

# 07

## Resources and capability

Achieving the strategy vision will take concerted and coordinated effort.

Effective biodiversity protection will work only if a wide range of organisations and individuals are involved and working together, as resources and volunteers are always limited.

Building effective partnerships between Ngāi Tahu, landowners, local communities, voluntary organisations and local and central government will be essential. Fortunately there are willing and able organisations and interested groups, businesses and individuals who have a stake in biodiversity protection.

**The Christchurch City Council** operates a network of conservation based parks with an area of over 5100ha. Biodiversity objectives are an important part of the Council's parks operational and capital programmes. These parks are supported by a team of rangers who have skills in conservation management including pest control, restoration planting and species monitoring.

**Environment Canterbury** have a range of statutory planning responsibilities and are active in stream care programmes, water quality monitoring and pest management. They initiated and facilitated the regional biodiversity strategy.

Environment Canterbury has landowner responsibility for 26,000ha of land and is committed to the protection and rehabilitation of ecosystem remnants, habitats and species within all its lands. Environment Canterbury landholdings along the Waimakariri River and on Kaitōrete Spit within Christchurch City are especially important for their dryland and wetland biodiversity values.

**The Department of Conservation** manages a widespread network of reserves across Banks Peninsula and has overall responsibility for indigenous biodiversity conservation under a range of statutory mechanisms, such as the *Conservation Act 1987*, *Reserves Act 1977* and *Wildlife Act 1953*. The department has wide ranging skills in conservation research, threatened species and pest management, monitoring, and site management and rehabilitation.

**Fish & Game New Zealand** is an angler and game bird hunter organisation which has a statutory mandate to manage New Zealand's fresh water sports fish fisheries and game bird hunting. A number of species on the game bird list are indigenous.

**Ngāi Tahu** through the six rūnanga, Te Ngāi Tūāhuriri Rūnanga, Te Hapū o Ngāti Wheke (Rāpaki), Te Rūnanga o Koukourārata, Onuku Rūnanga, Te Roto o Wairewa Rūnanga, Te Taumutu Rūnanga, and supported by Te Rūnanga o Ngāi Tahu, provide resource management skills and individually have mātauranga and kaitiakitanga over some important biodiversity assets.

Ngāi Tahu also owns significant areas of land in Akaroa, Port Levy (Potiriwi)/Koukourārata, Te Roto o Wairewa, and Rāpaki as well as the bed of Te Waihora/Lake Ellesmere.

**The Banks Peninsula Conservation Trust** arose out of widespread landowner dissatisfaction with the Banks Peninsula district plan provisions and processes of the 1990s. New Zealand Landcare Trust facilitated an agreement with the Council whereby a trust be set up to assist landowners to actively manage the landscapes and natural resources of the peninsula through voluntary mechanisms. The Conservation Trust has powers to register covenants pursuant to section 77 of the *Reserves Act 1977*.

The Trust has a good reputation with landowners and also undertakes a range of biodiversity promotion/ education activities, weed control and provides a forum for coordination between organisations and landowners. They are progressing many conservation initiatives on private land in a cost effective way that organisations such as district councils and government organisations can find difficult to achieve.

### Queen Elizabeth II Trust

was established "to encourage and promote the provision, protection and enhancement of open space for the benefit and enjoyment of the people of New Zealand". Their Banks Peninsula covenants contain some very important natural remnants. Covenant areas are routinely monitored and weeds, pests and other threats assessed.

Private trusts, societies and private owners manage large areas of land in Banks Peninsula and Christchurch with biodiversity and or recreation objectives. These include:

- » **Maurice White Native Forest Trust (Hinewai)** approximately 1200ha
- » **Orton Bradley Park** 655 ha
- » **Port Hills Trust Board** Mt Vernon Park 235 ha
- » **The Summit Road Society** Port Hills 148 ha
- » **AF Scott Estate.** Private land in Hoon Hay Valley 200 ha.
- » **Gama Foundation.** (Owned by Grant and Marilyn Nelson) Ōmahu Bush and the area around Gibraltar Rock is a combination of regenerating bush, tussock grassland and a volcanic outcrop, with a QEII National Trust covenant.

### Other key groups and organisations with biodiversity interests and objectives include:

- » Akaroa Heritage Park Trust (manage a conservation park beside Long Bay Road)
- » Avon Heathcote Estuary Ihutai Trust
- » Banks Peninsula Pest Management Liaison Committee
- » Banks Peninsula Reserves Committees
- » Cass Bay Reserves Committee
- » Christchurch Estuary Association
- » Diamond Harbour Community Association
- » North Canterbury Federated Farmers
- » Friends of Banks Peninsula
- » Governors Bay Landcare group
- » Joseph Langer Trust
- » Kaupapa Kererū
- » Little River Promotions Group
- » Lyttelton and Akaroa Harbour issues working parties
- » Ōtamahua Ecological Restoration Trust
- » Riccarton Bush/Pūtaringamotu Trust
- » 'Rod Donald Conservation Trust' (currently being set up, name may change)
- » Royal Forest & Bird Protection Society
- » Styx Living Laboratory Trust
- » Travis Wetland Trust
- » Waihora Ellesmere Trust

PHOTO: EMERGENT PODOCARP IN A LOWLAND FOREST PATCH PROTECTED BY A QE II NATIONAL TRUST COVENANT.





# 08

## Implementation risks and tasks

### 8.1 Risk summary

The main risks to delivering strategy outcomes are:

- » Reduction in emphasis on biodiversity priorities due to changes of corporate emphasis, loss of key staff and institutional knowledge and consequent impact on capital and operational works priorities – priorities are currently determined on a three year basis as part of the Council's LTCCP budget rounds.
- » The Council's failure to engage with and involve the community, Ngāi Tahu, and other groups, organisations and individuals.
- » Alienation of community support for biodiversity; the Council appears to take over or does not consult adequately with individuals or community groups.
- » Lack of financial resources to combat continued pressure from pest plant and animals or to fence bush areas off from stock.
- » Council does not adequately support community and or individual biodiversity initiatives.
- » Lack of cooperation/ partnership between organisations, iwi, community groups, business and individuals involved in biodiversity protection initiatives.
- » Lack of accurate information on biodiversity priorities, issues and solutions.
- » Lack of prioritisation leading to inability to protect the most vulnerable and threatened biodiversity.
- » Spreading resources across too many initiatives and thus failing to achieve any objective adequately.
- » Poor or inadequate monitoring.

