Airport Vegetation/Landscape and Airfield Works Plan

- Prepared for

Queenstown Airport Corporation Limited

- April 2026

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Part A: Landscape, Regulatory and Planning Background

1.0 General Background

Airport environments in New Zealand are continuously evolving to accommodate increasing population growth, passenger numbers, and operational demands. Ongoing development, including construction, infrastructure upgrades, and associated landscaping, inevitably alters the surrounding environment and habitat values. These changes can inadvertently influence wildlife behaviour and increase the potential for bird attraction within or adjacent to airport operational areas, thereby increasing attraction which can lead to bird strike increase causing safety impacts.

To maintain aviation safety, it is therefore essential that landscape and works plans are carefully developed and implemented to mitigate both development and post-development bird strike risks. Vegetation design and management play a critical role in achieving this, ensuring that plant selection, spatial arrangement, and maintenance practices minimise wildlife attractants, consequently decreasing bird strike risk, while contributing to the airport's overall landscape aesthetics, quality and local character.

2.0 Site Overview

Queenstown Airport is located at the base of the Wakatipu Basin within the Queenstown Lakes District, approximately 6 km from central Queenstown. The site occupies a broad Holocene alluvial terrace north of Kawarau River, characterised by generally flat terrain with expansive views toward the surrounding mountain ranges.

The airport's setting combines both highly modified areas including grassed airfields and developed infrastructure and natural ecological features associated with nearby river systems, wetlands, and open grasslands. These environmental elements collectively influence the presence and behaviour of bird species within and around the airport.

2.1 Ecological and Bird Risk Context

From an ecological perspective, Queenstown Airport sits within a diverse habitat mosaic that includes riverine, wetland, and open pastoral environments. These features provide feeding and roosting opportunities for a range of native and introduced bird species.

Key ecological factors influencing bird activity in the area include:

- Proximity to water bodies: waterbirds, especially wading species, are attracted to shallow water, exposed gravel bars, and riparian vegetation, particularly where the Shotover and Kawarau Rivers meet and at the associated delta/wetland systems before flowing into Lake Wakatipu.
- Open grass and pasture habitat: the surrounding alluvial terraces supporting open grassland and pastoral areas, offer foraging opportunities for problematic flocking species such as gulls, starlings, finches, and plovers.
- Human-modified attractants: constructed water bodies, stormwater ponds, and wastewater disposal fields in proximity to Queenstown Airport have created secondary attractant habitats, particularly for waterfowl and larger flocking birds. Recent bird observations near the Shotover wastewater dispersal field highlight the potential for increased bird congregation under approach and departure paths.

These environmental conditions, while integral to the regional ecosystem, present a heightened wildlife hazard risk for Queenstown Airport operations. It is therefore critical that any landscaping, reinstatement, or vegetation works undertaken within Queenstown Airport property are designed and maintained to neutralise or decrease bird-attractant habitats, such as areas of standing water, dense tree cover, or species providing abundant food or nesting resources.

3.0 Scope and Purpose

This plan acts to support proposed development activities at Queenstown Airport as well as post development mitigation measures. The plan provides a consistent framework for developments including, vegetation and landscape design, and reinstatement practices that maintain operational safety while preserving the airport's aesthetics and ecological quality. It aims to ensure that any disturbance to ground surfaces or vegetation is reinstated effectively and safely, maintaining both operational and environmental safety and standards.

The primary purpose of the plan is to guide the planning and construction process by clearly identifying potential habitat changes and assessing associated risks to bird activity, in alignment with the airport's Wildlife Hazard Management Plan (WHMP) and Safety Management System (SMS). In doing so, the plan seeks to:

- Prevent the creation of bird attractants, such as standing water, tall vegetation, or food sources.
- Ensure disturbed areas are reinstated efficiently and effectively to maintain safety, achieve regulatory compliance, and allow for practical, ongoing ground maintenance.

- Comply with all relevant national and local aviation safety standards.
- Reinforce the regional character of the Wakatipu Basin through the appropriate use of local and indigenous plant species.
- Promote awareness and understanding of wildlife management and safety requirements among contractors and other stakeholders, fostering a shared commitment to safety and supporting education through this plan.

This plan aligns with aviation safety requirements and environmental best practice, supporting both regulatory compliance and operational efficiency. It establishes the minimum reinstatement and landscape design standards for all works undertaken within Queenstown Airport property, covering both airside and landside areas.

The plan comprises the following key components:

- Regulatory/Best Practice Overview - summary of relevant aviation regulations, CAA guidelines, and industry best practices that inform vegetation and landscape management at airports. Section 4.0.
- Development/ Earthwork Reinstatement Standards - identification of potential habitat modification impacts, associated wildlife risks, and recommended mitigation and safeguarding measures. Section 7, Table 2.
- Grounds Management - guidance on vegetation control, ground reinstatement, surface water management, and practical measures to reduce wildlife attractants. Section 10.
- Plant Palette Risk Assessment – identification of planting palette that consist of very low-high risk plant species for development landscaping as well as landscape management strategies to reduce bird attraction after planting. Section 5.8.
- Wildlife Risk Mitigation - recommendations for managing bird attraction during construction. Section 7, Table 2.
- Communication and Planning Integration - guidance for coordinating vegetation management with construction planning, internal communications, and ongoing monitoring processes. Part B.

4.0 Regulatory Aviation Guidelines

The CAA Manual of Standards (MOS) Part 139.71 states the following:

"An applicant for the grant of an aerodrome operator certificate must, if any wildlife presents a hazard to aircraft operations at the aerodrome, establish an environmental management programme for minimizing or eliminating the wildlife hazard. "

Landscaping at an airport has the potential to create wildlife attractant issues, therefore the Civil Aviation Authority (CAA), the International Civil Aviation Organization (ICAO) and Airports Council International (ACI) have issued guidelines that address a variety of landscaping concerns.

CAA guidelines state the following:

"Landscaping developments include grass reinstatement, tree and shrub planting and may include the creation or enhancement of water features. Landscaping schemes have the potential to:

- "Create dense vegetation that may become a roost;"
- "Provide an abundant autumn and winter food supply in the form of fruits, nuts and berries;"
- "Create standing water or watercourses that attract gulls and waterfowl; and"
- "Result in areas of short grass that provide feeding opportunities for a wide range of hazardous wildlife".

"Trees provide food in the form of fruits, flowers, and leaves, and are a place for birds to roost or nest. Where possible, there should not be any trees within airside areas or the airport boundary. If trees are necessary, those that offer minimal resources should be chosen and planted in such a way as to reduce their attraction to birds."

"Dense vegetation, such as thorn thickets, game coverts and young un-thinned conifer screening belts, can provide nesting sites for woodpigeons, small passerines (perching birds) and corvids, as well as roosting sites for potentially large flocks of starlings." Chapter 4, Page 25.

The ICAO guidelines state:

"Much care must be taken when selecting and spacing plants for airport landscaping. Avoid plants that produce fruits and seeds desired by wildlife. Also avoid the creation of areas of dense cover for roosting by flocking species of birds. Thinning the canopy of trees or selectively removing trees to increase their spacing can help eliminate bird roosts that form in trees on airports." Chapter 7, Page 35.

ACI guidelines state:

"The planting of trees, bushes and other plants has the undesired effect of attracting wildlife, and particularly birds. The management of the wildlife hazard should be considered part of the project planning from the very beginning. Care should be taken with the selection of sites for planting and the varieties used which can have a significant impact on the presence of wildlife. In all cases, plants which produce food such as berries and fruit should be avoided. Also, continuous stands of vegetation should be avoided. Preferably, trees should be spaced so that they do not form a continuous canopy and shrubs should not be planted under the canopy of trees and should also be spaced so as to not touch each other. Open form trees and shrubs should be selected, avoiding coniferous trees and shrubs which provide year-round shelter." Annex A, Page 28.

5.0 Landscape Design Approach

5.1 Planning and Regulatory Context

The Proposed Queenstown Lakes District Plan (QLDP) sets out specific landscaping requirements for properties within Precincts A and B of the Queenstown Airport Mixed Use Zone (see Table 1 below). These provisions ensure visible road frontages have vegetation that supports urban design quality, visual amenity, and operational functionality.

Although these requirements were developed to guide urban development outcomes and did not specifically consider bird strike, all plantings must also comply with aviation safety requirements. This includes obstacle limitation surfaces (OLS) and height restrictions under Designation 4. As well as managed to reduce bird strike and wildlife hazards, in accordance with the Queenstown Airport WHMP (2023) and CAA Advisory Circular AC139-16.

