

1. Biodiversity

1.0 Introduction

1.0.1 Biodiversity includes all biological life - plants, animals, fungi and micro-organisms- the genes they contain and the ecosystems (on land or in water) where they live. The Resource Management Act 1991 (RMA) defines biological diversity as “*the variability among living organisms, and the ecological complexes of which they are a part, including diversity within species, between species, and of ecosystems*”. A more diverse ecosystem is better able to withstand environmental stress and has a greater chance of adapting to environmental change. The more species comprising an ecosystem, the more resilient and stable the ecosystem is likely to be. The biodiversity of a region is not only the native species of plants and animals. It also encompasses all life, including humans and their many introduced species of plant crops and domestic animals. However, the focus of this discussion paper is on the management issues relating specifically to Southland’s indigenous, or native, biodiversity and natural areas and ecosystems.

1.0.1.1 National Context

1.0.1.1.1 New Zealand’s native plants and animals are internationally important. This is because a large proportion of the species are endemic, in other words, they have evolved here and are found only in this country. About 90% of New Zealand insects, 80% of trees, ferns and flowering plants, 25% of bird species, all 60 reptile species, four remaining frogs and two species of bat, are found nowhere else on earth. (Environment New Zealand 2007). If these species are lost here, they are lost to the world. The islands of New Zealand have been likened to an ark. They have carried a distinctive collection of evolving plants and animals (nearly all birds and insects) in isolation for some 80 million years. This occurred between becoming separated from the great landmass of Gondwanaland and prior to the arrival of humans less than 1,000 years ago. The only mammals were bats and marine animals. Birds and insects adapted to fit most ecological niches, with many becoming flightless and ground dwelling, unaware of danger from predators. They also tended to develop slow, specialised evolution and breeding patterns, which meant that they were especially vulnerable to sudden changes.

1.0.1.1.2 New Zealand was one of the last large land areas on earth to be settled by humans. The arrival of humans about one thousand years ago was particularly hard on native species. Major loss of habitat occurred through land clearance. Over 45 bird species became extinct quite quickly through predation by humans, dogs, rats, stoats and possums and other introduced species. Many more plant and animal species have survived but are threatened (ca 2,500), and some may well become extinct in the future, as predators such as stoats and rats continue to

prevent successful breeding. Most of New Zealand's remaining indigenous vegetation occurs in high rainfall upland and mountain environments that have strong limitations for plant productivity, and therefore have not been subject to the same human development pressures as warmer, lower elevation areas. In contrast, there has been a substantial loss of indigenous vegetation and habitats in New Zealand's coastal, lowland, and montane environments, and the remaining indigenous vegetation in these environments has little legal protection (Environment New Zealand 2007). Vegetation clearance is ongoing, and the highest rates of loss are occurring in the most threatened environments, i.e. those that have already suffered the most historic vegetation clearance.

- 1.0.1.1.3 As well as being unique, scientifically important, and intrinsically valuable, New Zealand's biodiversity and natural ecosystems provide important indirect "ecosystem services." These include helping control erosion, flood and climate, recycling nutrients, performing pollination, pest control and filtering contaminants. New Zealand's biodiversity also has direct economic benefits through harvesting (timber, fish etc), and tourism.

1.0.1.2 **Southland Context**

- 1.0.1.2.1 Southland's location within New Zealand, its varied landforms and climate and rich human history, combine to make a very interesting and diverse area. It has a range of important and unusual natural features, native plants and animals. Southland's unique and diverse landscapes encompasses rolling land, inland plains, steep isolated mountains, exposed alpine areas such as the Mid Dome region, numerous watercourses, estuaries, lagoons, limestone hill soils, peatlands, red tussock grasslands, salt marshes, sand dunes, glacier-excavated lakes, a diverse coastline with wide bays, sandy bay-head beaches and rocky, cliffed coasts along with native podocarp-hardwood, beech, montane forests, subalpine scrub, manuka and exotic forest plantations. Together, these areas form a distinctive part of New Zealand's natural environment. Appendix 1 further outlines the unique biodiversity found throughout Southland's varying environments.

2. Emerging Issues requiring consideration

2.0 What has changed and what are the biodiversity issues now and for the future?

- 2.0.1 When thinking about emerging issues and possible future threats to biodiversity in Southland, we are required to consider the existing issues contained in the current Regional Policy Statement for Southland and the Southland District Plan to ascertain their relevance in today's environment. Appendix 2 and 3 contain a

detailed discussion assessing the relevance of these existing issues relating to Biodiversity.

2.0.2 Since the Regional Policy Statement became operative over a decade ago, science and ecology have come a long way and we now know much more about biodiversity, and thus have new issues to consider. However, most of the issues contained in RPS still occur today, but because of changes in land use and increased knowledge of biodiversity and ecology these issues are even more poignant today and therefore worth discussion. The following summary and text in detail outlines what are considered to be some biodiversity issues occurring now and those that will present future pressures.

2.0.3 **Summary of Issues**

- In some parts of the region, significant areas of indigenous vegetation and fauna habitats are becoming increasingly isolated and ecologically disconnected from each other due to intensification of land use between these areas.
- The coastal marine environment is especially sensitive to impacts on biodiversity
- Southland has several high value areas which are not currently receiving sufficient control of animal pests and/or weeds.
- Gaps in possum control by the Animal Health Board (as Bovine Tb is progressively eradicated) need to be filled.
- Current and future land use activities are likely to have increasingly adverse effects on the biodiversity values that remain on Southland's unprotected hill country and in coastal areas.
- There is an urgent requirement for biodiversity inventory surveys in priority areas.
- A large proportion of Southland's lowland streams and rivers lack indigenous riparian vegetation.
- Climate change predictions of a warmer, wetter climate are likely to increase the invasion, abundance, and distribution of ecological weeds, pest animals, pathogens, and vectors in Southland.
- Climate change is likely to result in a greater range of land use options, which could result in additional pressures on indigenous biodiversity
- There is a significant lack of information on the presence/absence and abundance of individual indigenous plant and animal species and their range (regardless of whether they are in public conservation areas or private land).

2.1 **Lack of biodiversity**

2.1.3 There is a lack of natural areas and biodiversity in lowland Southland plains. The flat and easy accessible Southland plains created conditions for intensive clearance of shrub and tussock, and draining of wetlands to provide productive agricultural land. Very few original areas of native forest remain in this area – most are secondary vegetation that has regenerated. There is virtually no public conservation

land in lowland Southland plains. A handful of landowners have privately protected sites, some with QEII covenants, which will ensure permanent formal protection. Sites in the lowland areas are generally very small (0.5 to 20 hectares) and fragmented. This means they are very vulnerable to damage due to the large amount of “edge” area that is exposed to impacts from wind, stock and weed invasion. They are also often too small and too far from other sites in the locality, to support significant populations of native animals such as birds and lizards.

2.2 Damage by stock

2.2.1 There are many pressures and threats to remaining biodiversity and areas of native vegetation. Domestic stock (sheep, cattle and deer), can destroy native vegetation and undergrowth, particularly in forest and wetland sites, and prevent regeneration. This occurs through grazing, trampling (especially in wet areas) and opening up places for weed invasion. As older plant individuals die they cannot be replaced and species gradually become locally extinct. Given that the location of many of the last natural remnants are within a productive farming landscape, the fencing of wetlands, gully forests and shrublands is essential to the long-term survival of some indigenous plant communities. The Council is working with some landowners to fence sites where stock is causing damage. Often these fences provide benefits for both the farming operation and conservation.

2.3 Feral animals and pest animals

2.3.1 Feral animals impact on biodiversity and natural areas through combined browsing and predation. Feral animals have impacts on natural areas and biodiversity both through consuming native vegetation, and predating on native birds, lizards and insects. Pigs, deer, goats and possums are the main grazers. Mustelids (ferrets, stoats and weasels), rodents (rats and mice), cats and to some extent, possums are the main predators. All of these species are widespread and numerous in Southland although several off-shore islands are predator-free. Some control is carried out on private properties mainly through hunting and trapping, although this is very variable. The Department of Conservation carries out a range of control programmes for various species on conservation land and surrounding buffer areas of private land. However, inevitably, it is the large tracts of native forest under Department of Conservation management that tend to provide a refuge for some species, making it difficult for both the Department and surrounding landowners to carry out ongoing effective pest control.

2.3.2 The Council is involved in both partially funding and coordinating feral animal control programmes run by the Animal Health Board to reduce the incidence of bovine Tb in Southland (mainly possums). This programme has had a significant effect in reducing possum density and, therefore, reducing the number of herds infected with bovine Tb and the browsing of indigenous vegetation. The AHB is confident that eradication of bovine Tb is within reach in Southland (AHB 2008). Because of effective possum density reductions in western Southland, possum control has been reduced in that area. Further reductions in AHB-funded possum control are likely as progress toward Tb eradication is made. Withdrawal of AHB

funding for possum control in Southland would result in a major gap in possum control. If this program is stopped the current local gains from a biodiversity protection perspective would be lost. It will be very important to develop inter-agency contingency strategies to deal with possum control in the absence of AHB intervention.

2.4 Pest Plants

2.4.1 Southland has its fair share of weed species. Some of these impact on natural values and biodiversity and pose a serious threat to the survival of indigenous plant species. Weeds can invade and displace native species, particularly in open habitats where light conditions often allow them to quickly out-compete less vigorous or large native species. The edges of forest and shrubland areas, regenerating hillsides, river beds and wetland and coastal sites, are also quite vulnerable to the impact of invasive weeds. It is often well beyond the capacity of individual landowners to control these weeds although some are making a serious effort, and many carry out limited control in places. Wilding tree species (pinus radiata and contorta, sycamore etc), are also a serious threat in some parts of Southland. They are capable of growing in a wide variety of situations and will out-compete most native vegetation in a short period of time. While relatively easy to control in the early stages, they have the potential to rapidly proliferate and destroy the integrity of native vegetation. The Council is carrying out limited control in one part of Southland. Other weeds like broom, gorse, hawthorn, and willows, are localised, yet widespread. They require vigilance and careful planning to ensure any control effort is effective.

2.5 Vegetation clearance and drainage

2.5.1 Small-scale vegetation clearance and drainage activities still occur throughout Southland. Even small-scale activities may have irreversible impacts on the ecological functioning of critical habitats or on scarce and rare indigenous plants and animals that are present in the area. In Southland, areas most vulnerable to vegetation clearance and land drainage are the smaller fragmented natural areas on the lowland plains. These natural areas are likely to be surrounded by fertile intensively farmed land and are threatened by development or encroachment from adjacent land uses. Day-to-day farming activities may also degrade remnant natural areas. For example, the grazing of livestock on unfenced coastal herbfields or on the margins of native forests and wetlands can destroy the forest under-storey.

2.5.2 The systematic draining of Southland's wetlands over the last 150 years has had a profound impact of aquatic ecosystems. The fish species, the giant kokopu, was once common in the wetlands and streams of Southland. Many of the small streams and waterways have been straightened, diverted and channelized over the last 150 years. Native riparian vegetation has been largely replaced by exotic willows and shrubs. This has seen the loss of the native fish species that rely on native invertebrates falling onto the water for food, from many of these waterways. While Southland's Proposed Regional Water Plan has in place a rule protecting "naturally occurring wetlands" from drainage, landowners are still clearing native

vegetation from the margins or in the wetlands, therefore affecting the hydrological functions of the wetland and without the presence of native vegetation, the wetland essentially falls outside the scope of the rule. The wetlands can only be fully protected if District Plans have provisions in place to prevent the clearing of native vegetation so that wetlands remain in their “naturally occurring” state.

2.6 Dams

2.6.1 The increasing use of dams to capture and store water has the potential to have both negative and positive effects on natural areas and biodiversity. They have the potential to drown the remnant terrestrial habitats in gullies and limit flows downstream. Dams can also act as barriers to fish movement both upstream and downstream. Many of Southland’s native freshwater fish are diadromous, which means they migrate to the sea at some stage of their life cycle. Therefore barriers such as dams on waterways stop these fish reaching available habitat. With appropriate design and surrounding plantings though, dams can provide small areas of indigenous vegetation and freshwater habitat for birds, insects, shortfin eels and waterfowl.

2.6.2 Proposals to divert the flows of rivers, for instance for power generation or irrigation can be a serious threat to the fauna and flora that rely on the aquatic and braided gravel systems. The wellbeing of rare fish and birds could be under threat. It is not just the large scale diversions that can be a serious threat. Changing small meandering streams into straight channels with sculptured sides severely reduces the areas of available habitat for instream life. Variability is the key for successful ecosystems. Straight uniform channels do not provide the variability of depth, flow, cover and bed type to allow for prospering aquatic communities. In some parts of Southland, many waterways have been highly modified and channelized already. Recent land development for dairy farms has resulted in numerous resource consent applications to divert and straighten streams to increase the efficiency of farm operations.

2.7 Discharges

2.7.1 Point and diffuse source discharges to water pose existing and future threats to freshwater habitats and aquatic life by reducing water quality. Overall, the quality of Southland’s freshwater is good. However, there is a tendency for freshwater quality and habitats to deteriorate towards lower reaches, which may impact on the ecological functioning of indigenous wildlife habitat, aquatic flora and fauna and ecological values. This is due to stormwater runoff of fertiliser, animal excreta and sediments and the increasing absence in riparian vegetation downstream. There is a strong relationship between good water quality and vegetation cover on stream banks (riparian vegetation). Point source discharges to rivers and streams may also be a potential problem in some localities.

2.8 Coastal threats

- 2.8.1 The Southland coastal marine environment is a particularly sensitive environment and many of the aforementioned threats pose even greater risks to this environment. Site-specific problems such as exposure to polluted river plumes, wastewater discharge, oil spills and litter all have an adverse effect on coastal areas. Except for large-scale infrequent discharges such as oil spills, pollution tends mainly to influence embayed coastlines and estuaries. Eutrophication, sedimentation and disease risk are the main pollution issues in Southland. Poorly flushed estuaries (or parts of estuaries) in catchments with intensive land use tend to be the most vulnerable (e.g. Waimatuku, Waituna, Lake Brunton, and parts of Jacobs and New River Estuaries). However, also vulnerable from contaminated river plumes are several of Southland's highly valued beaches (particularly Riverton and Oreti Beaches) (Robertson and Stevens 2008).
- 2.8.2 Drainage and reclamation has destroyed large areas of Southland's estuaries, both large and small. New River Estuary has lost 26% of its area since 1910 (mainly saltmarsh and freshwater marsh in the Waihopai Arm) (Robertson and Stevens 2008). This reclamation has destroyed the natural assimilative capacity of that arm of the estuary which has led to elevated sedimentation rates and poor habitat quality. In addition, many of the small tidal river estuaries in Southland have been drained which has reduced their ecological values.
- 2.8.3 The majority of Southland's dune systems are vegetated by marram grass, an introduced species which tends to out-compete the native sand-binders such as pingao and this replacement has caused dune instability problems and loss of biodiversity and natural character.
- 2.8.4 Coastal shoreline habitats function best with a natural vegetated margin which acts as a buffer from development and "coastal squeeze". This buffer protects against introduced weeds and grasses, naturally filters sediment and nutrients, and provides valuable ecological habitat. Currently, the majority of the coastal terrestrial margin in Southland is highly modified through cattle and sheep grazing. The effect of stock grazing in dunes reduces the height of plants and encourages mobilisation of dunes. It also leads to a decreased organic and nutrient content of the duneland. Stock trampling also encourages mobilisation as does sheep rubbing against small holes created in the surface of dunes known as blowouts. Stock grazing can be used to control weed growth in dunes, particularly in areas well back from the foredune, although excessive grazing leads to high levels of damage and weed invasion. Grazing in the extensive coastal herbfields in Southland has led to severe pugging and trampling issues in some areas (Robertson and Stevens 2008).
- 2.8.5 Vehicle use on Southland beaches and dunes is widespread (e.g. Oreti, Te Waewae, Kawakaputa Bay, Toetoes Beach). Such use, on dunes and the backshore of sandy beaches, has been demonstrated to be highly damaging to plants and animals. Available information for the effect of vehicles on the intertidal section of beaches is limited.

- 2.8.6 Currently, only small areas of the Southland coast are protected by seawalls (e.g. Colac Bay). However, in the future, pressure to protect the Southland coastline by artificial structures is expected to increase because of coastal development, associated defences against sea-level rise, and the greater frequency of storms. However, such artificial shoreline hardening, if allowed to be undertaken, will reduce the ecological services of shoreline habitats.
- 2.8.7 The sea provides a valuable food source, but harvesting fish stocks has a direct effect on species. This effect can range from decreasing genetic diversity in species that have been overfished, thus weakening a species' resilience to change, to using fishing techniques that can destroy habitats (such as oyster dredging of lace coral reefs in Foveaux Strait/Te Ara a Kiwa), to accidentally catching non-target species (such as fur seals and sea birds), known as 'bycatch'.
- 2.8.8 Direct human interaction with wildlife has the potential to significantly affect biodiversity, for example by disrupting the normal behaviours of dolphins. The time bottlenose dolphins spend resting and socialising has been affected by vessel presence in parts of Fiordland, while at Porpoise Bay Hector's dolphins were subjected to twice as much pressure from swimmers in 2002/03 as they were in 1995 to 1997. It's not clear what long-term effects this might have on their breeding and fitness, but the summer influx of tourist boats and swimmers does coincide with the important period of dolphin breeding and calf rearing. The direct effects of diving and boat anchors can also damage fragile coral colonies, which are slow-growing and will take years to recover (Environment Southland et al. 2005).
- 2.8.9 Alien invasive and nuisance marine species have the potential to irreversibly affect marine communities. For example, a large brown seaweed native to Japan, *Undaria pinnatifida*, was found growing in Paterson Inlet/Whaka a Te Wera on Stewart Island/Rakiura in 1997. Since its discovery in New Zealand in 1987, it has become widespread and threatens to exclude native species and thus alter habitats and biodiversity.

2.9 Changes in Land-Use

- 2.9.1 The Southland region is undergoing significant changes in land use which have and will continue to affect biodiversity. The following section names some key **changes in land-use** and explains how they are likely to impact on biodiversity.
- 2.9.2 **Residential development and urban sprawl**
- 2.9.2.1 Southland is no exception to the national trend of increased residential development in coastal areas. Ongoing development at Otatara, and new coastal developments west of Riverton and at Curio Bay in the Catlins are examples of this. Residential development has shown to be the most important factor related to weed invasion in lowland forest remnants (Wildland Consultants 2008) most likely because many weeds escape from residential gardens. Residential activity in coastal areas also can impact on native birds and lizards that occur in coastal areas,

through predation by domestic pets such as cats and dogs. Nesting seabirds (including penguins) are particularly susceptible to dog attack. As Southland has particularly high coastal biodiversity values, future coastal residential activity will need to be carefully managed if these values are to be maintained.

2.9.2.2 Peri-urban sprawl has occurred at Otatara, other sites around Invercargill City, and in small but growing towns such as Riverton, Winton, and Gore. This has already resulted in significant loss and fragmentation of nationally significant dune forest at Otatara. Invercargill is also surrounded by a number of significant alluvial forest remnants and wetlands which could potentially be adversely affected by residential or industrial expansion because of vegetation clearance, hydrological modification, and/or introduction of weeds and domestic pets. It will be important to ensure that residential and industrial development in these areas avoids adverse effects on indigenous ecosystems. Most of these areas in Southland are associated with rivers and there are good opportunities to involve communities in restoration of indigenous vegetation in riparian sites. Land use consents in these areas could potentially have indigenous restoration conditions attached, as it would be highly desirable to improve the buffering of existing remnants, and increase indigenous land cover overall.

2.9.3 **Greenfield Industries**

2.9.3.1 Southland supports many large industries in greenfield sites, or previously undeveloped land, including those involved in wood processing, meat processing, fertiliser manufacturer, dairying, and aluminium smelting. In general, industries such as these are sited in highly modified sites, but they can affect biodiversity values in surrounding areas by discharging to air and water and via landfills. Some of the existing industrial activities in Southland have significantly benefited local biodiversity values through extensive planting of native trees (e.g. the Dongwha MDF plant near Maitai), and restricting public vehicle access to sensitive areas (e.g. the NZAS aluminium smelter at Tiwai Point). The Southland plains are rich in natural resources, have abundant flat land, well-developed transport infrastructure, and access to natural water supply. These factors mean that future development of greenfield industries is likely. The potential for significant biodiversity mitigation should be considered when resource consents for greenfield industries are sought.

2.9.4 **Extractive Industries**

2.9.4.1 Southland features nationally significant reserves of lignite coal, and large peatlands that are mined for horticultural use. Raised bog peatlands are relatively resistant to some land use changes (for example, they often persist on farmland), but they are vulnerable to extractive peat mining. Exploitation of the coal resource has the potential to affect terrestrial vegetation overlying or adjacent to coal deposits, including any indigenous vegetation that is present. Oil exploration off the southern coast could potentially be associated with coastal facilities affecting coastal biodiversity, while oil spills are one of the few anthropogenic (caused by humans) factors that could have significant adverse effects on southern island ecosystems. Extractive industries can also have indirect effects through population

growth which in turn can increase demand for infrastructure improvements and the construction of new houses.

2.9.5 **Renewable and Alternative Energy**

2.9.5.1 The arrival of 'peak oil' and consequent increases in the price of fuels is seeing increased focus on the development of alternative, renewable fuel sources. Current government policy is to reduce reliance on thermal energy generation facilities that are associated with significant CO² emissions, and increase the proportion of renewable energy generation in New Zealand's electricity network. This has seen a 'gold rush' of wind farm 'prospecting' and a renewed focus on hydro-electricity generation. Hydro-electric developments are increasingly pushing into areas with natural values because the easy options in more modified landscapes have already been taken. Southland is the site of the first wind farm in southern New Zealand, and additional wind farms are proposed for the region. Electricity demand from renewable energy sources is not likely to decline, so future electricity generation proposals in Southland are probable.

2.9.5.2 There is also a new push and developments to find alternatives to petroleum based fuel. These developments include the growth of crops that can be harvested to manufacture biodiesel, or can be directly combusted to provide sources of energy for industries such as timber processing. Proposals also exist to produce 'green crude' oil from algae grown in ponds. It is possible that the development of renewable fuel sources could have effects on indigenous biodiversity. For example, increased competition for productive land for growing biofuel crops could result in increased development of hill country land for sheep farming.

2.9.6 **Forestry**

2.9.6.1 Exotic plantation forestry activities in Southland are generally concentrated on land that is marginal for farming. These areas often support stands of indigenous tussock grassland and shrubland vegetation that are vulnerable to conversion to forestry use. It is important that such vegetation is assessed before afforestation takes place. Recent expansion of forestry has occurred in upland areas on the Taringatura-Hokonui Hills and in Western Southland. Douglas fir is generally planted in these upland sites. Douglas fir can be associated with significant wilding spread which can adversely affect biodiversity values in adjoining areas. It produces cones and seed well before it is harvested, which can result in dense fringe spread on plantation margins. Fringe spread is not a problem where the surrounding land is intensively grazed or has an intact canopy of indigenous forest, but indigenous shrubland and tussock grassland vegetation is vulnerable to invasion by Douglas fir, as is rough grassland with a low intensity of grazing.

2.9.6.2 Plantation forestry is not entirely unfavourable to biodiversity, for example forestry plantations always support a greater diversity of indigenous elements than highly modified exotic farm pasture. This is because New Zealand was largely a forested landscape prior to human arrival, and much of our indigenous biodiversity is adapted to living in forests. Early-successional native plant species can fit their

life-cycles in within a forestry rotation, while populations of native birds can often find sufficient invertebrate food resources within plantation forests. The New Zealand Forest Accord has promoted greater consideration of biodiversity elements in plantation forests, as have schemes such as Forest Stewardship Council certification. Most of the larger forest owners in Southland are accredited under this scheme, which requires a minimum proportion of the forest estate to be set aside as indigenous reserve areas.

- 2.9.6.3 Logging of timber from indigenous forests on private land in Southland is an ongoing land use that has direct adverse effects on indigenous biodiversity. Beech, rimu, and miro are the main species that are logged (Wildland Consultants 2008). Logging of mature podocarps can have adverse effects on food resources and nest and roost sites for indigenous birds and bats, while beech trees are hosts for threatened mistletoes for which Southland is a haven. Ground-based logging also has the potential for adverse effects on waterways and stream quality, and road networks can facilitate weed invasion. It is important that when indigenous logging is carried out, adverse effects on values such as these are avoided or minimised. This can be achieved by practices such as removing logs by helicopter, avoiding the felling of large podocarps, using very small sizes in beech forest, establishing reserve areas, undertaking biodiversity offset activities, and avoiding forestry activities during the breeding seasons of indigenous birds. The Forest Stewardship Council certification described above incorporates wide-ranging principles that help to protect indigenous ecosystems. There is a perception that Southland lacks a level playing field with respect to the management of biodiversity values in both plantation and indigenous forestry. A regional best-practice code for forestry operations potentially affecting indigenous biodiversity could be useful in this respect.
- 2.9.6.4 The threat of adverse climate change effects due to carbon dioxide emissions has seen the recent development of an Emissions Trading Scheme (ETS) for New Zealand, and other government-sponsored activities such as the Permanent Forest Sinks Initiative (PFSI). These frameworks are designed to stabilise and reduce carbon emissions by providing incentives for establishment of carbon sinks. Establishment of new forests and/or permanent protection of regenerating indigenous forests are important carbon-sequestration strategies within these frameworks. The PFSI has the potential to increase protection of biodiversity values, if it involves protecting areas of indigenous forest that are regenerating on land which did not support indigenous forest at 31 December 1989. However there is potential for ETS and PFSI activities to have adverse effects on biodiversity values if they involve afforestation with exotic trees of areas of indigenous tussock grassland, shrubland, or regenerating indigenous forest. A considerable amount of hill country land in Southland would be eligible for carbon sink forestry activities, and this land also supports important components of Southland's indigenous biodiversity.

2.9.7 **Intensification of farming**

2.9.7.1 The effects of farming on biodiversity values vary widely due to differences in farming and personal philosophy, but some generalisations can be made. As farming competes for the same resources (especially soil and water) that sustain biodiversity there is a general negative relationship between the productivity of land and the amount of biodiversity it retains. This is because more productive land fosters more intensive land use, as the costs of this use are met by greater productivity. In farmed landscapes, the remaining biodiversity is most often found on steep landforms that are difficult to cultivate, at higher elevation where there are climatic constraints to plant productivity, and in wetland ecosystems that have proven difficult to drain. The relationship between land use and indigenous cover can be plainly seen when the Threatened Environment Classification is applied to Southland (Landcare Research). The highly productive Southland Plains contain land environments with very little remaining indigenous cover, while less productive land at higher elevation has more. Exceptions do occur, because there have always been farmers who have not been motivated to clear every last remnant of indigenous habitat from productive land.

2.9.7.2 The type of farming also has different effects on biodiversity. Cultivated land and exotic pasture support few indigenous biodiversity values, but hill country farms often retain indigenous remnants, and at higher elevation, the grazed vegetation may be primarily indigenous tussock grassland or shrubland. Sheep have smaller effects on indigenous vegetation than cattle or deer, which are able to browse higher, and penetrate more deeply into shrubland and forest.

2.9.7.3 Southland's productive farm land has proven very attractive for dairy farming use and this has seen a large number of recent farm conversions as the price of milk solids has risen. New Zealand farmers are quick to respond to market price signals and new farming techniques. There is a perception that sheep farming has been pushed further upslope through displacement from more productive lower elevation land by dairying, and this intensification of farming on higher elevation country is likely to have disproportionate effects on the Southland's remaining biodiversity values. With intensification of lowland land-use by conversion to dairy farming, the demand for water is putting great pressure on what is a very precious commodity. Abstraction of water from surface and groundwater sources can result in the recession of the headwaters of spring fed streams or the drying up of waterways altogether. Water flow in Southland's creeks, streams and rivers must be maintained at levels that allow native fish species to have a variety of habitats and therefore thrive, not simply survive. Future changes in farming land use will be determined by prices for farm-produced commodities, the costs involved in farming, and new technical developments that make farming easier.

2.9.8 **Tourism**

2.9.8.1 Tourism effects on biodiversity are usually localised to specific sites, and are not as pervasive as those outlined above. These effects can include disturbance of coastal wildlife (e.g. yellow-eyed penguin in the Catlins), construction of tourism facilities

in ecologically sensitive coastal sites (e.g. developments at Milford Sound), and greater intrusion of facilities into natural areas.

2.9.9 **Summary of land-use changes**

2.9.9.1 Southland region will continue to experience land uses and land use changes that affect biodiversity, but there are likely to be less predictable changes as well. These changes will provide both threats to biodiversity and opportunities to enhance biodiversity. As well as assessing the potential for adverse effects, there will be important opportunities for regional policy to promote biodiversity enhancement through mitigation and/or biodiversity offset activities that are attached to resource consents. These opportunities should not be ignored because new land use promoters may be more motivated and able to consider biodiversity enhancement activities than those undertaking existing land uses.

2.9.10 **Climate Change Effects on Biodiversity**

2.9.10.1 The most recent climate change predictions from the National Institute of Water and Atmospheric Research indicate that by 2090 Southland is likely to experience a warmer climate with an annual temperature increase of 1.9°C and wetter winters with an annual 7% increase in rainfall (NIWA 2008). These general climate effects are likely to result in changes in the distribution and abundance of weeds, pest animals, and plant and animal pathogens that are currently present in Southland, and increase the likelihood of invasion of those that are currently restricted to warmer regions. Species distribution limits on both local and wider scales are frequently caused by extreme climatic events, and changes in climatic averages are likely to involve changes to these extremes. A key factor influencing weed and pest abundance is likely to be a reduction in frost frequency due to warmer, wetter winters.

