

VEGETATION MONITORING AT THE KAIMAUMAU WETLAND, NORTHLAND



 providing
outstanding
ecological
services to
sustain
and improve our
environments



VEGETATION MONITORING AT THE KAIMAUMAU WETLAND, NORTHLAND

Proposal No. P4396

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Prepared for:
Department of Conservation
Kaitaia

Reviewed and approved for release by:



W.B. Shaw
Director/Principal Ecologist
Wildland Consultants Ltd

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1. BACKGROUND AND SCOPE

The Kaimaumau Wetland in Northland is a significant wetland and is administered by the Department of Conservation as a Scientific Reserve. In the 1970s a drain was dug through this reserve area. Far North District Council are now applying for a concession to continue to maintain the drain. While the drain has been in place for over forty years, there are still concerns that the drain is affecting the ability of the wetland to function, and that there are long term impacts of the drain on the wetland integrity. As part of a concession - proposed for 10 years - the Department of Conservation would like to include monitoring of the site so that any future renewal (or declining) of a concession is based on sound justifications. Wildland Consultants has been asked to provide an estimate of cost to set up and undertake this monitoring, including analysis of data and reporting of findings. DOC will also be installing piezometers to collect water level data, which would be supplied to Wildlands for analysis purposes.

Figure 1 shows the approximate drain location and potential transect/plot locations.



Figure 1: Drain location (red/black line) with approximate transect locations shown in green with plot locations shown in purple.

2. PROPOSED METHODS

Vegetation monitoring is proposed to be undertaken three-yearly for nine years.

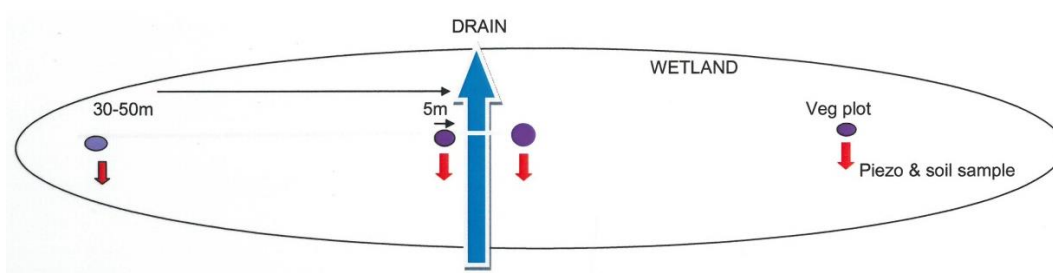
Year 1

- Determine the best experimental design for the monitoring, based on the number of plots that are able to be installed, which will be determined by budget. Distance from the drain will be determined by the depth of the drain, to ensure that plots are placed in sites that are outside the influence of the drain, noting the Waikato Regional Council has published these distances on predicted peat subsidence from drains:

Predicted peat subsidence (m) away from drains of different depths:

Drain Depth (m)	Distance from Drain (m)					
	25	50	100	150	200	300
1	0.07	0	-	-	-	-
1.5	0.28	0.17	0.05	-	-	-
2	0.49	0.34	0.18	0.09	0.02	-
2.5	0.70	0.51	0.31	0.19	0.11	0

- Plots will be installed in transects of at least four plots, perpendicular to the drain, with plots immediately adjacent to the drain on either side, and plots to the left and right of the drain at an appropriate distance away from the influence of the drain. Depending on budget and distance from the drain, it may be appropriate to install an additional plot at a midway point (making the transect six plots long):



- Plots will be 5 × 5 m in size, as we suggest that 5 × 5 m is the best size given the vegetation types likely to be encountered.
- Install between one and four transects along the length of the drain. There are two distinct basins that the drain cuts through, so ideally at least two transects will be installed, one in each basin.
- Each plot will be marked permanently with marker posts (metal or plastic) as required at each corner (tree tags may be sufficient near the drain if/where a dense cover of Sydney golden wattle exists).
- GPS coordinates of each plot will be recorded, and a Recce sheet on plot location will be filled in to ensure that plots can easily be relocated in three years time.
- Within each plot the following data should be recorded
 - Species present, including all vascular plants, mosses, and lichens;
 - Abundance of each species in each vegetation layer (estimated percentage cover);
 - Height of each vegetation layer (e.g. canopy, subcanopy, groundcover), and a maximum height for each vascular plant species.
 - Two photographs will be taken of each plot. From the southwest corner, one photograph should be taken with a view diagonally across the plot in a northeast direction, and one photograph in an easterly direction, towards the southeast corner.
 - The plot data will be used to calculate mean percentage cover and frequency, as per Daubenmire (1959).
 - Soil samples will be taken (just outside of each plot) for analysis of basic soil properties such as pH, phosphorus, cation exchange capacity, and volume

weight. The merits of including total nitrogen in this analysis should be discussed also (additional \$15 excluding GST per sample).