### 8.2 Implementation plan and implementation principles

The strategy will be supported by an implementation plan which outlines the budget implications of key implementation targets and actions. Budget allocation for strategy outcomes will be determined through the Council's LTCCP process.

The following are priority principles for the implementation plan to be effective:

- » The Council has a key supporting role in the implementation of biodiversity related objectives and policies of the Christchurch City Plan and Banks Peninsula District Plan.
- » The Council has a key role in supporting and guiding landowners and community groups who protect priority biodiversity on private land.
- » The Council maintains access to a high level of technical expertise for the survey, assessment, protection and monitoring of biodiversity in Christchurch and Banks Peninsula.
- » The Council supports and works with iwi, other agencies, organisations and the community on prioritised pest management initiatives.
- » The Council cooperates with and works with other organisations, trusts, business and individuals undertaking biodiversity initiatives.
- » The Council protects, maintains and enhances biodiversity values on Council-owned land.

PHOTO: THE LARGEST NATIONAL POPULATION OF PĪNGAO COVERS COASTAL DUNES ON KAITORETE SPIT.





8.3 Goals, objectives and implementation targets

**GOAL 1: CONSERVE AND RESTORE CHRISTCHURCH'S AND BANKS PENINSULA'S INDIGENOUS BIODIVERSITY.**

Goal	Objectives	Implementation target	Implementation actions	Lead (in bold) and contributing parties	Priority	Funding
Goal 1: Conserve and restore Christchurch's and Banks Peninsula's indigenous biodiversity	Objective 1.1: Priority Internationally, nationally and locally threatened species are protected and restored.	Target 1.1.1: Nationally and locally threatened species are identified, prioritised and monitored for conservation.	Action 1: Surveys of Christchurch and Banks Peninsula indigenous plants and animals are undertaken.	<b>DoC, CCC</b> , Ngāi Tahu, <b>ECan</b> , landowners, conservation trusts and societies, community	<b>Very high</b>	Additional funding required
		Target 1.1.2: Plans are prepared and implemented for nationally and locally threatened species protection.	Action 1: Conservation plans are prepared for nationally and locally threatened species.	<b>DoC, CCC</b> , Ngāi Tahu, <b>ECan</b> , landowners	High	Not funded
			Action 2: Policy and or legal mechanisms are investigated and implemented for threatened species on road verges and other transport corridors.	<b>CCC</b> , landowners, <b>DoC</b> , <b>ECan</b>	High	Not funded
			Action 3: Protection measures are initiated for priority species. See Action 1 above and Targets 1.1.1 and 1.2.1.	<b>DoC, CCC</b> , <b>Ngāi Tahu</b> , <b>ECan</b>	<b>Very high</b>	Additional funding required
		Target 1.1.3: Internationally threatened exotic species found in Christchurch and Banks Peninsula are protected as appropriate and practicable.	Action 1: An assessment of internationally threatened exotic species occurring in Christchurch City is undertaken.	<b>CCC Botanic Gardens</b> , community	Medium	Not funded
			Action 2: Priority internationally threatened exotic plant species are cultivated in Council parks and gardens.	<b>CCC Botanic Gardens</b> , community	Medium	Additional funding required
	Objective 1.2: Ecosystems, sites and habitats supporting biodiversity are protected and restored.	Target 1.2.1: Ecosystems, sites and habitats with indigenous species on Council and private land are identified, prioritised, protected and restored where appropriate.	Action 1: Surveys are undertaken of habitats with indigenous plants, invertebrates, lizards and fish, with priority given to land environments with <10% indigenous cover. See Target 1.2.2.	<b>CCC, DoC, ECan</b> , Ngāi Tahu, landowners, educational and research institutions, community, landowners	<b>Very high</b>	Additional funding required
			Action 2: An assessment and prioritisation of biodiversity on Council owned or managed land is undertaken.	<b>CCC</b> , <b>DoC</b> , <b>ECan</b> , Ngāi Tahu	<b>Very high</b>	Not funded

**GOAL 1: CONSERVE AND RESTORE CHRISTCHURCH'S AND BANKS PENINSULA'S INDIGENOUS BIODIVERSITY.**

Goal	Objectives	Implementation target	Implementation actions	Lead (in bold) and contributing parties	Priority	Funding
			Action 3: Management plan(s) and or other legal mechanisms provide long term protection for priority biodiversity on Council land.	<b>CCC</b> , <b>DoC</b> , <b>ECan</b> , Ngāi Tahu	<b>Very high</b>	Not funded
			Action 4: High priority biodiversity sites are purchased on Banks Peninsula (including the Port Hills), Kaitōrete Spit and the plains. See Strategy concept plans for initial options.	<b>CCC</b> , <b>DoC</b> , <b>ECan</b> , Ngāi Tahu, Business, landowners/ community, trusts.	<b>Very high</b>	Additional funding required
			Action 5: Implement protection measures for priority habitats that require physical protection such as fencing on Council land.	<b>CCC, ECan, conservation trusts</b> , <b>DoC</b> , Ngāi Tahu	<b>Very high</b>	Additional funding required
		Target 1.2.2: Areas and sites that contribute toward maintaining indigenous cover on land environments with 20% or less indigenous cover are identified, prioritised, protected and restored to a sustainable state wherever practicable.	Action 1: The relationship between remnant vegetation in threatened land environments, rarity and overall biodiversity is established in the Christchurch /Banks Peninsula area. (Also see Target 1.1.1 and research and monitoring targets).	<b>CCC, DoC</b> , Ngāi Tahu, landowners, conservation trusts, community, conservation organisations, research and educational institutions	High	Not funded
			Action 2: Highest priority sites in Christchurch and Banks Peninsula within acutely and chronically threatened land environments are identified and appropriate protection actions undertaken.	<b>CCC</b> , <b>DoC</b> , landowners, conservation trusts, Ngāi Tahu	<b>Very high</b>	Additional funding required
		Target 1.2.3: Management of biodiversity on private land is appropriately supported.	Action 1: Technical advice is made available to landowners. See Target 2.1.1. Action 2.	<b>CCC, ECan, conservation trusts</b> , NZ landcare trust, landowners, business	High	Additional funding required
			Action 2: Council provides for rates rebates on land covenanted for biodiversity protection purposes.	<b>CCC, landowners</b>	<b>Very high</b>	Funded
			Action 3: Council provides contestable grants for biodiversity conservation work on private land.	<b>CCC</b> , <b>ECan</b>	High	Not funded