Table 1: Queenstown Lakes District Council Proposed Rules

Rule	Precinct	Landscape Requirements	Consent Status/ Discretion
17.5.7A	A-Lucas Place & Howthorne Drive	Landscape strip along full road boundary (min. 1 m depth; average 3 m), except at access points	RD – discretion limited to visual effects and operational requirements
17.5.7B	B-Airport Development Structure Plan	Planting in designated strips, species must be selected from Section 17.10 (See Table 2) and include species that reach a minimum 5 m height unless restricted by Designation 4	RD – discretion limited to external appearance, visual dominance, and operational requirements

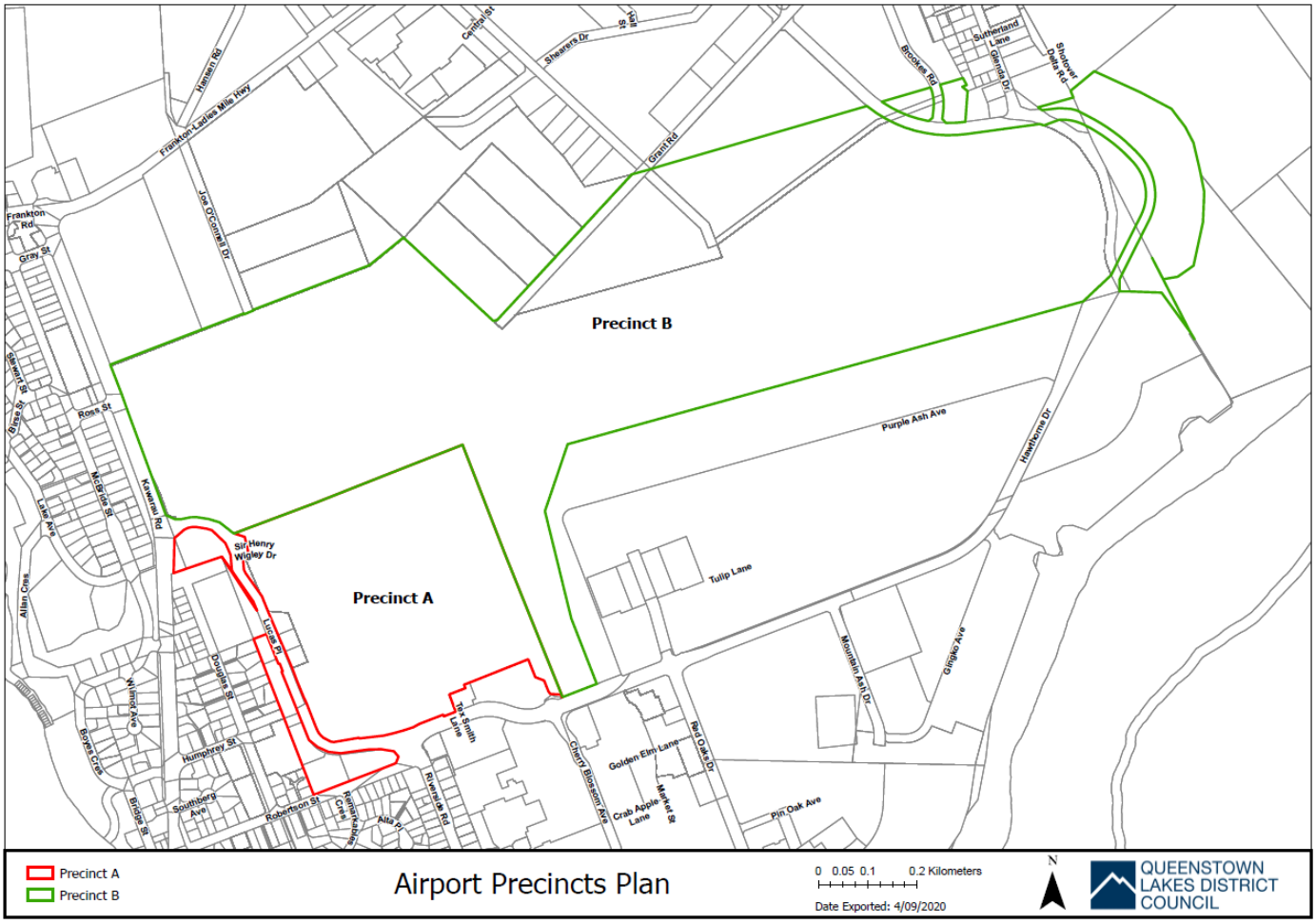

Figure 1: Airport Precinct Plan Map from Proposed District Plan

5.2 Landscape Requirements

Advice on past *planting within the defined landscaping strips around the airport* (Palmer, 2020) references the Christchurch International Airport Ltd (CIAL) Landscape Protocol (Opus, 2007, Appendix C) and *Sharing the Skies: An Aviation Industry Guide to the Management of Wildlife Hazards* (Transport Canada, 2004).

This advice assessed plant species proposed for landscaping around the Queenstown Aerodrome to determine their potential to increase bird strike risk by attracting birds for feeding, nesting, or roosting. Species were evaluated against relevant aviation wildlife hazard guidance and landscape protocols, with consideration given to proximity to operational areas, mature height, habitat structure, and the likelihood of attracting flocking bird species.

Recommendations were made to amend the CIAL planting list by prioritising species least likely to attract birds, ensuring appropriate tree spacing, avoiding invasive or pest species, and substituting plants better suited to local conditions.

The overarching objective was to reduce bird strike risk while supporting compliant and appropriate landscape design.

Pattle Delamore Partners (PDP) has peer-reviewed this advice, along with the Queenstown Mixed Use Zone provisions of the Queenstown Lakes District Plan and applied expert knowledge of fauna values and wildlife attraction to ensure that bird strike risk mitigation measures in this plan are robust and comprehensive, following the below design objective and principles.

5.3 Design Objectives and Principles

5.3.1 Design Objectives

The landscape approach intends to:

- Enhance aviation safety by minimising habitats or features that attract birds and wildlife to operational areas, while ensuring compliance with obstacle limitation surfaces (OLS) and height restrictions.
- Maintain ecological integrity, using resilient, low-maintenance, and locally appropriate indigenous species; avoid invasive or bird-attracting plants; and minimise impacts on surrounding habitats.
- Reinforce local character by reflecting the natural character of the Wakatipu Basin and wider Otago region by using indigenous species native to eastern Canterbury and Otago.
- Support regulatory compliance in ensuring all landscape works comply with relevant QLDP provisions, the airport's Wildlife Hazard Management Plan, and Safety Management System (SMS).
- Promote visual/functional quality by maintaining high-quality, visually coherent planting along public interfaces and precinct boundaries to enhance the airport's overall setting.

5.3.2 Design Principles

To achieve these objectives, landscape design and implementation shall:

- Apply risk-based plant species selection, and management methods of plant species that may attract birds, and/or provide nesting or feeding opportunities.
- Retain clear sightlines and operational visibility by avoiding dense, continuous shrub blocks; and vary canopy structure to balance function and aesthetics.
- Include low-maintenance and drought-tolerant plant species suited to local conditions to ensure sustainability.

- Enhance road frontages and precinct edges, screen service areas where appropriate, and ensure landscaping complements landscape/building character.

5.4 Wildlife Hazard and Vegetation Management Assessment

Vegetation species have been assessed by PDP against their potential to attract birds based on availability of food (nectar, berries, seeds, invertebrates), perching opportunity and nesting opportunity. Plants are categorised under a four-tier risk system:

- Very low risk: species to be implemented in high-risk areas.
- Low risk: species least likely to attract or support bird populations to medium-low risk areas.
- Moderate risk: species that may attract small birds in limited numbers to low-risk areas.
- High risk: species providing abundant food or nesting resources; to be avoided near operational zones and avoided generally where practicable.

5.5 Tree Species Risk Mitigation

- Trees may be used only as well-spaced specimens (minimum 4 m crown separation) to discourage roosting.
- Tall tree species are to be used only as isolated trees, ensuring compliance with airport height restrictions.
- Continuous shrub masses should be avoided near airside boundaries; preference is given to diverse, open, and vertically structured planting that limits movement and shelter for birds. Shearing to limit density is also recommended.
- Nectar/fruit providing trees should be avoided and should not be planted in dense groupings to limit attractiveness to groups of birds.
- Low to medium hedges (1-2 m) may be used for definition and screening; however, unmanaged fruiting trees are discouraged.
- Avoid species listed as pest or wilding species under the Otago Regional Pest Management Strategy.
- The majority of species listed on the provided planting palette are native and should be maintained and monitored to prevent wilding into restricted areas.

