as tuna (eels), Īnanga, galaxiids and paraki/smelt through predation, aggressive attacks and competition for prey.



Objective: over the duration of the plan Auckland Council will exclude perch (*Perca fluviatilis*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, human health, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: "exclusion" which means to prevent the establishment of perch on the Aotea / Great Barrier island group.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the sale, breeding, distribution and exhibition of the pest animal.
Education and advice	Provide information and advice on responsible fishing as well as identification, impacts and control of the pest animal.

7.2.1.14 Rainbow lorikeet (*Trichoglossus haematodus*)

Rainbow lorikeets are brightly coloured long-tailed parrots (75-157g), with blue heads, green wings and orange-yellow breasts. They are potential reservoirs for transmission of parrot-specific diseases to native parrots. Beak and Feather Disease Virus has been recorded in captive rainbow lorikeets in Aotearoa / New Zealand. They aggressively out-compete native nectar feeding avifauna including tūī, kōmakobellbird and hihi. These combined effects make them a threat to Tīkapa Moana / Hauraki Gulf islands habitats such as Hauturu / Little Barrier Island and Tiritiri Matangi Island. Unwanted Organism managed by the Department of Conservation and Ministry of Primary Industries as a National Interest Pest Response.



Objective: Over the duration of the plan Auckland Council will exclude rainbow lorikeets (*Trichoglossus haematodus*) from establishing on the Great Barrier Island group to prevent adverse effects on economic well-being, the environment, enjoyment of the natural environment and the relationship between Māori, their culture, and their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “exclusion” which means to prevent the establishment of rainbow lorikeets on the Aotea / Great Barrier island group.

Principal measures of achievement:

Service delivery (Control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and Surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the release of the pest animal outside of containment.
Education and Advice	Provide information and advice on responsible pet ownership as well as identification, impacts and control of the pest animal.

7.2.1.15 Red-eared slider (*Trachemys scripta elegans*, *T. scripta scripta*, *T. scripta troostii*)

Red-eared sliders are turtles with olive to brown carapaces patterned with yellow spots or stripes, and a distinctive red stripe behind each eye. They inhabit a wide variety of still or slow-moving water bodies including ponds, lakes, wetlands, rivers and drainage ditches. As opportunistic omnivores, potential impacts are likely via herbivory and the predation of zooplankton, molluscs, fish, frogs, crustaceans, insects, gastropods, birds and small reptiles. There are further risks to native reptiles and amphibians via disease transmission. Wetland bird reproductive success may be impacted through the displacement of parent birds from nests to use as basking sites. Feeding habits and associated activities are likely to result in food-web and ecosystem process impacts, and reduced water quality in invaded habitats.



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Objective: over the duration of the plan Auckland Council will exclude red-eared sliders and related sub-species (*Trachemys scripta elegans*, *T. scripta scripta*, *T. scripta troostii*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, human health, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “exclusion” which means to prevent the establishment of red-eared slider turtles on the Aotea / Great Barrier island group.

Rules:

7.2.1.15.1 No person shall move or allow to be moved any red-eared slider to Great Barrier island group.

7.2.1.15.2 No person shall breed red-eared slider on Great Barrier island group.

7.2.1.15.3 No person shall distribute or release (or cause to be released or distributed), any red-eared slider on Great Barrier island group.

The purpose of rules 7.2.1.15.1 and 7.2.1.15.3 is to specify the circumstances in which the pest may be communicated, released, or otherwise spread.

The purpose of rule 7.2.1.15.2 is to regulate activities that may affect measures taken to implement the plan.

A breach of these rules is an offence under s154N(19) of the Biosecurity Act.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the sale, breeding, distribution and exhibition of the pest animal.
Education and advice	Provide information and advice on responsible pet ownership as well as identification and impacts of the pest animal.
Requirement to act	Pet owners to ensure secure containment and prevent breeding.

7.2.1.16 Rudd (*Scardinius erythrophthalmus*)

Rudd are fish with bright red fins, usually 200-250mm as adults, but can be larger. Extensive herbivory can negatively affect aquatic plant growth, survival and community composition, sometimes leading to aquatic plant collapse in lakes. Some high impact aquatic weeds, including hornwort, are selectively avoided by rudd and may thus be further competitively advantaged. They may compete with native fish such as paraki/smelt and common bullies for invertebrate prey. Facilitation of nutrient and sediment suspension in the water column and predation of zooplankton by rudd can contribute to regime shifting of lakes from clear to turbid states.