**GOAL 1: CONSERVE AND RESTORE CHRISTCHURCH'S AND BANKS PENINSULA'S INDIGENOUS BIODIVERSITY.**

Goal	Objectives	Implementation target	Implementation actions	Lead (in bold) and contributing parties	Priority	Funding
			Action 4: Council supports the work of conservation trusts in the covenanting of private land for biodiversity protection.	<b>CCC</b> , conservation trusts	<b>Very high</b>	Additional funding required
			Action 5: Biodiversity technical and site management support is available to landowners on properties containing priority habitat within acutely and chronically threatened land environments. (Subject to Actions 1 and 2, Target 1.2.2)	Conservation trusts, NZ Landcare Trust, <b>CCC</b> , <b>ECan</b> , <b>DoC</b> , landowners, universities, CRIs	High	Additional funding required
		Target 1.2.4: Connectivity is maintained and established between habitat fragments wherever practicable.	Action 1: Road maintenance policy is developed to protect/ facilitate biodiversity corridors along road verges.	<b>CCC</b> , conservation trusts, DoC, ECan, landowners	High	Additional funding required
			Action 2: Identify opportunities for linking biodiversity sites and evaluate proposals in existing strategies and plans.	<b>CCC</b> , Ngāi Tahu, DoC, ECan, landowners	Medium	Funded
		Target 1.2.5: Priority biodiversity on sites subject to resource consents and district plan changes is protected and where appropriate restored and enhanced.	Action 1: District plan and other legal mechanisms are investigated to enable better protection of priority biodiversity sites from biodiversity pests (such as goats, deer, wild pigs, etc) on adjoining properties.	<b>CCC</b> , landowners Ngāi Tahu, community	Medium	Additional funding required
			Action 2: Funds are available to support actions (beyond RMA mitigation or avoidance requirements) that promote or protect biodiversity as part of the resource consent process.	<b>CCC</b>	High	Not funded
			Action 3: Assessment of biodiversity values is undertaken as part of area planning, resource consents and City Plan changes.	<b>CCC</b> , DoC, ECan, Ngāi Tahu, ecological consultants	<b>Very high</b>	Funded
		Target 1.2.6: The gene pool of locally occurring indigenous species is maintained.	Action 1: Ensure Council policy requires indigenous restoration plantings on Council land to be of genetically appropriate local origin.	<b>CCC</b> , Doc, Ngāi Tahu, landowners, community	<b>Very high</b>	Funded

**GOAL 1: CONSERVE AND RESTORE CHRISTCHURCH'S AND BANKS PENINSULA'S INDIGENOUS BIODIVERSITY.**

Goal	Objectives	Implementation target	Implementation actions	Lead (in bold) and contributing parties	Priority	Funding
		Target 1.2.7: The relative costs and benefits of biodiversity restoration and protection projects are understood and projects prioritised on a City wide basis.	Action 1: Develop criteria and prioritise biodiversity restoration projects.	<b>CCC</b> , conservation trusts, Ngāi Tahu, DoC, ECan	<b>Very high</b>	Not funded
			Action 2: Assess the value and feasibility of mainland island sites within Christchurch City and Banks Peninsula for protection and potential reintroduction of indigenous species.	<b>CCC</b> , DoC, ECan, Ngāi Tahu, landowners, business, conservation trusts and organisations.	<b>Very high</b>	Not Funded
			Action 3: Appropriate mainland island concepts are implemented as appropriate. Depends on result of Action 2 assessment above.	<b>CCC</b> and partners	Depends on the findings of the above investigation	Not funded
		Target 1.2.8: Ecosystem function is improved (including species restoration) to compensate for previous biodiversity losses and enhance remnant indigenous biodiversity.	Action 1: Prepare guidelines for the restoration of indigenous (and introduction of appropriate exotic species), including lists of species for introduction, appropriate sites and an implementation programme.	<b>DoC</b> , <b>CCC</b> , <b>Ngāi Tahu</b>	Medium	Additional funding required
			Action 2: Implement habitat restoration for priority sites on Council managed land. See Target 1.2.7 Action 1 and Target 1.2.8 Action 1.	<b>CCC</b> , <b>Ngāi Tahu</b> , community	High	Funded (by reallocation of funds)
			Action 3: Council works with Ngāi Tahu on species, habitat and ecosystem recovery programmes such as Kaupapa Kererū and Koukourāta Ki Uta Ki Tai, Te Roto o Te Roto o Wairewa Mahinga Kai Park and Te Waihora Mahinga Kai project.	<b>CCC</b> , <b>Ngāi Tahu</b>	<b>Very high</b>	Additional funding required

**GOAL 1: CONSERVE AND RESTORE CHRISTCHURCH'S AND BANKS PENINSULA'S INDIGENOUS BIODIVERSITY.**

Goal	Objectives	Implementation target	Implementation actions	Lead (in bold) and contributing parties	Priority	Funding
		Target 1.2.9: Biodiversity protection planning accommodates (wherever practicable) environmental events such as fire, storms, seismic events and sea level rise.	Action 1: Council takes steps to maintain capability to control wildfire on sites with priority biodiversity values.	<b>CCC, CDM and Rural Fire,</b> landowners, community, ECan, DoC, NZ Fire Service	<b>Very high</b>	Funded
			Action 2: The relative costs and benefits of government carbon sequestration schemes are evaluated and appropriate initiatives implemented for Council land.	<b>CCC,</b> Landcare Research EBEX21	High	Funded
	Objective 1.3 Species and habitats important to Ngāi Tahu are protected and where appropriate restored.	Target 1.3.1: Council is familiar with the species and habitats important to Ngāi Tahu.	Action 1: Work with Ngāi Tahu to identify and prepare a database of sites and species within Christchurch and Banks Peninsula and establish appropriate systems to protect sensitive information pertaining to sites.	<b>Ngāi Tahu, CCC</b>	High	Additional funding required
	Objective 1.4 Plant and animal pests are managed to minimise their impact on biodiversity.	Target 1.4.1: Pest management plans, policies and initiatives (internal and external), including for domestic animals on Council managed land, are prepared, contributed to, coordinated and implemented.	Action 1: A Council pest management strategy is developed.	ECan, <b>CCC,</b> DoC, Ngāi Tahu, landowners, business, community, Pest Liaison Committee.	<b>Very high</b>	Funded
			Action 2: Existing Council plant and animal pest programmes are maintained, monitored and adapted to changing circumstances.	<b>CCC</b> (Regional Parks, City Water and Waste)	<b>Very high</b>	Funded
			Action 3: Control of plant and animal pests is extended to new Council managed sites with priority on protecting nationally and locally threatened habitats and species.	<b>CCC,</b> DoC, ECan	<b>Very high</b>	Additional funding required
			Action 4: Control of plant and animal pests is maintained on priority existing Council managed biodiversity sites with nationally important and or locally threatened habitats and species such as the species on the oxidation ponds.	<b>CCC,</b> DoC	<b>Very high</b>	Additional funding required