5.6 Habitat Structure and Planting Form

- Maintain variability in canopy height and type to prevent extensive cover that supports roosting or nesting. Reduce canopy height and density to aid visual inspection for nests where required.
- Ensure minimum 4 m crown separation between tree canopies. Plant bushy trees sparsely to prevent nesting habitat.
- Select species with upright or vertical branching habits to discourage perching.
- Keep all plant heights within Airport Protection Measures and Obstacle Limitation Surface (OLS) requirements.
- Design plantings that are visually cohesive yet operationally safe, enhancing passenger experience while supporting airport safety.

5.7 Species Selection

Planting palettes have been developed based on the above principles. Species were drawn primarily from:

- Literature suggesting locally appropriate additions reflecting Queenstown's native alpine and dryland flora, alongside PDP knowledge on local bird species, habitat and foraging value.
- The Indicative Plant Species List from the Queenstown Lakes Proposed District Plan for Precinct B for developer use.
- *"Planting within defined landscaping strips around the airport"* advice from Ecological Consultant (Palmer, 2020)

The tables below present a consolidated plant palette for Queenstown Airport, adapted from the species list advised by Dawn Palmer-Natural Solutions for Nature Limited and the proposed District Plan, with additional consideration given to site suitability. The palette is intended to guide species selection for reinstatement works and landscape design. Each species entry identifies its risk level, suitability for airside and landside areas, and provides notes on bird attractancy, mature height, spacing requirements, and sourcing. Risk level definitions are provided in Section 5.4. Placement guidance is outlined below:

- **Airside** - restrict to very low risk species only and manage wilding of non-approved species.
- **Landside** - very low, low and moderate risk species may be used; high risk species only if required for visual or planning compliance, away from flight paths and with approval from Queenstown Airport. Maintaining 4 m canopy separation for trees and maintain OLS height limits. Consider planting lower risk species in areas that border the airside area.

- **Public/amenity zones (part of landside but further from runway)** - broader selection permitted where not within operational risk envelopes; can be any species listed, however use high risk species only with justification, at minimal densities, and with approval from Queenstown Airport.

5.8 Recommended Planting Palette for Queenstown Airport

This planting palate has been created using the following sources:

- QLDP indicative planting plan for Precinct B;
- Advice on planting within defined landscaping strips around the airport (Palmer, 2020);
- *Growing native plants in the Wakatipu* (Wakatipu Reforestation Trust, 2019);
- *List of plants in the QLDC District listed as threatened* (de Lange et al., 2012).

The above sources have been used alongside expert ecological flora and fauna knowledge. All species listed are native to New Zealand; however, not all are naturally indigenous to the Queenstown Lakes District. Several species are regionally appropriate to inland Otago, while others are non-local natives commonly used in amenity planting and supported by the District Plan. Species selection has therefore balanced local character, landscape function, and aviation safety considerations rather than strict pre-human vegetation patterns.

Note: Planting palette is not exhaustive. Particularly, plant species in the palette with risk considered high are not exhaustive, as the only high-risk species listed are the only species listed by QLPDP's Precinct B and have been included to prevent any planting of high-risk species in high-risk areas. Any plants not identified on this list desired for planting plans will require consultation with Pattle Delamore Partners to determine suitability/safety for the area of the airport where it may be planted, based on habitat, growth form, and bird attractancy values. The recommended species risks are subject to management measures being consistently implemented and risk may be higher or lower dependent on measures undertaken to reduce bird strike risk.

Plant species have been broken up into species types and listed in Table 2: a-f below:

- Table 2a: Grass and Tussock Species.
- Table 2b: Groundcover Species.
- Table 2c: Low-growing Species (herbs, ferns, and climbers).
- Table 2d: Sedges Flaxes and Rushes.
- Table 2e: Scrub Species.
- Table 2f: Tree Species.

5.8.1 Grasses and Tussock Species

Grasses and tussocks (family Poaceae) are typically sun-loving, drought-tolerant species that form clumps or mats, providing low structural complexity and limited food resources for fauna. Native tussocks dominate dry, exposed environments and contribute to soil stability and open-country vegetation structure while offering minimal shelter when planted sparsely and sheared annually. Seed may provide food source, shearing is a management measure to reduce attractancy. Avanex is commonly used in Airside areas of airfields across the world and is the only species determined to have very low bird attractancy.

Bird attractance to other exotic species of grass around the airport can be minimised by mowing grass between 100-200 mm long, prevented the formation of seed heads.

Table 2a: Grass and Tussock Species

Risk Level	Area of use	Scientific Name	Common Name	Bird value summary	Growth Habit[1]	Height (m)	Spacing (m)	Management Considerations	Habitat/Use Notes
1 - Very Low	Airside & Landside	*Festuca arundinacea*	Avanex/ Tall fescue	Mat-forming, no habitat provision, endophyte reduce bird attractancy	Grass			Mow to 100-200 mm	Primary open areas; Perennial mat-forming grass. Moist-dry soils Commonly used in airfields
2 – Low[2]	Landside	*Anemanthele lessoniana*	Gossamer grass	Seed provision	Grass	0.6-1	0.6-1.0	Shear once/year before seed ripens	Fine foliage, amenity grass, banks/verges Light shade to open sites, well-drained soil
2 - Low	Landside	*Austroderia fulvida*	Kakaho/toetoe	Seed provision but not a major food source, may provide nesting material or shelter	Grass	3	0.7	Shear once a year to prevent shelter provision	Tall, aesthetic seed plumes Well-drained, sunny sites
2 – Low[2]	Landside	*Chionochloa flavescens / C. flavicans / C. rigida/ C. rubra*	Broad-leaved snow tussock/ Mini toetoe / Narrow-leaved snow tussock / Red tussock	Potential shelter if dense, seeds may provide some food	Grass	0.6-1	1-1.4	Shear once/year before seed ripens	Open, dry slopes Amenity
2 – Low[2]	Landside	*Poa cita*	Silver tussock	Low food provision, possible shelter provision	Grass	0.6-1	0.6-1.0	Plant sparsely, do not allow to become dense, shear if necessary	Dryland grass, drought tolerant
2 – Low[2]	Landside	*Poa colensoi*	Blue tussock	Low food provision, possible shelter provision	Grass	0.3-0.6	0.4-0.6	Plant sparsely, do not allow to become dense, shear if necessary	Hardy, native to Central Otago Frost-tolerant, well drained soils
2 - Low	Landside	*Rytidosperma setaceum*	Wire tussock	Minimal food resource as seed is wind-dispersed, potential shelter	Grass	0.3–0.5	0.3–0.6	Shear once/year if necessary	Fine foliage, wind-dispersed seed, low maintenance, drought-tolerant

Notes:

1. *[1]Note: Within 200 m of OLS, cap-maintained height at ≤2.0 m and no continuous hedge lines >20 m.*
2. *[2]Listed in the Queenstown Lakes Proposed District Plan Indicative Planting Plan for Precinct B. Exotic species from the plan have been excluded in order to keep local character.*

5.8.2 Groundcover Species

Ground cover and low-growing species have been selected to provide durable vegetative cover, suppress weeds, and visually integrate with surrounding landscape treatments while maintaining low-moderate bird-strike risk. Species are predominantly native and endemic, suited to local soil and climatic conditions (source from local nurseries where possible), and most are tolerant of periodic mowing or trimming where required.