Stephen Moore

Objective: over the duration of the plan Auckland Council will exclude rudd (*Scardinius erythrophthalmus*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “exclusion” which means to prevent the establishment of rudd on the Aotea / Great Barrier island group.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the sale, breeding, distribution and exhibition of the pest animal.
Education and advice	Provide information and advice on responsible fishing as well as identification, impacts and control of the pest animal.

7.2.1.17 Snake-neck turtle (*Chelodina longicollis*)

Snake-neck turtles are medium-sized turtles with characteristically long necks (approximately 60% of the shell length). They are likely to prey on a range of zooplankton, aquatic and terrestrial invertebrates, amphibians, carrion, fish and crustaceans. Snake-neck turtles can dig nesting burrows in the ground which may disturb gardens, golf courses, gravel roads and other recreational land. They are carriers of *Salmonella* and risk transmitting the disease to native reptiles and humans.



Objective: over the duration of the plan Auckland Council will exclude snake-neck turtles (*Chelodina longicollis*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, human health, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “exclusion” which means to prevent the establishment of snake-neck turtles on the Aotea / Great Barrier island group.

Rules:

7.2.1.17.1 No person shall move or allow to be moved any snake-neck turtle to Great Barrier island group.

7.2.1.17.2 No person shall breed snake-neck turtles on Great Barrier island group.

7.2.1.17.3 No person shall distribute or release (or cause to be released or distributed), any snake-neck turtle on Great Barrier island group.

The purpose of rules 7.2.1.17.1 and 7.2.1.17.3 is to specify the circumstances in which the pest may be communicated, released, or otherwise spread.

The purpose of rule 7.2.1.17.2 is to regulate activities that may affect measures taken to implement the plan.

A breach of these rules is an offence under s154N(19) of the Biosecurity Act.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the sale, breeding, distribution and exhibition of the pest animal.
Education and advice	Provide information and advice on responsible pet ownership as well as identification and impacts of the pest animal.
Requirement to act	Pet owners to ensure secure containment and prevent breeding.

7.2.1.18 Sulphur-crested cockatoo (*Cacatua galerita*)

Sulphur-crested cockatoos are large stocky white parrots with a forward-curving yellow crest. In the Tāmaki Makaurau / Auckland region farmers have reported damage to pecan nuts, walnuts, feijoas, and plum crops but cockatoos have also been recorded damaging various cereal crops nationally. Birds will often attack kauri, rimu and other species, stripping bark, eating the growing tips, seed, flowers and fruit, and digging into the trees with their beaks. There is also a potential risk the cockatoos will spread Psittacine Beak and Feather Disease to native parrots.



Objective: over the duration of the plan Auckland Council will exclude sulphur-crested cockatoos (*Cacatua galerita*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “exclusion” which means to prevent the establishment of sulphur-crested cockatoos on the Aotea / Great Barrier island group.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the release of the pest animal outside of containment.
Education and advice	Provide information and advice on responsible pet ownership as well as identification, impacts and control of the pest animal.

7.2.1.18 Tench (*Tinca tinca*)

Tench are olive green-bronze fish (30-70cm), distinguished by red eyes, two barbels, large soft-rayed fins and copious mucous. They can contribute to poor water clarity via the consumption of zooplankton, thereby exacerbating algal blooms. Bottom feeding also causes the re-suspension of sediment and up-rooting of submerged macrophytes. These combined effects can contribute to lakes 'flipping' to an alternative stable state devoid of vegetation, with turbid water dominated by phytoplankton. Indirect effects to native fish species diversity via transmission of parasites, reduced water clarity, and/or competition for invertebrate prey are also likely.



Objective: over the duration of the plan Auckland Council will exclude tench (*Tinca tinca*) from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, human health, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: "exclusion" which means to prevent the establishment of tench on the Aotea / Great Barrier island group.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the sale, breeding, distribution and exhibition of the pest animal.
Education and advice	Provide information and advice on responsible fishing as well as identification, impacts and control of the pest animal.