- A draft report will be produced for the Department of Conservation, presenting the results of the first monitoring round.
- Any comments from DOC will be incorporated.
- A final report will be produced and provided to DOC.

Years 3 and 9

- Plots will be relocated and remeasured and an analysis of the results over time made.

3. COSTS

Costs are provided for year one of the project only. Costs in Years 3 and 9 can be expected to be within the ballpark of the Year 1 costs, with appropriate inflation adjustments and a small amount of additional time for greater analysis of results.

Costs include the use of one Department of Conservation staff member to assist with field work, for Health and Safety purposes.

Costs are based on one Wildlands staff members traveling from Auckland (Mt Eden office) to site (approximately five hours drive each way).

A basic soil analysis is included per plot: \$55 excluding GST per sample, analysed through Hills Laboratories.

Travel To and From Site, Project Set Up

Professional fees	2,460.00
Disbursements - Mileage	561.60

	3,021.60
Goods and Services Tax	453.24

	\$3,474.84

Set Up and Measurement of One Transect (Four Plots)

Professional fees		1,320.00
Disbursements:		
- Mileage	39.00	
- Accommodation at Houhora	220.00	
- Overnight allowance	40.00	
- Marker posts	240.00	
- Soil sampling	220.00	
	_____	759.00

		2,079.00
Goods and Services Tax		311.85

		\$2,390.85

Set Up and Measurement of Two Transects (Eight Plots)

Professional fees		3,300.00
Disbursements:		
- Mileage	78.00	
- Accommodation at Houhora	440.00	
- Overnight allowance	80.00	
- Marker posts	480.00	
- Soil sampling	440.00	
	_____	1,518.00

		4,818.00
Goods and Services Tax		722.70

		\$5,540.70

Set Up and Measurement of Four Transects (16 Plots)

Professional fees		5,280.00
Disbursements:		
- Mileage	117.00	
- Accommodation at Houhora	660.00	
- Overnight allowance	160.00	
- Marker posts	960.00	
- Soil sampling	880.00	
	_____	2,777.00

		8,057.00
Goods and Services Tax		1,208.55

		\$9,265.55

Reporting

Professional fees		3,747.50
Goods and Services Tax		562.13

		\$4,309.63

4. TIMING

Monitoring is best undertaken in spring, to capture the presence of any orchids in the wetland.

5. TO BE PROVIDED BY CLIENT

- Permission to access the site
- A person to be present for health and safety purposes, for the duration of the field work.

6. PROJECT TEAM

The project team will be led by **Tim Martin**, with assistance from **Sarah Beadel** and **Melissa Marler**. Tim has extensive experience in Northland, including ranking and defining wetlands. Sarah is a very experienced wetland botanist with experience in

Northland. Melissa has undertaken field work in a range of Northland wetlands and would undertake the field work for this project.

Dr Tim Martin - Senior Ecologist, Botanist

Wildland Consultants Ltd

Tim Martin is a well-qualified and experienced ecologist based at our Auckland office. He obtained an MSc (Hons) for his research on the ecology of the tree *Ascarina lucida* in northern New Zealand, and then a PhD from the University of Auckland, investigating the effects of storms on indigenous forests in central and southern North Island. He has an excellent knowledge of North Island ecosystems and vegetation types, including vegetation dynamics, plant species distributions, threatened plant species, naturalised flora, and climate-driven vegetation change. Tim has extensive experience in both the Northland Region and in wetland ecology, including undertaking the assessment of significant wetlands for the Far North District Council and Northland Regional Council, and wetland surveys for Waipu PNAP report and structure plans (Bay of Islands, Kerikeri and Doubtless Bay). He has been involved in wetland restoration projects in Takou Bay, Dairy Flat and Drury, wetland bird surveys, orchid surveys and assessment and evaluation of mangrove habitats and values. He has undertaken extensive field work and subsequent evaluation and assessment in wetlands from Kaitaia to Brynderwyn Range, including swamp forests, gumlands, ephemeral lakes and estuaries. Tim recently designed and implemented a ranking system for 304 freshwater and estuarine wetlands throughout Northland for the Northland Regional Council. This involved assessment of the values of a wide range of wetland types across the region, and field work to update existing information and wetland extent. Tim has significant expertise in the definition of wetlands and their boundaries, through analysis of the vegetation types, underlying soils and geology, flood regimes, and indicator species such as sundews, *Dracophyllum* sp., *Epacris pauciflora*, and maire tawake. Tim has recently mapped and assessed the ecological values of over 1000 ha of the Kaimaumau-Motutangi Wetland Complex in the Far North. This wetland, which is ranked as the 2nd highest value wetland in Northland, supports a complex mosaic of ponds, gumlands, ephemeral lakes, and bogs, and each of the habitats identified was assessed using the Far North District Council criteria for wetland significance. Tim has experience in a diverse range of ecological projects to complement his excellent botanical skills, including the mapping and ecological evaluation of forest, wetland, and estuarine habitats, ecological restoration, survey and monitoring of reptiles, freshwater fish surveys. He has undertaken assessments of environmental effects for quarries, mines, roads, reclamations, stream piping, rail corridors, and land subdivision. He has been involved in ecology projects in Auckland and Northland for over ten years and is very familiar with the region's flora and fauna. He has an excellent knowledge of Northland ecosystems and vegetation types, including threatened plant species, plant species distributions, and naturalised flora. Tim recently completed large-scale surveys of natural areas in Kerikeri, Bay of Islands, and Doubtless Bay for the Far North District Council. This included the mapping and description of indigenous vegetation, collating information on flora and fauna, and the prioritisation of areas for protection. Tim was the ecological advisor to Ontrack for the Oakleigh-Marsden Point rail link. He manages the ecological restoration of two wetland and riparian areas at Takou Bay in Northland, and is a trustee of the Motu Kaikoura Trust, which manages Kaikoura Island in the outer Hauraki Gulf.