Table 2b: Groundcover Species

Risk Level	Area of use	Scientific Name	Common Name	Bird value summary	Growth Habit[1]	Height (m)	Spacing (m)	Management Considerations	Habitat/Use Notes
1 - Very Low[2]	Airside & Landside	*Aciphylla subflabellata*	Speargrass	Spiky foliage discourages perching, wind pollinated so should not attract insects	Herb	0.5-1	0.6-1.0	Non-pedestrian areas, spike-risk to people	Dryland suitable
1 - Very Low[2]	Airside & Landside	*Austroblechnum penna-marina*	Little hard fern	No fruit/nectar, low habitat value, should not directly attract birds	Fern	0.1-0.2	0.3-0.5		Very small groundcover fern, shade tolerant, shade tolerant ground cover
1 - Very Low	Airside & Landside	*Doodia australis*	Rasp fern	Low structural perch value, no fruit/nectar	Fern	0.3	0.3		Moist shade, hardy Avoid frost-prone areas
1 - Very Low	Airside & Landside	*Anaphalioides bellidioides*	Button daisy/ hell's bells	Alpine mat, low habitat, low seed attraction	Groundcover	0.05–0.2	0.3–0.5		Frost-hardy, tolerates open gravel Attractive small white flowers
1 - Very Low	Airside & Landside	*Leptinella dioica*	Leptinella, Shore cotula	Low growing, insect pollinated	Groundcover	0.2	0.7		Minimal attractancy, turf
1 - Very Low[2]	Airside & Landside	*Scleranthus uniflorus*	Cushion plant	No fruiting, nectar or seeds, no habitat provision	Groundcover	0.05-0.1	0.3-0.5		Mats suppress weeds, gravel suitable, cushion forming
1 - Very Low	Airside & Landside	*Zealandia pustulata subsp. pustulata*	Hound's tongue fern/kowaowao	Low structural perch value, no fruit or flowers, minimal resource value	Groundcover	0.2	2.1		Moist shade, walls
1 - Very Low	Airside & Landside	*Raoulia australis / R. subsericea*	Raoulia / scabweed	Non-fruiting, small flowers, minor insect attraction, no habitat provision	Groundcover	0.05–0.1	0.3–0.5		Cushion plant, excellent for dry rocky areas, suppresses weeds
2 – Low[2]	Landside	*Acaena inermis*	Bidibid	Negligible seed attractancy	Groundcover	<0.2	0.3-0.5	Lacks burrs, okay for pedestrian area	Hardy, ground stabilising 'Purpurea' is an attractive cultivar with purple foliage
2 – Low[2]	Landside	*Acaena novae-zelandiae*	Red Bidibid	Low stature, minimal attractancy	Groundcover	<0.2	0.3-0.5	Avoid in high traffic/equipment routes due to tendency of burrs/seeds to disperse	Ground stabilising
2 - Low	Landside	*Arthropodium cirratum*	Rengarenga	May attract insects, may provide seed after flowering	Herb	0.6	0.42	Shear after flowering to prevent seed set	Sheltered, north-facing pockets only, expect winter burn, not airside

Table 2b: Groundcover Species

Risk Level	Area of use	Scientific Name	Common Name	Bird value summary	Growth Habit[1]	Height (m)	Spacing (m)	Management Considerations	Habitat/Use Notes
2 - Low	Landside	*Carmichaelia petriei*	Prostrate broom	Poor perching, non-fleshy pods unlikely food source	Groundcover	0.1–0.3	0.5–1.0		
2 - Low	Landside	*Dianella nigra*	NZ blueberry	Provides some fruit	Groundcover	0.5	0.5	Plant sparsely to prevent provision of significant food	Dry shade tolerant Use only in sheltered irrigated spots
2 – Low[2]	Landside	*Libertia spp. (L. Cranwelliae, grandiflora, ixiodes, peregrinans)*	NZ iris, mikoikoi	Produces minimal fruit, may attract insects	Herb	0.3-0.5	0.3-0.5	Keep nectar and fruit producers in small, separated areas to avoid continuous flowering corridors	Various cultivars, amenity, general garden beds Evergreen
2 - Low	Landside	*Mazus radicans*	Swamp musk	Possible insect attractant	Groundcover	0.1	1.4		Wet edges, swales, riverbanks
2 - Low	Landside	*Parablechnum novae-zelandiae*	Kiokio fern	Low structural perch value, large leaves may provide some shelter, no food provision	Fern	1.5	0.84	Plant sparsely	Moist ground Avoid frost prone areas
2 - Low	Landside	*Pratia angulata*	Panakenake	Small berries potential food source, may attract insects	Groundcover	0.2	0.7	Do not plant densely	Damp shade, edges Mat forming
2 - Low	Landside	*Selliera radicans*	Remuremu	Small, low-nectar production flowers, no habitat provision, fruit inconspicuous and unlikely food source	Groundcover	0.2	0.49		Estuarine
3 - Moderate	Landside	*Carpodetus serratus var. prostrata*	Prostrate putaputaweta	Prostrate so has lower attractancy, flowers may provide some nectar, may attract insects	Groundcover	0.30 - 0.75	0.7	Shear after flowering to prevent fruit set and keep low	Banks/retaining edges Suitable for low hedge
3 – Moderate[2]	Landside	*Clematis paniculata*	Puawānanga	Nectar-bearing flowers (other food sources preferable to birds), may provide shelter if allowed to grow thickly and densely	Climber/ wallcover	3-6 (climbing)		Manage extent and density, keep clear of airside structures	Attractive flowers, climbs, decorative
3 – Moderate[2]	Landside	*Muehlenbeckia axillaris*	Creeping pohuehue	Fruiting potential, low stature but potential shelter	Groundcover	0.1-0.2	0.3-0.5	Prevent from forming tall or continuous mats which provide habitat	

Notes:

1. *[1]Note: Within 200 m of OLS, cap-maintained height at ≤2.0 m and no continuous hedge lines >20 m.*
2. *[2]Listed in the Queenstown Lakes Proposed District Plan Indicative Planting Plan for Precinct B. Exotic species from the plan have been excluded in order to keep local character.*

Table 2c: Low-growing species (herbs, ferns, and climbers)

Risk Level	Area of use	Scientific Name	Common Name	Bird value summary	Growth Habit[1]	Height (m)	Spacing (m)	Management Considerations	Habitat/Use Notes
1 - Very Low[2]	Airside & Landside	*Aciphylla subflabellata*	Speargrass	Spiky foliage discourages perching, wind pollinated so should not attract insects	Herb	0.5-1	0.6-1.0	Non-pedestrian areas, spike-risk to people	Dryland suitable
1 - Very Low[2]	Airside & Landside	*Austroblechnum penna-marina*	Little hard fern	No fruit/nectar, low habitat value, should not directly attract birds	Fern	0.1-0.2	0.3-0.5		Very small groundcover fern, shade tolerant, shade tolerant ground cover
1 - Very Low	Airside & Landside	*Doodia australis*	Rasp fern	Low structural perch value, no fruit/nectar	Fern	0.3	0.3		Moist shade, hardy Avoid frost-prone areas
2 - Low	Landside	*Arthropodium cirratum*	Rengarenga	May attract insects, may provide seed after flowering	Herb	0.6	0.42	Shear after flowering to prevent seed set	Sheltered, north-facing pockets only, expect winter burn, not airside
2 – Low[2]	Landside	*Libertia spp. (L. Cranwelliae, grandiflora, ixiodes, peregrinans)*	NZ iris, mikoikoi	Produces minimal fruit, may attract insects	Herb	0.3-0.5	0.3-0.5	Keep nectar and fruit producers in small, separated areas to avoid continuous flowering corridors	Various cultivars, amenity, general garden beds Evergreen
2 - Low	Landside	*Parablechnum novae-zelandiae*	Kiokio fern	Low structural perch value, large leaves may provide some shelter, no food provision	Fern	1.5	0.84	Plant sparsely	Moist ground Avoid frost prone areas
3 – Moderate[2]	Landside	*Clematis paniculata*	Puawānanga	Nectar-bearing flowers (other food sources preferable to birds), may provide shelter if allowed to grow thickly and densely	Climber/ wallcover	3-6 (climbing)		Manage extent and density, keep clear of airside structures. Grows tall but can be managed	Attractive flowers, climbs, decorative

Notes:

1. *[1]Note: Within 200 m of OLS, cap-maintained height at ≤2.0 m and no continuous hedge lines >20 m.*
2. *[2]Listed in the Queenstown Lakes Proposed District Plan Indicative Planting Plan for Precinct B. Exotic species from the plan have been excluded in order to keep local character.*

5.8.3 Sedges, Flaxes, and Rushes

Rushes and sedges provide structurally simple, low-perching vegetation that mostly well suited to wetland margins, stormwater swales, and seasonally damp soils. These species typically offer strong erosion control, high tolerance to fluctuating moisture levels, and low wildlife-hazard risk due to their limited fruiting and minimal attraction to birds. Their fine, vertical growth habit creates dense ground-level cover without contributing to canopy height or perching opportunities, making them appropriate for both airside and landside use. There is potential for these species to be used as nesting habitat – planting sparsely and shearing annually minimises this risk. Note that one species of flax has been included here due to being included in the QLDP. It is not recommended for planting due to nectar provision.