7.2.2 Te noho wātea o te tupu orotā / Exclusion pest plants

These exclusion pest plants are potential pests which are not known to be established in the Aotea / Great Barrier island group. These pest plants all have the potential to establish on the Aotea / Great Barrier island group and are capable of causing adverse effects to the island's environmental, economic, human health, social or cultural values. Early intervention to manage pathways and respond in the event of incursions is a cost effective approach to prevent or minimise future costs of these pests within the high ecological value island group. Council will undertake active surveillance across the Aotea / Great Barrier island group to detect new pest plant incursions. Council may, at its discretion, undertake incursion responses to species other than those listed in the following section.

Objective: over the duration of the plan Auckland Council will exclude the pest plants specified below from establishing on the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: "exclusion" which means to prevent the establishment of the pest plants specified below on the Aotea / Great Barrier island group.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the sale, breeding, distribution and exhibition of the pest plant.
Education and advice	Provide information and advice on identification and impacts of the pest plant, and how to avoid spreading aquatic pest plants.

Alligator weed (*Alternanthera philoxeroides*)

Alligator weed is a perennial emergent aquatic bottom-rooted herb forming extensive floating mats on the water's surface but can also grow terrestrially, preferring damp ground. The dense mats can alter aquatic habitat structure (e.g. water flow, light penetration), alter invertebrate community composition and reduce native plant cover and diversity in wetlands and margins of water bodies. It will also displace valuable pasture species and block drainage channels, exacerbating flooding on farmland.



Brazilian rattlebox (*Sesbania punicea*)

Brazilian rattlebox is a deciduous shrub or small tree with red-orange flowers in showy inflorescences late spring-autumn and long winged seed pods. It will form dense almost monospecific stands, competitively excluding native plant species in perennial wetlands and watercourses, pasture, forest and scrub ecosystems. Dense growth in watercourses impedes water flow, exacerbates flooding, bank destabilisation and erosion, and can impede human access to watercourses. As a nitrogen fixing plant, it also has the potential to alter nutrient cycling regimes in invaded habitats.



Eric Hunt

Clematis flammula

Clematis flammula is a deciduous perennial woody climber, reaching up to 5-6m with white flowers between January and March and hairy plumed seeds. It has a smothering climbing habit and moderate shade tolerance therefore scrub and bush margins are most at risk of invasion, including in coastal areas. Uncertain to what extent intact forest is at risk. Closely related plants are highly invasive.



Eel grass (*Vallisneria australis*)

Eel grass is a bottom-rooted freshwater aquatic plant with strap-like leaves up to 5.5m long. Male flowers consist of large pollen-filled sacs produced at the base of mature plants. Female flowers are small and green and produced on the end of a very long, spirally coiled stalk that can extend to the water's surface. It is capable of forming dense stands which may displace other submerged plant species in suitable wai māori / freshwater habitats. These stands have the potential to impede drainage, exacerbating flooding, and impede recreational water uses. Entanglement in the pest plant can lead to drowning.



Elodea (*Elodea canadensis*)

Elodea is a submerged, bottom-rooting freshwater aquatic plant up to 5m tall, with small white and purple flowers borne at the surface of the water from November to January. It can reduce flow velocity and impede gas exchange in wai māori / freshwater ecosystems resulting in lowered dissolved oxygen levels and increased sedimentation. It may also impede water flow in drains, exacerbating flooding.



Hornwort (*Ceratophyllum demersum*)

Hornwort is a perennial submerged aquatic plant up to 7m tall which can be anchored to sediment by stems, or forms free-floating mats. Leaves are 10-40mm long, narrow, branched and whorled forming complex architecture. Hornwort forms dense monospecific stands which can displace all native submerged vegetation down to 15m depth. The dense stands alter water flow, increase flooding risk and impede recreational access of waterbodies. Because it can grow to greater depths than other aquatic pest plants, it is the species likely to have greatest impacts on deep-water charophyte meadows. Kōura are also likely to be especially impacted due to requirement for open habitat.



Rohan Wells, NIWA

Lagarosiphon/ oxygen weed (*Lagarosiphon major*)

Oxygen weed is a bottom-rooted submerged perennial aquatic herb with downward curving leaves, arranged in spirals on the stem. It is capable of forming dense stands; displacing native aquatic herb species, altering habitat availability for fish and invertebrates, and affecting dissolved oxygen levels by reducing gas exchange. The stands also can impede recreational water access to water bodies.