**GOAL 1: CONSERVE AND RESTORE CHRISTCHURCH'S AND BANKS PENINSULA'S INDIGENOUS BIODIVERSITY.**

Goal	Objectives	Implementation target	Implementation actions	Lead (in bold) and contributing parties	Priority	Funding
			Action 5: Council contributes to pest control programmes on private land in partnership with individual landowners where this improves biodiversity management of Council land, or is part of an agreed multi agency pest plan and or protects priority sites (subject to cost benefit analysis).	<b>CCC, Ecan, landowners, DoC,</b> Ngāi Tahu	<b>Very high</b>	Not funded
			Action 6: Consult with Ngāi Tahu Papatipu Rūnanga on pest or weed control works in and around waterways.	<b>CCC, Papatipu Rūnanga</b>	<b>Very high</b>	Funded
		Target 1.4.2: Council contributes to biosecurity risk assessment planning and implementation as required.	Action 1: Council responds to requests for information and assistance to manage bio security risks.	<b>MAF (Biosecurity NZ),</b> DoC, Ngāi Tahu, CCC, landowners, business	High	Funded
	Objective 1.5 New Council policy will take account of and be aligned with the goals and objectives of the biodiversity strategy.	Target 1.5.1: Strategies, bylaws and policy decisions will ensure that priority biodiversity is protected and maintained.	Action 1: Council policy will take account of indigenous biodiversity priorities.	<b>CCC</b>	<b>Very high</b>	Funded
		Target 1.5.2: Council capital and operation programmes will ensure the continued protection of priority biodiversity.	Action 1: Biodiversity initiatives will be funded as appropriate in the LTCCP.	<b>CCC</b>	<b>Very high</b>	Additional funding required



PHOTO: WIND SHEARED MONTANE TOTARA NEAR WAIPUNA PASS, BANKS PENINSULA.



**GOAL 2: RAISE AWARENESS AND UNDERSTANDING OF INDIGENOUS BIODIVERSITY**

Goal	Objectives	Implementation target	Implementation actions	Lead (in bold) and contributing parties	Priority	Funding
Goal 2: Raise awareness and understanding of indigenous biodiversity.	Objective 2.1: Information on local biodiversity is collated and readily available to Council staff and the community.	Target 2.1.1: Council maintains a data base of easily accessible (subject to privacy and cultural sensitivity limitations) biodiversity information.	Action 1: Biodiversity information about Council managed land is recorded on an asset management system.	<b>CCC</b> , Ngāi Tahu	<b>Very high</b>	Additional funding required
			Action 2: Biodiversity information on private land is easily available to appropriate Council staff for project prioritisation, monitoring, grants assessment, and prioritisation of technical and management assistance to land owners.	<b>CCC</b> , landowners, Ngāi Tahu	<b>Very high</b>	Additional funding required
		Target 2.1.2: Council staff understanding of biodiversity issues and responsibilities is adequate for planning and resource management purposes.	Action 1: Biodiversity training for Council resource managers, operational staff and planners will be implemented as appropriate.	<b>CCC</b> , DoC, conservation trusts, landowners	Medium	Additional funding required
	Objective 2.2: Opportunities are promoted to inform and enhance community understanding of biodiversity values, issues and management.	Target 2.2.1: Landowners, the public, conservation trusts and organisations sufficiently understand biodiversity issues, opportunities and constraints to enable appropriate protection and management.	Action 1: Public information, and training for landowners and conservation managers, is provided to assist biodiversity protection and enhancement.	<b>CCC</b> , Ngāi Tahu, conservation trusts, NZ Landcare Trust, ECan conservation organisations, community	High	Additional funding required
		Target 2.2.2: There is general community support for biodiversity protection and restoration.	Action 1: Displays and promotional material is provided in the Botanic Gardens and Council Service Centres as appropriate.	<b>CCC</b> , DoC, ECan, Ngāi Tahu, conservation trusts and organisations	Medium	Funded
			Action 2: Promotional initiatives are coordinated with DoC, ECan and other conservation organisations.	<b>CCC</b> , ECan, DoC, Ngāi Tahu, BPCT, QEII	High	Funded



**GOAL 2: RAISE AWARENESS AND UNDERSTANDING OF INDIGENOUS BIODIVERSITY**

Goal	Objectives	Implementation target	Implementation actions	Lead (in bold) and contributing parties	Priority	Funding
	Objective 2.3: The community understands Ngāi Tahu values and roles in biodiversity management.	Target 2.3.1: Cultural biodiversity information is made readily available by Council in partnership with Ngāi Tahu.	Action 1: Initiate discussions with Ngāi Tahu and disseminate culturally appropriate biodiversity information for staff and public use.	<b>Ngāi Tahu, CCC, community</b>	<b>Very high</b>	Additional funding required
		Target 2.3.2: Ngāi Tahu information about culturally important areas and species is identified, collated and maintained.	Action 1: Consult with Ngāi Tahu and record information in Council data bases as appropriate.	<b>Ngāi Tahu, CCC</b>	<b>Very high</b>	Not funded

**GOAL 3: ENCOURAGE WIDESPREAD PARTICIPATION IN SUPPORT OF INDIGENOUS BIODIVERSITY CONSERVATION**

Goal	Objectives	Implementation target	Implementation actions	Lead (in bold) and contributing parties	Priority	Funding
Goal 3: Encourage widespread participation in support of indigenous biodiversity conservation.	Objective 3.1: Strategic partnerships are facilitated, developed and maintained by Council with Ngāi Tahu, agencies, organisations and others with an interest in or responsibility for biodiversity, including other Canterbury local authorities.	Target 3.1.1: Partnerships enable the conservation of indigenous biodiversity.	Action 1: Council actively seeks partnerships with institutional, community and business to promote, protect and enhance biodiversity	<b>CCC, DoC, ECan, landowners, Ngāi Tahu, conservation trusts, conservation organisations, community, business.</b>	<b>Very high</b>	Funded
		Target 3.1.2: Partnerships with Ngāi Tahu (specifically ngā Papatipu Rūnanga) to sustain and manage biodiversity are built, strengthened and maintained.	Action 1: Identify the appropriate individuals and group(s) within Ngāi Tahu to work with on specific biodiversity projects in consultation with ngā Papatipu Rūnanga.	<b>Ngāi Tahu, CCC</b>	<b>Very high</b>	Funded
			Action 2: Council staff training encourages familiarity with rūnanga biodiversity aims and objectives.	<b>CCC, ngā Papatipu Rūnanga.</b>	High	Additional funding required