Table 2d: Sedges, Flaxes and Rushes

Risk Level	Area of use	Scientific Name	Common Name	Bird value summary	Growth Habit[1]	Height (m)	Spacing (m)	Management Considerations	Habitat/Use Notes
2 - Low	Landside	*Machaerina rubiginosa*	Orange nut sedge/Baumea	Low structural perch value, potential nesting habitat, especially when dense	Sedge	1	0.7	Plant sparsely, shear once a year Wetland suitable	Shallow margins.
2 - Low	Landside	*Bolboschoenus fluviatilis*	Kukuraho	Seeds provide food, may provide habitat, may form densely clumped patches that could provide nesting	Sedge	2.5	0.7	Plant sparsely, shear once a year before seed sets Wetland suitable	Shallow wetlands
2 - Low	Landside	*Carex buchananii / C. flagellifera / C. testacea / C. uncinata / C. virgata*	Upland/dryland carex group	Low bird attractancy, might provide insects, might provide shelter or nesting habitat, might provide seed as food	Sedge	0.4–0.7	0.4–0.6	Plant sparsely, shear once/year before seed ripens and to prevent growing dense. Plant in moist (only *C. flagilifera* and *uncinata*)-dry soils	Wind-dispersed seed, tolerant of cold, drought, and compacted soils
2 - Low	Landside	*Carex lessoniana, Carex virgata*	Wetland carex group	Low bird attractancy, might provide insects, might provide shelter or nesting habitat, might provide seed as food	Sedge	0.4–0.7	0.4–0.6	Latter species damp soil tolerant suitable for riparian edges and wetlands	Wind-dispersed seed, tolerant of cold, waterlogged and compacted soils
2 - Low	Landside	*Cyperus ustulatus*	Giant umbrella sedge	Low structural perch value	Sedge	1	0.7	Shear once/year before seed ripens and to prevent growing dense	Sheltered wet edges. Low structural perch value
2 - Low	Landside	*Machaerina teretifolia*	Pakihi rush	Low structural perch value, seedheads. May provide nesting opportunity if dense	Rush	1	0.35	Plant sparsely, do not allow to become dense, shear if necessary	Boggy ground
4 – High[2]	Landside	*Phormium spp (P. tenax*	Harakeke/Swamp flax	Attractive food source for nectar feeders, may provide nesting material or habitat for ground nesting birds	Flax	1.5	2	Keep nectar producers in small, separated areas to avoid continuous flowering corridors. Do not plant densely. Maintain so that ground is visible around the plant to prevent nesting	*P. tenax* grows larger and harder to maintain or inspect for nests. Tolerant of moist soils

Table 2d: Sedges, Flaxes and Rushes									
Risk Level	**Area of use**	**Scientific Name**	**Common Name**	**Bird value summary**	**Growth Habit[1]**	**Height (m)**	**Spacing (m)**	**Management Considerations**	**Habitat/Use Notes**
Medium	Landside	*Phormium. cookianum, and cultivars (e.g. 'Platts Black')*	Whararikí/Mountain flax and small flax cultivars	Attractive food source for nectar feeders, may provide nesting material or habitat for ground nesting birds Smaller than tenax	Flax	0.8	1	Keep nectar producers in small, separated areas to avoid continuous flowering corridors Do not plant densely Maintain so that ground is visible around the plant to prevent nesting	Consider *P. cookianum* for smaller planted, non-wetland areas, prefers drier soil

Notes:

1. *[1]Note: Within 200 m of OLS, cap-maintained height at ≤2.0 m and no continuous hedge lines >20 m.*
2. *[2]Listed in the Queenstown Lakes Proposed District Plan Indicative Planting Plan for Precinct B. Exotic species from the plan have been excluded in order to keep local character*

5.8.4 Shrub Species

Selected shrub species provide durable mid-height structure, support erosion control and ecological function, and maintain low bird-strike risk through limited fruiting and minimal perch value. These shrubs are suited to targeted landside areas where additional height or screening is required while remaining compatible with airport safety considerations.

Table 2e: Hedge/Scrub Species									
Risk Level	**Area of use**	**Scientific Name**	**Common Name**	**Bird value summary**	**Growth Habit[1]**	**Mature height (m)**	**Spacing (m)**	**Management Considerations**	**Habitat/Use Notes**
2 - Low	Landside	*Brachyglottis greyi*	Daisy bush	May attract insects, blossoms may provide some nectar	Shrub	2	1.05		Coastal hardy. Rare in its natural environment, may be hard to source Prefers rocky sites, full sun
2 - Low	Landside	*Corokia × virgata* 'Geenty's Green'	Compact corokia cultivar	Sterile/low-fruit cultivar, tight form, minimal seed attraction	Shrub	1.5–2	1.0–1.5	Prune to <2 m	Well drained, full sun Wind tolerant
2 – Low[2]	Landside	*Corokia cotoneaster*	Corokia	Sparse branching, small fruit	Shrub	3	1.5-2	Maintain open, discontinuous crowns; hedge to <2.5 m near OLS; avoid continuous hedgelines >20 m.	Amenity or hedging Free draining soils, open site tolerant
2 - Low	Landside	*Leucopogon fraseri*	Beard-heath	Produces small and sparce fruit that may be attractive	Shrub	0.3 to 1	1	Do not plant densely	Low montane/subalpine frost and drought hardy, frost and drought hardy
2 - Low	Landside	*Ozothamnus leptophyllus*	Tauhinu	Some shelter, may attract insects, seeds and flowers small and unlikely a good food source	Shrub	2	1.4		Tolerates poor soils, drought, frost, and strong wind

Table 2e: Hedge/Scrub Species

Risk Level	Area of use	Scientific Name	Common Name	Bird value summary	Growth Habit[1]	Mature height (m)	Spacing (m)	Management Considerations	Habitat/Use Notes
2 – Low[2]	Landside	*Pachystegia insignis*	Marlborough rock daisy	Low attractancy, potential insect attraction	Shrub	0.6-1	0.6-1.0		Dryland or rock garden amenity
2 - Low	Landside	*Discaria toumatou*	Matagouri	Spiny, tiny dry seed, very low bird attractancy, thorns, possible nesting/shelter (mainly for small birds)	Shrub	2–3	1.5–2.0	Can be sheared to prevent thickets forming which may provide shelter	Avoid pedestrian zones due to thorn risk Full sun, dry soils, exposed conditions
2 – Low[2]	Landside	*Coprosma acerosa 'Red Rocks'*	Sand coprosma 'Red Rocks'	Fruiting potential, small berries, may harbour insects, shelter provision for small birds	Shrub	0.5-1	0.6-1.0	Shear after flowering to prevent fruit set and to maintain low	Use sparingly, a coastal cultivar Low growing, attract red mat forming shrub Ovoid waterlogged or clay soils
3 – Moderate[2]	Landside	*Olearia lineata*	Twiggy tree daisy	Upright, fine foliage, minimal fruit. Fragrant flowers may attract birds and insects	Shrub	3	1.5-2	Maintain open crowns; hedge to <2.5 m near OLS; avoid continuous hedgelines >20 m. Do not plant nectar and fruit producers densely	Screening Full sun
3 - Moderate	Landside	*Olearia moschata*	Musk daisy	Open, sparse crown discourages perching, minimal fruit. Fragrant flowers may attract birds and insects	Shrub	1.5–2	1.0–1.5	Maintain open, discontinuous crowns; hedge to <2.5 m near OLS; avoid continuous hedgelines >20 m. Do not plant nectar and fruit producers densely	Alpine daisy Frost-tolerant
3 - Moderate	Landside	*Olearia odorata*	Twiggy daisy	Open, sparse crown discourages perching, minimal fruit Fragrant flowers may attract birds and insects	Shrub	1.5–2.5	1.0–1.5	Maintain open, discontinuous crowns; hedge to <2.5 m near OLS; avoid continuous hedgelines >20 m. Do not plant nectar and fruit producers densely	Fine-branched, tiny achenes, excellent screen without fruit draw, drought-tolerant
3 – Moderate[2]	Landside	*Coprosma crassifolia*	Small leaved coprosma	Berries seasonally, potential shelter if growing densely	Shrub	4	1.5-2	Use sparingly, shear after flowering to prevent fruit set and to minimise shelter opportunity	Hedging/screening