Rohan Wells, NIWA

Mickey Mouse plant (*Ochna serrulata*)

Mickey Mouse plant is a shrub up to 3m tall with serrated leaves and yellow flowers borne September to March. The fruit resemble the face of Mickey Mouse (black fruit attached to red sepals), and are produced in autumn. It is shade tolerant and bird dispersed, therefore has the potential to invade intact forest ecosystems. It is known to dominate scrub layers where invasive overseas, therefore impacts on native plants via competition and suppressing recruitment are likely.



Parrot's feather (*Myriophyllum aquaticum*)

Parrot's feather is a submerged, bottom-rooted perennial aquatic herb of which the top 10cm of foliage can be emergent. Sprawling foliage is pale grey-green and leaves are finely divided, feathery and arranged in whorls of 4 to 6. It is ranked as one of Aotearoa / New Zealand's worst aquatic pest plants, and is especially problematic in shallow, sheltered, nutrient rich lakes and wetlands. It can displace other plant species through rapid growth, shading and the release of biochemicals, thereby decreasing native plant species' richness. An increase in cover of parrot's feather is also associated with a decrease in invertebrate abundance and diversity in invaded water-bodies.



Rhamnus (*Rhamnus alaternus*)

Also known as: evergreen buckthorn

Rhamnus is an evergreen shrub up to about 5m high with glossy serrated leaves, small green flowers and dark glossy red or black fruit. It forms dense stands, preventing the recruitment of native plants in scrublands, forest margins and plantations. It will also act as low scrub on coastal cliffs, inshore and offshore islands and rocky outcrops.



Sharp rush (*Juncus acutus*)

Sharp rush is a perennial spiny rush up to 1m tall with sharp tips and clumped green to brown flower heads borne in summer followed by red, orange or brown fruit. It forms dense stands which can displace native salt marsh vegetation, impair plant recruitment, reduce native plant richness and alter invertebrate communities.



Sweet pittosporum (*Pittosporum undulatum*)

Sweet pittosporum is a shrub or small tree varying in height with wavy, prominently margined leaves, white bell shaped flowers and orange globular fruit. It is an invader of pasture, roadsides, coastal bluffs, cliffs and open scrubland but is also able to exploit gaps and edges to invade mature forest. Invasion is associated with reductions in native plant species richness and cover. It has the potential to hybridise with New Zealand *Pittosporum* spp. with impacts on genetic diversity possible.



7.2.3 Te murunga o te tupu orotā / Eradication pest plants

These eradication pest plants are present in low numbers or have a limited distribution within the Aotea / Great Barrier island group, and eradicating them appears to be feasible and cost-effective. These pests all have the potential to establish widely on Aotea / Great Barrier island group, and are capable of causing adverse effects to the islands' environmental, economic, human health, social or cultural values. Early intervention to prevent their extensive establishment is a cost effective approach to protecting the island from these pests, many of which are highly damaging elsewhere in the region.

Objective: over the duration of the plan Auckland Council will eradicate the pest plants specified below from the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, human health, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “eradication” which means to reduce the infestation level of the subject to zero levels in an area in the short to medium term.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the sale, propagation, distribution and exhibition of the pest plant.
Education and advice	Provide information and advice on pest plant identification, impacts and control.

Boneseed (*Chrysanthemoides monilifera*)

Boneseed is an evergreen shrub or small tree up to 3m in height with leathery irregularly serrated leaves, bright yellow flowers produced from September to February and hard oval green fruit which ripen to black. It is likely to crowd out native plants in open coastal areas or disturbed habitats, including freshly cleared forestry plantations. It may also alter plant community composition through allelopathy and competition, alter patterns of nutrient cycling, and facilitate other weeds. The plant is highly flammable and therefore a fire risk in invaded ecosystems.



Boxthorn (*Lycium ferocissimum*)

Boxthorn is a densely branched and spiny evergreen shrub up to 6m tall with creamy purple flowers and fleshy red fruit. It is a pest plant in coastal habitats; inhibiting the regeneration of native plants, invading coastal pastures, ensnaring seabirds and impeding access to nesting sites. Spines can become imbedded in bone or soft tissue, resulting in infection and pseudo-tumours.