2.9.10.2 Effects on indigenous flora and fauna are also likely if the climate becomes warmer and wetter. It is likely the treeline in alpine habitat will increase by 100 m for every 0.6°C rise in temperature (Halloy and Mark 2003). This increase could mean that New Zealand's alpine flora will be susceptible to extinctions as the area of alpine habitat decreases. It is also suggested that New Zealand's alpine areas will become increasingly dominated by exotic plants. Rates of exotic plant invasion will however be constrained by the buffer provided by montane forest, and lack of tolerance by exotic plants of the distinct oceanic alpine climate in New Zealand's mountains.

2.9.10.3 There are also likely to be changes in land use if southern areas become increasingly warmer. For example, climate change predictions show that by 2050 kiwifruit may be grown at Blenheim, and grain maize could potentially be grown on the Canterbury Plains (Kenny et al 2000). Southland has nationally important high class soils which are likely to support a wider range of crops under a scenario of increasing average temperatures increase without any limitation of rainfall. Land use changes almost always have the potential for effects on indigenous biodiversity.

2.10 Gaps in Biodiversity Inventory Surveys and Lack of Information

2.10.1 Biodiversity survey coverage in Southland is incomplete, but several inventory surveys for ecological values have been undertaken in parts of the region. These surveys have mostly taken place under the Protected Natural Areas Programme (PNAP), which has its basis in the Reserves Act 1977, particularly Section 3(1)(b) which identifies the need for:

“... the preservation of representative samples of all classes of natural ecosystems and landscapes which in the aggregate originally gave New Zealand its own recognisable character.”

2.10.2 While the criteria used to assess Recommended Areas for Protection (RAPs) are similar to many of those used to assess ecological significance under Section 6(c) of the Resource Management Act 1991, the purpose of assessments under the two acts differs. Under the PNAP, the objective is to protect the best of what (vegetation/landform) remains, whereas under the RMA the primary objective is sustainable management, which has a very broad context. Consequently, assessments under S6(c) are likely to identify a wider range of significant natural areas, with RAPs likely to represent some of the best quality sites within this range. For example, the S6(c) assessment identified a wider range of significant sites within Invercargill City District than did the PNAP survey of the wider Southland Plains Ecological District (ED).

2.10.3 Areas in Southland that have been surveyed include the Taringatua Ecological District within the Southland Hills Ecological Region (ER) which was surveyed by Simpson (1998). The Southland Plains ED, which makes up the bulk of the Makarewa ER (which also contains the smaller Waituna ED), was completed by Walls & Rance (2003). The Umbrella ED was surveyed by Dickinson (1998), but only the south-western part of the Umbrella ED lies within Southland. The Nokomai ED which is adjacent and to the west of the Umbrella ED, and these two districts making up the Waikaia Ecological Region was surveyed by Dickinson (1989). The Old Man ED lies directly to the north of the Nokomai and Umbrella EDs, and includes part of Southland, although it comprises one of the seven ecological districts within the Central Otago Ecological Region. The PNAP survey of the Old Man ED was undertaken as one of four pilot studies by Brumley *et al.* (1986). In Southland, only one district-wide survey for significant indigenous vegetation and significant habitats of indigenous fauna has been completed for the Invercargill City District (Bill 1999). Surveys on Scenic and Scientific Reserves on conservation land in Southland were assessed by Allen *et al.* (1989). Lastly, Johnson (1992) reported on the sand dune vegetation of the South Island, including the Southland and Stewart Island coast.

2.10.3 Several conclusions around significant gaps in biodiversity inventories, despite the surveys that have been done, can be made. For example, the most urgent priority for biodiversity surveys in Southland are the Gore, Waipahi, and Foveaux EDs, because no inventory surveys have been undertaken in these districts, and protected natural areas comprise less than 20% of the land area (Wildland Consultants 2004). Land environments which have not been covered by district-wide surveys, and in which very little indigenous vegetation remains, are also

priorities for inventory surveys. In addition to environments in the above three EDs, these environments are present in the eastern Catlins, Riverton-Te Wae Wae Bay coastal area, lower Waiau Valley, Scotts Gap, and Te Anau Basin. Northeastern Southland and an area southeast of the Takitimu Mountains retains more indigenous vegetation, but relatively little of it is protected, and these areas are also priorities for survey. The Southland Plains, while retaining very little indigenous vegetation, has been relatively well-served by biodiversity surveys and is not an immediate priority for inventory survey. Areas covered by PNAP surveys will still require inventory surveys for S6(c) purposes, but those surveys will be made much easier because of the existing information held in the PNAP reports. However it should be noted that the PNAP surveys of the Old Man, Nokomai, and Umbrella EDs were undertaken ca. 20 years ago, and changes are likely to have occurred within these districts since then.

- 2.10.4 Undertaking biodiversity surveys or inventories is critical because accurate and reliable information, either through research or monitoring, is essential to underpin management policies and actions. However, in many areas concerning indigenous biodiversity there is a lack of such information or that such information is difficult to access. This issue is not confined to Southland. The Department of Conservation maintains a number of datasets and undertakes a considerable amount of monitoring and research on indigenous biodiversity. However while there is significant information available stating that a problem exists, there is a less information to support agencies in their decision-making in relation to biodiversity management. Of particular concern is that baseline information such as the presence/absence and abundance of individual indigenous plant and animal species and their range (regardless of whether they are in public conservation areas or private land) is not available at a regional or district level. Without good baseline and on-going information on the presence/absence and abundance of individual indigenous plant and animal species, it is difficult to identify what local or regional contribution is needed, where the priorities lie, and the very effectiveness of the management actions being undertaken.
- 2.10.5 Through researching for this paper it has been observed that few agencies effectively monitor their progress against established, meaningful biodiversity goals. Therefore, they generally do not know whether the state of indigenous biodiversity is in decline and at what rate, and the extent to which their management efforts have been effective. There is also limited information on the ecological condition of remaining natural areas such as how severely they have been affected by possums or goats, their tolerance to grazing, or what species are at risk of loss from predators such as rats and stoats. There is also a need for research and the dissemination of information on the minimum areas of indigenous vegetation needed to sustain the values of different habitats, or the range of habitats needed to provide year round feed for different indigenous species, or the most cost effective actions to manage particular pest threats.
- 2.10.6 In relation to freshwater and marine ecosystems again there are significant gaps in certain types of information available to policy makers. Research agencies such as the National Institute of Water and Atmospheric Research, Landcare Research and

universities may hold large amounts of data and reports but much of it may be dated and has not been checked for many years or has been collected for another purpose and needs to be reassessed before it is used. Environment Southland has done some monitoring and investigation work on freshwater ecosystems but more will be needed to identify stretches of particular catchments of high natural value (e.g., because of the presence of rare and endangered species, spawning etc). In terms of the marine environment, one of the main concerns raised by Royal Forest and Bird Protection Society for New Zealand in its report summarising ecological rankings for New Zealand's commercial marine fisheries is that marine fisheries are being exploited based on poor information on the state of the stock (Weeber 2007)

2.11 The following are biodiversity issues for Southland District Council

2.12 Framing of Indigenous Vegetation

2.12.1 The second generation District Plan in the framing of indigenous vegetation issues will need to have a new focus on biodiversity. The Council now has specific functions under the RMA in relation to controlling the effects of the use, development, or protection of land for the purpose of maintaining indigenous biodiversity.

2.13 Indigenous Vegetation on Private Land

2.13.1 The list in section 1.7 'Indigenous Fauna and Flora' of the existing District Plan shows a large amount of indigenous vegetation located on private land within the Southland District. Most of this vegetation has no formal level of protection aside from that provided under existing District Plan rule HER.3 and those areas that are subject to QEII covenants. The existing District Plan under schedule 6.12 includes a list of 50 QEII covenanted areas and the QEII Trust has indicated that this figure would now be closer to 100.

2.14 Indigenous Vegetation in Maori Ownership

2.14.1 The list in section 1.7 'Indigenous Fauna and Flora' of the existing District Plan provides an estimate of 33720 ha of indigenous forest on Maori Lands. The history of these forested areas is relevant to the approach the Council should take towards their management. Maori ownership of many of these areas came about as a result of the South Island Landless Natives Act 1906 (SILNA). The Act followed a review of the outcomes associated with the settlement of Te Waipounamu (the South Island) by Europeans. The Crown agreed to make certain areas of land available to Maori in the South Island and a number of these areas are located within the Southland District. This is a complex issue with Treaty of Waitangi obligations/expectations attached to these lands which were provided for wrongdoings elsewhere. The original purpose of these areas was to provide for the economic security of Maori and some Maori owners may now wish to extract native timber from their land for commercial return.

2.15 Landuse change and development

2.15.1 There are a number of landuse changes occurring within the Southland District that are leading to or could potentially lead to reductions in areas of indigenous vegetation and habitats of indigenous flora and fauna. These changes are extensively detailed at the start of this document and also in the Wildland Consultants 2006 'Review of Biodiversity Policy in the Southland Regional Policy Statement.' They include the following;

- Coastal residential development and urban growth
- Greenfield industrial development
- Extractive industries
- Energy generation
- Exotic plantation forestry
- Indigenous forestry
- Renewable fuels
- Intensification of existing rural landuses and new rural development
- Carbon sinks
- Tourism development

2.16 Landuse Change

2.16.1 There is significant development pressure being placed on many of the remaining areas of indigenous vegetation located on private land in the Southland District. In particular there are changes in rural landuse and intensification of existing rural activities. A large amount of the indigenous vegetation on private land in the District is located in rural areas or on the fringes of rural areas. Over recent years there has been a significant increase in the number of dairy conversions taking place within the District. Movement from pastoral farming practices to dairying can result in the removal/modification of existing areas of indigenous vegetation through vegetation clearance, drainage of wetlands and also via stock grazing. These types of activities also occur with other forms of farming such as sheep and beef and deer farming and as rural landowners look to maximise the returns on their investments they often look to develop areas of their properties that may have previously been viewed as marginal and not worth developing. Areas of secondary re-growth that may have previously been modified but have now regenerated may come under development pressure in these situations. While this rural development may not always be taking place on a large scale the impact of these activities can be significant especially in certain rural areas on the Southland Plains where the amount of indigenous vegetation remaining is very limited. Low land indigenous vegetation is possibly under the most pressure from landuse change and is a key at risk area. Central governments national priorities for protecting rare and threatened native biodiversity on private land indicate that a focus on certain areas would be an appropriate approach for the second generation Southland District Plan to take.

2.17 Waituna

- 2.17.1 Waituna is one part of the District that could be a focus for biodiversity and indigenous vegetation issues in the second generation District Plan. This area has recently experienced an increase in the number of dairy farm conversions taking place which has given rise to land development pressure. There is also pressure to clear areas of indigenous vegetation on existing pastoral and dairy farms that have been unmodified for some time. Public concern about land modification and loss of biodiversity in the Waituna area has been received by the Council. Some of these concerns have related to modification and loss of indigenous vegetation on the periphery of the internationally-significant Awarua Wetland Reserve. The Awarua Wetland Reserve part of which extends into the Southland District is a recognised RAMSAR internationally significant site. There are concerns about the effects on-site from indigenous vegetation clearance as well as related ecological effects on the wetland itself.

2.18 Northern Southland/Te Anau Basin

- 2.18.1 There has also been public concern expressed about the modification of red tussock grassland in Northern Southland and the Te Anau Basin. Grazing and conversion of these areas associated with deer and dairy farming practices has led to loss of some of this indigenous vegetation. The second generation District Plan will need to recognise and address the biodiversity values associated with other forms of indigenous vegetation besides those found in indigenous forests.

2.19 Maintaining and Enhancing Biological Corridors

- 2.19.1 Increased levels of isolation for many of the remaining areas of indigenous vegetation in the District gives rise to questions about their long term ecological viability. The ability of these areas to naturally regenerate reduces along with reductions in their size.

2.20 Rule HER.3 – ‘Indigenous Flora and Fauna’

- 2.20.1 Section 3.4 ‘Heritage’ of the existing District Plan includes Rule HER.3 – ‘Indigenous Flora and Fauna’ and this rule forms the main regulatory control relating to areas of indigenous vegetation in the Southland District. Since the existing District Plan became operative the Council has processed a significant number of resource consent applications for modification of indigenous vegetation and there have been a number of problems administering this rule. Instances where indigenous vegetation clearance or modification has taken place have often given rise to problems when legal action has been required. The existing rule is considered to be open to a number of interpretations and this has become particularly apparent when the Council has had to take enforcement action.
- 2.20.2 Rule HER.3 – ‘Indigenous Flora and Fauna’ of the existing District Plan was formulated by way of an Environment Court Decision A039/01 [19 April 2001]).

The existing Plan clearly states that this rule is an interim measure and notes the following;

1. *The Rule is considered an interim measure by Council, with which to endeavour to provide for some indigenous vegetation modification in specific circumstances; while also requiring that specific assessments be undertaken in situations where proposed activities have discretionary activity status.*
2. *The Council recognises that its knowledge of significant indigenous vegetation and significant habitats of indigenous flora and fauna is far from complete and that the process of improving this knowledge will be ongoing. In order to do this Council will make use of the best available technology with specialised information.*

2.20.3 The Southland District Council has limited in-house expertise in the area of indigenous forest management and therefore relies on sourcing outside expertise on an as-required basis in the processing of these applications. A detailed assessment and inventory of all areas of significant indigenous vegetation in the District which would require the services of ecological experts has not yet been undertaken. The Council's knowledge of significant habitats of indigenous flora and fauna has therefore not increased significantly since the existing District Plan became operative. This gives rise to problems when areas of indigenous vegetation are cleared without a resource consent application having been made. Detailed knowledge of what has been removed is often not available and this is problematic in terms of potential enforcement action and also in the processing of any retrospective resource consent applications.

2.20.4 There are a number of reasons for this one of which relates to the large size and amount of significant vegetation that is situated within the District. The Southland District covers approximately 11% of the land area of New Zealand. While some of the indigenous vegetation in the District is located in large areas such as those in Fiordland and Rakiura National Parks there are significant amounts found in smaller localised areas. These smaller areas are often located on private land and are widely dispersed throughout the District. The wide dispersal of these areas and also their large numbers gives rise to significant logistical problems in their analysis as well as significant cost issues. A detailed survey and assessment of all these areas would be a large project and a significant undertaking by the District Council.

3. Options for addressing issues

3.0 Biodiversity policy in the current Southland Regional Policy Statement (RPS) appears to be based on securing the status quo. While maintaining existing biodiversity is important, in many areas of Southland (particularly on the Southland Plains) there is very little indigenous biodiversity remaining. In these areas, biodiversity policy needs to promote *restoration* of indigenous vegetation. Below is a suggested strategic framework for this. Even in highly modified areas valued for pastoral production, indigenous restoration should be possible, such as the planting of indigenous riparian vegetation alongside fenced streamsides. It is also

important to consider enhancement of existing remnants of indigenous vegetation in these areas. For example, many of the existing indigenous forest remnants on the Southland Plains are suffering from edge effects, regeneration failure, and weed invasion. The Regional Policy Statement could be used to provide a framework for Southland biodiversity policy using some tools developed by Central Government:

3.1 The New Zealand Biodiversity Strategy

3.1.1 The New Zealand Biodiversity Strategy was launched in 2000. It guides the work of six key government agencies, local government, and community groups, in halting the decline in New Zealand's biodiversity. The New Zealand Biodiversity Strategy (NZBS) was developed in response to the evident decline of New Zealand's indigenous biodiversity. Goal three of the NZBS is to:

“Maintain and restore the full range of remaining natural habitats and ecosystems to a healthy functioning state, enhance critically scarce habitats and sustain the more modified ecosystems in production and urban environments; and do what is necessary to maintain and restore viable populations of all indigenous species and subspecies across their natural range and maintain their genetic diversity”

3.1.2 The NZBS goes on to say that the latter can be achieved by maintaining a full range of natural habitats and ecosystems.

3.1.3 Following on from this a Ministerial Advisory Committee was appointed to consider methods to sustain indigenous biodiversity affected by private land management.

3.1.4 The Committees recommendations were that biodiversity management on private land should be managed by local government using a primarily non-regulatory approach. One of the responses considered was whether a National Policy Statement (NPS) on biodiversity was necessary to guide local decision making in protecting biodiversity values.

3.1.5 Despite the Advisory Committee recommending not to proceed with developing a NPS, a reference group was established in 2001 to look at this further. A considerable amount of work was done on developing an NPS over the next couple of years. Following a hiatus period the government announced in November 2006 that it will not, after all, be proceeding with a NPS.

3.2 Resource Management Act Amendment Act 2005

3.2.1 To give effect to the purpose and principles of the Resource Management Act, Environment Southland has been given clear duties and functions, which are set out in section 30(1) of the Resource Management Act. Prior to the enactment of the Resource Management Amendment Act 2005, Environment Southland had limited responsibilities for directly managing indigenous biodiversity. Although many of the Council's policies and programmes promote indigenous biodiversity,

these responsibilities were derived indirectly through its functions relating to managing the adverse environmental effects on the coast, air quality, land, or water. With the amendments, the Council has been given more explicit responsibilities for maintaining and enhancing indigenous biodiversity in the area. In relation to indigenous biodiversity Environment Southland now has the following functions:

- control the use of land for the purpose of maintaining and enhancing ecosystems in waterbodies and coastal waters; and
- establish, implement and review of objectives, policies, and methods for maintaining indigenous biological diversity.

3.3 National priorities for biodiversity on private land

3.3.1 A five year review of the work carried out to implement the NZBS to restore New Zealand's indigenous biodiversity was completed in 2006. An outcome of this review has been the release by central government in April 2007, of a "statement of national priorities" for protecting rare and threatened native biodiversity on private land. These priorities are to focus conservation efforts on private land but in a way that provides flexibility for local decision making. The expectations of central government are that:

- the stated priorities will be used to inform and support councils' biodiversity responsibilities under the RMA;
- in working to the same national priorities will help local and central government agencies coordinate their decisions and on-the-ground actions in relation to biodiversity.

3.3.2 This key recent initiative supports fulfilment of the aims of the NZBS by pointing biodiversity initiatives to areas and environments where historic biodiversity loss has been greatest, and where the remaining ecosystems, habitats, and species are most vulnerable to further loss. The Statement of National Priorities identifies four biodiversity national priorities, backed up by supporting evidence and in some cases incorporating biodiversity measurement tools. These national priorities are important for several reasons:

- they provide *essential* guidelines for Regional and District Council protection and restoration activities that contribute directly to the national biodiversity goals in the New Zealand Biodiversity Strategy;
- projects aligned with the national priorities will have a greater probability of receiving funding from national agencies such as the Biodiversity Condition and Advice Funds;
- they provide a clear framework for reporting on progress towards maintenance of biodiversity at a regional level; and
- the national priorities assist with identification of significant indigenous vegetation within the context of Section 6(c) of the Resource Management Act (1991).

- 3.3.3 As councils have responsibility for indigenous biodiversity on private land, they must provide the lead in giving effect to these national priorities. The priorities effectively capture many of Southland's biodiversity issues, and through the Regional Policy Statement the Council could adopt these priorities as a basis for setting policy on biodiversity. These policies should include identification, protection, and restoration of indigenous biodiversity. The national priorities can form a basis for managing, measuring, and reporting of indigenous biodiversity outcomes in Southland, and assessment of the region's contribution towards meeting national goals. The national priorities are set out below.
- 3.3.4 **National Priority 1:** To protect indigenous vegetation associated with land environments (defined by Land Environments of New Zealand at Level IV) that have 20% or less remaining in indigenous cover.
- 3.3.4.1 Figure 1 illustrates the occurrence of Priority 1 land environments across Southland. Land environments covered by Priority 1 are almost exclusively those that occur on lowland plains and inland basin floors. There is very little indigenous vegetation cover remaining on Priority 1 land environments in Southland and approximately half of it is legally protected, mostly in eastern Fiordland.
- 3.3.5 **National Priority 2:** To protect indigenous vegetation associated with sand dunes and wetlands; ecosystems that have become uncommon due to human activity.
- 3.3.5.1 Southland Region contains outstanding wetland and sand dune systems which on the mainland are under considerable pressure from the loss of major hydrological drivers and invasive weeds. However, these discrete ecosystems also provide important ecosystem services by stabilizing mobile sediment (dunes) and moderating flood water peaks (wetlands), while providing habitat for a suite of endemic plants and animals. The sustainability of these ecosystems and their biodiversity values is partially dependent on adjoining areas, and this needs to be considered when undertaking protection activities.
- 3.3.6 **National Priority 3:** To protect indigenous vegetation associated with 'originally rare' terrestrial ecosystem types not already covered by Priorities 1 and 2.
- 3.3.6.1 Originally rare ecosystems are highlighted because they represent spatial concentrations of indigenous biodiversity, often inhabited by species adapted to unusual environmental conditions. A large proportion of these 'originally rare' ecosystems are present in Southland. Originally rare Southland ecosystems that are not sand dunes and wetlands include: (Wildland Consultants 2008):
- coastal turf;
 - shingle beaches;
 - coastal rock stacks;
 - marine mammal influenced sites;
 - cloud forest;
 - sinkholes;

- cave entrances;
- ultramafic screes;
- boulderfields of silicic rocks;
- calcareous cliffs, scarps and tors'
- ultramafic hills'
- inland outwash gravels;
- braided river beds;
- granitic gravel fields.

3.3.6.2 In addition to these non-wetland non-sand dune systems, many of Southland's wetlands are also classified as 'originally rare'. These include lake margins, cushion bogs, ephemeral wetlands, dune slacks, domed bogs, string mires, blanket mires, tarns, estuaries, lagoons, seepages and flushes, and snow banks. An abbreviated list of 'originally rare' ecosystem types is given in the national priorities document.

3.3.7 **National Priority 4:** To protect habitats of acutely and chronically threatened indigenous species.

3.3.7.1 A wide range of acutely and chronically threatened flora and fauna occur in Southland District. These species occur from the highly modified Southland Plains to the intact interior of the upland National Parks.

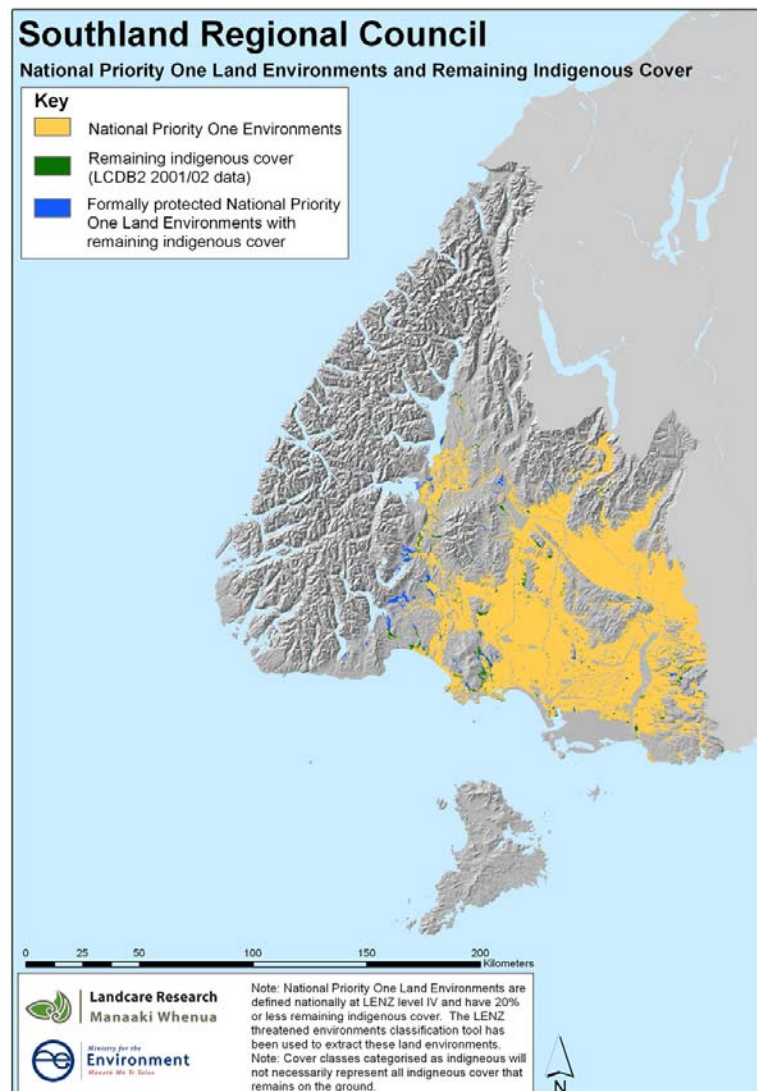


Figure 1: Land environments coded according to whether they meet National Priority 1 and the extent of indigenous cover and protected indigenous cover remaining on these Priority 1 environments.

3.4 Ecological networks and corridors

3.4.1 The four national priorities do not cover all of Southland’s biodiversity issues. In particular, they do not take account of aspects of ecological context, such as the importance of networks and corridors for maintaining species dispersal and gene flow.

3.4.2 The major rivers and streams that dissect Southland are key features of the region, and provide some of the distinctive landforms which are currently under most threat. This particularly applies to riparian and floodplain elements that occupy land adjoining waterways. Rivers are often protected in upper catchments by gully sides and gorges, but in lowland environments they are frequently utilized for

intensive agriculture. In Southland there remain only rare stands of indigenous forest in the alluvial lowlands that are the sparse remnants of the long-gone and now functionally extinct forests that used to cover the Southland Plains. However, biodiversity restoration on riparian margins remains important for the persistence of alluvial plains forests, as habitats that filter nutrients and water before they enter the waterways, and as evidence of the environmental sustainability of adjacent land practices. Most towns in Southland are associated with rivers and there are good opportunities to involve communities in restoration of indigenous vegetation in riparian sites. Land use consents in these areas could potentially have indigenous restoration conditions attached, as it would be highly desirable to improve the buffering of existing remnants, and increase overall indigenous land cover.

3.5 Ecological significance criteria

3.5.1 Policy 2.1 provides for the recognition and protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna. In this policy, criteria are listed for evaluation of the significance of indigenous vegetation and significant habitats of indigenous fauna. In most cases these criteria lack definitions and their meaning is vague, which will not assist their interpretation. The relevance and understanding of these criteria would be improved by using more explicit criteria with better definitions. For the assessment of potentially significant sites, ecologists suggest the criteria outlined in Appendix 4 and their definitions are used to assess whether a site is significant with respect to Section 6(c) of the Resource Management Act (RMA). These criteria have a strictly ecological basis, for example they do not address the cultural or amenity values which are referred to in other sections of the Act. Ecologists also suggest that the four national priorities are incorporated in these criteria for assessing ecological significance and in formulating priorities for management of Southland's indigenous biodiversity (Wildland Consultants 2008). These criteria are set out Appendix 4.

3.6 High value areas

3.6.1 Southland has several sites which either have existing intensive pest control, or would have the potential for significant biodiversity gains if intensive pest control and/or pest eradication was undertaken. These sites include:

- the Eglinton Valley and Clinton/Arthur/Cleddau Valleys are Operation Ark sites which experience intensive control of stoats and/or rats to protect bats, yellowhead and/or whio. It is anticipated that this work will need to be expanded to sustain populations of these species in these valleys;
- Stewart Island has been identified as a site where significant biodiversity benefits would be obtained from eradication of pest animals such as possums, cats, and rats. Eradication of whitetail deer would also result in substantive benefits, though there would be considerable resistance to this from hunters;

- Waitutu Forest is the most extensive area of lowland podocarp forest remaining in New Zealand and has been identified as a high priority for additional pest control to maintain its nationally-threatened mistletoes and indigenous bird species;
- the Sinbad Valley has been identified as a site with significant biodiversity values, including threatened lizards and invertebrates that require urgent protection from pest animals;
- nationally significant indigenous sand dune forest at Otatara is highly fragmented and many areas are suffering from the effects of ecological weeds. Integrated control of pests and weeds in this area would be highly desirable, but is handicapped by the need to deal with multiple owners.

3.6.2 Integrated pest control in these areas deserves strong support from all stakeholders, including regional and local authorities, because government support is most often given to united communities.

3.7 Controlling Weeds

3.7.1 The Southland Regional Pest Management Strategy (Environment Southland 2007) provides a comprehensive description of the existing and potential plant pests occurring in Southland Region, although the RPMS appears to have been published too early to include policy and rules relating to the invasive alga didymo. A number of significant ecological weeds are classed as ‘eradication plants’ and it is notable that eradication is the goal for these particular species. Many other significant ecological weeds are classed as ‘containment plants’ or ‘suppression plants’, owing to their widespread distributions and greater difficulty of eradication. It will be important that landowners understand the basis of the rules relating to these plants, and are given support for weed control. Enforcement of rules will be required within particular areas, particularly for species requiring eradication. Community support is essential for effective action against weeds. A key requirement of building such support is for agencies such as regional and local councils and the Department of Conservation to undertake weed control on the lands that they manage. Similarly, peer pressure and leadership from landowner and industry groups such as Federated Farmers and Landcare groups can help to build community support for weed control. Eradication of weeds can also provide a focus for community restoration projects in key habitats.

3.7.2 One example of a particularly problematic containment plant is the bird-dispersed Chilean flame creeper which is widespread in Southland but difficult to control. One goal of the RPMS is to destroy Chilean flame creeper in high value areas, but these areas are not defined. It is apparent that at least some high value indigenous forests in Southland (e.g. Otatara Scenic Reserve) support higher densities of Chilean flame creeper than surrounding indigenous forest sites. While eradication of Chilean flame creeper is difficult, it is relatively easy to pull down vines from the forest canopy. This has the positive effects of reducing flowering (and therefore dispersal) and enhancing the indigenous canopy and understory growth. It also demonstrates that meaningful control can be undertaken even when eradication is

difficult. Weed control is much more likely to be sustained when those undertaking the control know they are having a significant effect on it.