Table 2e: Hedge/Scrub Species

Risk Level	Area of use	Scientific Name	Common Name	Bird value summary	Growth Habit[1]	Mature height (m)	Spacing (m)	Management Considerations	Habitat/Use Notes
3 – Moderate[2]	Landside	*Coprosma propinqua*	Mingimingi/ small leaved coprosma	Berries seasonally, potential shelter if growing densely	Shrub	2 to 5	1.5-2	Use sparingly, shear after flowering to prevent fruit set and to minimise shelter opportunity	Hedging/screening
3 – Moderate[2]	Landside	*Coprosma robusta*	Karamū, large leaved coprosma/tree coprosma	Berries very attractive, potential shelter if growing densely	Shrub	3 to 6	1.5-2	Prune or get a non-fruiting cultivar/specimen, shear after flowering to prevent fruit set	Hedging/screening
3 – Moderate[2]	Landside	*Coprosma rugosa*	Needle leaved mountain coprosma	Berries seasonally, potential shelter if growing densely	Shrub	1 to 3	1.5-2	Use sparingly, shear after flowering to prevent fruit set and to minimise shelter opportunity	Hedging/screening
3 - Moderate	Landside	*Dodonaea viscosa*	Akeake	Low perching value, minor food source (seeds)	Shrub	7	1.75	Use sparingly, avoid planting densely	Windbreaks, coastal hardy
3 – Moderate[2]	Landside	*Veronica spp. ('Emerald Green', Veronica albicans, Veronica cataractae, Veronica evenosa, Veronica sect. Hebe, Veronica speciosa, Veronica stricta)*	Koromiko/hebe group. Hebe 'Emerald Green'. 'Albicans', Fiordland parahebe, Purple hebe, korimiko	Flowers attract insects, compact structure	Shrub	0.5-2.5	0.6-1.0	Shear after flowering to prevent seed set	Rocky beds, hedges, borders, screens, amenity
4 – High[2]	Avoid/Landside	*Muehlenbeckia astonii*	Shrubby pōhuehue	Potential bird shelter	Shrub	1.5 to 2.5	1.5-2	Avoid, use alternatives Shear to small sizes and space sparsely	Can be sheared into topiary shapes, visually appealing
4 – High[2]	Avoid/Landside	*Muehlenbeckia complexa*	Pōhuehue	Dense nesting cover, especially if planted tightly Fruits in late summer	Shrub/climber/ground cover	4 to 10 (climbing)	1-2	Avoid, do not plant tightly. Will climb if supported and can be trained as a ground cover, or shaped	

Notes:

1. *[1]Note: Within 200 m of OLS, cap-maintained height at ≤2.0 m and no continuous hedge lines >20 m.*
2. *[2]Listed in the Queenstown Lakes Proposed District Plan Indicative Planting Plan for Precinct B. Exotic species from the plan have been excluded in order to keep local character.*

5.8.5 Tree Species

Tree species have been chosen for long-term durability, climate suitability, and visual structure, with placement restricted to landside areas to avoid wildlife hazard risks. Species with significant fruiting or tall perching potential are located well outside airside zones, ensuring compliance with aviation safety standards while still delivering strong landscape and ecological outcomes.

Avoid planting any tree species densely and avoid planting in corridors. Maintain open, discontinuous crowns and consider OLS height restrictions when designing a planting plan.

Table 2f: Tree Species

Risk Level	Area of use	Scientific Name	Common Name	Bird value summary	Growth Habit[1]	Mature height (m)	Spacing (m)	Management Considerations	Habitat/Use Notes
2 – Low[2]	Landside	*Plagianthus regius*	Ribbonwood	Small flowers, limited food source (leaves eaten by kereru in winter, flowers in spring nectar-provision), deciduous, open crowned when mature	Tree	8 to 12	≥4	Avoid planting densely or in corridors	Moist, well drained soils, full sun. Open amenity areas
2 – Low[2]	Landside	*Pseudopanax crassifolius*	Lancewood	Sparse crown discourages perching, berries on mature trees and crown thickens, form change when mature	Tree	15	≥4	Good option in landside areas requiring vertical structure with minimal perch value in early decades	Prefers well-drained soils with full sun to partial shade Suited to exposed, drought-prone sites and general amenity planting
3 – Moderate[2]	Landside	*Olearia paniculata*	Golden akeake	Open, sparse crown discourages perching, minimal fruit. Small flowers may attract birds and insects	Tree	3 to 4	>4		Thrives in dry, windy, and exposed conditions Excellent for hedging, screens, coastal zones, and drylands
3 - Moderate	Landside	*Fuchsia excorticata*	Kōtukutuku	Fruiting potential, nectar rich flowers, nesting material provision, may attract nectar and fruit feeding birds. Very good food source	Tree	6	≥4	Plant sparsely, keep nectar and fruit producers in small, separated areas to avoid continuous flowering corridors Deciduous habit reduces attractiveness part of the year	Gullies, landside Moist, fertile soils, best used in shaded or sheltered areas
3 – Moderate[2]	Landside	*Griselinia littoralis*	Broadleaf	Occasional small berries (female specimens only), dense foliage offers shelter	Tree	4 to 6	≥4	Plant sparsely, keep nectar and fruit producers in small, separated areas to avoid continuous flowering corridors Consider only planting male specimens (non-fruiting)	Hedging/screening. Very wind-tolerant and hardy; good landside screening option when managed
3 - Moderate	Landside	*Hoheria sexstylosa*	Houhere	Flowers may attract insects and nectar feeders, shelter provision	Tree	5	≥4	Plant sparsely, keep nectar and fruit producers in small, separated areas to avoid continuous flowering corridors. Consider only planting male specimens (non-fruiting)	Sheltered sites, frost sensitive. Fertile, well-watered soils.

Table 2f: Tree Species									
Risk Level	**Area of use**	**Scientific Name**	**Common Name**	**Bird value summary**	**Growth Habit[1]**	**Mature height (m)**	**Spacing (m)**	**Management Considerations**	**Habitat/Use Notes**
3 - Moderate	Landside	*Myrsine australis*	Māpou	Fruiting potential, may attract kererū/blackbirds Dense foliage provides habitat, may attract insects	Tree	5	≥4	Shear after flowering to prevent fruit set and maintain to prevent high density	Sheltered margins. Potential hedge. Understorey Moist but well drained soils.
3 – Moderate[2]	Landside	*Pittosporum tenuifolium, cultivars such 'Golf ball'*	Kohuhu	Seeds may attract small birds, some nectar provision	Tree	6 to 8	≥4	Manage density, use sparingly for screening, shelter belt potential Shear after flowering to prevent fruit set	Compact mound, cultivars make good topiary trees Tolerant of wind, frost and dry soils
3 – Moderate[2]	Landside	*Pseudopanax ferox*	Savage lancewood	Berries. nectar and canopy provision on mature trees - form change when mature increases risk from low to moderate	Tree	5	≥4	Use sparingly, consider using only when young and replacing when canopy matures	Visually interesting amenity tree suitable for areas where height is wanted but with low perching value required Well-drained soils and full sun.
3 - Moderate	Landside	*Sophora prostrata*	Prostrate/dwarf kōwhai	Prostrate/low growing, flowering food source for nectar loving birds during spring Potential shelter for nesting	Tree	2	>4	Maintain at low heights, visually inspect for nests, shear when flowering if overly attractive to birds	Prostrate, low growing Rock gardens. Well drained soils, full sun
3 - Moderate/High	Landside	*Sophora spp. (S. Fulvida, S. microphylla, S. mollyi)*	Tree kowhai, weeping kowhai, Dragon's kowhai	Attracts nectar birds (tui/bellbird) during flowering, open crown and small leaved species not overly attractive shelter or nesting Leaves eaten by certain species (kereru)	Tree	10	≥4	Flowering season brief, monitor for excessive attraction (nectar-feeders) over this time	Free draining soils, full sun, light frost tolerance
4 – High[2]	Avoid/Landside	*Pittosporum eugenioides*	Lemonwood	Fragrant flowers and seed capsules, dense shelter	Tree	10 to 12	≥4	Avoid	
4 – High[2]	Avoid/Landside	*Pseudopanax arboreus*	Five-finger	Heavy fruiting, canopy provision	Tree	4 to 8	≥4	Avoid	
4 - High	Landside	*Podocarpus laetus*	Hall's tōtara	Fleshy fruit attractive food source, provides shelter	Tree	12 to 20	≥4	Use male clones where available, limit planting density and proximity of females to airside zones	Slow growing, could consider life cycle management

Notes:

1. *[1]Note: For all shrubs and trees within 200 m of OLS, cap-maintained height at ≤2.0 m and no continuous hedge lines >20 m.*
2. *[2]Listed in the Queenstown Lakes Proposed District Plan Indicative Planting Plan for Precinct B. Exotic species from the plan have been excluded and not recommend in order to keep local character*

5.9 Recommended traffic light Zones for Queenstown Airport

Statistics from the FAA and the Flight Safety Foundation (FSF) indicate that approximately 70% of bird strikes occur at or below 500 ft above ground level, predominantly during take-off and landing (FAA & FSF, 2025) Accordingly, it is recommended that wildlife hazard mitigation measures — including the management of habitat, land use, development activity, and environmental change — place greater emphasis on the airport environs and surrounding low-altitude airspace where aircraft are most vulnerable to bird strikes. ICAO guidance on wildlife hazard management also encourages consideration of land use and wildlife attractants beyond the immediate airfield boundary, commonly applying concentric planning areas of approximately 3 km, 8 km, and up to 13 km from the aerodrome reference point to reflect decreasing but ongoing risk with distance from the runway environment.