**GOAL 3: ENCOURAGE WIDESPREAD PARTICIPATION IN SUPPORT OF INDIGENOUS BIODIVERSITY CONSERVATION**

			Action 3: Opportunities for joint projects are investigated including land purchase, protection, restoration and research projects.	<b>CCC, Ngāi Tahu, ngā Papatipu Rūnanga.</b>	High	Funded
		Target 3.1.3: The provisions of the Canterbury Regional Biodiversity Strategy are supported.	Action 1: Council staff involvement with implementation of the Regional Biodiversity Strategy is maintained.	<b>CCC, ECan, Canterbury TLAs, DoC, community, conservation trusts.</b>	Medium	Funded
	Objective 3.2: Ecologically sustainable cultural use of indigenous biodiversity by Ngāi Tahu is supported.	Target 3.2.1: Cultural harvest protocols are clearly defined and implemented.	Action 1: Policy is developed to establish cultural harvest protocols on Council land.	<b>Ngāi Tahu, CCC, DoC, ECan, community</b>	High	Not funded
		Target 3.2.2: Rūnanga partner in the sustainable management of culturally important sites and species on Council land.	Action 1: A list of sites appropriate for rūnanga management involvement is developed.	<b>Ngāi Tahu, ngā Papatipu Rūnanga CCC</b>	Medium	Funded
	Objective 3.3: Community and private initiatives to protect and enhance biodiversity, including on private land, are supported.	Target 3.3.1: Incentives are provided to encourage community and landowner biodiversity protection.	See Target 1.2.3 Actions 1-5.	CCC, ECan, DoC, conservation trusts and organisations, business	High	Additional funding required
		Target 3.3.2: Council works with conservation trusts to facilitate conservation initiatives on private land.	See Target 1.2.3 Action 4.	CCC, conservation trusts, NZ Landcare Trust, landowners	High	Additional funding required



PHOTO: SUMMIT ROAD SOCIETY PLANTING DAY, PORT HILLS.

**GOAL 4: IMPROVE AND FACILITATE RESEARCH AND MONITORING OF INDIGENOUS BIODIVERSITY**

Goal	Objectives	Implementation target	Implementation actions	Lead (in bold) and contributing parties	Priority	Funding
Goal 4: Improve and facilitate research and monitoring of indigenous biodiversity	Objective 4.1: Monitoring programmes for the biodiversity of Christchurch City are established, coordinated and maintained.	Target 4.1.1: Monitoring ensures biodiversity sites are appropriately managed and objectives for conservation and restoration are achieved.	Action 1: Council in partnership with other agencies develops and implements methods to measure the health of remnant and restored biodiversity.	<b>CCC, Ngāi Tahu, DoC, ECan,</b> conservation trusts, landowners, community	Medium	Additional funding required
		Target 4.1.2: Monitoring programmes enable the viability and trends of priority ecosystems and species to be sufficiently understood to guide management actions.	Action 1: Monitoring programmes are maintained, and initiated where appropriate, to determine ecological change over the long term.	<b>CCC, Ngāi Tahu, DoC, ECan,</b> conservation trusts, CRIs, educational institutions, community	<b>Very high</b>	Additional funding required
		Target 4.1.3: Pests are monitored to enable appropriate management to be undertaken.	Action 1: Regular monitoring of priority pests is undertaken.	<b>CCC, DoC, ECan, Ngāi Tahu,</b> landowners, conservation trusts	<b>Very high</b>	Funded
	Objective 4.2: Biodiversity research is supported, facilitated, coordinated and managed to enable sustainable management of biodiversity.	Target 4.2.1: Research programmes enable the viability and trends of priority ecosystems and species to be sufficiently understood to guide management actions.	Action 1: Research is undertaken on the maintenance of priority remnant habitats in areas with <10 indigenous vegetation remaining. See Target 1.2.1 Action 1 and Target 1.2.2 Action 1.	<b>CCC, CRIs, educational institutions,</b> Ngāi Tahu, landowners	High	Additional funding required
		Target 4.2.2: Research funding supports local biodiversity protection and management outcomes.	Action 1: Council will engage with research and funding organisations, trusts and business to explore funding options for projects. Also see Target 3.1.2 Action 3.	<b>CRIs, Ngāi Tahu, educational institutions, CCC, ECan, conservation trusts, business</b>	<b>Very high</b>	Additional funding required
		Target 4.2.3: Research programmes enable prioritisation of biodiversity protection and management.	Action 1: Biodiversity needs are prioritised and applied to research project objectives.	<b>CRIs, Educational institutions, DoC, CCC, ECan,</b> landowners	<b>Very high</b>	Additional funding required
	Objective 4.3: The community is involved in biodiversity research and monitoring.	Target 4.3.1: Community biodiversity monitoring programmes provide better information on biodiversity.	Action 1: Existing monitoring programmes are evaluated and coordinated with Council programmes and research needs.	<b>CCC, Ngāi Tahu, DoC, ECan,</b> conservation trusts community	High	Funded

**GOAL 4: IMPROVE AND FACILITATE RESEARCH AND MONITORING OF INDIGENOUS BIODIVERSITY**

Goal	Objectives	Implementation target	Implementation actions	Lead (in bold) and contributing parties	Priority	Funding
			Action 2: New community research and monitoring programmes are facilitated to complement and assist Council biodiversity protection and restoration.	<b>CCC, Community Boards,</b> community.	Medium	Not funded
	Objective 4.4: Community attitudes to biodiversity are monitored.	Target 4.4.1: Monitoring gauges community support and concerns about biodiversity.	Action 1: Resident surveys (formal and informal) are undertaken.	<b>CCC</b>	High	Funded
			Action 2: Council will engage with iwi, community groups, organisations and trusts to maintain and increase understanding of community attitudes, concerns and initiatives.	<b>Ngāi Tahu, CCC, Community Boards, DoC, ECan, community groups, landowners</b>	<b>Very high</b>	Funded



PHOTO: THE PORT HILLS PROVIDE AN OUTSTANDING NATURAL LANDSCAPE BACKDROP TO CHRISTCHURCH.