Bushy asparagus (*Asparagus aethiopicus* syn. *A. densiflorus*)

Bushy asparagus is a scrambling perennial herb with a thick mat of tuberous roots, white flowers borne between October and March and red berries. Stems are hairy and bear 10mm long spines. Dense infestations are capable of excluding native vegetation particularly in coastal and forest ecosystems, and may impede recreational access to natural areas. Other impacts may be similar to climbing asparagus.



Cape pond weed (*Aponogeton distachyos*)

Cape pond weed is a bottom-rooted perennial aquatic plant with surface-floating linear leaves and white flowers borne on spikes emergent above the water's surface. Impacts appear to be relatively minor compared to some other aquatic weed species however there is some potential for competition with native freshwater vegetation, therefore this species is not desirable on Aotea / Great Barrier island group. There is also minor potential for entanglement of recreational equipment on long reaching stems.



Carex scoparia

Carex scoparia is a dense, green grass-like perennial sedge up to 90cm tall. Inflorescences have brown/green oblong spikes and are borne late spring to early summer. It invades wetlands and lake margins potentially out-competing native wetland plants, and altering habitat for native fauna (e.g. impeded fish access to spawning sites). Closely related species are invasive, capable of forming almost monocultural swards, excluding native plant species and dramatically reducing plant diversity.



Climbing asparagus (*Asparagus scandens*)

Climbing asparagus is a scrambling or climbing perennial, with tuberous fleshy roots, thin scale-like leaves, red berries and long, usually white, solitary flowers. It smothers forest floor and understorey up to 4m, causing reductions in native plant abundance and species richness, and promoting further invasion by other pest plant species via raised light levels. In the long-term there is the potential for increased erosion through catastrophic loss of canopy and an overall transformative loss of forest ecosystems throughout the region.



Climbing gloxinia (*Lophospermum erubescens*)

Climbing gloxinia is a climbing perennial herb with triangular leaves and red, pink or white trumpet-shaped flowers borne January to March. Moderate impacts may be expected based on its smothering habit and history of invasiveness. It is capable of invading very harsh dry environments. Threatened species may be at risk in a wide range of habitats including in rocky outcrops, grasslands and forests.



Egeria (*Egeria densa*)

Egeria is a bottom-rooted submerged perennial aquatic herb with long stems (3m and over) and white flowers borne at the water's surface between November and January. It forms dense stands displacing native aquatic plants and altering the habitat structure of macroinvertebrates and fish. Resultant impacts can include lowered dissolved oxygen levels, increased sedimentation, changes to primary production and nutrient cycling capacity of the invaded water body.



Giant reed (*Arundo donax*)

Also known as: bamboo reed, donax cane, arundo grass, cow cane, river cane, reed grass.

Giant reed is a sturdy perennial grass with large, spreading clumps of thick culms up to 6m tall, maize-like leaves and large fluffy purplish to silver inflorescences standing above the foliage. It invades riparian areas, wetlands and saltmarshes, altering hydrology by blocking water flow and displacing native plants by creating vast monocultures. Dense stands can impede drainage and exacerbate flooding in agricultural systems.



Grey willow (*Salix cinerea*)

Also known as: pussy willow, shrub willow, grey willow

Grey willow is a deciduous shrub or small tree up to 7m high with greenish grey to dark purple stems, oval leaves and 1.5–3.5cm long catkins appearing before the leaves. It forms vast dense stands and thickets causing blockages, flooding and structural changes in waterways. This can affect native plant species in wetlands and riparian ecosystems, through competition, shading and altered hydrology.



Hydrocotyle umbellata

Hydrocotyle umbellata is a semi-aquatic perennial, herb with tiny, white, star shaped flowers occurring in umbels of 10-60 flowers. It is a terrestrial plant in wet soils or aquatic in freshwater up to 1.5m deep. Appearance and growth form is variable depending on the invaded habitat type, either floating, creeping or mat forming. It forms dense monocultures that can exclude native plants and has the potential to hybridise with native *Hydrocotyle* spp. In agricultural systems, it may impact irrigation and drainage.



Moth plant (*Araujia hortorum*)

Moth plant is a perennial climber with scrambling stems, glossy leaves, white or pale pink flowers borne in clusters or single and fleshy, pear-shaped fruit. It smothers and kills plants up to medium-high canopy, preventing recruitment in forest, coastline, cliffs, shrublands, mānawa/mangroves, inshore and offshore islands, orchards and disturbed habitats. Based on its life-form, there can be long-term potential for catastrophic impacts on forest structure. Milky latex in stems, leaves and roots are poisonous and cause dermatitis.