On this basis, a traffic light system of Zones is recommended to help align development, land-use change, and environmental management with known bird-strike risk profiles (Appendix A). The Red Zone represents the highest bird strike risk areas closest to the airfield and critical flight paths, where it is recommended that development and environmental change be tightly managed to avoid introducing wildlife attractants, vertical structures, or habitat features likely to increase bird activity. The Orange Zone functions as an intermediate buffer where development, earthworks, planting, water management, and land-use activities should be carefully considered and managed to minimise wildlife attraction within approach and departure corridors. The Green Zone extends into the broader airport vicinity, where larger-scale development, earthworks, water introduction, land-use change, and vegetation establishment may still influence wildlife movement patterns and should be planned to avoid attracting hazardous wildlife into aircraft operating areas. These recommendations also apply within the OLS, with development and planting managed to avoid the introduction of features or species that could penetrate protected airspace over time.

5.9.1 The Red Zone

The Red Zone (Appendix A) is recommended to be located within the airside boundary of the Queenstown precinct and to include a 5 m buffer to help ensure earthworks and landscaping remains low risk around the airside perimeter fence. This buffer is intended to assist in keeping the fence line clear of tall or dense plant species that could interfere with the fence structure and potentially result in non-compliance with CAA Part 139 requirements.

The Red Zone is also recommended to extend into the approach and take-off fan within the OLS. This includes areas where aircraft are expected to operate below 500 ft during landing and departure, reflecting the heightened wildlife strike risk associated with low-altitude flight paths (approximately 70% of bird strikes occur at or below this height).

Landscaping standards for the Red Zone are recommended as follows.

5.9.1.1 Existing Environment and Land use

Landscaping within the Red Zone currently consists primarily of managed airfield grass monoculture. Ongoing maintenance and monitoring are recommended to ensure the area remains low risk from a wildlife hazard perspective. Key measures include:

Routine monitoring: Existing vegetation is inspected by the Wildlife & Airside Safety Manager as part of the WHMP.

Removal of risk species: Any naturally occurring plant species that emerge and are identified as posing a wildlife attraction risk are recommended to be removed or modified to maintain acceptable safety outcomes.

5.9.1.2 Proposed Developments and Environmental Change

Execution of this plan: This plan establishes clear accountability for contractors to ensure that works are carried out in a manner that mitigates wildlife attractant risks. It also provides for clear communication, oversight, and a formal sign-off process to support consistent implementation of the plan.

Airfield vegetation exclusion zone: It is recommended that vegetation not be planted within the airside Red Zone, with the exception of approved grass species. This includes areas within 5 m of the airside perimeter fence. This approach supports CAA Part 139 security considerations and helps reduce risks associated with vertical structure and potential wildlife attraction.

Limited planting near terminal entrances: Selected low-growing grasses or perennial flowering plants may be considered suitable in planter boxes bordering terminal buildings. Any such planting should align with the approved planting palette (very low and low categories) and spacing guidelines set out in Table 2.

Vegetation removal and soil exposure: Any works involving vegetation removal or exposure of topsoil are recognised as potential wildlife attractants. Contractors are recommended to implement mitigation measures outlined in this document. Following completion of works, exposed areas should be re-seeded with Avanex Tall Fescue grass or another Airport approved species. Detailed procedures for managing wildlife attractants during works and grass re-seeding are provided in Section B of this plan

The Orange Zone

The Orange Zone (Appendix A) is recommended to begin at the boundary of the Red Zone, extending from approximately 5 m outside the airside perimeter fence and continuing outward to approximately 3 km from the runway centreline. This zone forms part of a wider wildlife hazard management buffer beyond the immediate airfield environment.

Consistent with ICAO wildlife hazard management guidance, aerodrome operators are encouraged to consider land use and wildlife attractants within the broader airport vicinity. Industry and national guidance commonly apply concentric planning areas of approximately 3 km, 8 km, and up to 13 km from the aerodrome reference point to reflect decreasing but ongoing wildlife strike risk with increasing distance from aircraft operating areas.

5.9.1.3 Existing Environment and Land use

Existing landscaping within the Orange Zone should be monitored for wildlife attractiveness. Where bird activity or attractants are identified, it is recommended that the area be assessed by a suitably qualified ecologist, who can provide advice on measures to reduce wildlife risk.

As this zone includes private residential areas and commercial land uses, it is recommended that council planning documents clearly communicate the presence of the airport and the importance of managing wildlife attractants within this area.

5.9.1.4 New Developments and Environmental Change

New developments within the Orange Zone are recommended to use plant species rated very low to moderate in wildlife attractiveness, as identified in the Planting palette Tables in section 5.8. Landscaping proposals should be assessed and approved by Queenstown Airport and/or Council prior to project commencement, in accordance with Table 3. Queenstown Airport may seek independent expert advice when reviewing landscaping proposals.

Project review requirement: Any new project within the Orange Zone that involves excavation or landscaping is recommended to be reviewed prior to landscape designs being finalised, in accordance with this plan.

Vegetation removal and soil exposure: Works involving vegetation removal or exposure of topsoil are recognised as potential wildlife attractants. Mitigation measures outlined in this document are recommended to be implemented during construction, with exposed areas re-seeded using Avanex Tall Fescue or another airport approved species grass following completion of works. Further detail is provided in Section B of this plan.

5.9.2 The Green Zone

The Green Zone (Appendix A) represents the broader airport environment extending beyond the Orange Zone and generally within a 13 km radius of the aerodrome, where aircraft operations are less frequent at low altitude, but wildlife hazards may still influence approach and departure paths. While the overall bird-strike risk in this zone is lower, ICAO best-practice guidance recommends ongoing monitoring and management to minimise the potential for wildlife hazards affecting aircraft operations.

5.9.3 Existing Landscape

Existing environs within the Green Zone should be monitored and managed in a manner that avoids creating significant wildlife attractants. Where substantial bird activity is observed, further assessment by an appropriately qualified specialist may be considered.

5.9.4 New Developments and Environmental Change

New environs within the Green Zone should seek to avoid plant species or land uses that could attract hazardous wildlife into the wider airport operating environment. Planting choices should be informed by the planting palette and good-practice wildlife hazard management principles, with consideration given to site-specific conditions.

Part B: Contractor Requirements and Guidelines

6.0 General Contractor Requirements

- Site design plans: all excavation, construction, landscape and reinstatement plans must be developed using the information set out in this plan, prior to seeking approval by Pattle Delamore Partners. Any changes to submitted plans must be communicated and reapproved.
- Work Permits: All development works must be covered under an Authority to Work Permit or Method of Works Plan. This permit must evaluate the potential bird strike risk and mitigations prior to the commencement of work.
- Supervision: A qualified Site Supervisor shall oversee all reinstatement and landscaping works and communicate timely wildlife hazard concerns to Queenstown Airport.
- Timing: Reinstatement to commence within 5 working days of ground disturbance where practicable (sooner if bird hazard risk identified).
- Inspections: The Wildlife & Airfield Safety Manager or a designated QAC representative will inspect reinstated areas before sign-off.
- Temporary Conditions: Exposed soil surfaces within proximity to aircraft operational areas, including airside stockpiles, shall be treated with emulsion or an alternative fit-for-purpose stabilisation method to control dust and minimise conditions that may attract birds.

7.0 Reinstatement Standards – Materials and Specifications

Reinstatement materials and their specifications (listed in Table 2 below) are critical to ensuring that developed and restored areas meet required environmental and operational standards. All reinstatement works must comply with the following requirements to:

- Prevent the creation or increase of wildlife attractants,
- Ensure ease of ongoing ground management and maintenance, and:
- Maintain site stability and compatibility with the surrounding environment.