Tim was previously employed as a lecturer in ecology at the Auckland University of Technology, and has taught field courses in Northland, Auckland, Coromandel, central North Island, and the West Coast of South Island. He has also managed weed surveillance and control programmes in the Hauraki Gulf for the Department of Conservation, assessed the health of forest remnants in the Rodney District for the Auckland Regional Council, and worked in the Auckland Museum herbarium.

Sarah Beadel - Director
Wildland Consultants Ltd

Sarah is a very experienced botanist and ecologist, having worked as a consultant since 1985 when she established Wildlands. The business has since expanded to become a nationwide company. Sarah has extensive experience throughout New Zealand in restoration planning, identification of management issues and options for natural areas, vegetation surveys and mapping, evaluation of areas for relative ecological significance, problem plant (weed) assessment and monitoring, threatened species survey and monitoring, assessment of the impacts of introduced animals, and vegetation monitoring. Sarah has worked on identification, evaluation, and assessments on many wetland projects throughout New Zealand. She worked on the Bay of Plenty Regional Council Water Plan to prepare descriptions and photographs of examples of what constitutes a wetland and what does not. She worked on similar issues with Kapiti District Council and put together an inventory of wetlands in the Otago Region. Sarah has worked on designing, critiquing, refining, and interpreting many sets of ecological evaluation criteria throughout the country, including Waikato Region, Bay of Plenty Region, South Waikato District, Kapiti Coast, Tauranga City, and Taupo District. She has worked on many ecological surveys of indigenous vegetation and habitats on private land, to assess ecological values and identify management requirements. Sarah has been project leader for 13 Protected Natural Area Programme (PNAP) surveys, is the primary author of seven PNAP reports, covering over 800,000 ha, and secondary author for a further six. She has also undertaken natural heritage inventories for ten District Councils, and has been closely involved and/or project leader for many other large scale projects, including an inventory of wetlands throughout the Otago Region. Sarah has considerable experience with preparing restoration plans, and successfully managing the implementation of large restoration projects. She is highly competent at managing all aspects of projects, drawing together a wide range of specialist skill sets to produce a high quality result for the client. Sarah was the project manager for the Norske Skog Tasman wetland restoration project for ten years, which is one of the largest wetland restoration projects to be undertaken in the Bay of Plenty and New Zealand. This project has won several awards and has been recognised under the RAMSAR Convention, with a national award from the Minister of Conservation for the development (and implementation) of best practise in the conservation and wise use of wetlands. She has undertaken many vegetation surveys of natural areas (protected and unprotected), including detailed field surveys of the vegetation of Tauranga Harbour and Ohiwa Harbour, and of geothermal areas in the central North Island. Since the 1980s Sarah has also undertaken many projects on threatened and uncommon plants in the Bay of Plenty and other parts of New Zealand. She has worked on many vegetation monitoring projects, including the establishment and remeasurement of transects, plots, and photopoints in a diverse range of habitats, sand dunes, wetlands, forests, geothermal areas and shrublands. She was the implementation manager for the 2002-2007 Northern

Carbon Monitoring Programme. Teams established over 650 20 × 20 m permanent vegetation plots throughout the North Island and northern South Island. Sarah has served on the committee of the New Zealand Botanical Society, and is currently a Council member for the New Zealand Plant Conservation Network and the Rotorua Botanical Society (secretary for six years). She is passionate about indigenous plants and ecological restoration, and is the author of more than 500 botanical reports, papers, and articles.