3.8 Other Regional Council Tools

3.8.1 When managing biodiversity in other regions around New Zealand, Regional Councils have used a range of regulatory and non-regulatory tools. Southland has used some of these tools to a certain extent, but there are still several that have not been used in the region. Listed below are some of the activities available for Southland to use through the Regional Policy Statement:

3.8.2 Regulatory:

- Policies, plans, rules or performance standards set by regional councils and territorial authorities in plans prepared under the RMA.
- Other RMA rules.
- Identify and maintain a schedule of significant natural areas.
- Requiring an assessment of ecological effects as part of the resource consent applications affecting indigenous vegetation and indigenous fauna habitats.
- Requiring biodiversity offsets as a condition of land use consents.
- Decisions on applications and the imposition of conditions of consent that protect biodiversity values.
- Water conservation orders and heritage orders.
- Negotiated agreements between parties, including charters, accords, contracts or covenants.
- The purchase of land for reserves that include biodiversity values, or enable their restoration.
- The acquisition of land through reserves contributions.
- Regional Pest Management Strategies.
- Biodiversity strategies.
- Monitoring consent conditions.
- Undertaking enforcement or abatement actions when consents and rules are breached.
- Restricting access to sites with sensitive biodiversity values.

3.8.3 Non-regulatory

- Provision of works and services, e.g. pest and weed control, indigenous revegetation, wetland restoration.
- Promote practices which protect biodiversity.
- Provide for voluntary heritage preservation and protection.
- Provide rates relief for legally protected biodiversity sites.
- Assist individuals and groups with biodiversity fund applications¹.

¹ Provision of funding incentives has resulted in radical changes in the 'ownership' of biodiversity management in New Zealand. Throughout New Zealand, individuals and community groups have been empowered to manage biodiversity on both private and public land. These projects range in small scale indigenous riparian revegetation to pest control and pest-proof fencing of very large areas of land. Many of these projects have

- Establish contestable regional and local biodiversity funds².
- Establish awards for individuals and groups undertaking biodiversity work.
- Promote media coverage of biodiversity successes.
- Foster local biodiversity care groups.
- Encourage resource users and interested parties to sign and act in accordance with voluntary accords (e.g. the New Zealand Forest Accord).
- Work with/facilitate other organisations (e.g. DOC, NGOs, farming stakeholders).
- Liaise with territorial authorities.
- Monitor and gather information.
- Advocacy in resource consent processes.
- Providing biodiversity information to the public and schools.
- Encourage research relating to indigenous biodiversity.
- Encourage and support community involvement in biodiversity management.
- Provision of advice, information, and guidelines.
- Schedule of potential fish barriers and options to allow fish passage;
- Consultation with landowners, public, tangata whenua, and other stakeholders.,
- Repeated one-on-one consultation with owners of land having biodiversity values.

3.8.4 An example of incentive programs offered in the Taranaki region by both New Plymouth District Council and Taranaki Regional Council is appended (see Appendix 5).

3.9 Biodiversity Outcomes

3.9.1 A key role for the councils in Southland will be to provide a vision for indigenous biodiversity outcomes in Southland. The Regional Policy Statement has an important role in developing a biodiversity vision that incorporates functioning and valued ecosystems in the landscapes where people live, work, and recreate. Regulation, incentives and facilitation are important functions, but these work best when there is community support for an overarching biodiversity goal, or vision, for Southland. One way to obtain community support is to create pest-free sanctuaries which are major centres for intensive biodiversity conservation, often

been successful and together have played a significant part in reducing the decline in indigenous biodiversity. There are several external funding agencies that Council could assist individuals or groups with in obtaining funds for biodiversity restoration. Examples are appended.

² Regional and local councils commonly operate small contestable biodiversity funds, which can be targeted to landowners to help improve the condition of areas of significant indigenous vegetation on their properties. In Southland, it would also be important to target such funding to sites that are high priorities for restoration of indigenous vegetation. Rates relief is another financial incentive on a pro-rata basis for areas of indigenous vegetation that are legally protected. While councils in Southland do offer rates relief, it is not widely publicised and many landowners are unaware of this service. While these financial incentives may be small, they are critical in terms of building community support for a commitment to management of indigenous biodiversity on private land.

combining the resources of national and local government, business and community involvement. These sanctuaries are perceived as sites where people can see the maximum possible biodiversity benefits. Southland could also adopt a regional native species to represent biodiversity values and ecosystem processes within the region. Birds are important symbols of New Zealand indigenous biodiversity and one or more species (e.g. kereru, tui, black-billed gull) could be selected and reported on as outcome indicators for regional biodiversity enhancement activities. There are also synergies between existing programs such as the Living Streams project. For example, a selection of rivers and streams could be adopted for community-driven riparian restoration. Effective indigenous riparian revegetation almost always involves a range of property owners, and this can help to build local support and management. Rivers and streams such as the Makarewa, Waihopai, and Waituna provide strategic opportunities for indigenous riparian revegetation. These ideas have tangible expressions of biodiversity goals in common. It is important to have goals that are tied to landscape outcomes because they give stakeholders meaningful and motivational outcomes to aim for, are readily observed and appreciated by the public and can be easily measured to report on progress.

3.10 Biodiversity Strategy

- 3.10.1 Biodiversity Southland was formed in 2002 for the purpose of protecting and enhancing biodiversity on private land in Southland. Amongst its members are New Zealand Landcare Trust, Department of Conservation, Invercargill City Council, Southland District Council, Environment Southland, Te Ao Marama, Queen Elizabeth II National Trust, Te Runanga O Murihiku, Federated Farmers as well as a multitude of individuals who undertake biodiversity protection roles in their daily life. Biodiversity Southland convenes about every 6 weeks to discuss important issues relevant to protecting biodiversity and to work on various projects. Its latest project involves drafting a Biodiversity Strategy for Southland.
- 3.10.2 This strategy, once completed, will be a non-regulatory tool specifically developed to identify areas that are facing the greatest risk and require action from Southlanders. The goals and vision described above could be included in this strategy. At the end of the drafting process and approval by members and relevant stakeholders, the biodiversity strategy will become an important tool in the 'toolbox' for policy-makers to use when managing biodiversity. The Regional Policy Statement could simply name and endorse the strategy as giving guidance for what needs to be done. If the biodiversity strategy is to be used, then it will be critical to include reference to it in a statutory document such as the Regional Policy Statement.

3.11 Regional Policy Statement Provisions

- 3.11. While it is too early in the review of the Regional Policy Statement for drafting actual objectives, policies and methods, some generalisations about provisions that could be included based on the above issues and suggested framework can be made. For example, an objective could be added for restoring indigenous

vegetation and habitats for indigenous fauna in priority areas in Southland. Policies, based on the national priorities and significance criteria, could be included for identification, protection and restoration of indigenous biodiversity as well as a policy to explicitly recognize the role that regional and local authorities have in protecting and restoring biodiversity on land which they administer. It is very important that councils are seen to be taking a lead role in protecting and restoring biodiversity values on lands they administer because this will help to build community support for actions to protect and enhance indigenous biodiversity on private land. Methods for implementing the suggested policies could include investigating opportunities for restoration of ecological networks, and/or corridors and identifying opportunities for restoration of biodiversity on land administered by councils. Other methods might include documenting and mapping priority sites for protection, enhancement and restoration of indigenous biodiversity in Southland and promoting restoration of indigenous biodiversity in priority areas such as riparian sites, wildlife corridors, and land environments in which the cover of indigenous vegetation is less than 20%. It will also be important to advocate for sufficient funding to maintain the values of 'high value' biodiversity areas on conservation land, and to work with the Department of Conservation where this would assist biodiversity management on private land. A very useful method would be to foster community support for and involvement in indigenous biodiversity management. The support of landowners who manage land containing biodiversity values is critical if the full range of Southland's biodiversity is to be maintained. Organising groups of landowners on a catchment basis could be a useful method of integrating restoration of riparian sites along lengthy sections of streams.

3.12 Land Plan

- 3.12.1 One way to link together the discussion above on the whole policy framework based on the NZBS, National Priorities, identifying biodiversity in Southland, regulatory & non-regulatory tools and a biodiversity strategy is to develop a Land Plan that would include issues, objectives, policies and methods for managing biodiversity. This plan could be an RMA Plan based with Environment Southland or it could be part of a joint Land-Use Plan involving the three district councils and Environment Southland. The joint approach could be based on the current approach to this RPS and District Plan review.

3.13 Options and Solutions for Southland District Council issues

3.14 Updated Information

- 3.14.1 New sources of information developed since the existing District Plan became operative could be utilised to provide information on the estimated areas covered by habitats of indigenous flora and fauna and updated information on remaining indigenous forest. Landcare Research for example has developed a 'Threatened Environments Classification' which can be used to study areas of remaining indigenous vegetation as well as providing a classification system based on threat categories. Providing up to date estimates of the amounts of significant indigenous

vegetation remaining within the District including indigenous wetlands, tussock grasslands and forests would be a useful starting point for this issue in the new District Plan. If these areas could also be grouped into threat categories this would enable the Council through the new District Plan to focus on those areas most at risk and/or those areas where little indigenous vegetation remains.

3.15 Central Government Direction

- 3.15.1 The New Zealand Biodiversity strategy dated February 2000 has established a framework for action to conserve, use and manage New Zealand's biodiversity in a sustainable manner. Also of relevance is a preliminary report of the Ministerial Advisory Committee on biodiversity. This report named 'Bio-what?' addressed the effects of private land management on biodiversity. The content of much of the existing Southland District Plan predates both the Biodiversity Strategy and the 'Bio-What?' documents. The second generation District Plan will need to include indigenous vegetation biodiversity objectives and policy framed around this guidance. The government in April 2007 released a document entitled 'Protecting Our Places' which is a statement of national priorities for protecting rare and threatened native biodiversity on private land. The statement provides national guidance which local councils can use in planning and decision making around indigenous vegetation and biodiversity issues on private land. The four national priorities are identified in the above discussion.

3.16 Indigenous Vegetation in Private Ownership

- 3.16.1 In terms of biodiversity values associated with indigenous vegetation the second generation Southland District Plan could focus on areas identified in the national priorities outlined above. As mentioned previously the new Plan should broaden its focus to include wetlands, tussock grasslands and other areas of indigenous vegetation as well as forested areas. Landuse change within the Southland district and the types of development that threaten areas of indigenous vegetation located on private land are discussed in more detail below.

3.17 Indigenous Vegetation in Maori Ownership

- 3.17.1 The management of areas of indigenous vegetation in Maori ownership needs to be considered in light of its history and significance to Maori and their potential to provide for the economic, social and cultural security of their owners. The Council recognises the concept of Kaitiakitanga in respect to these areas of indigenous vegetation. Kaitiakitanga is defined under section 2 of the RMA 1991 as "*...the exercise of guardianship by the tangata whenua of an area in accordance with tikanga Maori in relation to natural and physical resources, and includes the ethic of stewardship...*" Given the history of these areas and the principals of kaitiakitanga the Southland District Council seeks to assist and encourage owners towards a sustainable management regime. This would enable owners to obtain some financial returns from these landholdings while also recognising the national importance of the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna under Section 6 (c) of the RMA 1991.

3.18 Maintaining and Enhancing Biological Corridors

- 3.18.1 The second generation District Plan could recognise the importance of retaining or establishing new links between remaining pockets of indigenous vegetation. One example is through the establishment of riparian margins along waterways which can provide a link between different pockets of indigenous vegetation including forest and wetland areas. This could be useful in the processing of resource consents where modification of indigenous vegetation is proposed. Retention of areas of vegetation that form important corridors could be required as part of this process and these areas could also be fenced off and preserved through covenants or other management mechanisms.

3.19 Regulatory Approach

- 3.19.1 In terms of the second generation Southland District Plan it is important that the Council's knowledge of significant indigenous vegetation and significant habitats of indigenous flora and fauna is increased. The best way to achieve this might be through the identification of priority areas where assessments of the significance of the indigenous vegetation and associated biodiversity values can be undertaken first. Over a wider timescale studies could continue with the eventual aim being a full inventory of all these areas. One key element in the undertaking of any surveys or studies of areas of significant indigenous vegetation will be the importance of landowner participation and involvement in the process. Landowner agreement to allow access to these areas will be required and their levels of co-operation and 'buy in' to the project would have a significant influence on the success of any proposed project.
- 3.19.2 The regulatory approach taken in the current District Plan provides for some indigenous vegetation modification as a permitted activity where specific circumstances apply and the new Plan could clarify and detail further the types of clearance and modification that are permitted. Where the proposed modification or clearance is not permitted the status of the activity is currently discretionary. Discretionary activity status allows the Council to assess each resource consent application and obtain expert advice where required. As outlined already in this paper the Council does not have extensive knowledge or detailed information about the large areas of indigenous vegetation in the District. Discretionary activity status enables the Council to assess the indigenous vegetation the resource consent relates to. The significance of the indigenous vegetation, the flora and fauna present and the biodiversity values associated with it can then be assessed prior to a decision being made. In some cases this can result in preservation of the parts of the indigenous vegetation with high conservation values while some clearance or modification of areas that are not of high value may be deemed appropriate.
- 3.19.3 The current Plan provisions relating to areas of significant indigenous vegetation give rise to uncertainties for both landowners and other stakeholders. Clearer identification of those areas considered to be land containing significant indigenous vegetation and significant habitats of indigenous fauna would be a useful starting

point; as well as clarification of permitted activities and those activities which require resource consent. Mapping of these areas for inclusion in the second generation Southland District Plan along with more robust plan provisions would help clarify the Southland District Council's approach towards indigenous vegetation issues which would be beneficial for all parties with an interest in these areas.

3.20 Non-Regulatory Approaches

- 3.20.1 District Plan rules such as Rule HER.3 – 'Indigenous Flora and Fauna' are one way through which the Southland District Council can achieve its responsibilities towards the protection and preservation of biodiversity. Rates relief, fencing subsidies and management agreements are all methods listed in the current District Plan that could be used to encourage land owners to protect areas of indigenous vegetation and any of these measures or a mix of them could be included as non-regulatory methods in the second generation Southland District Plan or even sit outside the District Plan.

3.21 Preparation of Non-regulatory Indigenous Vegetation Guidelines

- 3.21.1 Incentives such as those covered above could be combined with education measures. Education is another useful tool that the Council can use to help address biodiversity issues and its responsibilities under section 6 (c) of the RMA 1991. The District Council is currently examining options for the preparation of non-regulatory guidelines relating to areas of outstanding natural features and areas of indigenous vegetation. These guidelines will help inform property owners and developers about issues associated with areas of indigenous vegetation. The Council has already co-funded a similar document focusing on wetland maintenance and enhancement. These guidelines could also outline the importance of these areas in terms of their biodiversity values along with other environmental advantages that can be achieved through their preservation. The statutory background behind indigenous vegetation issues, policy and rules can also be explained in a simplified manner in these types of documents and this has the advantage of helping people understand why a particular approach has been taken or policy or rule adopted. The guidelines could also provide useful contacts for the public such as local landcare groups, the QEII Trust, DOC and other central government agencies and information sources. Information about funds and grants available from Central Government and other organisations for biodiversity initiatives could also be included. Central government with the release of recent biodiversity policy has set aside money for local community biodiversity conservation and preservation initiatives.
- 3.21.2 Field days and seminars are another useful tool and can be adopted for use in specific communities targeted at particular biodiversity issues that are relevant to their local environment.

3.22 Recognition of QEII Trust Covenants

- 3.22.1 The existing District Plan under schedule 6.12 includes a list of 50 QEII covenanted areas. The QEII Trust has indicated that a significant number of new covenants have been registered in the Southland District since this time. The QEII National Trust figures for June 2008 list 170 registered covenants within the Southland region with 53 approved QEII covenants totaling an area of 5,381 ha. The schedule of QEII covenanted areas will need to be updated in the second generation Southland District Plan to list the additional covenants that have been put in place since the existing Plan became operative.
- 3.22.2 The use of covenants, through the QEII National Trust, forms an important biodiversity preservation mechanism that sits outside local or central government jurisdiction. The existing District plan specifically lists QEII covenants as a method that can encourage the preservation of indigenous vegetation and the use of these covenants should again be listed in the second generation Southland District Plan and their use encouraged.

3.23 Landcare Groups

- 3.23.1 Council engagement and where appropriate support for local community organisations with an interest in the protection of areas of indigenous vegetation is another way in which the District Council can address its biodiversity obligations. A good example of this is the recent establishment of the Awarua Wetlands Advisory Group who have been active in securing funding for riparian planting and fencing within the Waituna catchment. The group with the co-operation of local landowners have fenced a number of waterways within the catchment that run through farmland. The fencing prevents stock accessing waterways and associated planting and establishment of riparian planting along these waterways can improve water quality as well as protecting and enhancing biodiversity. There are a number of landcare groups who are active throughout the Southland District. These landcare groups often facilitate the enhancement and protection of areas with high biodiversity values.
- 3.23.2 Central government funding is available through sources such as Nga Whenua Rahui, the Nature Heritage Fund, the Biodiversity Condition Fund and the Biodiversity Advice Fund for biodiversity preservation measures. The District Council by supporting and encouraging the establishment of local landcare groups can encourage the use of the outside funding sources for community initiatives relating to the protection and preservation of biodiversity.

3.24 Funding of Bio-diversity Southland Co-ordinator

- 3.24 The Southland District Council currently makes an annual contribution towards the activities a New Zealand Landcare Trust Regional Coordinator/Biodiversity Southland Coordinator. The biodiversity co-ordinator liaises with organisations within Southland on Biodiversity issues and supports landowners and community

groups involved in the protection of biodiversity on private land. The Southland District Council has agreed via the 2008/2009 Annual Plan submission process to provide ongoing funding of \$10,000 per year until 2010 for this position. The funding of this position is a useful non-regulatory approach to matters under Section 6(c) of the Resource Management Act 1991 and helps the Council meet its obligations in terms of the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna.

4. Questions

4.0 This is a time for the reader to think about the issues, both existing and emerging, raised in this discussion document and the options to address them.

4.1 Questions from Environment Southland

- Do you agree with the issues identified in this discussion document?
- Are there other issues relating to the biodiversity of Southland that need to be addressed?
- What do you think of the ways of dealing with the identified issues? (e.g. using National Priorities, significance criteria, directive toward restoring biodiversity instead of protecting status quo, regulatory (land-use consent conditions) vs. non-regulatory (funding from an environmental enhancement fund) methods, etc)
- Do you have a vision for biodiversity in Southland? If so what is it?
- What do you think of a Land Plan based on the approach to this review of the RPS and District Plan?
- Can you think of any ways of dealing with these issues?

4.2 Questions from Southland District Council

- How should the District Council approach/engage with private property owners in regard to areas of indigenous vegetation and habitats of indigenous flora and fauna located on their properties?
- Should the Council take a combination of regulatory and non-regulatory based approach to remaining areas of indigenous vegetation in the Southland District?
- What are the best ways through which the District Council can meet its obligations under section 6 (c) of the RMA 1991 to achieve the protection of areas of indigenous vegetation and significant habitats of indigenous fauna within the Southland District?
- What approach should the District Council take towards the protection and preservation of the remaining areas of indigenous vegetation on private land?
- What are the biggest threats/pressures on the remaining areas of indigenous vegetation and habitats of indigenous fauna in the Southland District?
- Is a detailed assessment/study of the Districts areas of indigenous vegetation and habitats of indigenous flora and fauna required?

- Given the large size of the District and the large amounts of indigenous vegetation located on private land what is the best approach towards obtaining this information?
- Should priority be given to protection of those areas of indigenous vegetation that are under the most development pressure e.g. in the Waituna area?
- Should the areas of the District for example the lowland plains and some coastal areas with the least amount of indigenous flora and fauna remaining on them be prioritised?

Appendix 1 – Biodiversity found throughout Southland’s varying environments

1.1 Southland’s Fauna-Terrestrial

- 1.1.1 Within New Zealand, regions have their own character and Southland is a special place for its fauna to live. Southland’s unique fauna include the mohua or yellowhead which is a small, insect eating bird that lives only in the forests of New Zealand’s South Island and Stewart Island. In the 1800’s, the mohua was one of the most abundant and conspicuous of Southland’s forest birds, but now it is the most threatened of its genus, *Mohoua*. The flightless takahe, the largest living member of the rail family, was once thought to be extinct but was rediscovered in 1948 in the alpine tussock grasslands of the Murchison Mountains, Fiordland. The kaka is a large parrot belonging to the *nestorinae* family, a group that includes the cheeky kea. South Island sub-species of kaka is still widespread, becoming progressively more common from Nelson (where it is relatively rare) down the West Coast to Fiordland. South Island kaka are also found around Halfmoon Bay (Stewart Island), Ulva Island, and on Codfish Island near Stewart Island. The kakapo (night parrot) is one of New Zealand’s unique ‘treasures’ and with only 91 known surviving birds it is listed internationally as a critically endangered species. Large, flightless and nocturnal, the kakapo is an eccentric parrot which can live for decades. By the 1970s, only a few isolated birds were known to exist in Fiordland. A survey of Stewart Island in 1977 found about 200 more birds but they were rapidly declining through predation by feral cats. Following translocations of all the remaining kakapo, they are now managed by the Department of Conservation on two offshore islands: Codfish Island, and Anchor Island in Fiordland. Other bird species found in Southland include the South Island saddleback, black-billed gull, crested grebe, Australasian bittern, Stewart Island fernbird, Stewart Island weka, and Southern New Zealand dotterel.
- 1.1.2 Southland is also home to the long tailed bat and short-tailed bat as well as a number of lizards— cloudy gecko, harlequin gecko, jewelled gecko, Fiordland skink, green skink, southern skink, and the small-eared skink. (Department of Conservation 2008)

1.2 Southland’s Fauna- Marine Species

- 1.2.1 The biodiversity of Southland's coastal marine environment is rich and complex. The ecosystems come in all shapes and sizes such as sandflats, rocky shores, reefs, estuaries, and rare marine corals in some of the fiords. Their biological diversity helps to keep them healthy and functioning properly. The constant changes in these ecosystems, as a result of natural and human influences, provide us with a useful measure of how healthy biodiversity is in our coastal marine environment. Hooker’s Sealions are only found in New Zealand and are one of the rarest species of sea lion in the world. These sea lions, arguably the most threatened because

of their restricted breeding range, frequent the Catlins' beaches and Waipapa Point. New Zealand fur seals can be found around the rocky coasts. The common penguin around Southland coasts is the Little Blue Penguin. The Fiordland Crested Penguin is found on the Fiordland and Stewart Island coasts, while the rare yellow-eyed penguin can be observed in the Catlins area. One of the smallest marine dolphins in the world, Hector's dolphins are only found in New Zealand's waters. This distinctive grey dolphin with black and white markings and a round dorsal fin is the most easily recognised species of dolphin in NZ. Hector's dolphins are found around the coast of the South Island but distribution is patchy. Populations are concentrated between Haast and Farewell Spit in the west, around Banks Peninsula in the east, and Te Waewae Bay and Porpoise Bay/Te whanaga aihē in the south. (Department of Conservation 2008).

- 1.2.2 A vast array of critters lives on our rocky shores and reefs. Southland supports the largest rock lobster (kōura) fishery in the country – in the 2002/03 fishing season, 82 commercial boats landed 21.7% of the total commercial catch in New Zealand. The region also sustains a large recreational and customary fishery for pāua, but the total allowable commercial catch is being reduced in each of the three pāua fishery management areas because of concerns about the state of the fishery. Blue cod (rāwaru) is the most important recreational fish catch in Southland, and commercial landings of blue cod were 63% of the total New Zealand catch. At the moment, catches of blue cod remain relatively stable. (Environment Southland, et al 2005). New Zealand has 13 species of black corals (all of which are endemic) and one species is found only in Fiordland and Stewart Island/Rakiura. Worldwide black corals are regarded as threatened species. Southland also has a diverse range of seaweeds; its bull kelps and bladder kelps are well known. However, environmental changes are affecting seaweed communities. For example, the intertidal seaweeds of Doubtful Sound/Patea are changing as a result of increased freshwater inputs from human activities.
- 1.2.3 The marine sediments (sands and mud between the high and low tide lines and on the soft seafloor beyond) are home to a range of different species, including shellfish, invertebrates and seafloor-hugging fish. Toheroa are a shellfish found in significant numbers at only two sites in Southland, but a 2002 survey at Oreti Beach concluded that although numbers may have stabilised since 1990, the fishery was in a state of decline (Environment Southland et al. 2005). The only legal harvesting of toheroa at present is the customary Māori take, which needs a permit. Flatfish (such as flounder and lemon sole) is an important recreational and commercial fishery, but the abundance of the fishery depends on 'juvenile survival' and is highly variable from year to year.
- 1.2.4 The strong currents and waves in Foveaux Strait/Te Ara a Kiwa provide ideal growing conditions for dredge oysters (tio). Commercial harvesting began in the 1860s and as oyster beds were depleted, new beds were found. Since 1986, outbreaks of the parasitic organism *Bonamia* have killed large numbers of oysters, contributing to the decline in oyster numbers, and closed the fishery for extended periods in the 1980s and 1990s. As a result, the fishery is now closely managed. We can do little about the disease which runs in cycles, but new research shows that we

can help nature to speed up the replenishment of stocks. Marine scientists have been working on enhancing the beds and have developed a system to build up stocks. On land plants produce enormous surpluses of seed which never land in the right area and on-grow. This happens at sea as well, where most species produce huge surpluses of larvae which find nowhere suitable to settle. Thousands of years ago humans learned to tap into the seed reservoir and produce more of the target crops. This can also be done with Bluff oysters by putting out surfaces such as weather oyster shell at the right time of year to collect spat. This process will be gradually upscaled until there is a full-blown enhancement scheme in operation. (Street 2007).

- 1.2.5 The species diversity in Southland's open waters includes marine mammals, jellyfish, and a vast variety of fish. There are signs, though, that diversity in the open waters is declining and four species of fish and five marine mammals are listed in the Southland species list under the New Zealand Threat Classification System (Environment Southland et al. 2005). The impact of human activity has depleted the populations of certain marine mammals and sharks, and their recovery is slow because their reproduction rates are low. After being hunted to commercial extinction, and being rarely seen in Southland waters from 1928 till the early 1990s, there were 12 reported sightings of the southern right whale (tohorā) in 2002.

1.3 Coastal Environment

- 1.3.1 Coastal areas in Southland region incorporate unique and outstanding biodiversity elements including nationally significant sand dune forests, estuaries, wetlands, and gravel beach vegetation. These systems are some of the most intact remaining in mainland New Zealand. A wide range of nationally threatened plants, birds, and lizards are found in these habitats. Nationally threatened species in coastal sites include the plants pikao, sand tussock and *Gunnera hamiltonii* (no common name). Nationally threatened fauna breeding in coastal Southland sites include banded dotterel, yellow-eyed penguin, Fiordland crested penguin black-billed gull and green skink. Some of New Zealand's most intact sand dune systems occur on Stewart Island and in western Fiordland, but mainland Southland is also notable for its sand dune ecosystems.
- 1.3.2 The coastal communities characterising these systems vary from the sand dune systems of Waipapa Point, Omaui, Oreti Beach, Colac and Kawakaputa Bays to the gravel beaches of Tiwai Peninsula and the western end of Te Waewae Bay; the rocky headlands of the Chaslands, Bluff, Omaui and Oraka Point to the estuaries of Waikawa, Haldane, Awarua Bay, New River and Jacobs River. Oreti Beach and its dunes are considered to be of District-wide importance as they are a fine example of dune form or geomorphology. Turf communities are made up of low growing, salt tolerant plants. Some of the coastal turf communities along the Bluff-Omaui coastline are nationally and regionally representative as they are the best examples of such communities in the region or the country. Coastal tussocklands, which include those dominated by red tussock or coastal tussock, and coastal shrublands, are also a feature of parts of the Southland coast (Hovell 2005).

1.4 Southland's Flora

- 1.4.1 Southland's natural landscapes are made up of trees, shrubs, herbaceous plants and grasses. In pre-Maori times, much of Southland was covered in indigenous forests. Maori burned large areas of forest, especially in northern Southland. European migrants cleared a majority of what remained as they set up farms in the 1800s, a process which is continuing to the present day. All the remains of indigenous lowland forest ecosystems in Southland are small, often widely scattered remnants of a much larger prehistoric forest. The Southland plains are particularly devoid of indigenous lowland forest due to clearing of the forest being made relatively easy by the low topography such as gullies and hillsides. Just 10% of the forest cover of the Southland Plains present in 1865 remains. The indigenous bush in Southland is largely held in Crown or Department Of Conservation estate. However, quite a lot in places is also held in private ownership.
- 1.4.2 Clearing of large areas of indigenous lowland forest has undoubtedly contributed to the extinction of several indigenous birds which fossil evidence shows were once common in Southland, such as Kakapo, Kiwi, Kokako, Saddleback and probably many plant and invertebrate species. The native forest remnants that remain in Southland such as the lowland forests of the Catlins, Te WaeWae Bay and Stewart Island are all important refuges for plants and native birds and help to give a New Zealand character to the landscape.
- 1.4.3 The Pre-Maori vegetation of the Southland Plains is believed to have been dominated by podocarp forest, mainly matai, kahikatea and mixed podocarp. Other forest types that would have been found include kowhai-ribbonwood forest along river margins, totara forest, silver beech forest along the Maitai River, and mixed Broadleaf and rata-kamahi forest on the limestone hills (Hovell 2006). As a consequence of the Maori fires, the forest was burnt and replaced by red tussock grassland. This magnificent flowing red grass was once very common throughout Southland. It would have been a familiar sight on the Southland plains and hill country. Now, it is rarely seen as the fertile ground on which it grew has been converted into green farm land. It is one of the largest grasses in cultivation growing to a metre high (Per. comm. Brian Rance 2008).
- 1.4.4 Southland region contains some of the most important areas of lowland podocarp forest remaining in New Zealand. Waitutu forest is the largest intact example of lowland mixed podocarp forest left nationally. Waitutu supports a high concentration of threatened flora and fauna, but many of its indigenous fauna populations are declining due to the effects of introduced predators. Stewart Island supports extensive areas of rimu forest which are home to weka and southern tokoeka. Lowland podocarp forest used to cover most of the Southland Plains but has now been reduced to small fragments in these areas (Wildland Consultants 2008).
- 1.4.5 Within Southland, cloud forest is restricted to the Catlins, where it is indicated by stands of kaikawaka forest growing on upland plateaux, generally in association

with southern rata, pink pine, and Hall's totara. These permanently moist forests provide rich habitat for bryophytes and ferns. The presence of rata sets this type of forest apart because rata are the southern version of the New Zealand 'Christmas tree' when they stand out in summer for their masses of bright red flowers. Hall's Totara is a tall forest tree that can grow for up to 600 years. Some of the most important totara forests in New Zealand can be found in Southland growing on the sand dunes in the Otatara area. Totara is one of the few forest canopy species that can tolerate being planted out in open situations. The generic name "Podocarpus" means seed with a foot referring to the seed being attached to a red fruit to attract birds. These fruits are a favoured food of the native pigeon. Maori used totara bark for covering houses and shelters and also for the outer covering for bags they kept muttonbirds in to bring them back from the islands. Nationally, this type of bush has been heavily altered and often eliminated by human activity. This makes it one of the most threatened ecosystem types in the country. The Otatara-Sandy Point area contains the best remaining example of coastal totara and toatara-matai sand dune forests in the whole of New Zealand (Hovell 2001).