# 09 Monitoring, evaluation and review

## CONTEXTUAL INFORMATION

Accurate monitoring of biodiversity trends is essential to determine if progress has been made.

Unfortunately there is currently limited historical data available to measure progress, especially in the area of species population trends.

Information compiled so far by individuals and organisations needs to be systemised and readily available. Skilled personnel are also needed to maintain many of the current data sets.

### Issues

- » Ongoing biodiversity loss of species and reduced population size and viability even within protected areas.
- » Changing impacts of land use resulting in fragmentation and changing pressures can effect population viability.
- » Dynamics of aggressive exotic species can impact upon indigenous species as they reach and spread in new locations.
- » Increasing pollutants and contamination can put populations under new environmental stresses.
- » Inappropriate but well intentioned management techniques can have undesirable impacts on remnant indigenous components.

### Desired environmental outcomes

- » The long-term viability of ecosystem functioning within appropriate parameters is maintained.
- » Indigenous species at risk do not decline or become lost within areas where they are supposed to be protected.
- » Connections between habitat patches are maintained and improved to ensure that populations have the ability to survive adverse events.
- » Site and ecosystem enhancement projects provide real benefits to biodiversity values.

### Sustainable monitoring

The following table provides an overall guide to biodiversity monitoring requirements in Christchurch and Banks Peninsula. Currently the level of monitoring undertaken by the City Council is well below that indicated as needed. However, other agencies, organisations and individuals are also undertaking monitoring. The following two factors are essential to improving and providing efficient and sustainable monitoring:

- » the Council commits budget and resources toward a higher standard of City-wide monitoring
- » the Council cooperates with and coordinates its monitoring activities with those of other organisations, agencies and individuals.

### Strategy review

The strategy will be reviewed at approximately nine year intervals to coincide with every third LTCCP round, with the first review due in five years.

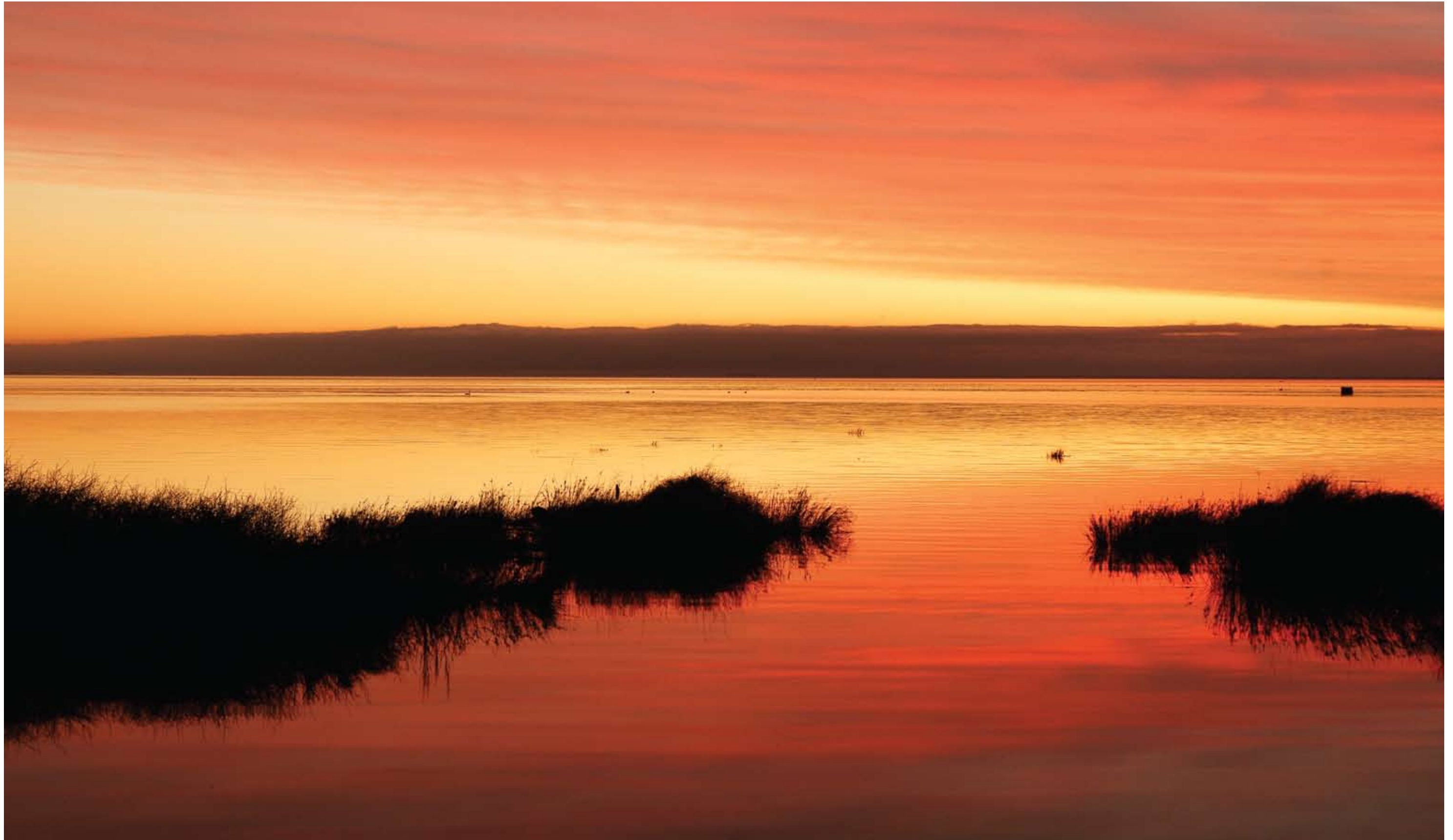
## 9.1 Biodiversity monitoring, measures and mechanisms