Queensland poplar (*Homalanthus populifolius*)

Queensland poplar is a shrub or small tree up to 5m tall with heart-shaped leaves turning red during cooler months, and inconspicuous flowers, borne in racemes up to 17cm long. It has the potential to displace native plant species in scrubland, regenerating bush, pine forest and coastal ecosystems, and may become a notable pest plant of roadsides and gardens.



Weedbusters

Reed sweet grass (*Glyceria maxima*)

Reed sweet grass is an erect clumping perennial grass, reaching almost 2m, with long, branched yellow-green to purple tinged flower heads. It produces creeping rhizomes which can form dense mats that are attached at the bank but are floating in deeper water in still or slow moving water bodies. These dense mats can trap sediment and accumulate masses of decomposing vegetation; altering stream morphology, dissolved oxygen levels and other biophysical properties of invaded wai māori / freshwater ecosystems.



Rhaphiolepis / sexton's bride (*Rhaphiolepis umbellata*)

Rhaphiolepis/ sexton's bride is a perennial shrub up to 3m tall with white and pink flowers borne in inflorescences between July and December, and purple-black fruit ripening between March and April. It invades coastal areas, particularly coastal cliffs, displacing native vegetation.



Rhus tree (*Toxicodendron succedaneum*)

Rhus tree is a deciduous tree up to 8m tall with pinnate leaves that turn red in autumn and yellow-green flowers borne in inflorescences up to 200mm long. It invades urban and coastal habitats, wastelands and bush margins and poses a high risk to human health. Contact with sap can cause severe contact dermatitis characterised by itchy, burning red welts and swelling. Rhus tree is also rated as the most allergenic plant in New Zealand. Naturalisation can therefore substantially reduce enjoyment of the outdoor environment.



Spanish broom (*Spartium junceum*)

Spanish broom is a deciduous shrub up to 3m tall with yellow pea-like flowers borne in loose racemes during summer and autumn. It is invasive in disturbed sites, often on hill country but also including poor or retired pasture, cliffs, transport corridors and riparian margins. Spanish broom is capable of forming dense monospecific stands which can reduce the cover of native plants in invaded habitats. As a nitrogen fixer, it has the potential to alter plant community compositions, including facilitating other exotic plant invasions, through elevated soil nutrient levels.



Tree of heaven (*Ailanthus altissima*)

Tree of heaven is a deciduous tree, up to 25m tall with a strong unpleasant odour, pale green-white flowers borne in spring and seeds encapsulated by twisted papery sheaths in autumn. It is a coloniser of disturbed open habitats, capable of forming dense stands which suppress other plant species through chemical inhibition. The leaf litter is high in nitrogen and decomposes rapidly, altering nutrient cycling regimes in some ecosystems, and facilitating the invasion of other pest plant species. Root intrusions can damage culturally important archaeological sites.



Tree privet (*Ligustrum lucidum*)

Tree privet is a medium sized evergreen tree growing up to 10m tall with white, fragrant flowers borne in clusters during spring-summer and poisonous purple-black berries. It displaces native shrubs and trees and can form dense stands which dominate the canopy layer and prevent recruitment of native species, thereby altering vegetation structure and diversity in forest and shrubland ecosystems. Root intrusions can damage archaeological features on maunga and other significant wāhi. Some people may have a reaction to privet, often as a cross-reactivity to their main allergens.



Water plantain (*Alisma plantago-aquatica*)

Water plantain is an emergent perennial herb up to 1m tall with oval leaves and multi-branched clusters of small pale lilac flowers produced in summer. It invades wetlands and other slow-moving water bodies impeding water flow, trapping debris causing silt to build up and potentially displacing native species where it occurs. It will also grow in damp pasture and has the potential to exacerbate flooding due to impeded drainage ditches.



Wild ginger (*Hedychium gardnerianum* and *H. flavescens*)

Also known as: kahili ginger (*H. gardnerianum*), yellow ginger (*H. flavescens*)

Both wild ginger species are herbaceous perennial plants that can grow up to 3m tall with large green leaves and orange berries. Kahili ginger has yellow flowers with red stamens, and yellow ginger has creamy flowers. They form dense stands preventing recruitment and suppressing up to 90% of native vegetation in forest ecosystems, potentially resulting in long-term impacts on forest composition. Invasion may alter decomposition and nutrient cycling patterns, and increase erosion in the long-term through loss of canopy.