1.4.6 There are very extensive stands of beech forest in Southland, predominantly in the west of the region, mostly within Fiordland National Park. Stands of mature red beech on relatively fertile sites in eastern Fiordland are nationally significant as habitats for threatened fauna, supporting long and short tailed bats, and threatened hole-nesting birds such as kaka, kakariki and mohua. Mountain beech grows on lower quality morainic soils and in mixed upland beech forest, while silver beech is the most widespread and abundant of the three species, occurring in all of mainland Southland's mountainous uplands.

1.4.7 Native forests are made up of an association of trees, shrubs, and ground dwelling plants. The plant associations differ from place to place within New Zealand. Many of these plant species in Southland have been nicknamed "Southlanders" because they are tough; they can grow in windy, cold, sunny, frosty places where plants from other regions can't survive. Even if the species also grow elsewhere, if they are grown from seed from Southland stock they will survive better.

1.5 Southland's Wetlands

1.5.1 Nestled amidst Southland's natural landscape are some of the most valuable ecosystems on earth – wetlands. Wetlands form a significant part of the ecological and landscape character of Southland, and they play an important role in the environment. Wetlands provide important habitats for endemic and migratory water birds and many species of fish, invertebrates and specially adapted plants. Wetlands also support processes that provide environmental services like water storage and flood control, nutrient removal, erosion control and water table maintenance. Wetland areas have always been highly valued by Maori providing a rich source of traditional food resources (fish and birds), flax and medicinal plants.

1.5.2 Most of New Zealand's wetlands were drained between 1920 and 1980 for pastoral and agricultural land use and urban development which has resulted in the destruction of more than 90% of New Zealand's original wetlands – one of the

highest losses recorded in the world. Southland however has retained around 37% of original wetland area (compared with 1% in other regions), yet many of these are under threat or not known about. Within the Southland Region, wetlands are located in a wide range of areas, including coastal margins, downland plains and alpine locations. Some of Southland's wetlands are of international or national significance, for example, the Waituna Wetland and the Te Anau string bogs. The Waituna Wetland is the largest in Southland as is designated under the Ramsar convention as a Scientific Reserve of International Importance. Many other wetlands are of regional importance. Several are peatlands, for example those on the Awarua Plains and Te Anau Basin. Raised bogs are a distinctive feature of valley floors in many parts of Southland Region. These include nationally important raised bogs such as Borland Bog near the Monowai River, which has attracted detailed scientific study. The Te Anau basin is also notable for raised bogs, and they are also found on the Southland Plains, and in the Catlins. There are also alpine ribbon and cushion bogs within high country areas. The lowland wetlands have been most affected by human activities such as land development. While numerous wetlands remain in Southland, they have been drastically reduced in number and are often considerably reduced in area and "naturalness" from those that existed prior to human settlement (Hovell 2003).

1.6 Southland's Freshwater Ecology

- 1.6.1 Southland has a variety of freshwater environments including wetlands, rivers, lakes and streams. Southland is drained by four major river systems—the Waiau, Aparima, Oreti and Mataura Rivers. With a combined area of 18,305 square km, these four catchments drain approximately 54 percent of Southland. Southland has a rich and diverse native fish fauna with approximately 23 species of fish and two species of fresh water crayfish (koura) known to inhabit the region's fresh water streams, lakes and wetlands for at least part of their lifecycle. This compares with 35 known native species for the whole of New Zealand. The biodiversity values are not restricted to indigenous species, though, and the quality of Southland's trout fishery is internationally recognized. Four of Southland's indigenous fresh water fish are listed as threatened with one, the short jawed kokopu listed as facing extinction and with the highest conservation priority. Aquatic macroinvertebrates (small animals with no backbone, but which can be seen by the human eye) are also a significant part of the freshwater ecosystem. They are an important source of food for fish and also feed on plant and algae material within the system (Environment Southland 2000).
- 1.6.2 The almost complete lack of indigenous riparian vegetation along lowland rivers and streams in developed areas of Southland Region contrast strongly with most of those in Fiordland and on Stewart Island, which apart from the effects of pest animals on riparian vegetation are in comparatively pristine condition. Southland Region would contain more rivers that have wholly indigenous catchments than any other region of New Zealand. These rivers (and other more modified but unobstructed rivers) provide particularly important habitats for indigenous freshwater fish such as long-finned eel and a diverse range of galaxiids such as the Gollum galaxias, giant kokopu, inanga, roundhead galaxias, and flathead galaxias.

Many of Southland's intact rivers are contained within national parks where commercial fishing is prohibited, and this is a key factor for sustaining populations of long-finned eel (Wildland Consultants 2008).

- 1.6.3 Within Fiordland, Southland also contains the best range of relatively pristine lakes in New Zealand, including several large lowland lakes which are also unfished on a commercial basis (recreational fishing for trout is commonly undertaken). Some of these lakes are nationally important as habitats for indigenous aquatic vegetation and fauna, and remain free of freshwater aquatic weeds. Lake Poteriteri is New Zealand's largest lake without road access, which is an important factor helping to maintain its weed-free state. Lakes Manapouri and Te Anau, while used for electricity generation, are managed largely within their natural lake level regimes and retain considerable shallow aquatic habitats, indigenous vegetation, and rare plant species.

1.7 Southland's Urban Centres

- 1.7.1 Urban areas are generally highly modified. However, there are opportunities to look after natural features like waterways, and increase habitat for native birds and insects by planting suitable species in both public areas and private gardens. Southland's main urban centres – Invercargill, Gore, Te Anau and Winton all have important rivers and streams running through them that support biodiversity and require suitable protection from adverse affects. There are also numerous estuaries, such as New River Estuary or Jacob's River Estuary, that are close to many urban areas and communities and thus provide access to interesting and valuable recreational areas. Looking after these natural features provides far-reaching benefits, for example in terms of water quality, for ecosystems beyond these areas.

1.8 Other Unique Features

- 1.8.1 Limestone outcrops and cliffs are scattered throughout Southland Region. Some of these have no indigenous vegetation cover, but there are notable exceptions, for example at Forest Hill. Limestone outcrops in Fiordland National Park are nationally significant as examples of intact limestone ecosystems that support plant species which are endemic to the region.
- 1.8.2 Soils derived from ultramafic rocks are rich in magnesium and have low levels of major nutrients. Southland has an extensive ultramafic rock belt in the Livingstone Mountains, ending at Black Ridge in northern Southland, and a narrow band in western Fiordland between Anita Bay, Milford Sound, through to Sutherland Sound. Smaller outcrops are found at Omaui, and near the summit of Mount Luxmore. Ultramafic outcrops typically support distinctive, undersized and sparse vegetation with endemic and distinctive plant species. On the Mt Luxmore ultramafics, a population of the Fiordland endemic snow tussock is the only known occurrence of this species on ultramafic habitats (Wildland Consultants 2008).

Appendix 2 – An assessment of issues presently included in the Regional Policy Statement for Southland 1997

2.1 How Relevant are the Existing Issues in the current RPS for Southland?

2.1.1 The following are considered to be the resource management issues within Southland relating to Biodiversity.

2.2 [Issue 1. Human activity and encroachment by exotic pest plants and pest animals has had and continues to reduce the aerial extent and ecological value of areas of significant indigenous vegetation and significant habitats of indigenous fauna. \(Refer to Objectives 2.1, 2.2; Policies 2.1, 2.3, 2.5; Methods 2.1-2.16\)](#)

2.2.1 This issue is still very relevant today. Human activity continues to reduce the aerial extent and ecological value of areas of significant indigenous vegetation and significant habitats of indigenous fauna. Human activity such as clearing native vegetation for the purpose of creating more space for pasture or farming still occurs on a regular basis in Southland. The areas of native vegetation that do remain are often small and are vulnerable to edge effects. These remnants, if not protected by fencing, are susceptible to grazing by cattle which reduces their extent. The small areas are also sometimes infested with pest plants and pest animals which reduce their ecological value. Large areas of significant indigenous vegetation such as those found in the Catlins or in Fiordland have also been invaded by pest plants and pest animals reducing biodiversity and ecological values.

2.3 *Objective 2.1 To protect areas of significant indigenous vegetation and significant habitats of indigenous fauna within Southland where this will maintain or enhance biodiversity of indigenous ecosystems.*

2.3.1 This objective is relevant and appropriately reflects issue 1. The areas of significant indigenous vegetation and significant habitats of indigenous fauna within Southland will need protection from human activity and encroachment by exotic pest plants and pest animals in order to maintain or enhance biodiversity of indigenous ecosystems and reverse the reduction of their aerial extent.

2.4 *Objective 2.2 To maintain and enhance the biodiversity of indigenous species within the Southland Region.*

2.4.1 This objective is relevant and appropriately reflects issue 1. Maintaining and enhancing the biodiversity of indigenous species within the Southland region will most likely involve addressing human activity and encroachment of exotic pest plants and pest animals. The variety of species found within Southland is a positive measure of the state of the Region's ecosystems and how they are being managed in terms of human activity and pest plants and pest animals.

2.5 *Policies 2.1 Identify and encourage the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna which maintain or enhance the biodiversity of indigenous ecosystems within Southland.*

2.5.1 This policy is partially relevant, apart from the number of marine reserves it states, and appropriately reflects Issue 1. Identifying areas of significant indigenous vegetation and significant habitats of indigenous fauna will help to understand the areas that are most under threat from human activity and exotic pest plants and pest animals. Encouraging their protection will most likely reverse the reduction in their aerial extent and ecological values. It is still true that while many of Southland's land areas of significant indigenous vegetation and significant habitats of indigenous fauna are already protected by being located within the Fiordland National Park, and reserves, such as on Stewart Island, and within the Catlins, or subject to formal protection covenants, there are others that may warrant protection as well, including those on areas of private land. The explanation states that there are currently two small marine reserves in Fiordland and a further one proposed for Paterson Inlet. This is no longer relevant because there are now ten marine reserves in Fiordland and one at Ulva Island. The explanation also lists matters which will be taken into account when identifying whether an area contains significant indigenous vegetation or is a significant habitat of indigenous fauna and in determining the level of protection. These matters are still relevant, but may require additions in terms of new scientific understanding expressed through such projects as the Threatened Classification system.

2.6 *Policy 2.3 Promote understanding of biodiversity and the factors than can impact positively and negatively upon it.*

2.6.1 This policy is relevant and appropriately reflects issue 1. Understanding biodiversity and the factors that can impact positively and negatively upon it will include understanding how human activity and encroachment of exotic pest plants and pest animals have reduced the aerial extent and ecological value of native vegetation. Human activity can, however, positively affect biodiversity by assisting in maintaining biodiversity by actively controlling pest plants and pest animals, for example. Understanding biodiversity, which includes significant indigenous vegetation and significant habitats of indigenous fauna, can help to ensure human activity maintains or enhances that vegetation or habitat instead of reduce its extent or ecological values.

2.7 *Policy 2.5 Reduce the adverse effects of pest plants and pest animals on:*

- a) biodiversity;*
- b) areas of significant indigenous vegetation; and*
- c) significant habitats of indigenous fauna.*

2.7.1 This policy is relevant and partially appropriately reflects issue 1. Encroachment or establishment by exotic pest plants and pest animals causes adverse effects on areas of significant indigenous vegetation and significant habitats of indigenous fauna. These adverse effects will need to be reduced in order to maintain or enhance ecological values of these areas. The explanation states "an acceptable level of pest

plants and pest animals is that at which the values for which the area is being protected are not compromised.” This statement is not really accurate in the sense that acceptable level is not defined and in this context is relatively meaningless. Reference to the Regional Pest Management Strategy objectives and rules would provide a clearer measure of pest impact on the values the RPS identifies. However it is not possible to objectively measure the values at risk because we don't have an inventory of those values/sites nor do we have an accurate measure of their current state or condition.

2.8 *Method 2.1 Information, education and public awareness*

2.8.1 This method is relevant and appropriately reflects issue 1. Information, education and public awareness of the effects of human activity and encroachment of exotic pest plants and pest animals will allow for better understanding and management of significant indigenous vegetation and habitats of indigenous fauna.

2.9 *Method 2.2 Consultation*

2.9.1 This method is relevant and appropriately reflects issue 1. Consultation with the relevant parties could help to establish the types of human activity allowed in or near areas of significant indigenous vegetation or habitats of significant indigenous fauna. Consultation is also an effective method to engage the community in the best approaches to managing encroachment of exotic pest plants and pest animals.

2.10 *Method 2.3 Advocating*

2.10.1 This method is relevant to issue 1. It is important to advocate to Government the need to recognize Southland’s biodiversity and the regional contribution of Southland to the nation’s national parks and reserves, and as a vital attraction for recreation. These things are dependent on the maintenance of biodiversity, maintaining or increasing the aerial extent and protecting areas of significant indigenous vegetation and significant habitats of indigenous fauna from harmful human activity and encroachment of exotic pest plants and pest animals.

2.11 *Method 2.4 Promotion*

2.11.1 This method is relevant and appropriately reflects issue 1. Promoting the use of voluntary protection mechanisms and encouraging landowners, interest groups and other persons to undertake certain actions such as pest plant and pest animal management or the adoption of areas of significant indigenous vegetation and significant habitats of indigenous fauna in order to keep them from harmful human activity will help to reverse the reduction in aerial extent and ecological value.

2.12 *Method 2.5 Negotiation, Facilitation, Mediation and Arbitration*

2.12.1 This method is relevant and appropriately reflects issue 1. There will be occasions when local authorities can encourage the adoption of maintaining or increasing the

aerial extent and ecological value of significant indigenous vegetation or significant habitats of indigenous fauna and managing the encroachment of exotic pest plants and pest animals by non-statutory means, such as facilitating discussions between developers and the community, between landowners and the tangata whenua, or acting as a mediator, when potential or actual conflicts arise.

2.13 *Method 2.6 Developing guidelines for resource users*

2.13.1 This method is partially relevant. Many guidelines have already been developed outlining the manner in which human activities are undertaken. These guidelines, for example, relate to activities such as grazing of stock adjacent to watercourses, maintaining nutrient balances, managing waterways on farms, and also relate to managing pest plants and pest animals, guides for planting native species, caring for the coast, wetlands, and native forest remnants. It is probably not necessary to “reinvent the wheel” and develop more guidelines, but instead ensure they are easy to access, which may mean consolidating them down to only relating to biodiversity.

2.14 *Method 2.7 Monitoring*

2.14.1 This method is relevant and appropriately reflects issue 1. Ongoing environmental monitoring will be necessary to determine the effects of changing human activity on the aerial extent of significant indigenous vegetation and areas of significant habitat for indigenous fauna. Monitoring will also be necessary to determine the level of encroachment of exotic pest plants and pest animals.

2.15 *Method 2.8 Investigations and Research*

2.15.1 This method is very relevant and appropriately reflects issue 1. This issue talks about reduction in aerial extent and ecological value, however it is not possible to objectively measure the values at risk because we don't have an inventory of those values/sites nor do we have an accurate measure of their current state or condition. For these reasons will be necessary to investigate and research methodologies for measuring the extent and values of the natural assets and the potential impacts of pests and weeds on them.

2.16 *Method 2.9 Prepare, implement and administer Regional and District Plans*

2.16.1 This method is partially relevant. The District Plan and the Regional Water Plan identify some areas of significant vegetation and areas of significant habitat for indigenous fauna such as wetlands and provide some protection for them in the form of rules. The District Plan has HER. 3 rule in place to protect indigenous vegetation from clearance, thus preventing more reduction in aerial extent of that vegetation, but the effectiveness of this rule depends on public awareness and compliance. The Plans could go further by requiring identification of areas with significant indigenous vegetation and habitats of indigenous fauna in order to protect them from human activity and exotic pest plants and pest animals.

2.17 *Method 2.10 Plans, documents and action under other Acts*

2.17.1 This method is relevant to issue 1. It is true there will be a need for management plans prepared under other Acts, for example the Biosecurity Act 1993, Conservation Act 1987 and Reserves Act 1977. However, some of these things have already been done; for example, the Regional Pest Management Strategy has been developed to manage encroachment of exotic pest plants and pest animals. It is also true that action can be undertaken to establish reserves, marine reserves and marine parks under the Reserves Act 1977 and Marine Reserves Act 1977. This may be appropriate to protect indigenous vegetation or habitats of indigenous fauna from harmful human activity. It will also be necessary to take action under the Iwi Resource Management Plan, Te Tangi a Taurira which has its own polices for managing biodiversity according to the values of Ngai Tahu ki Murihiku.

2.18 *Method 2.11 Resource Consents*

2.18.1 This method is relevant and appropriately reflects issue 1. In considering resource consents, consent authorities should recognize and provide for the provisions of section 6(c) of the RMA. This will help to ensure adverse effects from human activity on indigenous vegetation or habitats of indigenous fauna will be avoided, remedied or mitigated. For example, the burning of vegetation within high country fire areas, clearing indigenous vegetation, gravel extraction, discharges to air, land and water, damming, diverting and taking water all require a resource consent.

2.19 *Method 2.12 Public Works and Network Utilities*

2.19.1 This method is relevant to issue 1. Public works and network utility infrastructure, for example roads and transmission lines, can cause adverse effects on the ecological value of indigenous vegetation and habitats of indigenous fauna. Consideration should be given to those adverse effects and the means by which these can be avoided, remedied or mitigated.

2.20 *Method 2.13 Economic Instruments*

2.20.1 This method is very relevant and appropriately reflects issue 1. Economic incentives are an important tool to protect indigenous vegetation and habitats of indigenous fauna from human activity or encroachment of exotic pest plants and pest animals. Examples of using economic incentives are discussed below.

2.21 *Method 2.14 Assistance*

2.21.1 This method is relevant and appropriately reflects issue 1. Assistance can be given to community-based organizations by providing logistical, technical and advisory services and information on pest plant and pest animal management.

2.22 *Method 2.15 Delegations and Transfer of Powers*

2.22.1 This method is relevant to issue 1. It may be necessary to transfer certain powers such as compliance, back to Environment Southland that currently falls within the District Council. For example, clearance of indigenous vegetation could fall under a Regional Land-Use Plan and would be enforced by Environment Southland.

2.23 *Method 2.16 Ownership*

2.23.1 This method is relevant and appropriately reflects issue 1. Recognizing that in some instances restrictions on human activity, such as on the use of land, are desirable in order to protect areas of significant indigenous vegetation and significant habitats of indigenous fauna from reduction in their aerial extent, it may be desirable for that land to be held in public ownership.

2.24 *Issue 2. There is insufficient available information to accurately determine the value and location of areas of significant indigenous habitat, and the flora and fauna contained within them. (Refer to Objective 2.1; Policies 2.1-2.3; Methods 2.1, 2.2, 2.6-2.11)*

2.24.1 This issue is very relevant today. There are many unknown areas of significant indigenous vegetation and habitat that contain flora and fauna in the Southland region. There has not been an inventory of the sites and values of indigenous vegetation and fauna remaining in the Southland Region; therefore there is also no accurate measure of their current state or condition. Those sites that have been identified are mostly on Crown owned land, but many significant sites are located on private land and without a comprehensive inventory, there will remain insufficient available information to accurately determine their value and location. However, there is now quite a lot of information that could be gathered and a number of methodologies which could be used to do an inventory and measure the values at risk.

2.25 *Objective 2.1 To protect areas of significant indigenous vegetation and significant habitats of indigenous fauna within Southland where this will maintain or enhance biodiversity of indigenous ecosystems.*

2.25.1 This objective is relevant and appropriately reflects issue 2. Protecting these areas to maintain or enhance biodiversity of indigenous ecosystems will require adequate information on their value and location of these areas and the flora and fauna contained within them. Since there is a gap in this information, it becomes a resource management issue to address.

- 2.26 *Policy 2.1 Identify and encourage the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna which maintain or enhance the biodiversity of indigenous ecosystems within Southland.*
- 2.26.1 This policy is relevant and appropriately reflects issue 2. Identifying areas of significant indigenous vegetation and significant habitats of indigenous fauna will help to fill the gap of insufficient available information to determine their value and location. The explanation lists the matters to be taken into account when identifying these areas. It is important to note there are now many methodologies out there to use to determine significant indigenous vegetation, habitats of indigenous fauna and how to measure the values of those natural assets and the potential impacts of pests and weeds on them. For example, the Threatened Environment Classification is a simple tool that helps to identify environments in which much of the indigenous vegetation has been cleared and only a small proportion of what remains is legally protected. It is a practical tool that can be used to help identify places that are priorities for protection of indigenous biodiversity, to plan biodiversity protection activities, and/or to report achievements.
- 2.27 *Policy 2.2 Apply and give effect to Maori values in relation to areas of significant indigenous vegetation and significant habitats of indigenous fauna.*
- 2.27.1 This policy is relevant and appropriately reflects issue 2. Applying and giving effect to Maori values set out in the RMA cannot happen if there is insufficient information on locations and values of significant indigenous vegetation and areas of significant habitat of indigenous fauna. However, applying these Maori values during an inventory process can help to identify significant indigenous vegetation and habitats of indigenous fauna and help to measure the values at risk.
- 2.28 *Policy 2.3 Promote understanding of biodiversity and the factors that can impact positively and negatively upon it.*
- 2.28.1 This policy is relevant to issue 2. Understanding biodiversity can help the public to identify if they have significant indigenous vegetation or areas of significant habitat for indigenous fauna on their property and the values those hold. Promoting the understanding of biodiversity can make an inventory process easier and help fill the gap of insufficient information.
- 2.29 *Method 2.1 Information, education and public awareness*
- 2.29.1 This method is relevant to issue 2. The location and values of indigenous biodiversity is not fully understood. To achieve greater understanding, information and knowledge needs to be shared between the community and council agencies so that the location and values can be fully accounted for.

- 2.30 *Method 2.2 Consultation*
- 2.30.1 This method is relevant and appropriately reflects issue 2. On-going liaison with landowners, environmental interest groups, affected persons or companies, individuals, tangata whenua, government departments and government agencies will assist with the collection of information for identification of areas of significant indigenous vegetations and significant habitats of indigenous fauna.
- 2.31 *Method 2.6 Developing guidelines for resource users*
- 2.31.1 This method is no longer relevant to issue 2. There have been guidelines developed by many agencies such as other councils or research institutes such as Landcare Research for identifying sites of significant indigenous vegetation and habitats of indigenous fauna and determining their value.
- 2.32 *Method 2.7 Monitoring*
- 2.32.1 This method is not relevant to issue 2. Ongoing monitoring can only occur if there is sufficient information. We cannot monitor what we do not know exists.
- 2.33 *Method 2.8 Investigations and Research*
- 2.33.1 This method is relevant to issue 2. To provide decision-making bodies with sufficient information, it is desirable to encourage further investigation and research on biodiversity and areas of significant indigenous vegetation and significant habitats of indigenous fauna with Southland, for example:
- Identifying areas of significant indigenous vegetation and significant habitats of indigenous fauna.
- 2.34 *Method 2.9 Prepare, implement and administer Regional and District Plans*
- 2.34.1 This method is not relevant to issue 2. The explanation says that regional and district plans shall recognize and provide for the protection of areas in the Southland Regional identified as containing indigenous vegetation and significant habitats of indigenous fauna. However the issue is that there is insufficient information on their locations, so the regional and district plans cannot provide for their protection unless they have been identified.
- 2.35 *Method 2.10 Plans, documents and action under other Acts*
- 2.35.1 This method is not relevant to issue 2. It will not address the insufficient information to determine the values or locations of significant indigenous vegetation or habitats of indigenous fauna.

- 2.36 *Method 2.11 Resource Consents*
- 2.36.1 This method is not relevant to issue 2. Considering resource consents will not help to gain sufficient knowledge of locations or values of indigenous biodiversity.
- 2.37 Issue 3. Biodiversity within individual ecosystems can be adversely affected by activities and the effects of activities including: (Refer to Objectives 2.1, 2.2, 4.1, 4.3, 5.3, 6.1, 6.4, 8.1, 9.2, 10.2, 12.3, 13.2; Policies 2.1, 2.3-2.5, 4.1, 4.3, 4.5, 5.5, 6.1, 6.2, 6.7, 6.10, 8.1, 8.2, 10.2, 12.1, 13.8; Methods 2.1-2.16)
- Burning
 - Drainage of wetlands
 - Inappropriate land use practices
 - Alterations to flows in natural water bodies and coastal water
 - The presence of dams and other structures within water bodies and coastal water
 - River management works
 - Removal of vegetation within urban areas
 - Significant changes in land use
 - Ground disturbance
 - Disturbance of the seabed
 - Clearance of indigenous vegetation
 - Reclamation within the coast, lakes and rivers
 - Pest plants and pest animals
- 2.37.1 This issue is still relevant today and all the activities listed still have adverse effects on biodiversity plus others that are not listed such as discharges of contaminants to land or water. Some activities are more relevant than others in today's society, for example there are significant changes in land-use occurring in the region such as dairy conversions which are putting pressure on remaining habitats to be cleared for pasture.
- 2.38 *Objective 2.1 To protect areas of significant indigenous vegetation and significant habitats of indigenous fauna within Southland where this will maintain or enhance biodiversity of indigenous ecosystems.*
- 2.38.1 This objective is relevant and appropriately reflects issue 3. These areas of indigenous biodiversity will need protection from the adverse effects of the activities mentioned.
- 2.39 *Objective 2.2 Apply and give effect to Maori values in relation to the areas of significant indigenous vegetation and significant habitats of indigenous fauna.*
- 2.39.1 This objective is relevant and appropriately reflects issue 3. Applying and giving effect to Maori values can help to avoid, remedy or mitigate the adverse effects on indigenous biodiversity from the activities listed. In some cases applying or giving

effect to the values will require some conditions put on the activities listed or not allow them at all.

- 2.40 *Objective 4.1 To sustain the quantity of the region's water resources so as to-*
a meet the needs of a range of uses, including the reasonably foreseeable needs of future generations
b safeguard the life-supporting capacity of water and related ecosystems
- 2.40.1 This objective is relevant and appropriately reflects issue 3. Aiming to sustain the quantity of the region's water resources to safeguard water related ecosystems will help to address some of the effects on biodiversity of the activities listed. For example, sustaining the quantity of the region's water will address the drainage of wetlands, alterations to flows in natural water bodies and coastal water, the presence of dams, and reclamation within the coast, lakes and rivers.
- 2.41 *Objective 4.3 To ensure the taking, use, damming and diversion of water does not compromise environmental standards established for the region.*
- 2.41.1 This objective is relevant to issue 3. Environment Southland's Proposed Water Plan has set environmental standards to protect biodiversity in individual ecosystems such as aquatic ecosystems, fisheries and fish spawning. Ensuring these standards are not compromised will ensure that the taking, use, damming and diversion of water will not adversely affect biodiversity within individual ecosystems.
- 2.42 *Objective 5.3 To ensure the taking, use, damming, diversion of water and the discharge of contaminants into water does not compromise water quality standards established for the region.*
- 2.42.1 This objective is almost the same as the one above and refers to the same environmental standards so this is not relevant.
- 2.43 *Objective 6.1 To protect the natural character, heritage values and outstanding natural features of lakes, rivers and wetlands in the Region.*
- 2.43.1 This objective is relevant to issue 3. Protecting the natural character, heritage values and outstanding natural features of lakes, rivers and wetlands will help to address the adverse effects of activities such as drainage of wetlands, alterations to flows in natural water bodies, the presence of dams, river management works, and pest plants and pest animals on biodiversity within individual ecosystems.
- 2.44 *Objective 6.4 To avoid wherever practicable, remedy or mitigate, the adverse effects of activities in, on, under, adjacent to, or over the beds of lakes, rivers and wetlands.*
- 2.44.1 This objective is relevant to issue 3. Avoiding the adverse effects of activities such as those listed in issue 3 on, under, adjacent to or over the beds of lakes, rivers and wetlands will address the issue of biodiversity in those individual ecosystems being adversely affected.