Melissa Marler - Ecologist

Wildland Consultants Ltd

Melissa is an experienced restoration ecologist, who has worked in the Auckland region for the last 10 years managing revegetation and restoration projects, such as the restoration of the riparian margins of upper Meola Creek. Melissa has completed several lizard monitoring surveys throughout the Auckland region with Wildlands. She previously worked for Auckland City Council teaching freshwater ecology and also teaching macroinvertebrate and water monitoring between 2004 and 2007. She spent a further two years working for Morpium Environmental Ltd. During this time she carried out stream and wetland assessment work on Waiheke Island (Little Oneroa and Ostend/Onetangi). She has mentored and supported many community environmental groups including Friends of Oakley Creek, the St Lukes Environmental Protection Society (Meola Creek), Friends of Maungawhau, Kaipatiki Project (Eskdale Reserve network) and Friends of the Whau Inc (Whau River catchment). Melissa has carried out plant survey work in a variety of ecosystem types including rock forest, swamp maire forest (Brown's Bay and Eskdale Reserve, Birkdale), coastal broadleaf forest (Selwyn Bush and Kapa Bush), wetlands – for example sedgeland and kahikatea wetland forest remnants (Bethell's Valley), and scoria cone vegetation (Maungawhau). The latter involved searches for the relic scoria cone fern *Pellaea falcata* and other associated ferns such as *Cheilanthes distans* and *Asplenium flabellifolium*. Melissa has worked for a diverse range of clients including Auckland Council, community care groups, and private clients. She has been writing ecological restoration plans since 2008. This has included a plan for the restoration of a wetland in Te Henga as part of a subdivision requirement; and more recently she has produced plans for SEA sites at Selwyn Bush (Kohimarama) and Batger Quarry (Maungawhau). She has also written planting plans for many revegetation projects. Melissa has a BSc (Hons) in Conservation Management from the University of East Anglia (UK). Her plant-based thesis investigated the relationship between the density of the European rabbit and the abundance of the pest bryophyte *Campylopus introflexus* on lowland heath in Suffolk. She has a particular interest in diminutive plants and/or threatened plants and threatened ecosystem types, for example swamp maire forest, wetlands, and rock forest.

7. RELEVANT COMPANY EXPERIENCE

7.1 Wetland surveys, monitoring, delineation and significance assessment

Wildland Consultants Ltd has a very strong portfolio of experience with surveying, monitoring, delineating, and assessing wetlands. Staff have undertaken wetland survey and assessment projects in many parts of New Zealand, including Northland, Auckland,

Wellington, Wairarapa, the Kapiti Coast, Manawatu, Waikato, Bay of Plenty, Hawkes Bay, Gisborne, Waikato, Taranaki, and various parts of the South Island.

Recent projects include monitoring of vegetation change in the Whangamarino Wetland, the development of a guide for the identification of significant wetlands in Northland, assessment and ranking of wetlands in Northland; assessment of significance of wetlands in the Otorohanga District; compilation of a wetland register for the Otago Regional Council; wetland monitoring and wetland vegetation mapping in the Bay of Plenty Region; preparation of a database of all wetlands in the Bay of Plenty Region, and survey and assessment of key wetlands in the Waikato and Franklin Districts. A major survey of wetland and stream margins in plantation forests has been completed for Fletcher Challenge Ltd. Vegetation, flora, and fauna surveys and assessments have been undertaken of all the wetlands on the Rangitaiki Plains, all the wetlands within the Kapiti Coast District (2003); 304 wetlands in Northland, Whangamarino Wetland, Kopuatai Bog, Arawa Wetland, and many other wetlands throughout New Zealand. We have also undertaken monitoring of turf communities at Lake Whangape and Lake Wairarapa.

Examples of recent projects that this team have undertaken regarding wetlands include the following:

- **Whatuwhiwhi Wetland Monitoring**

Far North District Council commissioned Wildland Consultants Ltd (Tim Martin) to establish baseline monitoring of wetland vegetation adjacent to the discharge outlet from the Whatuwhiwhi wastewater treatment plant. The discharge is into the Waimango Lagoon, which is a low nutrient wetland system of high ecological value. The focus of the vegetation survey was to determine if there was any increase in the extent of eutrophic wetland vegetation due to the discharge. Wildlands had previously conducted a follow-up assessment in 2013.