Woolly nightshade (*Solanum mauritianum*)

Woolly nightshade is a perennial shrub or small tree, up to 4m high with grey-green furry leaves, violet flowers and dull yellow berries. It forms dense stands in disturbed scrub or forest, roadsides, pasture margins, urban areas and riparian margins, inhibiting the regeneration of native plant species in invaded sites. It can displace pasture grasses and clover, reducing food availability for stock, and will colonise clear-felled areas in forestry plantations. Direct or indirect contact with the plant may cause skin irritation and respiratory problems.



7.2.4 Aukati haere noa i te tupu orotā / Progressive containment pest plants

These progressive containment pest plants are present in low numbers or have a limited distribution within the Aotea / Great Barrier island group, yet have the potential to be highly damaging pests if they were to become widespread on the islands. Eradication may not be feasible in the short-term (for instance some species have very long-lived seed banks). Nonetheless, progressively containing these species is a cost effective approach to preventing their spread and impact on this high ecological value island group.

Objective: over the duration of the plan Auckland Council will progressively contain the pest plants specified below to zero density from the Aotea / Great Barrier island group to prevent adverse effects on economic well-being, the environment, human health, enjoyment of the natural environment and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga.

Intermediate outcome: “progressive containment” which means to contain or reduce the geographic distribution of the pest plant to an area over time.

Principal measures of achievement:

Service delivery (control)	Enter any property within the specified geographic area of the programme and carry out control work on this species.
Monitoring and surveillance	Undertake inspections, monitoring and surveillance of key risk areas to determine the presence of new infestations and status of existing or historical sites.
Enforcement	Enforce restrictions on the sale, propagation, distribution and exhibition of the pest plant.
Education and advice	Provide information and advice on pest plant identification, impacts and control.

Kangaroo acacia (*Acacia paradoxa*)

Kangaroo acacia is a perennial shrub up to 3m with 10mm long spines, inflorescences of many yellow flowers and leaves reduced to winged leaf stalks. It can form extremely dense stands potentially excluding native vegetation in open or disturbed sites including coastal areas, scrubland and forest margins. It is a nitrogen-fixing plant, potentially altering soil fertility, nutrient cycling dynamics and plant community compositions in invaded ecosystems.



Madeira vine (*Anredera cordifolia*)

Also known as: Madeira, mignonette vine, potato vine, lamb's tail.

Madeira vine is a perennial climbing vine up to 40m long with heart-shaped or oval fleshy leaves and drooping inflorescences of small fragrant cream flowers from January to April. It can rapidly invade disturbed forest and margins, plantations, gullies, scrublands, coastline, dunes and riparian margins by smothering and sometimes crushing understorey plants.



Mile-a-minute (*Dipogon lignosus*)

Mile-a-minute is an evergreen perennial climbing vine, with pea-like, white, pink or red flowers borne from July to January. It invades scrubland, forest margins, stream banks, wetlands, coastal areas including banks and open coastal forest; smothering trees and destroying forest structure. It is capable of nitrogen fixing and has the potential to alter nutrient cycling patterns, possibly favouring other exotic plants.



Purple groundsel (*Senecio elegans*)

Purple groundsel is an annual herb up to 60cm tall displaying deeply lobed leaves and purple flowers with yellow discs borne August-May. It invades coastal systems, the region's highest value dune ecosystems being most at risk. It is likely to out-compete co-occurring native plants, and has faster growth rates and a longer flowering period than some closely related native species.



Royal fern (*Osmunda regalis*)

Royal fern is a tall deciduous perennial fern with fronds up to 3m long. It forms dense stands in wetlands and freshwater ecosystems, which are likely to impact on native fauna and flora through mechanisms such as competition or habitat restructuring. It has the potential for obstructing access and reducing enjoyment of the natural freshwater environment, and may impact on the mauri of wai māori.



Smilax (*Asparagus asparagoides*)

Smilax is a scrambling perennial plant with branched green stems up to 3m and greenish-white flowers appearing between July and August, followed by red berries. It forms dense patches and smothers low growing plants and seedlings, usually in low canopy forests or coastal habitats. These dense stands can also obstruct access to recreational areas and smother garden plants.