- 2.45 *Objective 8.1 To promote the sustainable management of all soils.*
- 2.45.1 This objective is relevant to issue 3. Soil is an ecosystem in its own right and can be adversely affected by a number of the activities listed in issue 3 such as the clearance of vegetation. Promoting the sustainable management of soils will help to address the issue of biodiversity reliant on the ecosystem of soils being adversely affected by certain activities.
- 2.46 *Objective 9.2 To avoid, remedy and mitigate adverse effects on ecosystems which contribute to the diversity of landscapes in the region.*
- 2.46.1 This objective is relevant to issue 3. Avoiding, remedying or mitigating adverse effects on ecosystems which contribute to the diversity of landscapes in the Region will help to address the issue of the activities listed in issue 3 adversely affecting biodiversity that comprise those ecosystems which contribute to the diversity of landscapes.
- 2.47 *Objective 10.2 To maintain and enhance the environmental quality of the region's built environment.*
- 2.47.1 This objective is relevant to issue 3. Enhancing the environmental quality of the region's built environment could help to address some of the activities which adversely affect biodiversity listed in issue 3. For example, the built environment could be planted with native vegetation which could help to address the clearance of vegetation to establish the infrastructure.
- 2.48 *Objective 12.3 To provide for the co-ordinated and integrated management of air quality within the region.*
- 2.48.1 This objective is somewhat relative to issue 3. The effects of burning, which is an activity listed in issue 3, can result in poor air quality which in turn can adversely affect biodiversity.
- 2.48.2 Research indicates that there are localised impacts of air pollution on ecosystems in and around large scale discharges of contaminants to air, and that the distribution of some sensitive species across cities is affected by the level of air quality. Managing air quality within the Region can thus also help protect biodiversity, especially more sensitive ecosystems such as acidic soils.
- 2.49 *Objective 13.2 To avoid, wherever practicable, remedy or mitigate any adverse effects from the use and development of the natural and physical resources within the coastal environment.*
- 2.49.1 This objective is relevant to issue 3. Avoiding, remedying or mitigating any adverse effects from the use and development of the natural and physical resources within the coastal environment, for example the disturbance of the seabed, by consciously making an effort in undertaking such activities to specifically identify any adverse effects they may create and to improve the coastal environment will help to address issue 3 and protect biodiversity within the specific coastal environment.

- 2.50 *Policy 2.1 Identify and encourage the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna which maintain or enhance the biodiversity of indigenous ecosystems within Southland.*
- 2.50.1 This policy is relevant and appropriately reflects issue 3. It is hard to determine if biodiversity within individual ecosystems is adversely affected by activities without first identifying what that biodiversity is. By identifying areas of significant indigenous vegetation and significant habitats of indigenous fauna which maintain or enhance the biodiversity of indigenous ecosystems, it becomes clearer if activities adversely affect that biodiversity.
- 2.51 *Policy 2.3 Promote understanding of biodiversity and the factors that can impact positively and negatively upon it.*
- 2.51.1 This policy is relevant and appropriately reflects issue 3. Understanding biodiversity and the factors that can impact positively or negatively upon it can encourage people to think twice about engaging in any of the listed activities if they do cause adverse affects on biodiversity. For example, if people understand the function and purpose of wetlands and what can happen to biodiversity if they are drained, they may be less likely to drain them and instead enhance or restore them.
- 2.52 *Policy 2.4 Avoid, wherever practicable, remedy or mitigate adverse impacts on biodiversity and the natural processes of ecosystems.*
- 2.52.1 This policy is relevant to issue 3. Many activities undertaken can adversely impact upon biodiversity generally and on the biodiversity of individual ecosystems. Regard to those impacts, such as avoiding, remedying or mitigating them, is required in preparing district and regional plans, and in assessing resource consents.
- 2.53 *Policy 2.5 Reduce the adverse effects of pest plants and pest animals on:*
A biodiversity
B areas of significant indigenous vegetations; and
C significant habitats of indigenous fauna
- 2.53.1 This policy is relevant to issue 3. Pest plants and pest animals are listed as one of the activities in issue 3 which can have adverse effects on biodiversity within individual ecosystems. Reducing these adverse effects as the policy suggests, by taking action under the RMA and Biosecurity Act (and now the RPMS) to manage the pests will help to address issue 3.
- 2.54 *Policy 4.1 Prepare regional plans to clearly identify regimes for the management of water quantity.*
- 2.54.1 This policy is no longer relevant. The Proposed Regional Water Plan identifies a regime for the management of water quantity.

- 2.55 *Policy 4.3 Manage abstraction of water and the transferability of permits on the basis of effects of that abstraction, or transfer, taking into account the standards set for the water body and the use to which the water is to be put.*
- 2.55.1 This policy will be of ongoing relevance as the pressure for more water through irrigation arises. The abstraction or transfer of water can have adverse effects on biodiversity, particularly aquatic biodiversity and so abstraction of water should be closely managed through such avenues as the Proposed Regional Water Plan.
- 2.56 *Policy 4.5 In preparing, implementing and administering Regional and District Plans and in considering resource consents, local authorities shall assess the effects of land use and development on the quantity and sustainability of water in water bodies and provide for any adverse effects to be avoided wherever practicable, or remedied or mitigated.*
- 2.56.1 This policy is still relevant. Local authorities have given much attention to the effects of land use and development on the quantity and sustainability of water in water bodies in preparing, implementing and administering their Regional and District Plans. Considering resource consents is an on-going process and it is important to ensure land use and development activities allow adequate quantity and sustainability of water to maintain or enhance biodiversity.
- 2.57 *Policy 5.5 In preparing, implementing and administering Regional and District Plans and in considering resource consents, local authorities shall assess the effects of land use and development on ground water and surface water quality, including both point and non-point source discharges, and provide for any adverse effects to be avoided, remedied or mitigated.*
- 2.57.1 This policy is relevant to issue 3. Regional and district plans and resource consents can ensure the effects from land use and development do not adversely affect water quality in a way in which would harm aquatic biodiversity.
- 2.58 *Policy 6.1 Protect the following wetland ecosystems from inappropriate subdivision, use and development: (26 wetlands listed)*
- 2.58.1 This policy is relevant and appropriately reflects issue 3. This policy could be improved a bit better by referring to more wetlands that have been identified such as the Taramoa Peat Bog and by actively identifying more wetlands in the region requiring protection. In addition, wetlands need to be protected from inappropriate subdivisions, use and development which could explicitly note drainage which would align with the activities listed in issue 3.
- 2.59 *Policy 6.2 Encourage the undertaking of research investigating the relationships between wetlands and their surrounding environment and the activities that can impact upon wetlands.*
- 2.59.1 This policy is relevant because biodiversity within individual ecosystems such as a wetland can be very sensitive to their surrounding environment and more research is always necessary to improve understanding of particular activities that can put wetlands at risk so that appropriate action can be taken to mitigate the effects of those activities.

- 2.60 *Policy 6.7 Prepare information on the impacts and inter-relationships of various activities on lakes and river beds and wetlands to improve understanding.*
- 2.60.1 This policy is no longer relevant. Environment Southland and the territorial authorities have developed a wetlands toolkit for landowners and a book providing information on wetlands and coastal care. Environment Southland has also developed information on activities affecting watercourse such as grazing. Other agencies such as Department of Conservation and Ministry for Environment provide information on inter-relationships of various activities on lakes, riverbeds and wetlands. All this information could be better managed, instead, into a “one-stop-shop” so it is easily accessible.
- 2.61 *Policy 6.10 Recognize and provide for existing structures including hydro-electric installations and flood alleviation and river management works, and allow for their maintenance, upgrading or enhancement, while avoiding wherever practicable, mitigating or remedying any adverse effects.*
- 2.61.1 This policy is relevant to issue 3 because existing structures such as dams used for flood alleviation are necessary and will need maintenance or upgrading. These structures could adversely affect biodiversity and these affects will need to be avoided, remedied or mitigated. This policy could be more relevant to issue 3 by referring to the effects on biodiversity existing structures may impose.
- 2.62 *Policy 8.1 Maintain and enhance Southland’s soil resource by avoiding, remedying or mitigating the adverse effects of activities.*
- 2.62.1 This policy is relevant to issue 3 because soil resources are a type of ecosystem and provide important ecosystem services such as carbon storage. Biodiversity also helps maintain soil resources by forming soil and retaining soil. Certain activities, such as those listed in issue 3 like clearance of vegetation, degrade soil resources or even deplete them. It is important for these affects to be avoided, remedying or mitigated in order to maintain and especially enhance Southland’s soil resource.
- 2.63 *Policy 8.2 Provide for the sustainable management of the most versatile soils of the Region.*
- 2.63.1 This policy is not really relevant to issue 3. Versatile soils would have to be more clearly defined and policy 8.1 covers the relationship between soil resources and biodiversity in a reasonably comprehensive way.
- 2.64 *Policy 10.2 Require that network utilities associated with the built environment be undertaken in such a manner as to avoid wherever practicable, remedy or mitigate effects on the quality of natural and physical resources.*
- 2.64.1 This policy is relevant to issue 3. Network utilities associated with the built environment, for example sewage disposal and discharge of stormwater, can adverse affect biodiversity within individual ecosystems. These network utilities are important, but they should be undertaken so as to avoid, remedy or mitigate adverse effects on biodiversity.

- 2.65 *Policy 12.1 Prepare, implement and administer a Regional Air Quality Plan containing objectives, policies and methods concerning the discharge of contaminants into the air, which specify that –*
- A. minor discharges to air, which meet specified standards or criteria, will be permitted without the need for resource consents*
 - B. discharges will be classified according to their effects*
 - C. specified activities will be given time, where appropriate, to meet air quality standards*
 - D. exemptions to air quality standards will be permitted in some circumstances, where previous resource consents or previous Regional Plans have allowed the installation of machinery that no longer complies with adopted standards.*
 - E. an assessment of the effects of activities on air quality matters is undertaken in preparation and consideration of resource management documents and resource consents. Within that plan the following priorities will be adopted:*
 - Priority 1 adoption of action to protect public health and safety.*
 - Priority 2 protection of local air quality*
 - Priority 3 support of Government policies which seek to reduce “greenhouse gases” and eliminate ozone depleting substances*
- 2.65.1 This policy is no longer relevant because a Regional Air Plan has been developed. During its review, however, it could pick up any research undertaken about the effects of air quality on biodiversity and manage them accordingly.
- 2.66 *Policy 13.8 In cases where an activity results in the physical disturbance of the seabed and/or foreshore, including mining or reclamation, impose appropriate management regimes to avoid wherever practicable, or mitigate any adverse effects.*
- 2.66.1 This policy is relevant to issue 3. Activities which include mining or reclamation may result in physical disturbance of the seabed or foreshore which can adversely affect biodiversity such as marine life. These effects should be avoided or mitigated.
- 2.67 *Method 2.1 Information, education and public awareness*
- 2.67.1 This method is relevant and appropriately reflects issue 3. The potential environmental impacts of activities are not fully understood, either by landowners or scientists. To achieve greater understanding and to allow for better management and protection where necessary, information and knowledge needs to be shared with the community so that the protection of biodiversity within ecosystems can be promoted and enhanced.
- 2.68 *Method 2.2 Consultation*
- 2.68.1 This method is relevant and appropriately reflects issue 3. Establishing on-going liaison with landowners, environmental interest groups, affected persons or companies, individuals, tangata whenua, government departments and government agencies will assist with identifying ways to reduce the effects from the activities listed or how to undertake alternative activities if feasible.

2.69 *Method 2.3 Advocating*

2.69.1 This method is relevant to issue 3. Advocating to Government the need to recognize Southland's biodiversity in terms of its importance to national parks and recreation could ensure Government considers and provides adequate direction and policy for activities that could adversely affect biodiversity within ecosystems such as land-use intensification.

2.70 *Method 2.4 Promotion*

2.70.1 The explanation for this method is not relevant, but other kinds of promotion are relevant. For example, promoting best management practices for activities which could impact biodiversity such as grazing or best management practices for land-use which work with biodiversity and benefit from the biodiversity instead of against it would appropriately reflect issue 3.

2.71 *Method 2.5 Negotiation, Facilitation, Mediation and Arbitration*

2.71.1 This method is not relevant to issue 3. This method does not relate to the effects of activities on biodiversity within ecosystems.

2.72 *Method 2.6 Developing guidelines for resource users*

2.72.1 This method is relevant to issue 3 because guidelines can be produced for many of the activities listed in issue 3 so that they are carried out in a way with minimal effects on biodiversity. However, many guidelines have already been produce so it is important to make sure only guidelines are produced for those activities which most likely to impact biodiversity and do not already have some guidance relating to their effects on biodiversity.

2.73 *Method 2.7 Monitoring*

2.73.1 This method is relevant to issue 3. Ongoing environmental monitoring will be necessary, for example, to determine whether certain activities are adversely affecting biodiversity in individual ecosystems.

2.74 *Method 2.8 Investigations and Research*

2.74.1 This method is relevant to issue 3. It may be necessary to undertake investigations and research into the potential effects an activity could have on biodiversity in determining whether to grant a resource consent or in deciding the conditions on a resource consent if an activity is allowed.

2.75 *Method 2.9 Prepare, implement and administer Regional and District Plans*

2.75.1 This method is relevant and appropriately reflects issue 3. Regional and District Plans set the status for activities, and these plans should give consideration to

biodiversity when setting the status and conditions of activities such as those listed in issue 3.

2.76 *Method 2.10 Plans, documents and action under other Acts*

2.76.1 This method is relevant to issue 3. Documents under the Biosecurity Act 1993 such as the Regional Pest Management Strategy manage the activities and effects associated with pest plants and pest animals. Action can also be undertaken under the Reserves Act 1977 and Marine Reserves Act 1977 to protect biodiversity from certain activities by restricting them from an area deemed requiring reserve status. Te Tangi a Tauria also specifies certain action for managing biodiversity and the activities that affect it.

2.77 *Method 2.11 Resource Consents*

2.77.1 This method is relevant to issue 3. In considering resource consents, consent authorities should recognize and provide for the provisions of section 6(c) of the RMA. For example, some of the activities listed in issue 3 such as drainage of wetlands, damming or diverting water and clearance of indigenous vegetation require resource consent.

2.78 *Method 2.12 Public Works and Networks Utilities*

2.78.1 This method is relevant to issue 3. In the case of public works and network utility infrastructure, for example, roads and transmission lines, consideration should be given to the adverse effects from these activities on biodiversity within individual ecosystems.

2.79 *Method 2.13 Economic Instruments*

2.79.1 Economic incentives can be used to manage certain activities or the effects of activities on biodiversity. For example, landowners or community groups could apply for funding from a Regional Environmental Enhancement fund for fencing riparian margins which would protect biodiversity from changes in land use such as intensification of farming.

2.80 *Method 2.14 Assistance*

2.80.1 This method is relevant to issue 3. Assistance can be given to community-based organizations, for example Landcare groups, by providing logistical and technical support, including advisory services on best management practices and techniques for undertaking activities which may affect biodiversity. Assistance can also be given directly to landowners through staff such as Land Sustainability Officers on how to manage the effects on biodiversity from certain activities such as dairying.

2.81 *Method 2.15 Delegations and Transfer of Powers*

2.81.1 This method is relevant to issue 3. It may be necessary to transfer certain powers such as compliance, back to Environment Southland that currently falls within the District Council. For example, clearance of indigenous vegetation could fall under a Regional Land-Use Plan and would be enforced by Environment Southland.

2.82 *Method 2.16 Ownership*

2.82.1 This method is relevant to issue 3. Recognizing that in some instances restrictions on the use of land are desirable in order to provide biodiversity within individual ecosystems from certain activities, it may be desirable for that land to be held in public ownership.

2.83 [Issue 4. Changes to ecosystems can, because of food-chain linkages for example, adversely affect ecological values beyond the immediate area. \(Refer to Objectives 2.1, 2.2; Policies 2.1, 2.3, 2.4; Methods 2.1-2.16\).](#)

2.83.1 This issue is still relevant today. A change in an ecosystem necessarily affects the species in the system, and changes in species affect ecosystem processes. The distribution of species on Earth is becoming more homogenous. By homogenous, we mean that the differences between the set of species at one location on the planet and the set at another location are, on average, diminishing. The natural process of evolution, and particularly the combination of natural barriers to migration and local adaptation of species, led to significant differences in the types of species in ecosystems in different regions. But these regional differences in the planet's biota are now being diminished. Two factors are responsible for this trend. First, the extinction of species results in the loss of the presence of species that had been unique to particular regions. Second, the rate of invasion or introduction of species into new ranges is already high and continues to accelerate apace with growing trade and faster transportation.

2.83.2 When species decline or go extinct as a result of human activities, they are replaced by a much smaller number of expanding species that thrive in human-altered environments. One effect is that in some regions where diversity has been low, the biodiversity may actually increase—a result of invasions of non-native forms. (This is true in continental areas such as the Netherlands as well as on oceanic islands.)

2.83.3 Genetic diversity has declined globally, particularly among cultivated species. The extinction of species and loss of unique populations has resulted in the loss of unique genetic diversity contained by those species and populations. In cultivated systems, since 1960 there has been a fundamental shift in the pattern of intra-species diversity in farmers' fields and farming systems as the crop varieties planted by farmers have shifted from locally adapted and developed populations (landraces) to more widely adapted varieties produced through formal breeding systems (modern varieties). The on-farm losses of genetic diversity of crops and

livestock have been partially offset by the maintenance of genetic diversity in seed banks.

- 2.83.4 The term “ecological values” used in this issue is not relevant because it is not clearly defined. Instead ecosystem services or ecosystem processes would be more accurate.
- 2.84 *Objective 2.1 To protect areas of significant indigenous vegetation and significant habitats of indigenous fauna within Southland where this will maintain or enhance biodiversity of indigenous ecosystems.*
- 2.84.1 This objective is somewhat relevant to issue 4. Protecting areas of significant indigenous vegetation and significant habitats of indigenous fauna within Southland will only go so far in maintaining ecosystem processes. Remnants of protection are only valuable and useful if they are connected, through corridors for example, to other remnants or in-tact vegetation or habitats. Restoring areas so that they perform their intended ecosystem service(s) is a better way to address changes to ecosystems which can have effects beyond their immediate area.
- 2.85 *Objective 2.2 To maintain and enhance the biodiversity of indigenous species within the Southland Region.*
- 2.85.1 This objective is relevant to issue 3. Maintaining or enhancing the biodiversity of indigenous species is very important because changes in species affect ecosystem processes which are widely spread beyond the immediate area. For example a decline or loss of species results in a loss of genetic diversity. Loss of genetic diversity can imply lack of evolution and premature extinction. Fitness, or contribution of an individual’s genotype to the next generation, decreases with reduced genetic variation. When genetic variation disappears the basis for life on earth becomes impoverished.
- 2.86 *Policy 2.1 Identify and encourage the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna which maintain or enhance the biodiversity of indigenous ecosystems within Southland.*
- 2.86.1 This policy is relevant to issue 4. Identifying these areas can also help to identify any changes within ecosystems that are occurring which can help with developing adaptive management techniques to cope with the changes.
- 2.87 *Policy 2.3 Promote understanding of biodiversity and the factors that can impact positively and negatively upon it.*
- 2.87.1 This policy is relevant to issue 4. Biodiversity is necessary in order for ecosystems to function. Human activity can both positively and negatively affect biodiversity and understanding of the effects of human actions will assist in maintaining biodiversity. Ecosystems are also interrelated and actions undertaken in one area can have implications in another. A holistic approach to ecosystem management is there required, and this requires an understanding of biodiversity.

- 2.88 *Policy 2.4 Avoid, wherever practicable, remedy or mitigate adverse impacts on biodiversity and the natural processes of ecosystems.*
- 2.88.1 This policy is relevant to issue 4. Many activities undertaken can adversely impact upon biodiversity of ecosystems. Regard to those impacts and how they might affect ecosystem processes and the basis for life is required in preparing district and regional plans, and in assessing resource consents.
- 2.89 *Method 2.1 Information, education and public awareness*
- 2.89.1 This method is relevant to issue 4. The functioning of ecosystem processes, interactions and potential environmental impacts of activities is not fully understood, either by landowners or scientists. To achieve greater understanding and to allow for better management, information and knowledge needs to be shared with the community on how ecosystem services are crucial for life on the planet so that appropriate management can take place to ensure ecosystems can continue to function.
- 2.90 *Method 2.2 Consultation*
- 2.90.1 This method is relevant to issue 4. Establishing on-going liaison with landowners, environmental interest groups, affect persons or companies, individuals, tangata whenua, government departments and government agencies will assist with the collection of information for the identification of areas of significant indigenous vegetation and significant habitats of indigenous fauna and any changes in ecosystem functions.
- 2.91 *Method 2.3 Advocating*
- 2.91.1 This method is relevant to issue 4. Advocating to Government the need to recognize Southland's biodiversity and the regional contribution of Southland to the functioning of ecosystems on a national and global scale will help Government provide more direction or support for biodiversity management so that ecosystem services can continue to function.
- 2.92 *Method 2.4 Promotion*
- 2.92.1 This method is relevant to issue 4. Promoting the way in which biodiversity contributes to ecosystem processes and the way ecosystem processes sustain life and different land-use activities will help foster a positive attitude towards biodiversity within the community.
- 2.93 *Method 2.5 Negotiation, Facilitation, Mediation and Arbitration*
- 2.93.1 This method is not relevant to issue 4. While it will be useful, it does not directly address issue 4 and the changes to ecosystems which can have far-reaching effects.

2.94 *Method 2.6 Developing guidelines for resource users*

2.94.1 This method is relevant to issue 4. It may be appropriate to prepare and seek implementation of guidelines outlining the manner in which particular activities are undertaken so as to maintain the integrity and functioning of ecosystems and ecosystem services.

2.95 *Method 2.7 Monitoring*

2.95.1 This method is relevant to issue 4. Ongoing monitoring will be important to determine any changes such as a loss or increase in biodiversity and the associated changes in ecosystem processes.

2.96 *Method 2.8 Investigations and Research*

2.96.1 This method is relevant to issue 4. To provide decision-making bodies with the information they need, it is desirable to encourage further investigation and research on biodiversity and its relation to ecosystem processes and how they affect certain land uses, and how activities affect biodiversity and ecosystem processes.

2.97 *Method 2.9 Prepare, implement and administer Regional and District Plans*

2.97.1 This method is relevant to issue 4. Regional and District Plans should recognize and provide for the protection of areas in the Southland Region identified as containing indigenous vegetation and significant habitats of indigenous fauna that are of significance because they maintain or enhance biodiversity which contributes to the functioning of ecosystems.

2.98 *Method 2.10 Plans, documents and action under other Acts.*

2.98.1 This method is relevant to issue 4. The Plan Te Tangi a Tauira notes special values beyond the immediate area that can be affected by changes in ecosystems such as the ability to gather traditional sources of food or natural resources.

2.99 *Method 2.11 Resource Consents*

2.99.1 This method is relevant to issue 4. In considering resource consents, consent authorities should recognize and consider the effects activities may have on biodiversity and the functioning of ecosystem services.

2.100 *Method 2.12 Public works and network utilities*

2.100.1 This method is relevant to issue 4. In the case of public works and network utility infrastructure such as road, consideration should be given to the adverse effects on biodiversity and the ecosystems the activities may disturb and the means by which these can be avoided wherever practicable, or remedied or mitigated.

2.101 *Method 2.13 Economic Instruments*

2.101.1 This method is relevant to issue 4. Incentives for protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna could include subsidies and grants to achieve outcomes which may not otherwise be achieved. For example, grants could be given for habitat protection through fencing or for restorative planting. These activities have the potential to affect biodiversity and ecosystems in a positive way beyond the immediate area of the plantings, such as improving water quality.

2.102 *Method 2.14 Assistance*

2.102.1 This method is relevant to issue 4. Technical and advisory assistance can be given to community-based organizations on appropriate ways to restore biodiversity so ecosystems at the restoration site and beyond can function properly.

2.103 *Method 2.15 Delegations and Transfer of Powers*

2.103.1 This method is too general and will not specifically address issue 4.

2.104 *Method 2.16 Ownership*

2.104.1 This method is partially relevant to issue 4. If an area of significant indigenous vegetation or significant habitats of indigenous fauna is under threat from certain uses or activities it may be desirable to hold that land in public ownership so that there is not a change in that ecosystem which would have widespread effects. However, if the area reserved is a fragment amidst a human altered landscape unsuitable for habitat of indigenous species, simply publicly owning the land as a reserve will not address the changes to the ecosystem adequately enough because then there is the problem of habitat islands. Reserves form islands inside human-altered landscapes (habitat fragmentation), and that these reserves could lose species as they 'relax towards equilibrium' (that is they would lose species as they achieved their new equilibrium number, known as ecosystem decay). This problem could be remedied by providing habitat corridors to create connectivity between habitat islands, or reserves.

2.105 [Issue 5. Reductions in biodiversity impact upon the values of the takata whenua. \(Refer to objectives 2.1, 2.2; Policies 2.1, 2.2-2.4; Methods 2.1-2.16\)](#)

2.105.1 This issue is still very relevant today. The protection of indigenous biodiversity is an important value for Ngai Tahu ki Murihiku. Indigenous species, and the habitats that support them, must be protected for future generations. In many parts of the takiwa, where land use is dominated by agriculture and forestry, the impact of human activity on indigenous species has been significant. An important focus for Ngai Tahu ki Murihiku is finding ways to protect, maintain and improve habitat for all biodiversity, be in water, riparian margins, native bush or wetlands.

- 2.106 *Objective 2.1 To protect areas of significant indigenous vegetation and significant habitats of indigenous fauna within Southland where this will maintain or enhance biodiversity of indigenous ecosystems.*
- 2.106.1 This objective is partially relevant to issue 5. Ngai Tahu ki Murihiku would like to find ways to protect, maintain and improve habitat for **all biodiversity** whereas this objective seems more restrictive to only those areas considered significant. For Ngai Tahu ki Murihiku, all species are taonga, whether weta, snail or kiwi, and the effects of an activity on species must consider all species equally.
- 2.107 *Objective 2.2 To maintain and enhance the biodiversity of indigenous species within the Southland Region.*
- 2.107.1 This objective is relevant to issue 5. It fits with the focus for Ngai Tahu ki Murihiku and their policy to use planning, policy and resource consent processes to promote the protection and where necessary enhancement of native biodiversity of Murihiku.
- 2.108 *Policy 2.1 Identify and encourage the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna which maintain or enhance the biodiversity of indigenous ecosystems within Southland.*
- 2.108.1 This policy is relevant to issue 5. Identifying these areas will help to form programs and ways to slow or stop the loss of biodiversity. This will hopefully help to address the reduction in biodiversity which concerns Maori.
- 2.109 *Policy 2.2 Apply and give effect to Maori values in relation to areas of significant indigenous vegetation and significant habitats of indigenous fauna.*
- 2.109.1 This policy is relevant to issue 5 because the cultural, spiritual, historic and traditional association of Ngai Tahu ki Murihiku with taonga species must be recognized and provided for within all management and/or recovery plans associated with those species which may occur in areas of significant indigenous vegetation and significant habitats of indigenous fauna.
- 2.110 *Policy 2.3 Promote understanding of biodiversity and the factors that can impact positively and negatively upon it.*
- 2.110.1 This policy is relevant to issue 5. Making full use of the knowledge of tangata whenua with regards to indigenous biodiversity and the value of such knowledge in understanding biodiversity and how to protect and enhance it will help to address the decline in biodiversity and its affects on tangata whenua values.
- 2.111 *Policy 2.4 Avoid, wherever practicable, remedy or mitigate adverse impacts on biodiversity and the natural processes of ecosystems.*
- 2.111.1 This policy is relevant to issue 5. Ngai Tahu ki Murihiku would like to see adverse impacts avoided, remedied or mitigated by replacing indigenous vegetation that is

removed or damaged as a result of land use activity and recommend the planting of indigenous species as an appropriate mitigation measure for any adverse impacts as a result of a land use activity. These measures would help to either maintain the current occurrence of biodiversity or even increase it.

2.112 *Method 2.1 Information, education and public awareness*

2.112.1 This method is relevant to issue 5. The greater the public awareness around the benefits of biodiversity, the greater the chances of reversing its reduction which would address issue 5.

2.113 *Method 2.2 Consultation*

2.113.1 This method is relevant to issue 5. Engaging in consultation with tangata whenua and making full use of their knowledge with regards to indigenous biodiversity will help to identify solutions for biodiversity decline.

2.114 *Method 2.3 Advocating*

2.114.1 This method is relevant to issue 5. It will be important to advocate for the establishment of indigenous vegetation corridors *kei uta kei tai*, from mountains to the sea. This will help to address the reduction in biodiversity which affects tangata whenua values.

2.115 *Method 2.4 Promotion*

2.115.1 This method is relevant to issue 5. In order to reverse the reduction in biodiversity which affects tangata whenua values, it will be important to promote the management of whole ecosystems and landscapes, in addition to single species and to promote the integration of biodiversity management across land ownership land use boundaries.

2.116 *Method 2.5 Negotiation, Facilitation, Mediation and Arbitration*

2.116.1 This method is relevant to issue 5. Addressing the reduction of biodiversity when it impacts tangata whenua values could require facilitating discussions between landowners and the tangata whenua, or acting as a mediator when potential or actual conflicts arise.

2.117 *Method 2.6 Developing guidelines for resource users*

2.117.1 This method is relevant to issue 5. Guidelines can be developed for determining the values important to tangata whenua and how to give effect to them when undertaking an activity which may impact or cause a reduction in biodiversity and for considering consent conditions.

2.118 *Method 2.7 Monitoring*

2.118.1 This method is relevant to issue 5. Ongoing environmental monitoring will be necessary to determine the trend in biodiversity, i.e., whether it's increasing or decreasing in the region.

2.119 *Method 2.8 Investigations and Research*

2.119.1 This method is relevant to issue 5. It will be important to fully investigate and research identifying solutions for biodiversity decline, and not just the problems.