- **Ranking of Top Wetlands in Northland**

Northland Regional Council (NRC) commissioned Wildland Consultants Ltd to produce a draft list of the top wetlands in Northland. The Northland Regional Soil and Water plan requires NRC to identify and prepare a comprehensive state of the environment report on significant indigenous wetlands. Three hundred and four wetlands from throughout the region were assessed and ranked using a combination of PNAP data, field survey and desktop exercises. The assessment included both freshwater and estuarine wetlands (bogs, swamps, dune lakes, gumland, ephemeral, geothermal). Tim Martin developed the ranking system, based on wetland size, contribution to remaining wetland area in each ecological district, LENZ category, representativeness, diversity, uniqueness, degree of modification, and importance to threatened species. The ranking system was then trialled, revised, and applied to all wetlands. The output included mapping and describing wetland values, and ranking the wetlands, using a score out of 100, by wetland type and ecological district. The rankings will be used to prioritize wetland management.

- **Review of Wetland Ranking System for Greater Wellington Regional Council**

Wellington Regional Council commissioned Wildland Consultants Ltd in 2011 to undertake a review of the significance assessment and ranking system developed for a review of the Regional Freshwater Plan. This included a brief review of relevant national policy and case law, and a comparison with other methods in New Zealand for significance assessment and ranking of wetlands. It also included recommendations for the approach to significance assessment and criteria in the Regional Freshwater Plan and the Proposed Wellington Regional Policy Statement. The review provided a critique of the wetland ranking and ecological significance assessment system, including the interpretation and use of significance criteria; and recommendations on how to resolve and address any issues with the methodology.

- **Methodologies for Ranking of Lake Ecosystems for Biodiversity Management in the Waikato Region**

Wildland Consultants Ltd was commissioned by Waikato Regional Council in 2008 to develop and trial a framework for ranking the ecological values of lake ecosystems, including adjacent wetlands. This project involved the amalgamation and adaptation of existing ranking systems so that they were relevant to the region, and able to be rigorously applied on a regional scale. Rankings were made for forty-nine lakes within the Waikato Region.

- **Monitoring of Wetland Vegetation Along the Upper Waikato River**

The Upper Waikato River contains a number of wetland habitats that collectively provide important habitat for diverse and abundant populations of fish, waterfowl and invertebrates. Under the consented operation of the Waikato Hydro System it was predicted that these wetlands would retain their character but that plants more typical of drier habitats may extend into the landward edges of the wetland. Both variables were measured in 2003 and 2008, at nine permanent transects established at three sites along the Upper Waikato River. Data was analysed to determine whether dryland species had increased in frequency and canopy cover. It was suggested that consideration be given to not monitoring the extent of wetland area as the lateral extent and composition of wetland communities are better indicators of wetland condition.

7.2 Wetland restoration

Wildland Consultants Ltd is very experienced in the management and restoration of wetlands, including those at Hannahs Bay, Rotorua (willow control, water management, planting, boardwalks, interpretation panels etc); management and implementation of the Norske Skog Tasman restoration project; a wetland restoration project for CHH Tissue upstream of the Norske Skog Treatment Ponds; identifying survey and monitoring priorities for lands administered by the Department of Conservation; wetland restoration (excavation, planting, willow control) at Lake Okaro and Awakaponga Wildlife Management Reserve; preparation of a restoration plan for seven wetlands surrounded by dairy farms on the Rangitaiki Plains; preparation of a restoration plan for Te Harakeke Wetland, Kapiti Coast; creation of a wetland for a tributary of

Wharemauku Stream, Paraparaumu; preparation of a restoration plan for wetlands on a dairy farm near Reporoa; and are currently undertaking a restoration implementation plan for Pharazyn Reserve on the Kapiti Coast. Many other projects have been undertaken on wetlands throughout New Zealand.

7.3 Other relevant experience in Northland

Recent experience that Wildland Consultants Ltd has in Northland includes an ecological assessment for the review of the Kaipara District Plan natural character overlays (2011); the mapping and description of natural areas for the Kerikeri-Waipapa Structure Plan, the Bay of Islands Structure Plan, and the Doubtless Bay Structure Plan. This work essentially updated and built on the existing PNAP reports for these areas, including mapping the current extent of natural areas, the addition of new sites, and updating vegetation descriptions. The assessment work for the Kaipara District Plan used existing PNAP survey data to define ecological values and features that contribute to natural character.

We have assessed threatened plant populations within QEII covenants in Northland as part of a joint project between DOC and QEII Trust. This work involved the establishment of monitoring, and the development of research and management recommendations for sand daphne (*Pimelea villosa*) at Pataua Bay, and *Christella dentata* and *Pittosporum obcordatum* at Awanui.

Wildlands also recently carried out ecological survey work and assessment of natural areas in Aupouri ED, and also near Whangarei for forestry clients. Between 2000 and 2004 field surveys and assessments of all natural areas in Carter Holt Harvey Forests in Northland were undertaken. Some of these forests are now managed by other forest managers, including Hancocks Forest, Olsens and Rayonier.