Measure	Mechanism of measurement	Explanation	Lead agency	Contributing parties	Cost implementations	Timing
<b>Land area protected:</b> Area of protected land that is either zoned conservation or under a QEII, BPCT or other conservation covenant	City and District Plan Zoning Layer, conservation covenants data, ecological heritage sites, land use zoning	Dedicated areas put aside for conservation play an important role in supporting ecosystems and their inhabitants. These zones occur in areas where natural and heritage values predominate. There are different methods and levels of protecting land, through council or crown ownership; through the conservation zoned areas within the City Plan, or privately owned land protected by a covenant.	CCC	-	Internal	Medium term, ongoing
<b>Land cover:</b> Changes in land use type over time. Land cover changes over time	National land cover database Landsat/Spot Satellite Imagery	The extent of different indigenous land cover classes will suggest what might be happening to terrestrial and aquatic habitats and ecosystems. Habitat loss is closely linked to habitat fragmentation. Change in land use is a key driver of fragmentation, making these areas vulnerable to threats including development, cultivation, forestry, fire and pests.	CCC	Landcare Research	Internal	Medium to long term
<b>Ecological heritage sites area and quality:</b> Number of hectares of land covered by ecological heritage sites and ecosystem health of selected sites	CCC zoning layer and GIS cadastre. Monitoring of the biodiversity of selected sites	Sites of ecological heritage quality are places which have high levels of indigenous natural value. The number of these sites provides a measure of whether new high-value sites are being identified or existing sites are being degraded or maintained.	CCC	-	Internal	Ongoing
<b>Linking of biodiversity sites:</b> New linkages created between biodiversity sites	CCC zoning layer and GIS cadastre national land cover database Landsat/Spot Satellite Imagery	Although there are many natural areas and ecological heritage sites, their highly fragmented nature and often small size means they are vulnerable to threats including development, cultivation, forestry, fire and weeds. If the small sites could be linked to other appropriate sites by "green corridors or linkages", this will facilitate the natural spread of plants and animals between the sites.	CCC, Ecan, other TLAs, DoC	Landcare Research, DoC, Ecan	Internal	Ongoing
<b>Impervious surfaces:</b> Percentage of impervious surfaces within each catchment by zone for the urban area of the City	Landsat/Spot Satellite Imagery	Changes over time in the extent of impervious surfaces will indicate what might be happening to terrestrial and aquatic habitats and ecosystems. Conventionally drained stormwater systems deliver a wide range of contaminants to waterways. There is a strong correlation between impervious surfaces and impacts on aquatic habitats. As the extent of impervious surfaces increases so too do the impacts on aquatic ecosystems.	CCC	Landcare Research	Internal	Ongoing, medium term

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PHOTO: TE WAIHORA/  
LAKE ELLESMERE, ONE OF  
THE CITY'S MOST IMPORTANT  
BIODIVERSITY SITES.

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9.1 Biodiversity monitoring, measures and mechanisms

Measure	Mechanism of measurement	Explanation	Lead agency	Contributing parties	Cost implementations	Timing
<b>Surface water quantity and quality:</b> Surface water quality guidelines (nutrient, biochemical oxygen demand) by site.	CREAS, Habitat fragmentation/ loss; riparian cover.	This measure provides an indication of the quality of habitat in waterways based on what we understand is 'good' habitat. Frogs (amphibians) could be a useful indicator of environmental quality in aquatic and semi aquatic environments.	ECan, CCC, Ngāi Tahu	Community monitoring, research institutions and CRIs, private companies	Internal and shared	Ongoing
<b>Threatened plant species:</b> Population sizes of some of the species on the threatened list are increasing.	Survey of the number of indigenous plants recorded for each species representative of different habitat types: <i>Olearia adenocarpa</i> , (drylands); <i>Daucus glochidiatus</i> , native carrot (Port Hills); <i>Desmoschoenus spiralis</i> , <i>pingao</i> (coastal); <i>Gunnera arenaria</i> (wetlands) <i>Myosotis australis var lytteltonensis</i> (cliffs and outcrops); <i>Eryngium aff. vesiculosum</i> (Banks Peninsula). <i>Gunnera arenaria</i> is now extinct in Christchurch, however restoration is feasible.	A large number of native plants found in Christchurch and Banks Peninsula are on the nationally threatened plant list. Future plant biodiversity will require a functioning ecosystem as the size and distance between habitat sanctuaries and patches of native plants is critical for these processes to occur. These native species are classed as either nationally critical ( <i>Olearia adenocarpa</i> ), in serious decline ( <i>Daucus glochidiatus</i> ), or in gradual decline ( <i>Desmoschoenus spiralis</i> ; <i>Gunnera arenaria</i> ) and are a significant indicator of the state of biodiversity in Christchurch. The is especially important as it is almost endemic to Christchurch.	DoC, CCC	Ngāi Tahu, landowners, BPCT, ECan, CRIs	Internal and shared	Urgent
<b>Locally vulnerable plant species:</b> Population numbers and trends of species present in critically low numbers	Population parameters for plants found in critically low numbers within the city: <i>Gastrodia cunninghamii</i> , <i>Spiranthes novae-Zelandiae</i> , <i>Sphagnum cristatum</i> , <i>Eleocharis dentatus</i> , <i>Ranunculus glaberrimus</i> , <i>Utricularia dichotoma</i> , <i>Libocedrus bidwillii</i> , <i>Gratiola nana</i> and <i>Gahnia xanthocarpa</i> amongst others.	Both on the plains and on Banks Peninsula, there are indigenous plant species present in very small numbers, as low as one tree or a single clump. Some that have been recorded in the past have disappeared altogether (e.g. <i>Spinifex sericeus</i> , <i>Euphorbia glauca</i> ). These are not on the threatened species lists, but are significant potential biodiversity losses. For these plants, monitoring and a recovery programme are essential to ensure that the list of losses grows no longer. Indeed, there are still discoveries of native plants in the city, such as the aquatic <i>Zanichella palustris</i> which has not been recorded in Christchurch before.	CCC		Internal and shared	Urgent and ongoing