2.120 *Method 2.9 Prepare, implement and administer Regional and District Plans*

2.120.1 This method is relevant to issue 5. Regional and District Plans should provide for consideration of values important to tangata whenua and provide appropriate provisions to stop the reduction in biodiversity. District and Regional Plans should use planning and resource consent processes to promote the protection and, where necessary, enhancement of native biodiversity of Murihiku, specifically:

- A enhancement and restoration of degraded areas;
- B planting of native species to offset or mitigate adverse effects associated with land use activities;
- C the incorporation of biodiversity objectives into development proposals
- D prohibiting the use of pest plant species in landscaping

2.121 *Method 2.10 Plans, documents and action under other Acts*

2.121.1 This method is relevant to issue 5. Policy and action to address the reduction of biodiversity can be prepared and happen using the Iwi Resource Management Plan, Te Tangi a Tauira which will help to ensure any impacts on tangata whenua values are accounted for and resolved.

2.122 *Method 2.11 Resource Consents*

2.122.1 This method is relevant to issue 5. In order to address the reduction in biodiversity which can affect the values of tangata whenua, Ngai Tahu ki Murihiku would like to use as a consent condition, when applicable, the enhancement of indigenous biodiversity as a means to remove adverse impacts of proposed activities.

2.123 *Method 2.12 Public Works and Networks Utilities*

2.123.1 This method is relevant to issue 5. In the case of public works and utility infrastructure, for example, roads and transmission lines, consideration should be given to the reduction of biodiversity in areas of significant indigenous vegetation and significant habitats of indigenous fauna and the impacts this could have on the values of tangata whenua. Consideration should be given to the means by which this can be avoided, remedied or mitigated.

2.124 *Method 2.13 Economic Instruments*

2.124.1 This method is relevant to issue 5. Ngai Tahu ki Murihiku has a policy to ensure efforts are directed at identifying solutions for biodiversity decline, and not just the problems. Economic instruments are a type of solution which can be useful for not only stopping the reduction in biodiversity but also for increasing it through such means as providing grants for native restorations and plantings.

2.125 *Method 2.14 Assistance*

2.125.1 This method is relevant to issue 5. Assistance can be given to community-based organizations by providing logistical and technical support for establishing indigenous vegetation corridors, reintroducing indigenous species, or restoration of degraded areas. This assistance would help to address the reduction in biodiversity and align with the policies of Ngai Tahu ki Murihiku outlined in Te Tangi a Tauira.

2.126 *Method 2.15 Delegations and Transfer of Powers*

2.126.1 This method is relevant to issue 5. In some cases it may be appropriate to delegate or transfer certain powers to iwi authority in accordance with the provisions of section 33 of the Act.

2.127 *Method 2.16 Ownership*

2.127.1 This method is partially relevant to issue 5. In some instances holding land in Maori ownership may be desirable in order to stop the reduction in biodiversity. Maori have a special connection to native biodiversity through such means as flax and shellfish gathering. However, if some native forest lands are returned to Maori, they may have an interest in harvesting the timber for economic purposes. This can be done in a sustainable manner though.

2.128 [Issue 6. There is a scarcity of information on the Region's ecosystems, the changes that are occurring to them, the rate of those changes, and the consequences for flora and fauna contained within them. \(Refer to Objective 2.1; Policies 2.1, 2.3-2.5; Methods 2.1, 2.2, 2.6-2.11\)](#)

2.128.1 This issue is very relevant today. There has never been an extensive inventory of biodiversity and its interaction with ecosystems in the Southland region. The region has been undergoing extensive and rapid land use changes without any studies done on the effects this is having on biodiversity and ecosystems. Climate change is also happening and will continue to occur which will have widespread effects for flora and fauna.

2.129 *Objective 2.1 To protect areas of significant indigenous vegetation and significant habitats of indigenous fauna within Southland where this will maintain or enhance biodiversity of indigenous ecosystems.*

- 2.129.1 This objective is not relevant to issue 6. It is difficult to protect these areas when little is known about them or where they even exist. In order to protect them, comprehensive, accurate and up-to-date information about the extent and nature of indigenous species and habitats in an area is needed as a pre-requisite to successful biodiversity management.
- 2.130 *Policy 2.1 Identify and encourage the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna which maintain or enhance the biodiversity of indigenous ecosystems within Southland.*
- 2.130.1 This policy is very relevant to issue 6. Identifying areas of significant indigenous vegetation and significant habitats of indigenous fauna is a start to gathering information on the region's ecosystems. This information can be used as a baseline for determining the changes to ecosystems and the consequences for flora and fauna.
- 2.131 *Policy 2.3 Promote understanding of biodiversity and the factors that can impact positively and negatively upon it.*
- 2.131.1 This policy is relevant to issue 6. Understanding biodiversity means also understanding ecosystems and how they interact. Understanding these interactions requires adequate information on the ecosystems and this information can help determine factors such as any changes to ecosystems that can impact negatively or positively on flora and fauna.
- 2.132 *Policy 2.4 Avoid, wherever practicable, remedy or mitigate adverse impacts on biodiversity and the natural processes of ecosystems.*
- 2.132.1 This policy is not relevant to issue 6. While it is good to avoid impacts, this will not help address the scarcity of information in the region.
- 2.133 *Policy 2.5 Reduce the adverse effects of pest plants and pest animals on:*
A biodiversity
B areas of significant indigenous vegetation; and
C significant habitats of indigenous fauna
- 2.133.1 This policy is not relevant to issue 6. While it is necessary to reduce adverse effects of pest plants and pest animals, this will not help address the scarcity of information in the region. More information on ecosystems, the changes that are occurring and the consequences for flora and fauna will instead help to reduce adverse effects of pest plants and pest animals.
- 2.134 *Method 2.1 Information, education and public awareness*
- 2.134.1 This method is relevant to issue 6. The functioning of ecosystems, interactions and potential consequences for flora and fauna is not fully understood. To achieve greater understanding, information and knowledge about any recognized changes in ecosystems needs to be shared with the community and local authorities so this

information can be used to better manage the ecosystems and flora and fauna contained within them.

2.135 *Method 2.2 Consultation*

2.135.1 This method is relevant to issue 6. Establishing on-going liaison with landowners, individuals, community groups, and tangata whenua will assist with the collection of information for the identification of biodiversity. These groups may also have historical knowledge of the region and can help to determine changes to ecosystems and the flora and fauna that are occurring.

2.136 *Method 2.6 Developing guidelines for resource users*

2.136.1 This method is not relevant to issue 6. Guidelines for resource users will not help to address the scarcity of information in the region.

2.137 *Method 2.7 Monitoring*

2.137.1 This method is very relevant to issue 6. Ongoing environmental monitoring will be necessary to determine the extent and state of biodiversity, changes to ecosystems and resulting consequences.

2.138 *Method 2.8 Investigations and Research*

2.138.1 This method is very relevant to issue 6. To adequately manage biodiversity, it is necessary to investigate and research the remaining biodiversity in the region, the changes to ecosystems from changes in land use and loss of biodiversity, and the consequences for flora and fauna.

2.139 *Method 2.9 Prepare, implement and administer Regional and District Plans*

2.139.1 This method is relevant to issue 6. Regional and district plans could provide for inventories and studies to be carried out to increase the information on the region's ecosystems.

2.140 *Method 2.10 Plans, documents and action under other Acts*

2.140.1 There may need to be action for gathering information under the Regional Pest Management Strategy or Te Tangi a Taurira.

2.141 *Method 2.11 Resource consents*

2.141. This method is not relevant to issue 6. Resource consents deal with activities and effects of activities. They are not generally used for increasing information on the region's ecosystems.

- 2.142 Issue 7. There is a lack of awareness of ecological processes and potential environmental impacts of activities. (Refer to Objective 2.1; Policies 2.3, 2.4; Methods 2.1, 2.4, 2.6-2.8, 2.14)
- 2.142.1 This issue is relevant today. Many people do not understand or are not aware of the way ecosystems work in providing services that maintain life on the planet and benefit their land-use activity and means of living. People may also not be aware of the effects on ecosystems when biodiversity becomes fragmented or less diverse as it adapts to a human altered landscape.
- 2.143 *Objective 2.1 To protect areas of significant indigenous vegetation and significant habitats of indigenous fauna within Southland where this will maintain or enhance biodiversity of indigenous ecosystems.*
- 2.143.1 This objective is not relevant to issue 7. Protecting these areas will not necessarily increase awareness of ecological processes so this objective does not specifically address issue 7.
- 2.144 *Policy 2.3 Promote understanding of biodiversity and the factors that can impact positively and negatively upon it.*
- 2.144.1 This policy is relevant to issue 7. Promoting understanding of biodiversity and the factors that can impact positively and negatively upon it will help to improve awareness of ecological processes and potential environmental impacts of activities.
- 2.145 *Policy 2.4 Avoid, wherever practicable, remedy or mitigate adverse impacts on biodiversity and the natural processes of ecosystems.*
- 2.145.1 This policy is not relevant to issue 7. It is difficult to avoid, remedy or mitigate adverse impacts on biodiversity and the natural processes of ecosystems if there is a lack of awareness of those processes. Avoiding, remedying or mitigating the impacts will not help to increase awareness, rather increasing awareness will help to avoid the impacts.
- 2.146 *Method 2.1 Information, education and public awareness*
- 2.146.1 This method is very relevant to issue 7. Raising public awareness through information and education can help people realize the benefits of functioning ecosystems and may make sure their activities or use of the land have less of an impact on ecosystems. They may also become interested in restoring ecosystems and protecting biodiversity. Information could be produced on certain species which are under more pressure from land use activities but are not widely understood, such as information on tussock and scrub which for many people does not seem valuable or beneficial to their land.

2.147 *Method 2.4 Promotion*

2.147.1 This method is relevant to issue 7. Promoting to the community to get involved with certain actions like pest plant management will help to raise public awareness of the state and benefits of biodiversity in the region.

2.148 *Method 2.6 Developing guidelines for resource users*

2.148.1 This method is no longer relevant. There have been many guidelines developed from lots of other councils, Environment Southland and other government departments such as DOC. These guidelines can be collated and distributed to people undertaking activities which affect biodiversity in order to raise their awareness of the impacts of the activity and how that impact can be avoided by following the guidelines.

2.149 *Method 2.7 Monitoring*

2.149.1 This method is relevant to issue 7. Ongoing environmental monitoring of ecosystems and publication of the data will help to raise awareness of any changes to the ecosystems or impacts from activities.

2.150 *Method 2.8 Investigations and Research*

2.150.1 This method is relevant to issue 7. Investigating and researching ecological processes and the impacts from certain activities will help to increase awareness among the researchers which can be passed on to the public as well.

2.151 *Method 2.14 Assistance*

2.151.1 This method is relevant to issue 7. Providing assistance in the form of logistical and technical support including advisory services on sustainable land management practices and techniques will help to raise awareness of the impacts of land practices and how to make sure they are sustainable.

2.152 [Issue 8. The introduction of plants and animals in some instances has had adverse impacts upon biodiversity and the balance of ecosystems. \(Refer to Objectives 2.1, 2.2; Policies 2.1, 2.3-2.5; Methods 2.1-2.16\)](#)

2.152.1 This issue is partially relevant today. The introduction of non-native plants and animals has had adverse impacts upon biodiversity by competing with native species or preying on them. However, ecology has evolved and we now know that ecosystem management is not about “balancing”, but about resilient and adaptive ecosystems; ecosystems are constantly in a state of flux. The introduction of plants and animals has led to ecosystems becoming less resilient and able to adapt to changes in land-use or the effects of climate change.

- 2.153 *Objective 2.1 To protect areas of significant indigenous vegetation and significant habitats of indigenous fauna within Southland where this will maintain or enhance biodiversity of indigenous ecosystems.*
- 2.153.1 This objective is relevant to issue 8. Protecting areas of significant indigenous vegetation and significant habitats of indigenous fauna will mean managing the introduced plants and animals that adversely affect those areas.
- 2.154 *Objective 2.2 To maintain and enhance the biodiversity of indigenous species within the Southland Region.*
- 2.154.1 This objective is relevant to issue 8. Maintaining and enhancing the biodiversity of indigenous species incorporates managing the plants and animals which have been introduced and preventing new ones from becoming introduced.
- 2.155 *Policy 2.1 Identify and encourage the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna which maintain or enhance the biodiversity of indigenous ecosystems within Southland.*
- 2.155.1 This policy is relevant to issue 8. Encouraging the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna incorporates encouraging the appropriate management of introduced plants and animals where they have or could have adverse impacts on biodiversity. These areas need protection from introduced plants and animals through fencing, trapping and in some instances biocontrol or spraying of weeds.
- 2.156 *Policy 2.3 Promote understanding of biodiversity and the factors that can impact positively and negatively upon it.*
- 2.156.1 This policy is relevant to issue 8. Promoting understanding the factors that can impact positively and negatively upon it includes promoting understanding how the introduction of non-native species can negatively impact biodiversity. For example, planting a non-native species in a garden could cause the spread of that specie into native bush upsetting its ecosystem.
- 2.157 *Policy 2.4 Avoid, wherever practicable, remedy or mitigate adverse impacts on biodiversity and the natural processes of ecosystems.*
- 2.157.1 This policy is relevant to issue 8. Adverse impacts, as described in issue 8, can come from the introduction of plants and animals. It is therefore necessary to avoid, remedy or mitigate these impacts on biodiversity by managing the introduced plants and animals and preventing new introductions.
- 2.158 *Policy 2.5 Reduce the adverse effects of pest plants and pest animals on:*
A biodiversity
B areas of significant indigenous vegetation; and
C significant habitats of indigenous fauna

- 2.158.1 This policy is relevant to issue 8. Reducing the adverse effects of pest plants and pest animals on biodiversity directly addresses the issue of the introduction of plants and animals which adversely impact biodiversity.
- 2.159 *Method 2.1 Information, education and public awareness*
- 2.159.1 This method is relevant to issue 8. Raising public awareness through information and education about the adverse effects introduced plants and animals can have on biodiversity will help to encourage the planting of native species instead of introduced ones and to encourage keeping introduced animals such as dogs and cats away from sensitive areas that are habitat for native birds and other fauna.
- 2.160 *Method 2.2 Consultation*
- 2.160.1 This method is relevant to issue 8. Establishing on-going liaison with landowners, environmental interest groups, individuals, tangata whenua, and government departments will assist with the collection of information for identifying biodiversity which is threatened from introduced species.
- 2.161 *Method 2.3 Advocating*
- 2.161.1 This method is relevant to issue 8. We can advocate to Government the need to recognize Southland's biodiversity and the regional contribution of Southland to the nation's national parks and reserves, and as a vital attraction for recreation, dependent on the maintenance of biodiversity and management of introduced plants and animals.
- 2.162 *Method 2.4 Promotion*
- 2.162.1 This method is relevant to issue 8. Promoting the use of voluntary protection mechanisms and encouraging landowners, interest groups and other persons to undertake certain actions such as pest plant and pest animal management, fencing and planting/restoration of native species will help to address the problem of introduced plant and animals.
- 2.163 *Method 2.5 Negotiation, Facilitation, Mediation and Arbitration.*
- 2.163.1 This method is not relevant to issue 8. These methods probably will not be needed for managing introduced plants and animals.
- 2.164 *Method 2.6 Developing guidelines for resource users*
- 2.164.1 This method is not relevant. Many guidelines have already been developed for managing and controlling the introduction of plants and animals. For example Weedbusters have developed "Weedbusting, A guide to recognising and controlling invasive weeds", "Plant me Instead! Southland", and "Pest Plants, A guide to pest plant management in the Southland Region". Environment Southland has also produced numerous factsheets on pest animals and pest plants.

2.165 *Method 2.7 Monitoring*

2.165.1 This method is relevant to issue 8. Ongoing environmental monitoring will be necessary, for example, to determine whether biodiversity is being sustainably managed by assessing pest plants and pest animal trends to see if they are becoming more or less of a problem for biodiversity.

2.166 *Method 2.8 Investigations and Research*

2.166.1 This method is relevant to issue 8. To provide decision-making bodies with the information they need, it is desirable to encourage further investigation and research on biodiversity and areas of significant indigenous vegetation and significant habitats of indigenous fauna within Southland, for example: identifying and where necessary managing threats to areas of significant indigenous vegetation and habitats of indigenous fauna by pest plants and pest animals. It is also important to investigate and research using biocontrol methods to manage the pest plants and pest animals.

2.167 *Method 2.9 Prepare, implement and administer Regional and District Plans*

2.167.1 This method is not relevant to issue 8. The Regional Pest Management Strategy is a better plan for addressing introduced plants and animals.

2.168 *Method 2.10 Plans, documents and action under other Acts*

2.168.1 This method is relevant to issue 8. Reviewing the Regional Pest Management Strategy is required under the Biosecurity Act 1993.

2.169 *Method 2.11 Resource Consents*

2.169.1 This method is relevant to issue 8. Conditions can be put on resource consents to undergo pest plant or pest animal management as a way to mitigate the effects of a land-use activity.

2.170 *Method 2.12 Public Works and Network Utilities*

2.170.1 This method is not relevant to issue 8. Public works and network utilities will probably not have any bearing on the introduction of plants or animals.

2.171 *Method 2.13 Economic Instruments*

2.171.1 This method is relevant to issue 8. Incentives such as grants or rates rebates are effective tools for encouraging members of the community to undergo pest plant and pest animal management on their own properties or on public lands.

2.172 *Method 2.14 Assistance*

2.172.1 This method is relevant to issue 8. Assistance can be given to community groups by providing logistical and technical support on pest plant and pest animal management. For example, Environment Southland has played a leading role in helping the Aparima Pestbusters with ongoing technical advice, physical field assistance and guidance relating to funding sources and applications – ensuring a professional and co-ordinated approach to its activities.

2.173 *Method 2.15 Delegations and Transfer of Powers*

2.173.1 This method is not relevant to issue 8. It is unlikely that there will be a transfer of managing introduced species on private land to another statutory body.

2.174 *Method 2.16 Ownership*

2.174.1 In some instances it may be desirable to hold land in public ownership in order to manage threats from introduced plants and animals; however this is unlikely, and more likely to hold land in public ownership if it's under threat from development pressure.

Issue	Relevant	Relevant Objectives	Relevant Policies	Relevant Methods
1	Yes	2.1, 2.2	2.1(partially), 2.3, 2.5	2.1, 2.2, 2.3, 2.4, 2.5, 2.6(partially), 2.7, 2.8, 2.9(partially), 2.10, 2.11, 2.12, 2.13, 2.14, 2.16
2	Yes	2.1	2.1, 2.2, 2.3	2.1, 2.2, 2.8
3	Yes	2.1, 2.2, 4.1, 4.3, 6.1, 6.4, 8.1, 9.2, 10.2, 12.3(somewhat), 13.2	2.1, 2.3, 2.4, 2.5, 4.3, 4.5, 5.5, 6.1, 6.2, 6.10, 8.1, 10.2, 13.8	2.1, 2.2, 2.3, 2.4(somewhat), 2.6, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.13, 2.14, 2.15(somewhat), 2.16
4	Yes	2.1(somewhat, 2.2	2.1, 2.3, 2.4	2.1, 2.2, 2.3, 2.4, 2.6, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.13, 2.14, 2.16
5	Yes	2.1(partially), 2.2	2.1, 2.2, 2.3, 2.4	2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.13, 2.14, 2.15, 2.16
6	Yes	None	2.1, 2.3	2.1, 2.2, 2.7, 2.8, 2.9, 2.10
7	Yes	None	2.3	2.1, 2.4, 2.7, 2.8, 2.14
8	Partially	2.1, 2.2	2.1, 2.3, 2.4, 2.5	2.1, 2.2, 2.3, 2.4, 2.7, 2.8, 2.10, 2.11, 2.13, 2.14, 2.16(somewhat)

2.175 In addition to the above issues, associated resource management issues within Southland relating to biodiversity can also be found in the following sections:

2.176 Tangata whenua

Issue 1 Protection of wahi tapu

Issue 2 Recognition of customary use of water and importance of wahi tapu, wahi taoka and mahika kai

- Issue 3 Consideration of cultural and traditional spiritual values
- Issue 4 Regard for kaitiakitanga

2.176.1 Tangata whenua issues relate to biodiversity because mahinga kai was, and is, central to the Ngai Tahu ki Murihiku way of life. Mahinga kai is about mahi nga kai—it is about places, ways of doing things and resources that sustain the people. The loss of mahinga kai is attributed to habitat degradation, resource depletion, and the introduction of predators that have severely reduced the traditional foods of Ngai Tahu. Tangata whenua issues also relate to biodiversity because Tane and Tangaroa are the two atua who are responsible for all living things in the environment, or biodiversity. The protection of indigenous biodiversity is important for Ngai Tahu ki Murihiku. Indigenous species, and the habitats that support them, must be protected for future generations. These issues will be covered in greater depth in the Tangata Whenua Paper.

2.177 Water Quantity

- Issue 1, 2 Changes in flows in levels of water
- Issue 3 Conflicts in allocation of water
- Issue 4 Effects of taking, diversion and damming of water
- Issue 5 Consequences of uses to which water is put
- Issue 6 Effects on water quality

2.177.1 Water quantity issues relate to biodiversity because changes in the levels or flows of water can affect aquatic biodiversity in the water system and downstream of it. Water levels and flows can also affect terrestrial biodiversity that use water systems for feeding. Structures in water such as dams can affect biodiversity because they can obstruct fish passage. Diverting water by draining it from a wetland also can significantly affect flora and fauna that was a part of the wetland or part of the ecosystem the wetland formed. These issues will be covered in greater depth in the Water Quantity Paper.

2.178 Water Quality

- Issue 1 Water requirements of communities
- Issue 2 Effects of water quality
- Issue 3 Treatment of discharge of waste

2.178.1 Water quality issues relate to biodiversity because healthy biodiversity depend on the quality of water. For example, water can become cloudy from unhealthy water quality which affects the amount of sunlight aquatic biodiversity receives. Contaminants in the water from wastes or effluent can also harm biodiversity. These issues will be covered in greater depth in the Water Quality Paper.

2.179 Lakes, Rivers and Wetlands

- Issue 1 Intrinsic values of water bodies and wetlands require protection and better understanding
- Issue 2 Effects of loss of habitat for wildlife and freshwater fish, and impediments to fish passage
- Issue 3 Loss of significant wetlands
- Issue 5 Difficulties in balancing the needs and interaction of many parts of a complex and dynamic system
- Issue 6 Changes in levels and flows can result in loss of natural character and instream values
- Issue 8 Effects of gravel extraction
- Issue 9 Effects of agricultural runoff
- Issue 12 Impacts of hydro-electric power generation
- Issue 14 Effects of harvesting sphagnum moss

2.179.1 Lakes, rivers and wetlands issues relate to biodiversity because these ecosystems provide important ecosystem services such as water regulation and supply, flood control and water treatment. They are also very important habitat for different forms of biodiversity. These issues will be covered in greater depth in the Rural/Land Use Paper and further down in this Biodiversity Paper.

2.180 Soils

- Issue 2 Effects of the discharge of wastes
- Issue 3 Effects of vegetation clearance
- Issue 6 Activities can have cumulative effects lower in the catchment
- Issue 7 Effects of disturbing the ground
- Issue 9 Effects of pest plants and pest animals

2.180.1 Soil issues relate to biodiversity because soil ecosystems are very important for maintaining biodiversity. Biodiversity is also very important to maintain healthy soil ecosystems so the two are very much interrelated. Vegetation clearance affects biodiversity values, but also can accelerate soil erosion. These issues will be covered in greater depth in the Rural/Land Use Paper.

2.181 Landscape and Natural Features

- Issue 3 Contribution which biodiversity makes to the varied Southland landscape

2.181.1 Landscape and natural feature issues relate to biodiversity because often it is biodiversity which makes the landscape or natural features so unique and important. For example, the different types of indigenous vegetation can provide a unique landscape in the midst of a human altered pastoral landscape. These issues will be covered in greater depth in the Landscape Paper.

2.182 Built Environment

- Issue 5 Cumulative adverse effects can be significant
- Issue 7 Effects of the built environment

2.182.1 Built environment issues relate to biodiversity because the built environment can significantly change habitat for biodiversity. The built environment usually also results in discharges of wastes e.g. stormwater and sometimes even the removal of habitat for biodiversity. These issues will be covered in greater depth in the Urban Issues Paper.

2.183 Transportation

- Issue 1 Effects of all forms of transportation

2.183.1 Transportation issues relate to biodiversity because transportation via the sea, for example, can bring in exotic species which impacts the native biodiversity. Transportation also requires roading infrastructure which impacts biodiversity. There have also been studies showing that headlights of vehicles and road noise disturb species behavioral patterns. These issues will be covered in greater depth in the Transportation Paper.

2.184 Air Quality

- Issues 1, 6 Effects of global climate change
- Issue 3 Discharges to the atmosphere

2.184.1 Air quality issues relate to biodiversity because poor air quality can adversely affect biodiversity. Research indicates that there are localised impacts of air pollution on ecosystems in and around large scale discharges of contaminants to air, and that the distribution of some sensitive species across cities is affected by the level of air quality. The effects of global climate change can also affect biodiversity because warming effects can change native species and pest distribution. These issues will be covered in greater depth in the Energy & Infrastructure Paper and further down below in the Biodiversity Paper.

2.185 Coast

- Issue 3 Effects of discharges
- Issue 4 Waste disposal
- Issue 7 Introduction of new organisms from ballast water
- Issue 8 Damage to estuarine ecosystems
- Issue 13 Effects of structures
- Issue 14 Effect of reclamations and impoundments
- Issue 17 Effect of pest plants in coastal areas
- Issue 19 Effects of excavation, dredging, drainage and extraction in coastal areas
- Issue 20 Effects of modification of sand dunes and beach ridges
- Issue 21 Effects of rising sea level as a result of climate change

- Issue 23 Effects of habitat modification on diversity of fish populations
- Issue 30 Lack of knowledge and understanding of the full effects of undertaking activities and development within the coastal marine area.

2.185.1 Coastal issues relate to biodiversity because the coastal marine environment is important habitat for biodiversity. The coastal environment also has a diverse array of ecosystems that provide important ecosystem services. There are many issues affecting biodiversity in the coastal environment such as the effect from fishing, boating, to land-use such as grazing adjacent to the coastal environment. The coastal environment is also affected by exotic species. These issues will be covered in greater depth in the Coastal Paper.

2.186 Mineral and Energy Resources

- Issue 1 Global effects of greenhouse gas emissions
- Issue 2 Effects of use, development, production and transportation of energy resources
- Issue 4 Effects on ecosystems

2.186.1 Mineral and Energy Resources relate to biodiversity because certain mineral and energy resources such as coal emit CO₂, a primary greenhouse gas which contributes to climate change. Climate change has the ability to affect the distribution of species among other things. Developing mineral and energy resources requires large amounts of infrastructure which could adversely affect biodiversity by modifying or even destroying habitat and ecological values. These issues will be covered in greater depth in the Energy and Infrastructure Paper.

2.187 Cross Boundary

- Issue Coastal processes
- Pest plants and pest animals
- High country burning
- Consistency in monitoring
- Protection of landscape values
- Water quantity and quality
- Land development
- Structures

2.187.1 While there isn't a separate paper detailing cross boundary issues, these issues will be discussed during consultation with the stakeholders while drafting policy.

2.188 The following are considered to be the resource management issues within Southland relating to rivers and wetlands (Chapter 5.6) within the context of biodiversity.

2.189 [Issue 2. Loss of habitat for wildlife and freshwater fish, and impediments to fish passage, especially in tidal reaches, are affecting the viability of some populations.](#)

(Refer to Objectives 6.1, 6.4, 13.7; Policies 4.4, 6.1, 6.3, 6.6, 6.7, 14.5; Methods 6.1-6.18)

- 2.189.1 This issue is still relevant today and relates to biodiversity. The clearance of indigenous vegetation has resulted in loss of habitat for native birds and invertebrates. The drainage of wetlands results in loss of habitat for waterfowl, migratory birds and freshwater fish and macroinvertebrates. There is also loss and modification of riparian margins which results in loss of habitat in the form of wildlife corridors and loss of food, shelter and breeding sites that aquatic organisms require. The migratory fish in Southland waters are affected by barriers to migration such as weirs, dams and low flows.
- 2.190 *Objective 6.1 To protect the natural character, heritage values and outstanding natural features of lakes, rivers and wetlands in the region.*
- 2.190.1 This objective is somewhat relevant to issue 2 from a biodiversity perspective. By protecting values such as natural character, heritage and outstanding natural features, biodiversity will also be protected because protecting these values will usually result in retaining habitats and lakes, rivers or wetlands in a natural state without dams or other impediments to fish passage. However, protecting those values may not necessarily benefit biodiversity because riparian margins are critical habitats for biodiversity but they may not seem to have natural character, heritage or outstanding natural features and would therefore “fall between the cracks” for protection even though they are important for maintaining biodiversity.
- 2.191 *Objective 6.4 To avoid wherever practicable, remedy or mitigate, the adverse effects of activities in, on, under, adjacent to, or over the beds of lakes, rivers and wetlands.*
- 2.191.1 This objective is relevant to issue 2. Many activities including gravel extraction, tree planting, drainage, damming, flood protection and river management works, jetties can have adverse effects on fish passage, spawning areas and riparian vegetation habitats. These effects should try to be avoided or remediated.
- 2.192 *Objective 13.7 To identify and protect significant conservation values within the coastal marine area.*
- 2.192.1 This objective is not relevant to issue 2. What are significant conservation values? They could be fish passages in tidal reaches, or coastal habitat or marine habitat in which case this would be relevant, but they may not be. This objective needs more clarification and context.
- 2.193 *Policy 4.4 Encourage the conservation of water and its efficient allocation and use.*
- 2.193.1 This policy is relevant to issue 2. Conserving water and allocating it efficiently and fairly will ensure adequate flow levels in rivers, streams and wetlands for fish to live in and migrate.