We undertook the ecological assessment for the Northland Regional Corrections Facility site, and are now involved in ecological restoration planning and implementation at this site.

In 2007 Wildlands undertook a detailed assessment of estuarine vegetation in Whangarei Harbour for the Northland Regional Council. An updated map of estuarine vegetation within the harbour was produced as part of the study which also ranked areas of estuarine habitat according to their relative values. Wildlands has also undertaken ecological assessments of proposed roading (e.g. Whangaruru Harbour) and rail links (Marsden Point), subdivisions, and water supply dams (Ngunguru and Mangere catchments). Ecological resource documents and considerable advice have been provided to landcare groups, companies, iwi, councils and Department of Conservation on a wide range of topics, including large scale ecological surveys, flora and fauna management, monitoring guidelines, and research advice. Company staff are well known.

8. OTHER COMPANY INFORMATION

Wildland Consultants Ltd is a progressive ecological consultancy committed to the care and enhancement of our natural environment. The company has been operating since 1985 and is committed to providing high quality ecological information, advice, and technical services to a wide range of clients. The company specialises in:

- **Survey and Monitoring**
 - Survey, assessment, monitoring and management of biodiversity, threatened species, vegetation, fauna, pest plants (weeds), and introduced mammalian pests.
- **Ecological Restoration**
 - Planning.
 - Implementation - restoration planting, revegetation, weed control, pest control (including predators), monitoring, and ongoing wildlands management.
 - Large and small scale - extensive track record based on practical experience.
 - Rehabilitation and restoration of degraded sites.
- **Ecological Evaluations and Solutions**
 - Assessments of land use effects.
 - Sustainable land management.
 - Policy and management advice.
 - Rehabilitation and ecological restoration.
 - Preparation and presentation of expert evidence for hearings and appeals.
 - Geographic Information System (GIS) mapping and analysis.
- **Ecological Research**
 - Vegetation.
 - Fauna.
 - Threatened plants.
- **Project Management**
 - Large and small scale projects.

Wildland Consultants Ltd has a strong track record, developed over many years, with a long term commitment to ecological restoration. Strong ongoing client relationships are an important focus of the business. Clients include government departments, regional councils, district councils, large corporations, other consultancy firms, private landowners and businesses.

The company has offices in Auckland, Rotorua, Wellington, Whakatane, Tauranga, Hamilton, Christchurch and Dunedin; staff work nation-wide.

9. AWARDS

Since 2013 Wildlands has worked on various components of the Waikato Expressway, one of the largest new road construction projects in New Zealand. In

2015 the lead planning firm for the Huntly Section won a national-level award for this project, and Wildlands was part of the team that peer-reviewed the project for Waikato Regional Council, enabling consents to be granted within very tight timeframes, and with all ecological issues addressed. Wildlands is assisting with the implementation of a field component of Project Twin Streams for Auckland Council, restoration of the margins of the Opunuku and Oratia Streams, and the overall project won a 'Green Ribbon' award, for Waitakere City Council, in 2010. SCA Hygiene Australasia, Kawerau, a company client, also won a significant award from the sustainable Business Network, for a riparian project on the Tarawera River, which was planned and implemented by Wildlands. Wildlands managed the streamside and riparian restoration of Olympic Park in Auckland which won the "Outstanding Park Award for 2007" (awarded by the New Zealand Recreation Association). Wildlands also won a major regional award from the Sustainable Business Network in 2005, "presented in recognition of an outstanding contribution to sustainability". Wildlands is nationally recognised for expertise in ecological rehabilitation and restoration. The company manages a large wetland restoration project for Norske Skog Tasman and this has won two awards; from Environment BOP (2000) and a national award under the Ramsar convention from the Minister of Conservation (2001), for industry best practice for wetland restoration. Other Wildlands projects have also won awards from Environment BOP (2004): Ohinemataroa (Whakatane) River restoration and a plant nursery project at the Taneatua School.

10. HEALTH AND SAFETY

Wildland Consultants has a comprehensive health and safety plan, which is reviewed on a regular basis. The company won an award from Norske Skog Tasman in 2001 for having an outstanding health and safety record over the previous five years.

The Wildlands Health and Safety manual contains best working practices and safety instructions for maintaining plant, equipments and vehicle safety. The Wildlands Health and Safety manual addresses the safety of employees, contractors and the general public.

The Wildlands Health and Safety manual and Site Specific Safety Plans are used to identify, eliminate and minimise hazards. Wildlands employees are experienced in developing site specific safety plans that are developed prior to commencement of works. These plans are communicated to employees and subcontractors prior to commencing work. Health and Safety audits are conducted to monitor compliance with the site safety plan and to ensure that the plan is up to date.