Note: it is a requirement to observe wildlife activity for the duration of the project. If an increase in wildlife activity is observed the Wildlife & Airside Safety Manager must be advised immediately. Appropriate wildlife deterrent measures should be available on site and used if activity arises to deter bird activity on site.

Table 3: Reinstatement Standards			
Aspect	**Standard**	**Specification**	**Explanation and Mitigations**
Ground Profile & Drainage	Maintain existing grades and ensure water drains freely	No standing water > 12 hours post heavy rainfall	Standing water attracts birds to feed and bathe Contact the Wildlife & Airside Safety Manager immediately if bird activity is present Use appropriate wildlife deterrence measures if standing water attracts bird species to the area
Soil Compaction	Sub-grade compaction with no soft spots	95 % MDD[1] (minimum)	Uneven ground can create future issues such as areas that pool water or uneven, rough ground that makes lawn maintenance difficult
Topsoil	Clean screened topsoil free of contaminants or organics including rocks over 10 mm	At least 150 mm (after compaction) pH 6–7	Screened ensures its weed free ensuring grass success and minimises future food source for birds
Surface Finish	The surface must be left smooth, firm and level with its surrounds (drains, manholes, mag-signs, stands etc) Hard clay/soil lumps, rocks, stakes and survey markers must be removed off site	Smooth and level with surrounds	Surface finish quality allows for ease of grounds maintenance and ensures efficiency and safety of contractors and their equipment

Table 3: Reinstatement Standards			
Aspect	**Standard**	**Specification**	**Explanation and Mitigations**
Open substrate	Open substrate near operational areas i.e. runway or taxiways must be covered with emulsion or similar fit-for-purpose product Areas further away from the runway or landside can be left to ensure ground has settled before grass is sown	The area must be sprayed with 2 herbicide applications with the final application 1 week prior to grassing Glyphosate and Li 1000 (or similar) can be used for these applications	Open substrate near operational areas can create dust and affect aircraft operations. Contact the Wildlife & Airside Safety Manager immediately if bird activity is present. Use wildlife deterrent measures if open substrate attracts bird species to the area
Grass seeding	Avenex must be sown in all areas where the ground has been disturbed unless another grass specie is approved by the airport	Avanex pre-emergent herbicide to be added with seed application Granular fertiliser such as DAP to be used at time of sowing Seeding depth must be drilled between 5-10 mm 75 mm Spacing 70 kg/ha	Avanex is a unique type of tall fescue produced by PGG Wrightson that can assist in reducing the number of birds on or near sports fields, amenity areas and airfields. Alkaloids produced by the endophytes not only reduce the number of insects available for birds to feed on but can also reduce the number of bird species feeding on the grass
Permitted Gravel Areas	Selective areas may permit gravel application by Queenstown Airport	Crushed gravel (≤ 20 mm) or geotextile where grass not permitted	Gravel may be required in areas where grass is not permitted. This allows for ease of grounds maintenance and can reduce wildlife attractance in areas hard to access

Table 3: Reinstatement Standards			
Aspect	**Standard**	**Specification**	**Explanation and Mitigations**
Stockpiles	Stockpiles may be required on site following excavation or for ground reinstatement	Cover piles with shade cloth or geotextile	Stockpiles may be attractive to roosting birds that cause a threat to aviation. Contact the Wildlife & Airside Safety Manager immediately if bird activity is present. Use wildlife deterrents if covered stockpiles attract bird species to the area.
Fertiliser	Requirements for healthy grass and efficient grown	Minimal nitrogen content; avoid rapid growth stimulation	Fertiliser ensures efficient growth of grass, reducing weed species uptake that attracts bird species to feed
Maintenance Heights	Grass should be maintained during the project	Airside - 150 mm–200 mm Landside – 120 mm-150 mm	Grass maintenance ensures seed heads are removed discoursing seed eating birds
Irrigation	Projects that fall inside dry season may require irrigation if rain is not forecast during time of seed sowing	Irrigation efficient enough to water all areas sown with grass seed	Ensures effective and efficient grass growth following sowing
Site Landscaping	Landscaping must be designed to reduce bird attractancy	Consult the recommended planting pallet in section 5.8 Permitted to sign off from Queenstown Airport	Ensures bird attractancy and mitigation of bird strike risk

Table 3: Reinstatement Standards			
Aspect	**Standard**	**Specification**	**Explanation and Mitigations**
Site waste	No exposed site waste	Store organic and non-organic waste in covered, bird-proof skips Site manager to ensure provisions for contractors' compliance to zero waste policy	Waste attracts scavenging wildlife to forage
Water barriers/ equipment that may hold water	No standing water on site	Ensure all water barriers are plugged or taped Do not leave drums or any equipment on site that may hold water	Queenstown Airport have obligations with the ministry of health. Borders must plan to be free from stagnant water to reduce foreign mosquito breeding risks

Notes:
1. *MDD: Maximum dry density*

8.0 Quality Assurance and Sign-Off

Table 4: Airport Works Quality Assurance and Sign-off		
Stage	**Responsibility**	**Verification**
Work design Plans	Contractor and Project Manager	Plans submitted, reviewed and signed off by Pattle Delamore Partners
Pre-works	Contractor and Safety Team	Work zone inspected, drainage confirmed
During works	Project Manager and Safety Team	Ensure compliance with Table 2, 3 and submitted plans. Ensure Appendix B checklist is completed
Post-works	Contractor, Project Manager and Safety Team	Ensure compliance with Table 2, 3 and submitted plans.

Table 4: Airport Works Quality Assurance and Sign-off		
Stage	**Responsibility**	**Verification**
		Ensure Appendix B checklist is completed for post work inspection
1-Month review	Project Manager and Safety Team	No bird activity, drainage maintained 95% of grass with only 5% weed is deemed complete upon final inspection and sign off

9.0 Non-Conformance and Corrective Action

If reinstated areas create bird attractants (e.g. standing water, excessive growth):

1. Notify the Wildlife and Airfield Safety Manager immediately as detailed in table 3.
2. Rectify within 24 hours (re-grade, re-seed, or drain).
3. Costs of corrective action may be charged to the contractor.

10.0 Grounds Management Following Works

10.1 Landscaping

It is recommended that grounds contractors are educated and follow the Planting Palette Tables 2 within this plan. This will ensure that new and old landscaping is maintained to ensure bird attractancy risk is mitigated.

For example, discontinuous crowns between trees and an open structure should be maintained. Flax species should be sheared once a year before seeds set.

Grounds Management - guidance on vegetation control, ground reinstatement, surface water management, and practical measures to reduce wildlife attractants.

10.2 Grounds Conditions

Grounds should continue to be monitored by grounds contractors to ensure that there are no potential wildlife attraction risks. i.e. standing water, ground rutted with tire tracks, weed infestations. Any attraction risks should be reported to the Wildlife and Airfield Safety Manager immediately.

11.0 References

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Appendix A: Traffic Light Zone Queenstown Airport Map

Still in development.

Appendix B: Ground Reinstatement Sign-off Checklist following Airport Approval

Note: This checklist is only to be used following project plan approval from Queenstown Airport. Details of specifications identified below can be found in Table 2 and 3 within this plan.

Date: _____ **Project Approval Date:** _____

Area: _____**Contractor:** _____

Project Supervisor: _____

Check Item	Airside	Landside	✓
Ground re-graded to shed water (no pooling)	☐	☐	
All temporary stockpiles covered / removed	☐	☐	
Waste contained and moved form site daily	☐	☐	
Water barriers and equipment free from pooling water	☐	☐	
Grass maintained to spec (150-200 airside and 120-150 landside)	☐	☐	
Wildlife deterrent tools available on site	☐	☐	
Even soil compaction (95 % MDD)	☐		
150 mm clean, screened topsoil applied	☐	☐	
Surface finished, smooth, firm and level free of rocks, lumps and stakes/ survey markers	☐	☐	
Open substrate weed sprayed prior to grassing	☐	☐	
Avanex/ other sown with fertiliser application to spec	☐	☐	
Consideration if irrigation is needed for grass establishment for 95% coverage	☐	☐	
Gravel applied to approved areas	☐	☐	
Pre-approved plant species planted to spec as detailed in Table 2a-f			
Area inspected and approved by Airfield Manager	☐	☐	

Sign-Off:

Supervisor _____ Date _____

Airfield Manager _____ Date _____