- 2.194 *Policy 6.1 Protect the following wetland ecosystems from inappropriate subdivision, use and development (lists 51 wetlands)*
- 2.194.1 This policy is somewhat relevant to issue 2. Protecting the wetlands from inappropriate subdivisions, use and development could help to prevent any more loss of habitat for wildlife and freshwater fish. However the list of wetlands is not comprehensive enough and an inventory is in the early stages of identifying more wetlands. This policy would be more relevant if it included identifying the wetlands as well.
- 2.195 *Policy 6.3 Establish within regional and district plans provisions for the preservation of the natural character and the protection of heritage values and outstanding natural features of lakes, rivers and wetlands in the Region.*
- 2.195.1 This policy is somewhat relevant for the same reasons as listed in objective 6.1.
- 2.196 *Policy 6.6 Enhance the water quality, amenity and in-stream values of lakes, rivers and wetlands and promote bank stability.*
- 2.196.1 This policy is relevant to issue 2. Enhancing the water quality can happen in a number of ways and one of these includes protecting and/or restoring native vegetation and wetlands because they can act as filters against sediments and contaminants entering waterbodies. Protecting and restoring native vegetation and wetlands to enhance water quality, amenity and in-stream values will also increase habitat for wildlife and fish. However this is consequential, so the biodiversity values should be added into the policy.
- 2.197 *Policy 6.7 Prepare information on the impacts and inter-relationships of various activities on lakes and river beds and wetlands to improve understanding.*
- 2.197.1 This policy is no longer relevant. Lots of information has already been prepared such as Clean Streams, Catchment brochures and wetlands books.
- 2.198 *Policy 14.5 Avoid, wherever practicable, remedy or mitigate the adverse effects of energy production, use, transmission and distribution.*
- 2.198.1 This policy is somewhat relevant to issue 2. Government has released new energy policy that sees 90% of electricity generated in New Zealand powered by renewable energy sources by the year 2025. Development that increases renewable electricity generation capacity can, however, have adverse effects manifesting locally and positive effects manifesting nationally. In some instances the benefits of renewable electricity generation can compete with matters of national importance as set out in section 6 of the Act, and with matters to which decision-makers are required to have particular regard under section 7 of the Act. In particular, the natural resources from which electricity is generated can coincide with areas of significant natural character, significant amenity values, historic heritage, outstanding natural features and landscapes, significant indigenous vegetation and significant habitats of indigenous fauna. Government will release a

National Policy Statement for Renewable Electricity Generation (NPS) which will ensure local government adopts a nationally consistent approach to balancing the competing values associated with the development of New Zealand's renewable energy resources. This policy will have to align with the NPS if renewable energy projects have the potential to impact habitat for wildlife or interfere with fish passage.

2.199 *Method 6.1 Information, education and public awareness*

2.199.1 This method is relevant to issue 2. The more informed, educated and aware the public is of the effects loss of habitat and impediments to fish passage can have on biodiversity and the functioning of ecosystems, the more likely they are to want to do something about it or engage in activities which benefit habitat and fish passage rather than harm it.

2.200 *Method 6.2 Promotion*

2.200.1 This method is relevant to issue 2. Encouraging landowners, interest groups and other persons to undertake certain actions, for example the planting of riparian vegetation will help to address the issue of loss of habitat for wildlife and freshwater fish. Encouraging the safest course of impact for fish passage which is to leave the natural streambed in place, but if a crossing is needed, encourage building a bridge will ensure the safe passage of fish.

2.201 *Method 6.3 Consultation*

2.201.1 This method is relevant to issue 2. Consultation with the tangata whenua, interest groups, adjoining landowners and other interested groups is a good way to establish land management practices that protect or restore habitat for wildlife or freshwater fish and a good way to ensure any development in rivers or streams considers how to design for the safe passage of fish.

2.202 *Method 6.4 Developing guidelines for resource users*

2.202.1 The method is partially relevant to issue 2. Guidelines have already been developed for restoring degraded or lost river habitats and for restoring or creating wetlands. Guidelines could be developed for how to ensure safe fish passage.

2.203 *Method 6.5 Protocols and Accords*

2.203.1 This method is relevant to issue 2. The Dairying and Clean Streams Accord has been developed with five priorities for action to reduce the impact of dairying on streams, rivers, lakes and wetlands, as follows:

dairy cattle access to waterbodies; dairy cattle stream crossings; dairy shed effluent; nutrient management; and significant or important wetlands. The Accord promotes planting riparian vegetation which will help to address the loss of habitat in issue 2 and it promotes correct design and installation of bridges and culverts for the passage of fish. However, a protocol will need

to be developed between local authorities, organizations and landowners for access to land for an inventory of indigenous habitats and wetlands in order to establish appropriate management tools and monitor the state of habitat for wildlife and freshwater fish.

2.204 *Method 6.6 Monitoring*

2.204.1 This method is very relevant to issue 2. Monitoring populations of native biodiversity such as birds or fish will help to establish trends in those populations and whether or not they are declining from such things as loss of habitat or impediments to fish passage.

2.205 *Method 6.7 Investigations and Research*

2.205.1 This method is relevant to issue 2. Where insufficient information is known about a population of wildlife or fish or about their habitat, it is appropriate to carry out research to expand knowledge and understanding.

2.206 *Method 6.8 Prepare, implement and administer Regional Plans*

2.206.1 This method is partially relevant to issue 2. The explanation refers to the Regional Sustainable Use Plan which does not exist. But the method could be relevant if it makes appropriate provision for the protection and restoration of habitat for wildlife and freshwater fish in the Region in the Regional Coastal Plan, Regional Water Plan and others that are prepared.

2.207 *Method 6.9 Prepare, implement and administer District Plans*

2.207.1 This method is relevant to issue 2. District planning is concerned with the integrated management of the effects of the use, development and protection of land and associated resources. Co-ordination of regional and district planning is essential to achieve lake, river and wetland management objectives. The bullet points listed are still relevant but they could link more closely with the issue of loss of habitat for wildlife and fish. For example, the first one only calls for consistency in preserving the natural character of lakes, rivers and wetlands, but it could also call for consistency in protecting the habitat values these ecosystems provide.

2.208 *Method 6.10 Plans, other documents and action under other Acts*

2.208.1 This method is relevant to issue 2. Action can be taken using other Plans, documents or other Acts. For example, the Iwi Resource Management Plan for the Region, Te Tangi a Tauira has policies in place for restoring habitats that have been lost and protecting habitats for wildlife and freshwater fish. It also has policies in place to ensure that all native fish species have uninhibited passage from the river to the sea at all times, through ensuring continuity of flow ki uta ki tai.

2.209 *Method 6.11 Resource Consents*

2.209.1 This method is relevant to issue 2. Many activities carried out within, on or near lakes, rivers and wetlands may not be permitted activities in Regional and District Plans and may require resource consents. In preparing and considering resource consents, for example draining wetlands, regard should be given to the ecological criteria as set out in Step 4 below. Granting or declining resource consents or some activities will help to address the loss of habitat for wildlife and freshwater fish and the impediments to fish passage.

2.210 *Method 6.12 Economic Instruments*

2.210.1 This method is relevant to issue 2. Economic instruments can be used to curb the loss of habitat for wildlife and freshwater fish. Subsidies or grants from an Environmental Enhancement fund or such can be given for planting riparian vegetation or restoring degraded habitats. There is also the possibility of using incentive programs such as wetland mitigation banking.

2.211 *Method 6.13 Assistance*

2.211.1 This method is relevant to issue 2. Assistance can be given, in various forms such as advice or technical support, to landowners, community groups and other persons to carry out certain works. This can include advice and support on how to create or restore wetlands or degraded river habitats in order to bring back populations of native species.

2.212 *Method 6.14 Works and Services*

2.212.1 This method is not relevant to issue 2.

2.213 *Method 6.15 Delegations and Transfer of Powers*

2.213.1 This method is relevant to issue 3. It may be necessary to transfer certain powers such as compliance, back to Environment Southland that currently falls within the District Council. For example, clearance of indigenous vegetation that may be habitat for wildlife could fall under a Regional Land-Use Plan and would be enforced by Environment Southland.

2.214 *Method 6.16 Ownership*

2.214.1 This method is relevant to issue 2. In cases where areas within and adjoining lakes, rivers and wetlands are of high conservation or biodiversity value, i.e. they provide important habitat or significant wetlands, it may be appropriate that they be held in public ownership.

2.215 *Method 2.17 Classification of Water*

2.215.1 This method is no longer relevant. The Proposed Regional Water Plan has classified water into natural state waters, mountain, hill, lake-fed, spring-fed, lowland (hard bed), lowland (soft bed), Mataura 1, Mataura 2 and Mataura 3, mountain lakes, hill lakes and lowland/coastal lakes. A consultative process identified, for waterbodies outside Natural State waters, values to be protected and supported. The water plan details the water quality parameters and relevant standards that have been identified as being necessary to protect these values by focusing on the critical or most sensitive values for each waterbody.

2.216 *Method 2.18 Water Conservation Orders.*

2.216.1 This method is relevant to issue 2 because a water conservation order aims to recognise the outstanding amenity or intrinsic values that waters provide, in either a natural or modified state. Water conservation orders can be used to preserve that natural state or protect characteristics such as:

- the water body's value as a habitat or fishery
- its wild and scenic nature
- its value for recreational, historic, spiritual, cultural or scenic purposes.

2.217 Issue 3. Within the Region, significant wetlands have already been lost, and it is difficult to protect all remaining wetlands, especially as their intrinsic values are not widely understood. The loss of values on the margins of the Waituna wetlands is of particular concern, given its significance as a Wetlands of International Significance. Provision needs to be made however, for the continued opening of this lagoon. (Refer to Objective 6.1; Policies 6.1-6.3, 6.6-6.8; Methods 6.1-6.4, 6.7-6.13, 6.16, 6.18)

2.217.1 This issue is still relevant. Wetlands are continually drained and turned into pasture or their ecological value is degraded by weed invasion or grazing and trampling. The Waituna wetland is continually under pressure from development and pressure to convert margins for dairy conversions.

2.218 *Objective 6.1 To protect the natural character, heritage values and outstanding natural features of lakes, rivers and wetlands in the Region.*

2.218.1 This objective is partially relevant to issue 3. The natural character, heritage values and outstanding natural features of wetlands are important to protect in order to protect the remaining wetlands from loss, but some wetlands are not very well understood or seen to have those values, but they have important biodiversity and ecosystem service values which should be protected. It is also important to not only, protect the values of remaining wetlands, but to restore or create wetlands which may result in important biodiversity values, but lack heritage, or natural character.

- 2.219 *Policy 6.1 Protect the following wetland ecosystems from inappropriate subdivision, use and development: (lists 51 wetlands)*
- 2.219.1 This policy is partially relevant to issue 3. These wetlands listed are important and still require protection, but there are more out there than just these which need to be inventoried and their values assessed. Because many wetlands have been lost, it is also important to restore any possible ones, and create new ones if feasible.
- 2.220 *Policy 6.2 Encourage the undertaking of research investigating the relationships between wetlands and their surrounding environment and the activities that can impact upon wetlands.*
- 2.220.1 This policy is relevant to issue 3. While wetlands have been more researched and we know more about them, there is always still more to find out. The more we know about wetlands, the better we can manage them and engage the community in wanting to retain them or restore them.
- 2.221 *Policy 6.3 Establish within regional and district plans provisions for the preservation of the natural character and the protection of heritage values and outstanding natural features of lakes, rivers and wetlands in the Region.*
- 2.222 This policy is partially still relevant to issue 3. Preservation of the natural character of wetlands, protection of outstanding natural features, and protection of historic heritage are statutory requirements under the RMA. The Proposed Regional Water Plan says it will provide a framework that protects the natural character, heritage values and outstanding natural features of lakes, rivers and wetlands. Southland District Plan protects heritage values of indigenous vegetation which may be present at certain wetlands. However, Regional and district plans could go further than just protecting natural character, outstanding natural features and historic heritage by protecting wetlands based on the ecological criteria outlined in step 4 below.
- 2.223 *Policy 6.6 Enhance the water quality, amenity and instream values of lakes, rivers and wetlands and promote bank stability.*
- 2.223.1 This policy is not relevant to issue 3. While enhancing the water quality, amenity and instream values of wetlands is important, it will not help to address the continued loss of wetlands. Protecting remaining wetlands and creating new ones will achieve this.
- 2.224 *Policy 6.7 Prepare information on the impacts and inter-relationships of various activities on lakes and river beds and wetlands to improve understanding.*
- 2.224.1 This policy is not relevant to issue 3. This type of information in the form of a wetlands tool kit and a wetlands information book has been developed for the region.

- 2.225 *Policy 6.8 Provide a water management regime for Waituna Lagoon and its catchment.*
- 2.225.1 This policy is still relevant to issue 3. A water management regime for the Waituna Lagoon has not been developed, but the Proposed Regional Water Plan calls for a management plan for the Waituna to be developed.
- 2.226 *Method 6.1 Information, education, and public awareness*
- 2.226.1 This method is relevant to issue 3. Public awareness of the values of wetlands is critical in order to get landowners in the region to protect any wetlands that remain on their property, practice activities that may affect wetlands in a way that does not adversely impact them and to engage the public in restoring or creating new ones for future generations.
- 2.227 *Method 6.2 Promotion*
- 2.227.1 This method is relevant to issue 3. Promoting landowners and community groups to restore wetlands will help to ensure there is no net loss of wetlands and will help to maybe even increase the quality and quantity of wetlands in the region.
- 2.228 *Method 6.3 Consultation*
- 2.228.1 Consultation with the tangata whenua, interest groups, adjoining landowners, statutory bodies and interested people and groups is essential if there are any proposals to protect a wetlands through such means as purchasing, establishing a water conservation order, establishing significance criteria, or if there are proposals to modify or drain a wetland.
- 2.229 *Method 6.4 Developing guidelines for resource users*
- 2.229.1 This method is no longer relevant. Guidelines have been developed for grazing near a wetland, keeping a wetland wet, controlling pest animals and weeds, planting a wetland, creating or constructing a wetland, legally protecting a wetland, and creating a wildlife and fisheries haven.
- 2.230 *Method 6.7 Investigations and Research*
- 2.230.1 This method is relevant to issue 3. Wetlands in the region are being lost, but at an unknown rate because many wetlands are unaccounted for in the region. Investigation and research could be put into an inventory of wetlands to assess their values and help raise awareness if their value and benefits.
- 2.231 *Method 6.8 Prepare, implement and administer Regional Plans*
- 2.231.1 This method is relevant to issue 3. The Proposed Regional Water Plan has been developed and is almost operative. It has some provisions protecting wetlands from being lost through drainage. There is a rule that requires resource consent to

drain any regionally significant wetland or naturally occurring wetland. It is important that the plans policies are implanted so that wetlands are valued more, and the rules are enforced.

2.232 *Method 6.9 Prepare, implement and administer District Plans*

2.232.1 This method is relevant to issue 3. District plans can help to protect wetlands. For example, Southland District Council's District Plan has a HER. 3 rule which requires resource consent to clear indigenous vegetation. In many cases a wetland functions properly because of the native vegetation in it, or on its margins. If a landowner decides to drain a wetland, he or she may first clear the vegetation. The values of the wetland are then lost, so the wetland would probably be allowed to be drained. It is therefore very important for rules like the HER.3 to be utilized so that native vegetation is able to remain intact and support the functioning of a wetland.

2.233 *Method 6.10 Plans, other documents and action under other Acts*

2.233.1 This method is relevant and appropriately reflects issue 3. Te Tangi a Taurira has its own issues and policies concerning wetlands. Wetlands are an important natural and cultural resource to Ngai Tahu ki Murihiku as they are rich in biodiversity and important sources of mahinga kai and provide important ecosystem services. The RPS should account for the provisions in this plan relating to wetlands.

2.234 *Method 6.11 Resource Consents*

2.234.1 This method is relevant to issue 3. Resource consents can be used in order to ensure activities such as drainage of wetlands or clearance of indigenous vegetation that is part of a wetland only occurs in certain situations where it is appropriate and will not adversely affect the environment. Restoration and enhancement of wetland areas can also be part of a consent application where it is deemed feasible to include such conditions.

2.235 *Method 6.12 Economic Instruments*

2.235.1 This method is relevant to issue 3. Economic instruments can provide a very important means for protecting and restoring wetlands. Examples include: subsidised riparian fencing, mitigation banking, rates rebates. See below for more discussion on using economic instruments.

2.236 *Method 6.13 Assistance*

2.236.1 Assistance can be given to landowners or community groups to carry out wetland activities. For example, assistance can be given to help control pest plants and pest animals, planting a wetland, legally protecting a wetland, creating a wetland.

2.237 *Method 6.16 Ownership*

2.237.1 This method is relevant to issue 3. In cases where areas within and adjoining wetlands are of high recreational or conservation value, for example significant wetlands, it may be appropriate that they be held in public ownership.

2.238 *Method 6.18 Water Conservation Orders*

2.238.1 This method is relevant to issue 6. The RMA provides for the issuing of Water Conservation Orders, and these can be used to protect values of wetlands.

2.239 Issue 4. Many wetlands are valued by recreational enthusiasts for duck hunting, bird watching and eeling. These areas have also traditionally been used by the takata whenua as important resources for food and flax gathering. (Refer to Objectives 1.2, 4.1, 5.1, 6.1-6.3; Policies 1.2, 6.1, 6.4, 6.5; Methods 6.1-6.13, 6.16)

2.239.1 This issue is still relevant today. Wetlands attract many duck and bird species and are also habitat for eels. Wetlands are also important to Ngai Tahu ki Murihiku because they are an important source of mahinga kai. It is assumed that the real issue is that if wetlands continue to decline and disappear then so will the opportunities for recreational enthusiasts to duck hunt and bird watch and for tangata whenua to collect food and flax, although the issue does not explicitly say this.

2.240 *Objective 1.2 To recognize the importance of wahi tapu, wahi taoka, mahinga kai, and the customary use of water to Kai Tabu.*

2.240.1 This objective is relevant to issue 4. Recognizing the importance of especially wahi taoka and mahinga kai will help to ensure the continued existence of wetlands suitable for birdlife, ducks, eels and other fish species regarded as mahinga kai and could also help to ensure mitigating effects of activities by restoring or enhancing a wetland includes planting native species adapted to living in wetlands such as flax.

2.241 *Objective 4.1 To sustain the quantity of the Region's water resources so as to-*
a. meet the needs of a range of uses, including the reasonably foreseeable needs of future generations
b. safeguard the life-supporting capacity of water and related ecosystems.

2.241.1 This objective is relevant to issue 4. Wetlands are a related ecosystem to water and the quantity of water in a wetland needs to be sustained so as to remain suitable for its ecological functioning which includes as habitat for ducks, birds, eels and mahinga kai. The quantity of water of the region's wetlands needs to be sustained to meet needs of recreational users and for food gathering and flax gathering.

2.242 *Objective 5.1 To sustain the quality of the Region's water resources so as to:*
a. meet the needs of a range of uses, including the reasonably foreseeable needs of future generations

b. safeguard the life-supporting capacity of water and related ecosystems.

- 2.242.1 This objective is relevant to issue 4. Wetlands are a related ecosystem to water and the quality of water in a wetland needs to be sustained or improved so as to remain suitable for its ecological functioning which includes as habitat for ducks, birds, eels and mahinga kai.
- 2.243 *Objective 6.1 To protect the natural character, heritage values and outstanding natural features of lakes, rivers and wetlands in the Region.*
- 2.243.1 This objective is relevant to issue 4. Wetlands have natural character, heritage values and outstanding natural features because they are often teeming with birdlife and aquatic species and are good sources of native vegetation such as flax and mahinga kai. Protecting these values will help to ensure the continued existence of wetlands for recreational enthusiasts and food and flax gathering.
- 2.244 *Objective 6.2 To recognize and provide for the relationship of Maori and their culture and traditions with lakes, rivers and wetlands.*
- 2.244.1 This objective is relevant to issue 4. As issue 4 states, wetlands have been traditionally used for food and flax gathering and it is important to recognize this tradition and relationship of Maori with wetlands in order for the tradition to be able to continue.
- 2.245 *Object 6.3 To maintain and enhance public access by suitable means, to, along and across lakes, rivers and wetlands and their margins, and where appropriate, the use of those areas for recreational purposes.*
- 2.245.1 This objective is relevant to issue 4. The provision of access to the margins of lakes, rivers and wetlands is a matter of public interest. Access to rivers, lakes and wetlands for recreational purposes and the gathering of mahinga kai is considered to be a high priority. It is recognized, however, that there are areas and circumstances where restriction on public access may be necessary under other legislation, or on a short term basis.
- 2.246 *Policy 1.2 Recognize “Te Whakatau Kaupapa o Murihiku” as a Kai Tabu resource management reference planning document for the Region.*
- 2.246.1 This policy is no longer relevant. There is a new Ngai Tahu resource management reference planning document, “Te Tangi a Tauira.”
- 2.247 *Policy 6.1 Protect the following wetland ecosystems from inappropriate subdivision, use and development: (lists 51 wetlands)*
- 2.247.1 This policy is relevant to issue 4. Protecting those wetlands will also enhance and maintain populations of ducks, birds and eels for recreational enthusiasts and in some cases where flax is present at the wetland provide continued opportunity for traditional flax gathering.

- 2.248 *Policy 6.4 Consult with the tangata whenua and provide for Maori cultural and traditional spiritual values in relation to the use and management of lakes, rivers and wetlands.*
- 2.248.1 This policy is relevant to issue 4. Consultation with tangata whenua will help to ensure the use and management of lakes, rivers and wetlands will allow continued existence of important biodiversity such as flax and mahinga kai.
- 2.249 *Policy 6.5 Encourage the provision and enhancement of access to and along the beds and margins of lakes, rivers and wetlands, except where restrictions are necessary to –*
- a. protect important amenity and ecological values;*
 - b. protect sites important to the tangata whenua;*
 - c. avoid adverse environmental effects;*
 - d. protect the integrity of flood alleviation or river management works;*
 - e. protect rare and/ or endangered species;*
 - f. protect public health and safety; and*
 - g. provide for national security needs.*
- 2.249.1 Parts a-f of this policy are relevant to issue 4. Encouraging the provision and enhancement of access to and along the beds and margins of lakes, rivers and wetlands to do parts a-f will help to ensure recreational enthusiasts and tangata whenua can continue to enjoy the values wetlands provide them.
- 2.250 *Method 6.1 Information, education and public awareness*
- 2.250.1 Raising public awareness through information and education of the values wetlands hold for recreational enthusiasts and tangata whenua, will help to ensure lakes, rivers and wetlands are safeguarded for recreational enthusiasts and tangata whenua to be able to continue accessing and enjoying (unless in certain circumstances the lake, river or wetland is sensitive to those types of uses).
- 2.251 *Method 6.2 Promotion*
- 2.251.1 Promoting the values of wetlands associated with recreation and traditional food and flax gathering can lead landowners or other bodies to undertake certain actions such as legally protecting a wetland or planting riparian vegetation so they too can enjoy it for recreational or traditional purposes which will also, in turn, enhance the biodiversity.
- 2.252 *Method 6.3 Consultation*
- 2.252.1 Consultation with tangata whenua and/or recreational users of wetlands is very important especially when an application for resource consent is lodged which would aim to somehow modify the area.

2.253 *Method 6.4 Developing guidelines for resource users*

2.253.1 This method is no longer relevant to issue 4. Guidelines have been developed for how to create a wetland that is a haven for wildlife and hence good for recreational use and guidelines have also been developed for how to plant natives such as flax which could be good for traditional flax gathering.

2.254 *Method 6.5 Protocols and Accords*

2.254.1 This method is relevant to issue 4. Protocols could be established at certain wetlands, on private land for example, so that recreational users could access them or tangata whenua could for traditional food and flax gathering.

2.255 *Method 6.6 Monitoring*

2.255.1 This method is relevant to issue 4. Monitoring will be important for the abundance of species at wetlands to make sure their numbers remain stable and viable for recreational users now and for future generations.

2.256 *Method 6.7 Investigations and Research*

2.256.1 This method is relevant to issue 4. Where insufficient information is known about a resource, for example, wetlands, it is appropriate to carry out research to expand knowledge and understanding.

2.257 *Method 6.8 Prepare, implement and administer Regional Plans*

2.257.1 This method is relevant to issue 4. It is important to make appropriate provisions for the protection of natural character, heritage values and outstanding features of wetlands in the Region in the Coastal Plan, Water Plan, and other Regional Plans that are prepared. Protecting the natural character, heritage values and outstanding natural features encompasses the region's wetlands' suitability for habitat for species important to recreational users, and suitability for traditional food and flax gathering.

2.258 *Method 6.9 Prepare, implement and administer District Plans*

2.258.1 This method is relevant to issue 4. District planning is concerned with the integrated management of the effects of the use, development and protection of land and associated resources. Coordination of regional and district planning is essential to achieving wetland management objectives. Particular areas where coordination is needed in relation to wetlands used for recreational purposes and traditional food and flax gathering include:

- the need for consistency in preserving the natural character of wetlands
- the need for district planning to recognize the effects that land and water based activities and subdivision can have on wetlands

- access provisions
- consultation with tangata whenua and their participation in decision-making

2.259 *Method 6.10 Plans, other documents and action under other Acts*

2.259.1 This method is relevant to issue 4. The Iwi Resource Management Plan, Te Tangi a Taurira has its own policies for managing wetlands to provide for traditional food gathering. For example, the Plan has a policy to recognize or the importance of coastal wetland areas as mahinga kai communities and, where appropriate, expand or create new coastal wetland areas.

2.260 *Method 6.11 Resource Consents*

2.260.1 This method is relevant to issue 4. Many activities carried out within or near wetlands require resource consent. In preparing and considering resource consents, for example diversion of water or clearance of native vegetation, regard should be given to effects on wetlands which include effects on recreational use and traditional food and flax gathering.

2.261 *Method 6.12 Economic Instruments*

2.261.1 This method is relevant to issue 4. Economic instruments are an important tool for protecting wetlands. For example, in the U.S. anglers and hunters support the policy of wetland mitigation banking which aims for a “no net loss” of wetlands. Other types of economic incentives such as grants, subsidies, rates relief, or waived consent fees are useful for protecting or creating wetlands which can be used for recreational purposes or for traditional food and flax gathering by tangata whenua.

2.262 *Method 6.13 Assistance*

2.262.1 This method is relevant to issue 4. Assistance can be given to landowners, interest groups and other persons in varying ways to carry out certain works and functions, such as creating or restoring a wetland that provides biodiversity and recreational opportunities.

2.263 *Method 6.16 Ownership*

2.263.1 This method is relevant to issue 4. In cases where areas within and adjoining wetlands are of high recreational or traditional value it may be appropriate that they be held in public ownership with appropriate consultation with tangata whenua and recreational users in order to maintain access for those purposes.

2.264 [Issue 9 Agricultural runoff and inappropriate riparian management can adversely affect water quality, wetlands and estuaries. \(Refer to Objective 6.4, 8.2; Policies 6.2, 6.4, 6.6, 6.7, 8.5; Methods 6.1-6.18\)](#)

- 2.264.1 This issue is very relevant today because of the increase in the amount of dairy farms in the region which increases the amount of agricultural runoff entering waterbodies, wetlands and estuaries. Agricultural effluent tends to influence embayed coastlines and estuaries. Eutrophication, sedimentation and disease risk from agricultural effluent are big pollution issues in Southland. Poorly flushed estuaries (or parts of estuaries) and in catchments with intensive land use, tend to be the most vulnerable from this type of pollution (e.g. Waimatuku, Waituna, Lake Brunton, and parts of Jacobs and New River Estuaries). In appropriate riparian margin management is also a big issue. For example, coastal shoreline habitats function best with a natural vegetated margin which acts as a buffer from development. This buffer protects against introduced weeds and grasses, naturally filters sediment and nutrients (from agricultural runoff), and provides valuable ecological habitat. Currently, the majority of the coastal terrestrial margin in Southland (mapped area) is highly modified through cattle and sheep grazing.
- 2.265 *Objective 6.4 To avoid wherever practicable, remedy or mitigate, the adverse effects of activities in, on, under, adjacent to, or over the beds of lakes, rivers and wetlands.*
- 2.265.1 This objective is partially relevant to issue 9. It does not mention estuaries which are referred to in issue 9. Intensive land-use activities such as dairying or sheep and beef farming result in agricultural effluent runoff which degrades the quality of water. The resulting agricultural effluent can be even more detrimental to water quality if there are no buffers or riparian margins between the activity and the wetland or estuary. Avoiding, remedying or mitigating the adverse effects of these activities in, on or adjacent to the beds of lakes, rivers, wetlands (and estuaries) by using appropriate riparian margins would help to reduce this problem.
- 2.266 *Objective 8.2 To avoid, wherever practicable, adverse effects arising from sedimentation and nutrient runoff from land into waterbodies.*
- 2.266.1 This objective is more relevant than the one above to issue 9. Avoiding the adverse effects from sedimentation and nutrient runoff from land into waterbodies, particularly wetlands and estuaries, allows estuaries to be flushed and provides habitat for species which cannot live in wetlands or estuaries with degraded water quality.
- 2.267 *Policy 6.2 Encourage the undertaking of research investigating the relationships between wetlands and their surrounding environment and the activities that can impact upon wetlands.*
- 2.267.1 This policy is very relevant to issue 9. Currently the Southland Wetlands Working Party are working with Bev Clarkson, Landcare Research Wetland Ecologist investigating what the effects are of removing part of a wetland (i.e. 50m strip) on the rest of the wetland.
- 2.268 *Policy 6.4 Consult with the tangata whenua and provide for Maori cultural and traditional spiritual values in relation to the use and management of lakes, rivers and wetlands.*

- 2.268.1 This policy is relevant to issue 9. Consultation with tangata whenua in relation to the use and management of wetlands (and estuaries) is important in order to ensure their policies for activities are taken into consideration. For example they would like required that wetlands are fenced in any area where they may be at risk from stock damage and they would like a stronger focus on riparian management because riparian margins have a role in maintaining or improving ecological functioning of wetlands and estuaries.
- 2.269 *Policy 6.6 Enhance the water quality, amenity and instream values of lakes, rivers and wetlands and promote bank stability.*
- 2.269.1 Enhancing the water quality and promoting bank stability of lakes, rivers and wetlands (and estuaries) is relevant to issue 9. Enhancing the water quality means controlling agricultural runoff and promoting bank stability means decreasing erosion. Both these things can happen through good riparian management on lakes, rivers, wetlands and estuaries since most of these are all interconnected.
- 2.270 *Policy 6.7 Prepare information on the impacts and inter-relationships of various activities on lakes and river beds and wetlands to improve understanding.*
- 2.270.1 This policy is relevant to issue 9. Much information has been prepared on the impacts of various activities on lakes, river beds and wetlands. But more information should be prepared on the impacts on the functioning of wetlands from the removal of marginal strips from wetlands.
- 2.271 *Policy 8.5 Promote land use practices which avoid the contamination of soils.*
- 2.271.1 This policy is relevant to issue 9. Contaminated soils can arise from the discharge of agricultural wastes and the application of contaminants, such as chemicals to land. These can leach into ground water or run-off into surface water and degrade water quality which could in turn affect wetlands and estuaries.
- 2.272 *Method 6.1 Information, education and public awareness*
- 2.272.1 This method is always relevant. The more the public is aware, through information and education, of the way agricultural effluent and inappropriate riparian management can affect water quality, wetlands and estuaries, the more they will want to try to do something about it.
- 2.273 *Method 6.2 Promotion*
- 2.273.1 This method is always relevant. Encouraging landowners, interest groups and other persons and bodies to undertake certain actions, for example planting of riparian vegetation or adoption of newer agricultural effluent application systems will help to address degraded water quality and inappropriate riparian management.