Employees are taught the approved safety training methods regarding equipment and are supervised by skilled and qualified employees. All employees are familiar with the requirements of our Safety Policy and Safety Manual. All subcontractors are required to sign and abide by our Health and Safety Plan.

11. SUSTAINABILITY

Wildlands is strongly committed to the sustainable management of land, water, and biodiversity, which is a fundamental cornerstone of the business. Our mission statement is *“to provide high quality and cost-effective ecological information, advice, and technical services to enable clients to achieve sustainable management and enhancement of indigenous biodiversity, ecosystems, and resources”*. This is the basis for all projects the company undertakes. The company has a strong focus on the provision of objective technical advice, and protection and enhancement of natural environments, recognising that people are an integral part of the environment. The main focus of the company is on the following: biodiversity survey and monitoring, ecological restoration, and assessment of ecological effects.

The company won a major regional award from the Sustainable Business Network in 2005, “presented in recognition of an outstanding contribution to sustainability”.

One of the core values of Wildland Consultants Ltd is to not only contribute to and facilitate projects that have environmentally desirable outcomes, but to undertake these projects in a way that minimises our environmental footprint. The company achieves efficiency and a reduced footprint through actions such as:

- Using fuel-efficient vehicles;
- Preferentially buying high quality, locally sourced goods;
- Recycling paper, plastics, metal, and glass;
- Composting of food scraps;
- Reducing the numbers of vehicle movements;
- Cycling to work and local work meetings (and providing cycling-friendly facilities).

The nature of Wildlands work involves a lot of vehicle travel, including use of 4WD vehicles, aircraft, and production of hard copy report outputs. Although the energy use associated with work of this nature cannot be eliminated, substantial reductions can be achieved by a range of approaches. To deliver services in an environmentally sustainable manner, Wildlands policy in terms of resource use and energy consumption is to:

- Minimise fuel consumption associated with undertaking field programmes through careful planning and attention to logistics;
- Minimise any other travel that might be required, through the use of video and teleconferencing;
- Use recycled products where this is possible;
- Dispose of computer hardware equipment in an eco-friendly manner;
- Reduce waste and recycle;
- Use energy efficiently;
- Rechargeable batteries will be used for electronic equipment (e.g. GPS units).

12. INSURANCE

Wildland Consultants Ltd insurance includes:

- Professional indemnity (\$5 million)
- Public liability (\$10 million)
- Forest and Rural Fires Act cover (\$5 million)
- Statutory liability (\$1 million)

13. RESOURCES AND EQUIPMENT

The Company has adequate resources to undertake a wide range of projects, including staff with appropriate training and experience, 4WD vehicles, other field equipment, in-house Geographic Information Systems (GIS) - ARCGIS 10.1 and ARCVIEW, and other necessary computer software, including laptops and field PCs. Wildland Consultants Ltd maintains vegetation monitoring field equipment, including GPS, levels, cameras (with GPS capability), SLR cameras with hemispherical lenses, all-weather plot sheets, tree height measurement equipment, photopoint equipment, metal detectors, tree diameter tapes, range finders, and other necessary field gear. For fauna survey work we have high quality binoculars and spotting scopes, digital bird call players with amplifying speakers, automatic digital bat detectors and bird recorders, field PCs linked to GPS, and fish survey traps and nets.

14. REPORTING

Wildland Consultants Ltd will maintain verbal and written communication with the client Project Manager, detailing the work undertaken, progress made and any problems encountered, to ensure that contracts are fulfilled on time and to a standard satisfactory to the client.

15. MEDIA POLICY

Wildland Consultants Ltd maintains a media policy that ensures project confidentiality. Unless otherwise agreed, all media inquiries are directed to the client.

16. BIOSECURITY POLICY

Wildland Consultants Ltd has implemented a biosecurity policy to ensure that weed propagules and animal pests are not transported between different working areas.

17. INTELLECTUAL PROPERTY OWNERSHIP AND CONFIDENTIALITY

Hard copy and digital outputs from company projects will not be used by Wildland Consultants Ltd or provided to other parties without the client's permission. The concepts and information contained in Wildland Consultants Ltd contract reports are subject to copyright. The use or copying in whole or part without permission constitutes an infringement of copyright.

18. COMPANY SYSTEMS, POLICIES, AND PROCEDURES

Company Structure

Wildland Consultants has a flat management structure with centralised decision-making and planning ensuring that operations and resources can be delivered efficiently and high quality standards are consistently maintained.

Wildlands is a privately-owned company. The two shareholders both work full time in the Company, one as Managing Director and the other as Financial Director and Senior Project Manager.