9.1 Biodiversity monitoring, measures and mechanisms

Measure	Mechanism of measurement	Explanation	Lead agency	Contributing parties	Cost implementations	Timing
<b>Indicator bird species:</b> Population numbers and trends of key bird species.	Bird counts for specific indigenous bird species, representative of different habitat types: variable oystercatcher (coastal); white flipped penguin (coastal) bar-tailed godwit (mudflats); New Zealand scaup (freshwater); pūkeko (wetlands); wrybill (riverbeds); black fronted tern (riverbeds); bellbird, kererū (wooded).	The presence and distribution of key species of indigenous birds gives an indication of the suitability of habitat and the availability of food. Birds are high up the food chain and are therefore dependent on the availability of food sources (e.g. invertebrates and fauna) to sustain them.  *Ngāi Tahu through the Kaipapa Kererū project are looking at a monitoring programme on Banks Peninsula. A similar programme will be required for tū when it is reintroduced to the Peninsula.	CCC	DoC, Ngāi Tahu, ECan, landowners, community, OSNZ	Internal and shared	Urgent and ongoing
<b>Threatened bird species</b> Population sizes of species on the threatened list are increasing.	Bird counts for specific indigenous bird species including: southern crested grebe (Lake Forsyth/Te Roto o Wairewa); black fronted tern; Caspian tern; wrybill; white flipped penguin; yellow eyed penguin; bittern; black billed gull.	Monitoring of threatened bird species such as the grebes on Lake Forsyth/Te Roto o Wairewa provides essential data to aid management of national populations. Species that need to be monitored are those that breed or have a significant part of the population wintering or moulting in Christchurch or Banks Peninsula.	DoC	CCC, ECan, conservation groups, OSNZ	Internal and shared	Urgent and ongoing
<b>Important bird habitat population counts</b> Stable or increased populations of indigenous water birds.	Water bird counts, at least on a biannual basis, of Lake Ellesmere, Lake Forsyth, Avon Heathcote Estuary, Bromley oxidation ponds and Linwood Paddocks and the Head of Lyttelton Harbour.	These areas host Christchurch and Banks Peninsula's largest concentrations of indigenous birdlife and are of national importance for water birds.	CCC, OSNZ	DoC, ECan, Fish & Game	Internal	Urgent and ongoing

9.1 Biodiversity monitoring, measures and mechanisms

Measure	Mechanism of measurement	Explanation	Lead agency	Contributing parties	Cost implementations	Timing
<b>Christchurch City fish abundance:</b> Fish population abundance and trends.	Presence, abundance, and species richness of 13 indigenous fish species and two introduced species that are currently found in Christchurch waterways. Surveys (CCC; NIWA; DOC).	Fish populations are affected by water quality, particularly contaminants from industrial discharges, flushing of chemicals and pollutants from roadways and escape of effluents from drainage systems. A key water quality issue includes sedimentation from development, which has major impacts on fish, smothering fish and insects (which are a source of food for most fish) habitats. Another major threat to fish are obstacles that prevent migration of species to estuarine and upstream environments for spawning. The presence, abundance and species richness of fish gives an indication of habitat condition and biodiversity. The 13 indigenous fish species monitored in Christchurch City are: shortfin eel ( <i>Anguilla australis</i> ); longfin eel ( <i>Anguilla dieffenbachia</i> ); inanga (whitebait) ( <i>Galaxias maculatus</i> ); Canterbury galaxiid ( <i>Galaxias vulgaris</i> ); common bully ( <i>Gobiomorphus cotidianus</i> ); upland bully ( <i>Gobiomorphus breviceps</i> ); giant bully ( <i>Gobiomorphus gobioides</i> ); common smelt ( <i>Retropinna retropinna</i> ); bluegill bully ( <i>Gobiomorphus hubbsi</i> ); black flounder ( <i>Rhombosolea retaria</i> ); lamprey ( <i>Geotria australis</i> ); Canterbury mudfish ( <i>Neochanna burrowsius</i> ); torrentfish ( <i>Cheimarrichthys fosteri</i> ). The following two introduced species do not contribute to indigenous biodiversity. However, trout are a more sensitive bio-indicator of toxins present in habitat and thus are included in the list: trout ( <i>Salmo trutta</i> ); Quinnat (Chinook) salmon ( <i>Oncorhynchus tshawytscha</i> ).	NIWA, CCC	CCC, DoC, Ngāi Tahu, ECan, research institutions	Internal	Ongoing
<b>Banks Peninsula fish abundance:</b> Fish population abundance and trends in Lakes Forsyth/Te Roto o Wairewa and Ellesmere/Te Waihora and hill waterways of Banks Peninsula.	Presence, abundance, and species richness of key indigenous fish species. Surveys (CCC; NIWA; DoC, Ngāi Tahu).	Extensive monitoring and catchment management assessment has been undertaken on the two lakes. More assessment is needed of the hill streams and waterways to determine population trends.	NIWA, research institutions	CCC, DoC, Ngāi Tahu, ECan, Fish & Game, commercial fishing interests	Internal and shared	Urgent and ongoing
<b>Animal Pests:</b> Reduction in risk to biodiversity of priority sites.	Population surveys undertaken.	Rats, possums, rabbits, deer, pigs, goats and mustelids reduce native biodiversity by preying on native birds and feeding on native vegetation, etc. Pest fish are also a threat to waterway and lake biodiversity.	ECan, DoC	CCC, landowners, MAF (biosecurity pests)	Internal and shared	Urgent and ongoing

9.1 Biodiversity monitoring, measures and mechanisms

Measure	Mechanism of measurement	Explanation	Lead agency	Contributing parties	Cost implementations	Timing
<b>Plant pests:</b> Reduction in risk to biodiversity of priority sites.	Pest plant species surveys undertaken. On Banks Peninsula a plant pest control strategy is being developed.	On Banks Peninsula a strategic list of 12 weeds has been identified for control (old mans beard, sycamore, yellow passionfruit, grey willow, banana passionfruit, Japanese honeysuckle, tradescantia, smilax, wild ginger, seleginella, South American barberry, Cotoneaster simonsii) to prevent further damage to the region's biodiversity. Others such as Darwin's barberry and hawthorn are a major threat.	ECan, MAF (biosecurity pests)	CCC, DoC, landowners, community, MAF (biosecurity pests)	Internal and shared	Urgent and ongoing
<b>Perceptions of biodiversity:</b> Resident's attitudes and perceptions of the state of the City's biodiversity.	Regular Council Survey of residents' perception of Christchurch and Banks Peninsula. Biodiversity programmes/work to be developed.	One of the Biodiversity Strategy's key goals is to encourage local communities to work together to sustain the City's biodiversity. Therefore, we need to measure whether people's attitudes to, perceptions of, and aspirations for the Christchurch and Banks Peninsula's biodiversity are changing over time. Survey of rural landowners' attitudes to biodiversity and what conservation measures they are undertaking is very important.	CCC	Community, BPCT	Internal	Ongoing



PHOTO: GRAZING LEVELS, FENCES AND ASPECT INFLUENCE PLANT COVER; BANKS PENINSULA.