2.274 *Method 6.3 Consultation*

2.274.1 This method is always relevant. Consultation with the tangata whenua, interest groups, landowners and statutory bodies is essential if objectives and policies are to be achieved. Consultation helps to see different views and perspectives about how to address agricultural runoff and riparian management and implement those ways.

2.275 *Method 6.4 Developing guidelines for resource users*

2.275.1 This method is partially relevant. Guidelines have already been developed such as clean streams, FDE guideline booklet and for riparian management. Upon further investigation of the effects of removing a strip from the margins of a wetland, guidelines may need to be prepared for activities involving removing the strip.

2.276 *Method 6.5 Protocols and Accords*

2.276.1 This method is still relevant to issue 9. The Dairying and Clean Streams Accord has been developed between Fonterra, Minister of Agriculture and Forestry, the Minister for the Environment, and Local Government NZ to stop the decline in water quality from dairying activities. However, Forest and Bird and Fish and Game have report the accord fails to do this so it may be appropriate to re-visit this accord.

2.277 *Method 6.6 Monitoring*

2.277.1 This method is relevant to issue 9. Monitoring will be necessary to determine trends in water quality and effects on wetlands and estuaries and causes of the effects, (e.g. increased intensive land-use, agricultural runoff).

2.278 *Method 6.7 Investigations and Research*

2.278.1 This method is relevant to issue 9. It will be important to investigate and seek advice on the effects of removing a strip (e.g. 50m strip) from a wetland on the rest of the wetland and its hydrological function. Further investigations and research can be undertaken relating to cumulative effects of agricultural runoff.

2.279 *Method 6.8 Prepare, implement and administer Regional Plans*

2.279.1 This method is currently being done. The Proposed Regional Water Plan has provisions for meeting water quality standards and the Regional Effluent Land Application Plan is under review to deal with agricultural effluent discharges. A Regional Land-Use Plan could be developed to deal with riparian vegetation as well.

2.280 *Method 6.9 Prepare, implement, and administer District Plans*

- 2.280.1 This method is relevant to issue 9. The Regional Council could jointly prepare and implement a Regional Land-Use Plan with the District Councils to recognize the effects that land and water based activities and subdivisions can have on wetlands and estuaries.
- 2.281 *Method 6.10 Plans, other documents and action under other Acts*
- 2.281.1 This method is relevant to issue 9. Other plans such as Te Tangi a Tauira have policies which should be taken into account for managing agricultural effluent and riparian management and the effects on wetlands and estuaries.
- 2.282 *Method 6.11 Resource Consents*
- 2.282.1 This method is relevant to issue 9. Requirement for riparian restoration or establishment could be used as a condition of a resource consent. Riparian zone management should be a basic requirement for the protection and restoration of water quality in intensively farmed catchments.
- 2.283 *Method 6.12 Economic Instruments*
- 2.283.1 This method is relevant to issue 9. Economic instruments can be used to engage landowners or interested groups in riparian vegetation planting which helps to filter nutrients from entering waterbodies, creates ecological corridors and can prevent weed invasion of wetlands.
- 2.284 *Method 6.13 Assistance*
- 2.284.1 This method is relevant to issue 9. Assistance can be given to landowners, interest groups and other persons to carry out certain works and functions. The form that the assistance can take may vary. Where riparian areas are subject to approved management, or voluntary protection, assistance will be given towards the management of any pest plants and pest animals in those areas. Free advice through Land Sustainability can be given to landowners about appropriately using effluent application systems.
- 2.285 *Method 6.14 Works and Services*
- 2.285.1 This method is not relevant to issue 9. Landowners are ultimately responsible for the agricultural runoff from their land and riparian management on their properties.
- 2.286 *Method 6.15 Delegations and Transfer of Powers*
- 2.286.1 This method is relevant to issue 9. It may be necessary to transfer certain powers such as compliance, back to Environment Southland that currently falls within the District Council. For example, clearance of indigenous vegetation, especially in riparian zones, could fall under a Regional Land-Use Plan and would be enforced by Environment Southland.

2.287 *Method 6.16 Ownership*

2.287.1 This method is partially relevant to issue 9. Holding a wetland or estuary in public ownership, could help to address inappropriate riparian management of the wetland or estuary, but agricultural runoff could still pose a problem since it is a non-point source of pollution and could be happening upstream of the wetland or estuary and affect either even if they are publicly owned.

2.288 *Method 6.17 Classification of Water*

2.288.1 This method has been done through the Proposed Regional Water Plan. However, it will need to be reviewed either every 10 years or earlier if appropriate.

2.289 *Method 6.18 Water Conservation Orders*

2.289.1 This method is partially relevant for the same reason as in Method 6.16. Since agricultural runoff is a non-point source problem, it can happen far from the wetland or estuary that has a water conservation order issued and still cause either water quality problems.

2.290 [Issue 10. Vegetation clearance and landscape modification can result in increased sediment loads in streams and rivers. \(Refer to Objectives 2.3, 5.2, 6.1, 6.4, 8.2; Policies 6.3, 6.5-6.7, 6.11; Methods 6.1-6.18\)](#)

2.290.1 This issue is very relevant today. Vegetation clearance still happens in the region, especially in or on the margins of wetlands which degrades the functioning of the wetland. Vegetation clearance increases erosion which increases sediment loads in rivers and streams which in turn results in poorly flushed estuaries. From a biodiversity perspective vegetation clearance results in a loss of terrestrial biodiversity because of a loss of habitat and results in a loss of aquatic biodiversity because of less shade, and increased contaminants (nutrients) and sediments in the aquatic habitat.

2.291 *Objective 2.3 does not exist*

2.292 *Objective 5.2 To ensure that in the use and development of water and land resources, and the discharge of contaminants, water quality is maintained and wherever practicable enhanced.*

2.292.1 This objective is relevant to issue 10. The use and development of water and land resources such as converting bush or wetlands into productive farm pasture can result in clearance of vegetation or landscape modification (for example drainage of a wetland) and degrade water quality. It is important to ensure that this type of conversion does not have these results so that water quality can be maintained and more likely be enhanced so as to fit with the BHAG.

2.293 *Objective 6.1 To protect the natural character, heritage values and outstanding natural features of lakes, rivers and wetlands in the Region.*

- 2.293.1 This objective is relevant to issue 10 if the existence of vegetation is considered to be part of the natural character, heritage values or outstanding natural features of lakes, rivers and wetlands in the Region. It could be more relevant if “to protect the biodiversity values” was also added.
- 2.294 *Objective 6.4 To avoid wherever practicable, remedy or mitigate, the adverse effects of activities in, on, under, adjacent to, or over the beds of lakes, rivers and wetlands.*
- 2.294.1 This objective is relevant to issue 10. Avoiding adverse effects of activities such as vegetation clearance on or adjacent to the beds of lakes, rivers and wetlands will reduce the chances of erosion and sediment loading and will help to maintain biodiversity as well.
- 2.295 *Objective 8.2 To avoid, wherever practicable, adverse effects arising from sedimentation and nutrient runoff from land into water bodies.*
- 2.295.1 This objective is relevant to issue 10. Avoiding adverse effects arising from sedimentation and nutrient runoff from land would include ensuring vegetation is not cleared on land.
- 2.296 *Policy 6.3 Establish within regional and district plans provisions for the preservation of the natural character and the protection of heritage values and outstanding natural features of lakes, rivers and wetlands in the region.*
- 2.296.1 Preserving the natural character, heritage values and outstanding natural features of lakes, rivers and wetlands would most likely include preserving any vegetation related to those areas which provides important biodiversity values and water quality values for the areas.
- 2.297 *Policy 6.5 Encourage the provisions and enhancement of access to and along the beds and margins of lakes, rivers and wetlands, except where restrictions are necessary to-*
- A protect important amenity and ecological values;*
 - B protect sites important to the takata whenua;*
 - C avoid adverse environmental effects;*
 - D protect the integrity of flood alleviation or river management works;*
 - E protect rare and/ or endangered species;*
 - F protect public health and safety; and*
 - G provide for national security needs*
- 2.297.1 This policy is not relevant to issue 10. Providing access to and along the beds and margins of lakes, rivers, and wetlands will not really address the issue of vegetation clearance.
- 2.298 *Policy 6.6 Enhance the water quality, amenity and instream values of lakes, rivers and wetlands and promote bank stability.*

- 2.298.1 This policy is relevant to issue 10. Enhancing the water quality, amenity values and bank stability of lakes, rivers and wetlands will no doubt require maintaining or planting more vegetation and stopping any clearance.
- 2.299 *Policy 6.7 Prepare information on the impacts and inter-relationships of various activities on lakes and river beds and wetlands to improve understanding.*
- 2.299.1 This policy is relevant to issue 10. Currently the Southland Wetlands Working Party is looking to prepare a Land Development brochure covering the impacts and inter-relationships of various activities on lakes, rivers and wetlands.
- 2.300 *Policy 6.11 Manage the effects of activities that could adversely impact on the quality and quantity of water in rivers and lakes used for public and rural water supplies, and the structures used to draw such waters.*
- 2.300.1 This policy is partially relevant to issue 10. The effects of activities, such as vegetation clearance, that could adversely impact on the quality of water in rivers and lakes includes sediment and nutrient loading and these effects should be managed by, for example, planting vegetation. Managing the effects of structures to draw such waters probably is not so relevant to this issue.
- 2.301 *Method 6.1 Information, education and public awareness*
- 2.301.1 This method is relevant to issue 10. Public education and awareness will lead to a better understanding of the effects of vegetation clearance and landscape modification which may help to slow or stop them from occurring and can even help to restore vegetation or landscapes.
- 2.302 *Method 6.2 Promotion*
- 2.302.1 This method is relevant to issue 10. Promoting the benefits intact vegetation and landscapes can have on water quality can help to maintain or enhance vegetation and landscapes in the region.
- 2.303 *Method 6.3 Consultation*
- 2.303.1 This method is relevant to issue 10. Consultation with the tangata whenua, interest groups, landowners and interested people, especially over landscape modification, is essential so that the region has some it can be proud of to pass to future generations.
- 2.304 *Method 6.4 Developing guidelines for resource users*
- 2.304.1 This method is still relevant to issue 10. Guidelines have been developed for a range of activities which might involve vegetation clearance such as grazing stock. Guidelines are in the process of being developed land development activities and applying for resource consent to clear vegetation or modify wetlands.

2.305 *Method 6.5 Protocols and Accords*

2.305.1 This method is relevant to issue 10. A Dairying and Clean Streams Accord has been developed, but it does not cover vegetation clearance.

2.306 *Method 6.6 Monitoring*

2.306.1 This method is relevant to issue 10. Monitoring could be used to monitor possible water quality degradation resulting from clearance of vegetation or increased water quality due to planting of vegetation.

2.307 *Method 6.7 Investigations and Research*

2.307.1 This method is still relevant to issue 10. Much is already known about the effects of vegetation clearance on water quality because of sediment and nutrient loading, but science is always changing and/or improving so it is important to always further investigate and research.

2.308 *Method 6.8 Prepare, implement and administer Regional Plans*

2.308.1 This method is relevant to issue 10. It will be important to make appropriate provisions for the protection and restoration of vegetation that remains or that has been cleared in the Regional Coastal Plan, and a Regional Land-Use plan if developed.

2.309 *Method 6.9 Prepare, implement and administer District Plans*

2.309.1 This method is relevant to issue 10. It is important to coordinate regional and district planning to achieve lake, river and wetland management objectives. Particular areas where coordination is needed include: the need for district planning to recognize the effects that land and water based activities (such as vegetation clearance) and subdivision can have on lakes, rivers and wetlands.

2.310 *Method 6.10 Plans, other documents and action under other Acts*

2.310.1 This method is relevant to issue 10. The Iwi Resource Management Plan Te Tangi a Tauira has policies regarding vegetation clearance, landscape modification and effects of water quality which will need to be considered.

2.311 *Method 6.11 Resource Consents*

2.311.1 This method is relevant to issue 10. In the SDC District Plan resource consent is required to clear native vegetation. It may be appropriate to use a 'one stop shop' consenting process of farm activities requiring consent from the district council and Environment Southland which would cover the clearance of vegetation. In considering consents, regard should be given to the effects vegetation clearance has on biodiversity and water quality.

2.312 *Method 6.12 Economic Instruments*

2.312.1 This method is relevant to issue 10. Economic instruments are a good tool to use to maintain vegetation or restore it.

2.313 *Method 6.13 Assistance*

2.313.1 Assistance can be given to landowners, or community groups in a variety of ways to help with protecting vegetation (i.e. fencing) and with planting.

2.314 *Method 6.14 Works and Services*

2.314.1 This method is not relevant to issue 10. It cannot really address vegetation clearance.

2.315 *Method 6.15 Delegations and Transfer of Powers*

2.315.1 This method is relevant to issue 10. It may be appropriate to delegate the control over vegetation clearance to the Regional Council since it has a large impact on water quality. For example, it may be necessary to transfer certain powers such as compliance, back to Environment Southland that currently falls within the District Council. The clearance of indigenous vegetation could fall under a Regional Land-Use Plan and would be enforced by Environment Southland.

2.316 *Method 6.16 Ownership*

2.316.1 This method is relevant to issue 10. In cases where areas within and adjoining lakes, rivers and wetlands are of high conservation values and contain vegetation that may be under significant development pressure, it may be appropriate that they be held in public ownership.

2.317 *Method 6.17 Classification of Water*

2.317.1 This method has been done through the Proposed Regional Water Plan.

2.318 *Method 6.18 Water Conservation Orders*

2.318.1 It is unclear whether a water conservation order can protect against vegetation clearance. Orders may be applied over rivers, lakes, streams, ponds, wetlands, or aquifers, and can cover freshwater or geothermal water. If granted by the Minister, a water conservation order can restrict or prohibit water 'takes', discharges and other uses of the water. It doesn't really seem to apply to vegetation.

2.319 [Issue 14. The unsustainable harvesting of sphagnum moss adversely affects the ecological values of wetlands. \(Refer to Objectives 6.1, 6.2, 6.4; Policy 6.14; Methods 6.1, 6.2, 6.6-6.11\)](#)

- 2.319.1 There is no detected active sphagnum harvesting currently, however this issue is still relevant because the amount undertaken depends on markets and hence potential revenue so it is something that could be an issue again and so should be kept. Much of the peat soils in bogs are created through the decomposition of sphagnum. The harvesting results in the removal of sphagnum and as part of harvesting some other species may also be cut or removed. Therefore the bog vegetation is disturbed. The bog vegetation is reasonably resilient and will regenerate, dependent upon the frequency of harvesting. Other impacts are often associated with access. Often the sphagnum and/or harvesting operators travel by 4-wheeler bikes. These can create tracks which may impact upon drainage patterns and may also introduce weeds. Some tracks are still evident despite no use for several years.
- 2.320 *Objective 6.1 To protect the natural character, heritage values and outstanding natural features of lakes, rivers and wetlands in the Region.*
- 2.321.1 This objective is relevant to issue 14. The natural character, heritage values and outstanding natural features of wetlands can be harmed from sphagnum moss harvesting especially through access means. If sphagnum moss harvesting occurs again, it will be important to protect these values from those impacts.
- 2.322 *Objective 6.2 To recognize and provide for the relationship of Maori and their culture and traditions with lakes, rivers and wetlands.*
- 2.322.1 This objective is relevant to issue 14. If harvesting was to occur again, vehicle damage to wetlands and the harvesting itself could negatively impact upon the relationship of Maori and traditions with wetlands.
- 2.323 *Objective 6.4 To avoid where practicable, remedy or mitigate the adverse effects of activities in, on, under, adjacent to, or over the beds of lakes, rivers and wetlands.*
- 2.323.1 This objective is relevant to issue 14. The effects of activities such as harvesting sphagnum moss in a wetland relate to the disturbance of bog vegetation and vehicle damage. These effects need to be avoided if harvesting was to occur again.
- 2.324 *Policy 6.14 Promote the management of sphagnum moss in a sustainable manner that avoids long term environmental effects on wetlands.*
- 2.324.1 This policy is relevant to issue 14. This would include promoting ways to reduce impact from vehicle access.
- 2.325 *Method 6.1 Information, education and public awareness*
- 2.325.1 This method is relevant to issue 14. Raising public awareness, particularly of the effects vehicles can have on wetlands used for sphagnum moss harvesting can help to find solutions to this issue.

- 2.326 *Method 6.2 Promotion*
- 2.326.1 Promoting more benign ways to harvest sphagnum moss will help to reduce environmental impacts on wetlands.
- 2.327 *Method 6.6 Monitoring*
- 2.327.1 This method is relevant to issue 14. If harvesting was to occur again, the wetlands would need to be monitored to see if drainage was affected by vehicles or if there was increased weed invasion. The bog vegetation would also need to be monitored to see how much other species are being removed as “bycatch”.
- 2.328 *Method 6.7 Investigations and Research*
- 2.328.1 This method is relevant to issue 14. Investigations and research could be undertaken to find alternative ways to harvest sphagnum moss without harming other species or causing vehicle damage.
- 2.329 *Method 6.8 Prepare, implement and administer Regional Plans*
- 2.329.1 This method is relevant to issue 14. Regional Plans could include policies or rules for harvesting sphagnum moss. For example it could be a controlled or discretionary activity and require consent.
- 2.330 *Method 6.9 Prepare, implement and administer District Plans*
- 2.330.1 This method is not relevant to issue 14. Since harvesting occurs in a bed of a wetland, this issue falls under the function of Regional Plans.
- 2.331 *Method 6.10 Plans, other documents and action under other Acts*
- 2.331.1 This method is relevant to issue 14. The Iwi Resource Management Plan Te Tangi a Tauira has policies in place for protecting wetlands from modification.
- 2.332 *Method 6.11 Resource Consents*
- 2.332.1 Harvesting sphagnum moss could be an activity that would require resource consent. In considering 3resource consents, regard should be given to the effects of vehicle damage, weed invasion and effects of other species in the wetland.

Issue	Relevant	Relevant Objectives	Relevant Policies	Relevant Methods
2	Yes	6.1(somewhat), 6.4	4.4, 6.1(somewhat), 6.3(somewhat), 6.6, 14.5(somewhat)	6.1, 6.2, 6.3, 6.4(partially), 6.5, 6.6, 6.7, 6.8(partially), 6.9, 6.10, 6.11, 6.12, 6.13, 6.15, 6.16, 6.18
3	Yes	6.1(partially)	6.1(partially), 6.2, 6.3(partially), 6.8	6.1, 6.2, 6.3, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13, 6.16, 6.18
4	Yes	1.2, 4.1, 5.1, 6.1,	6.1, 6.4, 6.5	6.1, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 6.9,

Issue	Relevant	Relevant Objectives	Relevant Policies	Relevant Methods
		6.2, 6.3		6.10, 6.11, 6.12, 6.13, 6.16
9	Yes	6.4(partially), 8.2	6.2, 6.4, 6.6, 6.7, 8.5	6.1, 6.2, 6.3, 6.4(partially), 6.5, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13, 6.14, 6.15, 6.16(partially), 6.18
10	Yes	5.2, 6.1, 6.4, 8.2	6.3, 6.6, 6.7, 6.11(partially)	6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13, 6.15, 6.16
14	Yes	6.1, 6.2, 6.4	6.14	6.1, 6.2, 6.6, 6.7, 6.8, 6.10, 6.11

Appendix 3 - An assessment of issues presently included in the Southland District Plan

3.1 Section 1 ‘The Resources of the District’ of the existing Southland District Plan identifies the District Council’s obligations to consider issues associated with the management of areas of indigenous flora and fauna. The Plan recognises that Section 6(c) of the Resource Management Act requires the Council to provide for the management of indigenous vegetation resources and notes that the Southland District has many areas of significant indigenous vegetation and habitats of indigenous fauna, including habitats of threatened species.

3.2 The existing District Plan provides the following breakdown of the areas of indigenous forest in the District:

1.	Those administered by the Department of Conservation	
	Western Southland	105000 hectares
	Fiordland National Park	1212000 hectares
	Northern Southland	29500 hectares
	Eastern Southland	17100 hectares
	Catlins Otago	36000 hectares
	Stewart Island	<u>147100 hectares</u>

TOTAL	<u>1646900 hectares</u>
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2.	Indigenous Forest in Private Ownership	
	Primary Regeneration of Native Forest	2649.5 hectares
	Podocarp/Hardwood/Shrub	6520 hectares
	Beech	11224.5 hectares
	Beech/Podocarp/Hardwood	2900 hectares
	Podocarp/Hardwood	<u>5551.5 hectares</u>

TOTAL	<u>28845.5 hectares</u>
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TOTAL FOREST COVER 26196 hectares (excluding native shrub)

3.	Maori Lands	
	Waitutu	2200 hectares
	Western Rowallan	1720 hectares
	Rowallan Alton	13200 hectares
	Hokonui	5210 hectares
	Marahiku	180 hectares
	Stewart Island	<u>11210 hectares</u>

TOTAL	<u>33720 hectares</u>
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4. Crown Beech Management Programme

TOTAL 12000 hectares

3.3 The figures used in table above show a breakdown of ownership and land areas of indigenous forest in the District and come from information sourced in 1992. As such the figures are now considered to be quite dated and new estimates of indigenous vegetation cover within the District would need to be sourced for inclusion in the second generation District Plan.

3.4 *Framing of the Indigenous Flora and Fauna Resource and Related Issues*

3.4.1 The list above and most of section 1.7 'Indigenous Fauna and Flora' of the existing District Plan has a focus on forested areas of indigenous vegetation. Other areas of indigenous flora and fauna are briefly mentioned including those found in wetland areas but the focus is mainly around indigenous forests. In terms of the second generation Southland District Plan and the framing of indigenous flora and fauna issues it is important that other areas of significant indigenous vegetation such as wetlands and tussock grasslands are identified when the issue of indigenous vegetation is framed. The importance of these areas of indigenous flora and fauna and the biodiversity values associated with them should be noted along with those of indigenous forest areas. Information on the estimated areas covered by these habitats could be listed along with updated estimates of the remaining areas of indigenous forest.

3.5 *Indigenous Forest in Government Ownership*

3.5.1 Although the information in section 1.7 'Indigenous Fauna and Flora' of the existing District Plan is dated it does provide a useful starting point in terms of assessing areas of indigenous vegetation within the Southland District and the biodiversity values associated with them. Those forest areas of indigenous vegetation in section 1 of the table are administered by the Department of Conservation (DOC) and as such are subject to a management regime that is focussed on their preservation and enhancement. Most of the 12,000 ha that was managed under the Crown Beech Management Programme is also now managed and administered by the DOC and is therefore also subject to a management regime focussed on its preservation and enhancement. The area of indigenous forest managed by the Department of Conservation may well have increased since this information was sourced in 1992 through additions to the DOC estate within Southland. In terms of biodiversity the indigenous flora and fauna located within these forest areas is protected and therefore does not need to be a focus in terms of the second generation Southland District Plan.

Appendix 4 - Ecological significance criteria

- 4.1 **Representativeness:** Whether the site includes a stand of vegetation that is a good example of the typical vegetation of its ecological district. 'Typical' refers to the common vegetation types at a baseline state (usually 1840 or pre-human) at which the vegetation is assumed to have been closest to its original condition. The assessment of representativeness necessarily incorporates information on the quality (e.g. structure and composition) of the vegetation, and comparison with the quality of stands of the same (or similar) vegetation type that occur elsewhere in the ecological district.
- 4.2 **Indigenous cover on LENZ environments:** Whether the site includes Level IV land environments which have less than 20% indigenous cover remaining, or on which less than 20% of the indigenous cover is legally protected.
- 4.3 **Wetlands and sand dunes:** Whether the site includes wetland or sand dune habitats, and the extent that these are covered by indigenous vegetation.
- 4.4 **Rarity:** Whether a site provides habitat for a species, vegetation type, or ecosystem that is threatened or uncommon at national, regional, or local scales. For this criterion, the national scale should include reference to the most recent national classification of threatened and uncommon species. Regional rarity should be assessed at the scale of Southland Region, and local rarity at the scale of the ecological district.
- 4.5 **Distinctiveness/special features:** Whether the site includes any distinctive or unusual features such as species distribution limits, intact ecological sequences, type localities, intact ecological functions, ecosystems that are 'originally rare' on a national scale, or any other special ecological features not covered by other criteria.
- 4.6 **Diversity and pattern:** Whether the site contains a high diversity of species, habitats, ecosystems and/or landforms, or exhibits complex patterning of ecological features. When comparing species richness between sites, it is important to compare 'apples with apples', because different ecosystems can have intrinsic differences in species richness.
- 4.7 **Naturalness/intactness:** Whether the site contains vegetation and habitat types that are less affected by pests, weeds, or other modifications, relative to similar vegetation and habitat types elsewhere in the ecological district.
- 4.8 **Ecological context:** The relationship between the site and its surroundings. For example, whether the site has an important role in ecological processes such as dispersal and migration, buffering of adjacent indigenous vegetation or ecosystems, or hydrological functions.

- 4.9 **Fauna habitat:** Whether the site is an important feeding, breeding, roosting, nesting, and/or resting site for indigenous fauna, whether on a temporary, seasonal, or permanent basis.
- 4.10 **Size and shape:** The degree to which the size and shape of the site affect its long-term viability in the absence of active management.
- 4.11 **External Funding Agencies**
- The national Biodiversity Advice and Condition Funds administered by the Department of Conservation and Ministry for the Environment which are restricted to use on private land.
 - The Community Conservation Fund which allows community groups to apply for funding to undertake biodiversity projects on land administered by Crown agencies and regional and local councils.
 - The Queen Elizabeth the Second National Trust (QEII) which fosters voluntary uptake of legally-binding covenants to protect and manage biodiversity on private land.
 - Various biodiversity funds provided by commercial businesses to generate goodwill, for example the Honda Tree Fund, and support for wetlands from Banrock Station winery.
 - Carbon storage incentives such as the Permanent Forest Sink Initiative operated by the Ministry for Agriculture and Fisheries. Regenerating indigenous forests may also be eligible for allocation of tradable carbon units.

Appendix 5 - Examples of Incentives used in Taranaki Region

5.1 New Plymouth District Council

5.1.1 The New Plymouth District Plan provides an incentive of one extra allotment for land owners of significant natural areas that are subdividing and who formally protect a significant natural area through a covenant.

5.1.2 New Plymouth District Council has also implemented a significant natural areas landowner liaison programme and an incentives programme to encourage the formal protection of areas of indigenous forest. The incentives programme includes annual funding through the heritage protection fund and rates relief for formally protected areas.

5.2 Taranaki Regional Council

5.2.1 The Taranaki Regional Council is considering expanding the funding criteria of its Environmental Enhancement Grant scheme to not only protect wetlands and enhance fish passage, but also protect other areas that are regionally significant for biodiversity reasons. Any funding application for an Environmental Enhancement Grant would be considered on a case by case basis and could include application for costs associated with:

- formally protecting land (e.g. surveying and covenanting land);
- fencing land or waterways to exclude livestock;
- removing or modifying structures that are barriers to fish passage.

5.2.2 Expansion of the Environmental Enhancement scheme to include other ecosystems potentially increases the cost of the scheme, but this is considered appropriate given the wider community values associated with the areas being targeted and the significant biodiversity benefits that are anticipated. In addition to the Environmental Enhancement scheme, consideration may be given to rates relief where the landholder has formally protected land for biodiversity purposes. Other assistance includes the provision of native plants at low cost to landholders to promote the ecological functioning or connectivity of indigenous vegetation, the provision of pest control equipment, and the undertaking of pest control.

5.2.3 The Taranaki Regional Council has further financial incentives that can be provided to promote the maintenance and enhancement of indigenous biodiversity, including:

- funding, in part or in whole, goods, works or services that would mutually benefit both the landholder and the public. for example, this might be the covenanting and/or fencing of regionally significant natural areas or pest plant and animal management;
- rates relief;

- leases, management agreements, covenants or access rights securing the protection of natural values on privately owned or managed property;
- purchasing land through active acquisition or via properties containing regionally significant natural values becoming available on the open market;
- the provision of native plants to those undertaking restoration projects.

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