Quality Assurance

Wildland Consultants has a long-standing reputation as a company which undertakes work to a very high standard, often exceeding client expectations. We are committed to producing high quality work, and have systems in place to ensure this. We pride ourselves on our innovation and ability to inspire managers to implement restoration initiatives. Interdisciplinary teamwork is a core business value of Wildlands. We have a strong focus on personal communication, both within the company structure and with all external clients and stakeholders. Wildland Consultants has well-defined Quality Assurance procedures to ensure all work is carried out to the equivalent of the standards stipulated in ISO 9000/9001.

Quality management and quality assurance are the responsibilities of Wildlands directors, project managers, team leaders and individual team members. All employees are expected to maintain high quality standards, and directors take an active interest in outputs. Projects are reviewed regularly by Directors and other senior staff to ensure that quality standards are being met. All written outputs are peer-reviewed prior to release.

- Wildlands has a core staff of around 60, and additional staff or sub-contractors are engaged on a project-by-project basis. All staff or contractors engaged in a particular project have the appropriate training and experience.
- Staff are only allocated to particular tasks if they have the appropriate training and experience.
- Training requirements are identified annually (minimum requirement) and as required, and staff are given the required training by attending courses, conferences, workshops, or other appropriate avenues.

- Staff (and contractors) must hold appropriate certification for hazardous or specialist tasks (e.g. agrichemicals, pesticides, 4WD, ATV, firearms, boats, etc).
- Wildlands' company systems, policies and procedures are documented in various manuals and plans (e.g. the staff manual, the health and safety plan), which are reviewed regularly and readily available in hard copy and from the Wildlands intranet.

SUMMARY OF COMPANY SERVICES

Freshwater and Estuarine Wetlands

- Surveys
- Identification of species and habitat/vegetation types
- Assessments of relative ecological value
- Management assessments
- Monitoring

Vegetation Survey

- Natural area surveys
- Coastal surveys (harbours and dunelands)
- District Plan inventories (including SNAs)
- Sites of Special Biological Importance (SSBI)
- Geothermal vegetation
- Streams and streamsides
- Dune ecosystem restoration

Strategic Advice

- Biodiversity assessment and planning
- Weeds
- Pest animal
- Threatened species
- Ecosystem restoration
- Rehabilitation
- Assessments of significance under the Resource Management Act
- Policy formulation at district, regional and national levels

Fauna Survey

- Birds
- Bats
- Fish
- Snails
- Insects
- Lizards
- Frogs

Mapping

- Geographic Information System (GIS) mapping and data analysis
- Vegetation pattern (past and present) and habitats
- Weeds (distribution and density)
- Sites of significant ecological value
- Bioclimatic zones
- Landform
- Ecological district boundaries
- Fauna distribution
- Weed species

Threatened Species

- Field survey
- Recovery planning
- Ecological research
- Monitoring

Weeds

- Field inventories (terrestrial and aquatic) and mapping
- Assessments of weed control priorities
- Development of inventory systems

- Preparation of weed strategies
- National overviews of individual weed species (e.g. *Spartina*)
- Control options for individual species on a region-wide basis

Pest Animal Impacts

- Exclosures
- Permanent vegetation plots Pigs, deer, goats, and possum
- Photopoints
- Survey data analysis and report preparation
- Animal control priorities
- Wild animal management plans

Ecosystem Restoration and Rehabilitation

- Baseline surveys
- Restoration plans and strategies
- Industrial site rehabilitation
- Vegetation and fauna

Indigenous Revegetation

- Project design and management
- Contract management
- Staff supervision
- Selection of planting material
- Site preparation
- Planting
- Ongoing maintenance of plantings
- Small and large projects
- Indigenous ornamental/residential gardens and wetlands

Monitoring Design and Implementation

- Vegetation condition and trend
- Effects of introduced animal pests and grazing
- Threatened species population trends and management requirements
- Geothermal vegetation
- Wetland vegetation
- Ecological integrity
- State of the Environment reporting - biodiversity indicators

Offshore Islands

- Ecology
- Restoration
- Management
- Planning

Assessments of Environmental Effects

- Ecological assessments
- Surveys and mapping of vegetation and fauna
- Proposed land subdivision, quarries, roads, power generation, forestry, and other land uses
- Reports and advice
- Expert evidence for hearings and appeals
- Resource Management Act assessments of effects
- Independent ecological advice to councils and hearings commissioners



Wildlands

*Providing outstanding ecological services
to sustain and improve our environments*

Call Free 0508 WILDNZ
Ph: +64 7 343 9017
Fax: +64 7 3439018
ecology@wildlands.co.nz

99 Sala Street
PO Box 7137, Te Ngae
Rotorua 3042,
New Zealand

Regional Offices located in
Auckland, Hamilton, Tauranga,
Whakatane, Wellington,
Christchurch and Dunedin

ECOLOGY RESTORATION BIODIVERSITY SUSTAINABILITY

www.wildlands.co.nz